



**ASSESSMENT OF THE USE OF RISK-BASED PRICING OF MORTGAGE LOANS BY
COMMERCIAL BANKS IN LESOTHO**

By

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ABSTRACT

The prevalence of highly restructured loans in Lesotho raises concerns about impeded economic growth. To address this concern, this study investigated the use of risk-based pricing of mortgage loans by commercial banks in Lesotho. The objectives were to examine (i) the parameters used by commercial banks when pricing mortgage loans, (ii) challenges commercial banks encounter in implementing risk-based pricing and (iii) exploring ways in which commercial banks in Lesotho may efficiently adopt risk-based pricing for mortgage loans.

The study was quantitative and employed a survey research design to collect primary data. Purposive and convenience sampling criteria were used to select experts in the areas of mortgage loans. These sampling techniques yielded a sample of 63 respondents (37 males and 26 females). Experts were primarily from regulatory authorities and banks, with additional representation from finance professionals. Data were collected using a structured questionnaire and analysed using descriptive, factor and correlation analysis.

In terms of objective one, the results show that commercial banks in Lesotho use borrower income level, borrower credit score, employment type, loan-to-value ratio, cost of capital, property location and value, and cost of funds to price mortgage loans. As for the second objective, the main challenges in implementing risk-based pricing on mortgage loans include operational factors: insufficient staff training on risk-based pricing models, inconsistent borrower credit history and lack of credit scoring and data analytics tools. Regarding the third objective, this study shows that efficient adoption of risk-based pricing on mortgage loans should consider an investment in advanced credit scoring models, educating borrowers about risk-based pricing, training staff on risk management, and strengthening regulatory requirements for transparency. This study contributes to risk-based mortgage pricing literature, providing insights for Lesotho's banks, policymakers, and regulators to enhance the national financial system.

Keywords: financial stability, mortgage loans, prime lending rate, restructured loan, risk-based pricing.

DECLARATION

I, Matokoloho Masakoane, declare that this research report is my work. I solemnly confirm that, to the best of my knowledge, it is original and has never been submitted or published anywhere. This report is being submitted for the partial fulfilment of the requirements of the Master of Management in Finance and Investment at Wits Business School, Johannesburg. I confirm that before conducting this research, I received an ethical clearance certificate from the research committee of the Wits Business School. I further declare that I have not submitted this research for any degree or examination at this or any other University.



Signed on the 26th day of March 2025 in Maseru

DEDICATION

I dedicate this milestone to my dear grandmother, who sadly passed away during this journey. Your love, sacrifices, and wisdom will forever be remembered.

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“Educate a woman, educate a community” – Malala Yousafzai

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LIST OF ABBREVIATIONS AND ACRONYMS

CBL	Central Bank of Lesotho
CAPM	Capital Asset Pricing Model
CMA	Common Monetary Area
COVID-19	Coronavirus Disease 2019
DTI	Debt-to-Income Ratio
EAD	Exposure at default
ECL	Expected Credit Loss
FCP	Financial Consumer Protection
FICO SCORES	Fair Isaac Corporation scores
GDP	Gross Domestic Product
IMF	International Monetary Fund
IT	Information Technology
LGD	Loss Given Default
LSL	Lesotho Loti
LTV	Loan-to Value Ratio
OECD	Organisation of Economic Co-operation and Development
NCA	National Credit Act of South Africa
NPL	Non-performing loan
PCA	Principal Component Analysis
PD	Probability of default
SA	South Africa
SADC	Southern African Development Community
SARB	South African Reserve Bank
UN	United Nations
ZAR	South Africa Rand

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The role of credit in driving economic growth is undeniably crucial. When used effectively and transparently by individuals, businesses, and governments, credit can enhance the production of economic goods, elevate living standards, and reduce dependence on public taxation for revenue generation (Joseph, 2013). According to Mukatuni (2021), credit facilitates the transfer of financial resources from surplus units to deficit units, promoting a more efficient allocation of economic resources and, consequently, stimulating economic growth.

Commercial banks occupy a pivotal position in the lending landscape, serving as primary financial intermediaries that connect individuals and organisations with surplus capital to those requiring funding (Saunders & Linda, 2002). These institutions generate income by securing deposits from surplus units at lower interest rates and subsequently extending loans to deficit units at elevated rates (Motelle & Mokete, 2018). Lending activities are a significant source of income for commercial banks (Mukatuni, 2021). Consequently, loan pricing has become a critical factor influencing profitability and overall financial performance (Muller et al., 2024).

This research investigates risk-based pricing as a fundamental component of mortgage loan pricing (Handhika et al., 2021), which has garnered considerable discussion, particularly following the 2008 financial crisis (Thoka, 2015). The necessity of accurate mortgage loan pricing cannot be overstated. Excessive pricing of residential loans can have considerable adverse effects on both lenders and borrowers. Higher interest rates on mortgages might result in elevated default rates as borrowers struggle to honour their monthly payments (Njoki, 2014). The mispricing of mortgage loans poses a risk to commercial banks' financial stability and profitability, as demonstrated by the 2007-2009 financial crisis, which stemmed from the mispricing of mortgage loans (Magri, 2018).

These global impediments in mortgage pricing are particularly relevant in Lesotho, where the banking sector's structure and economic constraints magnify the risks associated with loan pricing decisions (International Monetary Fund (IMF), 2019). Therefore, comprehending the Lesotho banking landscape is crucial for assessing the implementation of risk-based pricing strategies and their influence on mortgage affordability and accessibility.

Lesotho's banking sector comprises four (4) commercial banks. These include three subsidiaries of South African banks—Standard Lesotho Bank, Nedbank Lesotho, First National Bank (FNB) Lesotho—and the local Lesotho PostBank (Kwong & Kurosaki, 2023). Standard Lesotho Bank, a subsidiary of South Africa's Standard Bank Group, is the largest in terms of assets. Nedbank Lesotho Limited, a subsidiary of South Africa's Nedbank Group, is the second largest, followed by First National Bank Lesotho, a subsidiary of South Africa's FirstRand. The fourth and smallest commercial bank is Lesotho PostBank, which is wholly owned by the government of Lesotho (Central Bank of Lesotho, 2019).

International Monetary Fund (IMF, (2019) highlighted that, despite the profitability and liquidity of the banking sector, a larger portion of their assets are invested abroad and in government securities. This practice makes access to credit difficult for small and medium enterprises (SMEs) in Lesotho and thus a barrier to financial inclusion and economic growth (FinMark Trust, 2023). Another challenge, which is indicated as a barrier for financial inclusion, is high banking service fees (International Monetary Fund (IMF), 2019). High banking service fees, including the prime lending rate, limit individuals and SMEs from borrow formally from commercial banks (Matooane, Bhanye, & Matamanda, 2023).

The financial Institutions' risk-averse investment strategies and high pricing structures manifest in the low appetite of commercial banks for long-term financing, such as mortgage loans, further exacerbating financial exclusion for individuals seeking homeownership. The Central Bank of Lesotho (2023) indicates that the housing market in Lesotho remains in its nascent stages, with commercial banks predominantly favouring the provision of unsecured personal loans over mortgage loans (Central Bank of Lesotho, 2019). Unsecured personal loans, characterised as short-term credit

without asset-based collateral, are priced to reflect the heightened risk borne by lenders (Mukatuni, 2021). Conversely, a mortgage loan denotes credit extended for property acquisition, where the property is collateral (Magri, 2018).

The Central Bank of Lesotho's (2023) financial stability report underscores this trend by showing that in 2023, credit extended to the business sector constituted only 27.2% of commercial banks' loan portfolios, while household credit represented 70.2%. Within the household credit, personal loans accounted for 52.3%, whereas mortgage loans constituted a mere 17.9%. Moreover, there is a noted increase in restructured mortgage loans (Central Bank of Lesotho, 2023). The increased number of restructured mortgage loans raises concerns about their impact on the real estate market, household finances and the banking sector's stability.

Definition of Key Concepts

Establishing precise definitions for these core concepts is essential to ensure a mutual comprehension of the terminology employed throughout this investigation into risk-based mortgage loan pricing within the Lesotho context.

Risk-Based Pricing: Risk-based pricing represents a methodology to determine interest rates for borrowers. In this approach, lenders assign interest rates to individual borrowers or borrower categories, predicated on credit risk assessments, which incorporate factors such as credit scores, income, and down payments (McCoy, 2007). This technique utilises credit scoring systems, such as FICO scores, to ascertain the appropriate risk premium to a loan (Giacoletti et al., 2021). The basic principle is to align interest rates with the probability of default. A higher likelihood of default corresponds with a higher interest rate charged and vice versa (Magri, 2018).

Ghosh (2012) created a risk-based pricing model, an enhancement of the model initially suggested by Phillips. The Phillips risk pricing model classifies applicants into two or more categories based on the lender's risk level evaluation (Phillips, 2013). The rate in each band is computed by the equation;

$$r_i = r_c + m + l_i .$$

The equation for Ghosh's risk-based pricing model is;

$$r_i = r_c + m + l_i + r_s + r_f ;$$

Where:

r_i is the final rate charged to borrowers in band i,

r_c is the cost of capital,

m is a standard margin,

l_i is a risk premium,

r_s is the cost of service and

r_f is the cost of funds.

Cost of Capital: This term denotes the cost of equity, representing the expenses associated with investor-provided funds (Brealey et al., 2019). It signifies the rate of return demanded by shareholders. The Capital Asset Pricing Model (CAPM) is frequently employed to estimate the cost of equity, considering the risk-free rate, risk premium, and beta (Sharpe, 1964).

Standard Margin (Fixed Margin): This refers to the difference between the interest revenue from borrowers and the interest expenditure paid to depositors. It is a key determinant of the bank's profitability (Brigham & Ehrhardt, 2013).

Risk Premium: This is the compensation for expected loss associated with the borrower's defaults (Saunders & Cornett, 2018).

Cost of service: The cost of service encompasses the expenses associated with providing services to borrowers, which include administrative expenses, personnel costs, and compliance-related expenditures (Rose & Hudgins, 2013).

Cost of Funds: This represents the expenses incurred by a bank in procuring funds for lending activities. It encompasses interest payments to depositors and interest paid to other financial institutions for interbank borrowing (Ghosh, 2012).

Risk-based pricing is grounded in the principles of financial intermediation, which clarifies the role of commercial banks as intermediaries that facilitate the transfer of economic resources from surplus units (savers) to deficit units (borrowers) (Allen & Santomero, 2001).

Risk-based pricing is beneficial, particularly for emerging markets like Lesotho, where a larger segment of the population remains underserved (FinMark Trust, 2023). Risk-based pricing of mortgage loans is crucial for driving financial inclusion, as it enables access to credit for low-income households and minority communities, thus stimulating growth in homeownership (Thoka, 2015). It also motivates borrowers to improve their financial behaviour by rewarding them for a credit score upgrade, timely loan repayments, and overall improvement in creditworthiness (Agarwal, Amromin, Ben-David, Chomsisengphet, & Evanoff, 2014). These borrowers are charged low interest rates and access loans at more favourable terms (Magri, 2018). Despite Magri (2018)

emphasis that risk-based pricing contributes to financial inclusion by protecting lenders from default risk, Stiglitz & Weiss (1981) challenge this view and asserts that that risk-based pricing inherently give rise to adverse selection and moral hazard primarily due to challenges posed by information asymmetry. Furthermore, Chamsisengphet and Pennington-Cross (2006) claim that risk-based pricing affect loan quality resulting to mortgage portfolio dominated subprime loans. Considering these opposing viewpoints, their relevance in Lesotho's unique market warrants further investigation. This study, therefore, will explore whether these competing dynamics are applicable in Lesotho.

Mortgage Loan

A mortgage loan is a type of secured consumer credit employed to fund property acquisitions, wherein the property acts as collateral for the loan (Tang, 2021). These loans frequently represent the most substantial financial commitment individuals make throughout their lives (Magri, 2018). The loan is secured by the borrower's property ownership, allowing the lender to repossess it in the event of default. Mortgage loans are integral to the real estate market, facilitating access to the capital required for homeownership or investment property acquisition. When paired with risk-based pricing, mortgage loans play a crucial role in fostering economic growth and promoting financial inclusion. Unlike personal loans, mortgage loans are considered less expensive due to their long-term structure. This structure allows lenders to spread repayments over 20 to 30 years (Matooane, Bhanye, & Matamanda, 2023). This enables lenders to enjoy consistent interest income. Mortgage loans not only benefit lenders, but they also empower borrowers, especially first-time buyers with homeownership (Campbell & Cocco, 2015) a dream to many. Mortgage loans are particularly important in Lesotho where housing finance is considered inaccessible and expensive (World Bank, 2016).

Financial Stability

Crockett (1996) defines financial stability as the effective operation of financial institutions and markets that constitute the financial system. This stability is particularly crucial in mortgage lending. The 2007-2008 financial crisis illustrated the potential for

mispriced mortgage loans to destabilise the banking sector and precipitate widespread financial crises (Claessens & Kose, 2013). Maintaining the financial stability of the banking sector is essential for a nation's broader economic development (Gomes & Sarkisyan, 2023). A stable and resilient financial system can foster economic growth by directing financial resources towards productive investments.

Prime Lending Rate

The prime lending rate is the interest rate lenders charge prime borrowers for mortgage loans (Awoyemi & Jabar, 2014). The term "prime borrowers" is defined by Mian and Sufi (2008) as borrowers with no likelihood of default in the next period, and they borrow at a lower rate. These borrowers are characterised by strong credit history, high credit scores, stable income and manageable levels of debt (Zalata et al., 2020). Mortgage loans to borrowers with interest rates above the prime lending rate are termed subprime mortgage loans (Magri, 2018). The current prime lending rate in Lesotho is 10.75%, comprising a 7.25% repo rate and a 3.5% standard margin (Financial Institutions (Banks) (Pricing) Directives, 2024). This approximately equals to the prime lending rates in other Common Monetary Area (CMA) countries: South Africa, Eswatini, and Namibia. These countries are in a common monetary area because their currencies are pegged to ZAR, the South African Rand, and as a result, the ratio between their currencies and ZAR is 1:1.

Restructured Loan

The Central Bank of Lesotho characterises a restructured loan as one that lenders have modified through refinancing, rescheduling, or other adjustments due to deteriorations in the borrower's financial standing or a failure to adhere to the original repayment terms (Financial Institutions (Banks) (Asset Classification) Regulations, 2016).

1.2 Research Problem Statement

Growth in a nation's Gross Domestic Product (GDP) is contingent upon investment, including residential investment, which encompasses the acquisition of new housing units (Blanchard & Johnson, 2012). Homeownership is a significant avenue for

households to accumulate wealth (Chamsisengphet & Pennington-Cross, 2006). Mortgages constitute a substantial portion of household debt, representing approximately 70% of total household loans within Eurozone countries (Magri & Pico, 2011).

Nevertheless, the mortgage lending sector in Lesotho remains underdeveloped, with commercial banks prioritising unsecured personal loans over mortgage financing. The observed emphasis on unsecured personal lending within Lesotho's commercial banking sector raises apprehensions regarding the potential for diminished investment in real estate, which could impede the nation's economic growth trajectory. The high rate of restructured loans, as shown in Figure 1.1, is a key concern.

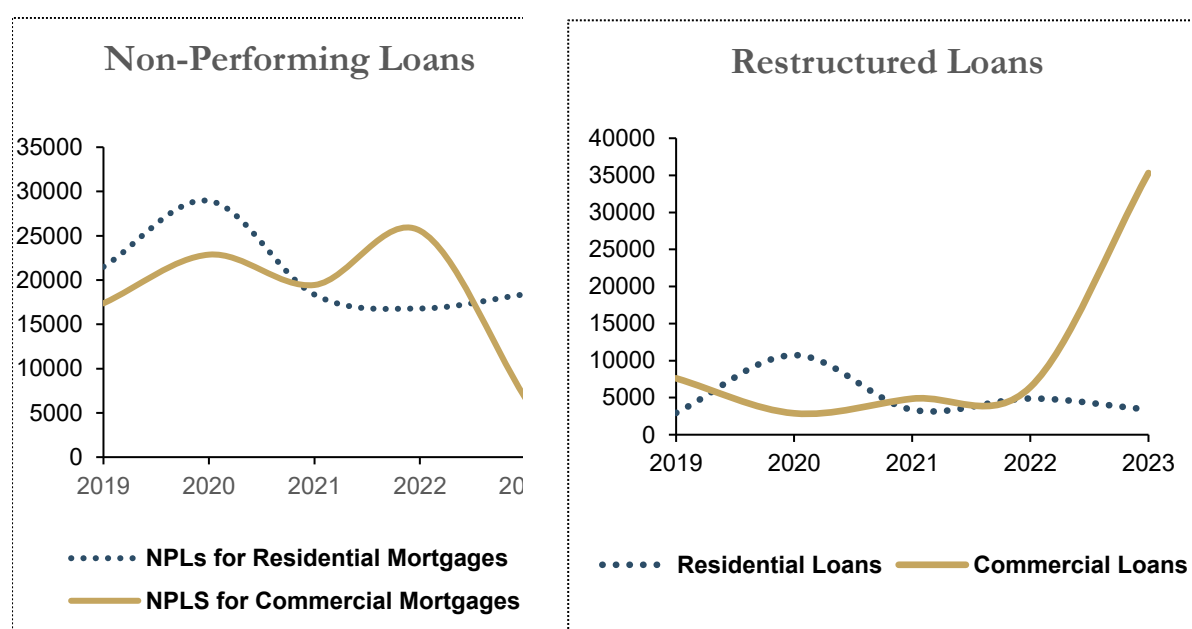


Figure 1. 1: Different Types of Loans

Source: Financial Stability Report (2023)

As depicted in Figure 1.1, the COVID-19 pandemic period witnessed a surge in commercial mortgage non-performing loans (NPLs), reaching M25,000,000, and a corresponding increase in residential non-performing loans, peaking at M29,000,000 within the banking sector (Central Bank of Lesotho, 2023). This escalation can be attributed to the real estate business sector's diminished capacity to service outstanding mortgage debt held by banks (Central Bank of Lesotho, 2023). Following the COVID-19 pandemic, non-performing loans declined, but the restructured loans

increased from M4,500,000 in 2020 to a substantial M35,000,000 in 2023, representing a remarkable 700% growth over just three years.

The elevated rate of restructured mortgage loans within Lesotho's commercial banking sector, as highlighted in the Central Bank's 2023 financial stability report, presents a significant concern (Central Bank of Lesotho, 2023). This followed an increase in nonperforming mortgages, which started in 2019 and ended in 2022. The prevalence of mortgage loan restructuring by borrowers, indicative of financial hardship, portends a decline in new mortgage loan demand, negatively impacting Lesotho's real estate and banking sector.

In response to these emerging challenges, loan pricing has become a subject of considerable scrutiny, prompting the Central Bank of Lesotho to issue directives to the banking sector, outlining the methodology for calculating the prime lending rate (Financial Institutions (Banks) (Pricing) Directives, 2024). The Central Bank of Lesotho's issuance of pricing directives may indicate a discrepancy between current loan pricing practices and borrowers' risk profiles, potentially leading to mispriced mortgage loans and diminished accessibility and affordability of mortgage credit.

Furthermore, the substantial prevalence of restructured mortgage loans in Lesotho suggests that borrowers are experiencing repayment difficulties, possibly due to mispricing. Commercial banks may not implement an effective risk-based pricing mechanism when extending mortgage loans, thus necessitating this investigation. Risk-based pricing is crucial in mortgage lending as it enables banks to establish prices that accurately reflect the risk associated with individual borrowers, ensuring appropriate compensation for the credit risk assumed.

The absence of risk-based pricing can result in the mispricing of mortgage loans, with significant implications for the financial system and the broader economy. Mispriced residential loans can have detrimental effects on both lenders and borrowers. For lenders, it can jeopardise commercial banks' financial stability and profitability, as evidenced by the 2007-2009 financial crisis, which was partially attributed to the mispricing of mortgage loans (Magri, 2018).

A study on the impact of loan restructuring conducted in Rwanda by Wilberforce et al. (2024), revealed that a high incidence of restructured loans can contribute to elevated levels of non-performing loans. However, to the best of the researcher's knowledge in Lesotho, no prior research has examined the causes of restructured loans or possible solutions, making this study a valuable contribution to the literature.

1.3 Research questions

1.3.1 Main Research Question

How is risk-based pricing used by commercial banks in Lesotho when granting mortgage loans?

1.3.2 Secondary Investigative Research Questions

1. What are the parameters considered by Lesotho's commercial banks when pricing mortgage loans?
2. What challenges do Lesotho's commercial banks face when implementing risk-based pricing on mortgage loans?
3. How can commercial banks in Lesotho efficiently adopt risk-based pricing for home loans?

1.4 Research Purpose and objectives

1.4.1 Research purpose

The study sought to investigate the use of risk-based pricing for mortgage loans by commercial banks in Lesotho.

1.4.2 Research Objectives

1. To investigate the parameters used by commercial banks in Lesotho when pricing home loans.
2. To explore the difficulties encountered by commercial banks in Lesotho when adopting risk-based pricing on home loans.

1.4.3 Hypotheses

Objective one is expanded to examine which are important parameters that Lesotho's commercial banks consider when pricing mortgage loans. Second, it is also of interest to investigate which of those parameters have more influence on the pricing of mortgage loans by commercial banks in Lesotho. Third, it is also vital to examine if the parameters included in the pricing of mortgage loans in Lesotho are aligned to international standards. The following hypotheses will be considered in this study:

- H0: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service are not all important parameters that Lesotho's commercial banks consider when pricing mortgage loans.
- H1: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service are all important parameters that Lesotho's commercial banks consider when pricing mortgage loans.
- H0: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service do not all have a greater influence on the pricing of mortgage loans in Lesotho.
- H1: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service have greater influence on the pricing of mortgage loans in Lesotho.
- H0: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service, which are considered in mortgage loans pricing in Lesotho, are not all aligned with international standards.

H1: Borrower credit score, Loan-to-value ratio, Borrower income level & stability, Employment type, Property location & value, Cost of capital, Cost of funds, and Cost of service, which are considered in mortgage loans pricing in Lesotho, are all aligned with international standards.

1.5 Significance of the Study

This research seeks to address the knowledge gap and deepens comprehension of risk-based pricing in African economies, the critical yet underexplored topic given the continent's distinct challenges such as information asymmetry, regulatory capabilities, and financial inclusion. Investigating risk-based pricing for mortgage loans in Lesotho is critical for various stakeholders within the nation's real estate and financial sectors. The findings and insights from this research could enhance the efficiency and inclusivity of Lesotho's mortgage lending market, thereby fostering overall economic growth and financial stability. Additionally, the study may provide valuable input for policy discussions on mortgage regulation and supervision within the country.

The study's recommendations for effective risk-based mortgage pricing may improve Lesotho's commercial banks' profitability and financial stability. This would enable banks to adequately compensate for the credit risk they undertake while promoting responsible lending practices. More accurate assessments of borrowers' risk profiles and appropriate mortgage loan pricing could also improve financial inclusion, which remains a significant challenge in Lesotho (Sekantsi, 2019).

Moreover, this investigation may contribute to informed policy discussions regarding mortgage regulation and supervision within Lesotho. Recommendations for effective risk-based residential loan pricing are expected to improve Lesotho's commercial bank profitability and financial resilience. Accurate risk assessment and pricing can ensure appropriate credit risk compensation and promote responsible lending, potentially addressing financial inclusion challenges (Sekantsi, 2019). Lesotho households could also derive benefits from an efficient risk-based pricing system. Mortgage loan borrowing costs may be reduced, stimulating overall housing demand. Consequently, this could catalyse growth in the construction sector, creating employment opportunities in the real estate industry and bolstering the nation's economic progress.

Renters in Lesotho may also benefit from a potential reduction in commercial property rents if lower borrowing costs are passed on.

The outcomes of this study may have significant implications for homeowners in Lesotho. As property values appreciate over time, homeowners can refinance their properties, potentially freeing household income for various expenditures, including consumption and savings. This could positively impact the country's GDP, as increased household spending and savings are known to stimulate economic growth (Blanchard & Johnson, 2012).

Additionally, this research can positively influence Lesotho's property registration system. By addressing the issue of risk-based pricing, the study may encourage the utilisation of mortgage finance as a more favourable alternative to costly personal loans. This, in turn, may result in a rise in the number of registered deeds with the Lesotho Land Administration Authority (LAA). Implementing this may enhance the efficacy and clarity of the property registration system, which is vital for advancing a well-operating real estate market.

The potential impact of this study on the credit rating industry within Lesotho warrants particular attention. Currently, Lesotho possesses a single credit scoring entity, Experian, and the quality of credit assessments is widely perceived as inadequate due to the lack of market competition. Implementing risk-based pricing on mortgage loans could stimulate increased demand for credit rating services (Magri, 2018). This, in turn, may create an environment conducive to new market entrants, thereby fostering competition and elevating the overall standard of credit evaluation within the country.

This research is particularly pertinent to Lesotho's developing mortgage market. Ascertaining the role of risk-based pricing for mortgage loans is of paramount importance. Understanding the prevailing practices and challenges associated with implementing risk-based pricing on mortgage loans can provide policymakers, regulators, and commercial banks with valuable insights for developing a more efficient and inclusive mortgage lending market that supports national economic growth and development.

Finally, this study aligns with the overarching objective of strengthening financial stability and inclusion within Lesotho's banking sector. Implementing effective risk-based pricing for residential loans can improve the financial system's stability while broadening access to mortgage credit for more diverse borrowers at fair rates. This is highly pertinent to various stakeholders, such as households, the real estate industry, tenants, homeowners, commercial banks, and the credit rating sector. This investigation contributes to a more efficient and inclusive mortgage lending market by addressing the research problem and offering recommendations for effective risk-based pricing. In the long run, this will aid in promoting the country's economic development and financial stability.

1.6 Scope of the Study

The study focused on how commercial banks in Lesotho use risk-based pricing on mortgage loans. It did not cover loan types or financial products provided by commercial banks, as those variables were beyond the scope.

1.7 Assumptions

1. Commercial banks operating within Lesotho possess the data and information required to implement risk-based pricing methodologies for mortgage loans.
2. The selected financial experts can provide accurate and reliable data for this investigation.
3. The legislative framework in Lesotho supports and encourages the adoption of risk-based pricing in mortgage loan practices.

1.8 Organisation of the Study

This research is structured into five distinct chapters.

Chapter 1: Provides an introductory overview of the study, encompassing the contextual background, the identified research problem, the study's aim, objectives, and research questions.

Chapter 2: Presents a comprehensive review of the existing literature about risk-based mortgage loan pricing.

Chapter 3: Details the research methodology employed in conducting this study.

Chapter 4: Presents and analyses the findings derived from the research.

Chapter 5: Concludes the study by formulating recommendations for the effective implementation of risk-based pricing on mortgage loans within the Lesotho context.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant existing research on the risk-based pricing of mortgage loans. The review examines the management practices of commercial banks operating in Lesotho and perceptions regarding governmental policies, which may impact the implementation of risk-based pricing on mortgage loans. This chapter also identifies knowledge gaps within the current body of literature and outlines the theoretical frameworks that underpin this investigation. Finally, the chapter discusses the regulatory framework and mortgage loan pricing strategies used by commercial banks in Lesotho.

2.2 Theoretical Framework

The study is underpinned by a hybrid theoretical framework integrating the financial intermediation and credit risk management theories. The subsequent discussion elaborates on each theory.

2.2.1 Financial Intermediation Theory

The financial intermediation theory explains the fundamental role of commercial banks as key facilitators within the financial system, allowing for the efficient transfer of economic resources from surplus entities (savers) to those in need of funds (borrowers) (Saunders & Cornett, 2011). This theory elucidates and reinforces the importance of commercial banks within the mortgage finance sector, highlighting their impact and authority over the distribution of credit in the economy.

Within the Lesotho financial sector landscape, the banking sector exerts a dominant influence (Central Bank of Lesotho, 2023) with all the four banks being commercial banks. These commercial banks fulfil a crucial intermediary function within the mortgage lending market. They mobilise deposits from diverse sources and deploy these funds to provide mortgage loans to individuals and enterprises seeking to

purchase or invest in real estate (Bhattacharya & Thakor, 1993). This intermediation function is essential for the growth and development of the real estate sector as it facilitates the efficient allocation of capital.

Banks are instrumental in channelling capital from savers to those with viable investment opportunities in the housing market. In Lesotho, for instance, commercial banks significantly contribute to mortgage lending (Central Bank of Lesotho, 2023). Consequently, this study concentrates on the risk-based pricing of mortgage loans offered by commercial banks.

Mortgage loan pricing is a critical component of the financial intermediation process, as it directly influences both the accessibility and cost of borrowing for individuals (Diamond & Rajah, 2001). Accurate borrower risk assessment allows commercial banks to obtain suitable compensation for credit risk, fostering responsible lending and financial inclusion.

2.2.2 Credit Risk Management Theory

Credit risk management theory provides a further theoretical foundation for this study, emphasising the importance of accurately assessing and pricing the risks associated with lending activities, such as mortgage loans, to safeguard the financial stability and profitability of commercial banks (Saunders & Linda, 2002).

In line with credit risk management theory, commercial banks should adopt a holistic strategy to manage the risks linked to their lending operations. This involves the creation of robust credit-scoring models, setting lending limits and risk thresholds, and implementing monitoring and control mechanisms (Grouchy et al., 2006). The modern theory of credit risk calculates expected credit loss (ECL) based on the probability of default (PD), loss given default (LGD) and exposure at default (EAD). The formula for ECL is: $ECL = PD * LGD * EAD$. Commercial banks can only remain profitable by minimising these components of ECL. This formula is part of the Internal Ratings Based (IRB) approach under the Basel II standard (Basel Committee on Banking Supervision, 2004).

Within mortgage lending, commercial banks should conduct thorough evaluations of borrower creditworthiness. This entails considering a range of factors, including income levels, employment stability, credit history, and the value of the collateral. An accurate assessment of a borrower's probability of default enables commercial banks to implement a risk-based pricing strategy for their mortgage loan portfolios.

Risk-based pricing, predicated upon the probability of default, is crucial for commercial banks' financial stability and profitability. Failure to accurately evaluate the credit risk inherent in mortgage lending activities can lead to banks undercharging or overcharging for the risk they assume. This can cause higher defaults and financial instability (Jorion, 2001).

The current study is grounded in a robust theoretical framework, integrating financial intermediation and credit risk management theory. The financial intermediation perspective emphasises the pivotal role of commercial banks within the mortgage lending market and the significance of their pricing decisions. Conversely, credit risk management theory underscores the necessity of precise risk assessment and pricing to preserve the stability of the banking sector and the broader financial system. These theories posit that risk-based pricing models for mortgage loans are essential for Lesotho's commercial banks to achieve financial stability and drive economic growth by fostering an accessible and sustainable mortgage loan market, which could ultimately revitalise the national economy.

Considering the embryonic development of Lesotho's mortgage sector, the theoretical frameworks of financial intermediation and credit risk management are highly applicable to this context. Commercial banks operating within Lesotho predominantly favour unsecured personal loans over mortgage lending. This suggests a potential misalignment between the banks' financial intermediation function and the effective credit risk management within the mortgage lending market.

This hybrid theoretical framework enables the researcher to examine the factors influencing commercial banks' decisions regarding risk-based pricing in Lesotho. It also allows for an investigation into the challenges encountered in implementing credit risk management practices and the broader implications for the accessibility,

affordability, and financial stability of the mortgage lending sector. Analysing these elements allows policymakers to develop policies that align commercial banks with financial intermediation and credit risk management, promoting an efficient and inclusive Lesotho mortgage market.

2.3 Empirical literature review

While numerous investigations have been conducted, predominantly in developed economies like the United States and Italy, and to a lesser extent in African nations such as Kenya and South Africa, research specifically addressing risk-based mortgage loan pricing in Lesotho is conspicuously absent.

2.3.1 Evidence from non-African Countries

Within developed economies, mortgage loans typically constitute the largest segment of consumer loan portfolios, and risk-based pricing is the prevailing methodology for determining consumer loan interest rates. Wendy (2006) indicates that the use of risk-based interest rates in US consumer lending became widespread in the mid-1990s. This shift was linked to Fannie Mae's increased funding of mortgages and the development of automated credit-scoring models. The requirement by Fannie Mae for credit bureau scores in loan resales solidified risk-based pricing as a standard practice (Thoka, 2015). This was made possible by the increased availability of data and increased computing power that allowed for more accurate risk assessment.

Phillips (2013) identifies risk-based pricing as a predominant consumer credit pricing methodology in North America, particularly for mortgage loans, constituting a significant portion of consumer debt. Post-2008 financial crisis, Eurozone household income and wealth analyses reveal a heightened sensitivity to borrower risk in consumer loan pricing, reflecting the increased integration of economic and financial variables (Magri, 2018). Analysis of household income and wealth within the Eurozone indicates that since the 2008 financial crisis, consumer loan pricing has become increasingly risk-sensitive, with households' economic and financial circumstances significantly influencing interest rates and the likelihood of delinquency (Magri, 2018). Magri and Pico (2011) analysed the increasing adoption of risk-based mortgage

interest rates in Italy. Utilising EU-SILC data, they quantified the correlation between Italian mortgage interest rates and household mortgage delinquency probability, a proxy for credit risk. The study confirmed a significant trend towards risk-sensitive mortgage pricing among Italian lenders.

In developed countries, risk-based pricing benefits banks and borrowers. Wendy (2006) demonstrates that risk-based pricing increases loan accessibility for high-risk households that could be excluded from credit markets. Chamsisengphet and Pennington-Cross (2006) found that risk-based pricing can facilitate homeownership for individuals who have historically faced discrimination or failed to qualify for mortgages under conventional lending criteria. This is particularly relevant to Lesotho, where a substantial portion of the population may lack established credit histories and favourable credit scores necessary for prime loans. Zou (2015) suggests that implementing risk-based mortgage loan pricing can create a new avenue for credit access for these individuals, thereby enhancing homeownership rates and economic inclusion.

Magri (2018) established that borrower-specific risk significantly determines Italian consumer loan pricing, with mispricing posing systemic and profitability risks. The study's finding that risk-based pricing optimises loan allocation, fostering stability and growth, is echoed by Tang (2019). Tang's work underscores the role of risk-based pricing in efficient capital distribution, enabling effective risk management. These insights are critical for Lesotho, where optimised risk management is vital for bank stability and economic development.

Amaral et al. (2023) argue that risk-based pricing empowers banks to customise interest rates for individual borrowers, moving away from a uniform pricing model. By evaluating the specific risk factors associated with each borrower, banks can offer tailored pricing, enhancing customer satisfaction and loyalty. Handhika et al. (2021) demonstrate that risk-based pricing enhances market fairness and transparency by mitigating cross-subsidisation, wherein low-risk borrowers are not burdened with costs attributable to high-risk counterparts. This resource allocation optimisation yields mutual benefits for lending institutions and borrowers, promoting market efficiency. Similarly, Muller et al. (2022) posit that risk-based pricing fosters responsible financial

behaviour by aligning product or service costs with inherent risk profiles. This incentivises borrowers to cultivate strong creditworthiness, potentially resulting in preferential pricing and loan terms.

2.3.2 Evidence from African Countries

African nations are increasingly implementing risk-based pricing models for mortgage loans, a practice that has demonstrated various advantages (Handhika et al., 2021). Risk-based pricing has proven to be beneficial in several ways. Ndarwa and Mulinge (2023) indicated that risk-based pricing allows Kenyan banks to manage risk and attract more customers by offering personalised interest rates based on credit risk profiles. The cited study demonstrates that to enhance lending practices and mitigate credit risk, the Central Bank of Kenya (CBK) established credit reference bureaus in 2010 and is currently promoting the adoption of a risk-based pricing model among banks.

Tiriongo et al. (2023) further explore this topic by examining the influence of banks' internal factors on risk-based credit pricing within the Kenyan context. The cited study highlights eight key internal factors banks should consider when pricing mortgage loans. The first internal factor is the bank's risk management practices, including credit risk models, internal credit scoring systems and collateral. Moreover, other factors include capital adequacy, operational efficiency, portfolio composition, financial health, the bank's market position and competition, loan product design and terms and credit assessment systems such as borrower income, credit history and employment status. The study found that the advantage of risk-based pricing is its ability to mitigate the risk and potential losses for banks. Adapting product or service pricing to individual borrower risk profiles allows banks to assess potential risks, empowering banks to adjust pricing for appropriate compensation when extending credit to higher-risk borrowers.

Thoka (2015) examined the risk-based pricing of financial products in South Africa, focusing on the development of credit pricing models that enhance credit affordability. The study analysed the relationship between price sensitivity and offered interest rates, alongside an evaluation of the National Credit Act of South Africa (2005). The

findings demonstrated that this model increases credit accessibility by enabling lenders to charge higher interest rates to high-risk borrowers, thus promoting financial inclusion. The model incentivises low-risk borrowers while adequately compensating lenders for extending credit to those with higher risk profiles.

Mukatuni (2021) investigated the risk-based pricing of financial products in South Africa, examining the risk-based pricing model, its benefits and drawbacks, and areas for enhancement within the consumer credit sector. The findings validated that the model enhances credit accessibility by allowing lenders to apply higher interest rates to borrowers with increased risk. Moreover, the model provides incentives for low-risk borrowers and ensures lenders are compensated for extending credit to those with higher risk profiles (Mukatuni, 2021).

However, some research indicates that this increased accessibility is not without cost. Chamsisengphet and Pennington-Cross (2006) establish a strong correlation between poor credit history, elevated delinquency, and default rates, leading to higher interest rates under risk-based pricing. Muller et al. (2022) further substantiate that risk-based pricing constrains debt accumulation for high-risk applicants through increased borrowing costs. This is consistent with Wendy's (2006) observation of a significant risk premium escalation for such borrowers. Magri & Pico (2011) quantify this effect in Italy, demonstrating a 21-basis point increase in mortgage interest rates per 1% rise in default probability, a figure lower than the 38-basis point premium reported by Wendy (2006) for the US in the 1990s.

In addition, White (2004) establishes a connection between risk-based pricing and predatory lending practices. Agarwal et al. (2014) define predatory lending as imposing unjust and exploitative loan terms on borrowers, often facilitated by aggressive sales techniques, or loans with terms and conditions that ultimately disadvantage borrowers. White (2004) demonstrates that predatory lending is prevalent in low- and moderate-income neighbourhoods and appears to be disproportionately targeted at Black and Hispanic individuals (Mazur, 2022). White (2004) examined the debate surrounding predatory lending regulations and the subprime mortgage market, employing two contrasting hypotheses: the efficient pricing and the opportunity pricing hypothesis. The efficient pricing hypothesis posits

that prices are directly linked to risk and that the market is expanding credit access by offering higher rates and fees to borrowers with elevated risk profiles (O'Sullivan, 2018). Conversely, the opportunity pricing hypothesis suggests that the high interest rates and fees charged in the subprime market significantly exceed risk-related costs.

White (2004) contends that existing research predominantly supports the opportunity pricing hypothesis, attributing market inefficiencies to seller obfuscation, information asymmetries, and search costs. The challenge for policymakers lies in determining whether interest rates and fees accurately reflect these costs. Chamsisengphet and Pennington-Cross (2006) also link risk-based pricing to subprime loans, defining a subprime loan as one that incurs a premium above the prevailing prime market rate. They argue that borrowers pay a premium commensurate with the anticipated mortgage default risks within a risk-based pricing model.

Stiglitz and Weiss (1981) further argue that risk-based pricing can heighten default risk through adverse selection and moral hazard, particularly in a country like Lesotho where weak credit registries worsen information asymmetry. This argument stems from the fact that banks, in their attempts to increase profitability, may attract a large pool of high-risk borrowers who are willing to pay high interest (adverse selection) under this model, thus increasing default risk.

The above criticism highlights the need for regulation. In response to public concerns about predatory lending in the United States of America, the Home Ownership and Equity Protection Act (HOEPA) was created (Ho & Pennington-Cross, 2006). HOEPA restricts prepayment penalties, balloon payments, prohibitions on joint insurance financing and participation in loan counselling. HOEPA strengthens protections for high-rate home loans and is now widely adopted by numerous states (Ho & Pennington-Cross, 2006).

Deng and Gabriel (2006) examined the role of mortgage insurance in the subprime loan market, specifically focusing on the Federal Housing Administration's (FHA) mortgage insurance on subprime loans in the United States. Their study indicated that while loans extended to minority borrowers and those with lower credit quality exhibit higher default risks, these risks are balanced by faster prepayment rates, reducing the

likelihood of loan termination among underprivileged groups. This demonstrates the potential for significant savings in housing finance costs for underrepresented borrowers through pooling FHA-insured mortgages and applying risk-based pricing.

Thoka (2015) analysed the influence of the South African National Credit Act No. 34 of 2005 (NCA) on risk-based pricing. The study revealed that the NCA, by establishing a maximum interest rate (interest rate cap), created a scenario where banks could maximise profits while simultaneously marginalising a considerable number of borrowers. However, its simplicity allowed the NCA to serve as an effective model for structuring interest rates for high-risk borrowers, thus expanding the number of borrower classifications. According to Schmulow (2016), the South African Parliament enacted the NCA in 2015 to combat irresponsible lending and safeguard financial consumers by promoting fair and transparent credit provision. Despite criticisms against risk-based pricing, its advantages outweigh its disadvantages.

Having discussed the benefits and criticisms of risk-based pricing of mortgage loans based on the literature from African and non-African countries, it is equally important to explore the challenges commercial banks encounter in implementing risk-based pricing before and during the crisis period such as Covid-19.

2.4 Implementation Challenges of Risk-Based Pricing Before COVID-19

Globally, before Coronavirus disease (COVID) 2019, information asymmetry, data quality and availability were the major challenges of risk-based pricing (Li, Lin, Liu, & Woodside, 2012). While developed countries relied on their well-established credit reporting systems, this situation was worse in underdeveloped mortgage markets like Lesotho, where credit bureaus are scarce and informal employment accounts for more than 40% of the total workforce (Matooane, Bhanye, & Matamanda, 2023). Without credit histories and employment verifications, commercial banks struggled with credit risk assessment, and as such, classified a large number of population as high-risk. To balance this risk, commercial banks charged inflated risk premiums, resulting in increased borrowing costs and financial exclusion.

2.5 Implementation Challenges of Risk-Based Pricing During COVID-19

COVID-19 significantly disrupted various sectors of the economy, triggering a shift in demand across multiple sectors (Central Bank of Lesotho, 2020). As the death toll increased, governments were forced to impose strict lockdown and social distancing measures, compelling people to stay at home (Gill, 2024). This adversely affected industries like transport, hospitality, retail and banking, all of which experienced a decline in demand for their products. Because of a fall in demand, some businesses were closed. This downturn resulted in employees' layoffs, consequently increasing unemployment rate and default risk (Lambie-Hanson, Gerardi, & Willen, 2022) (Central Bank of Lesotho, 2020).

In response to this economic crisis, governments introduced monetary and fiscal policy relief measures aimed at mitigating its adverse impact on the economy, the financial system and individual consumers (Central Bank of Lesotho, 2020). This significant step included reducing borrowing costs by cutting the repo rate (South African Reserve Bank, 2021). Additionally, loan payment holidays and financial support to micro, small and medium-sized enterprises were introduced to mitigate default risk (Development Bank of Southern Africa, 2021). Unfortunately, Risk-based pricing models failed to adapt, undermining the intended relief of these interventions. Increased mortality rates, demand volatility and shifting borrower risk profiles forced the banks to charge a mortality risk premium and a default risk premium (Gill, 2024). The pandemic rendered predictive models and historical data that risk-based pricing relies on outdated (Burkhardt, Naveira, Giovine, & Govindarajan, 2020), highlighting a need for more dynamic and value-based pricing models.

2.6 Regulatory Framework in Lesotho Mortgage Pricing

The regulatory framework was also considered. The Central Bank of Lesotho has a central function for enforcing regulation and supervision of financial institutions. It also formulates the guidelines for lending activities and consumer protection.

2.6.1 Central Bank of Lesotho Act 2000

The Central Bank Act 2000 establishes the functions and operations of the Central Bank of Lesotho. It sets out the primary objective of the Central Bank of Lesotho, namely, maintaining price stability and using monetary policy to achieve this objective. The Central Bank of Lesotho affects mortgage pricing by adjusting the repo rate in response to inflation; higher inflation leads to a higher repo rate, aimed at reducing spending and borrowing.

Commercial bank borrowing costs, which are directly tied to the Central Bank of Lesotho's repo rate, increase when the repo rate rises, impacting the prime lending rate, which is calculated as the repo rate plus 350 basis points (Financial Institutions (Banks) (Pricing) Directives, 2024). Consequently, elevated borrowing costs for commercial banks result in increased mortgage interest rates for residential and commercial properties. Conversely, reducing the repo rate lowers commercial bank borrowing costs, leading to a corresponding decrease in mortgage interest rates. Damane's (2020) research explored the determinants of interest rate spreads in Lesotho and demonstrated that inflation positively influences Treasury bill and commercial bank interest rates.

2.6.2 Financial Institutions Act of 2012

The Financial Institutions Act of 2012 exerts influence on mortgage pricing. This Act is the principal legislative framework governing and supervising financial institutions, including commercial banks. It aims to preserve financial stability by mandating sound risk management practices for commercial banks' lending activities, particularly those related to mortgage loans. The Act underscores that commercial banks should implement robust credit risk management procedures, which involve assessing borrowers' capacity to repay their mortgages. This assessment evaluates borrowers'

income, credit history, financial performance, and collateral value. Typically, credit scoring models are employed to determine borrowers' creditworthiness.

2.6.3 Financial Consumer Protection (FCP) Act 2022

The Financial Consumer Protection (FCP) Act 2022 of Lesotho is one of the instruments used by the Central Bank of Lesotho to regulate financial institutions. It ensures transparency and protects consumers against usurious practices. Section 25 of the FCP Act mandates that commercial banks have internal policies, procedures and methodologies for determining the pricing of products or services offered to consumers. The Central Bank of Lesotho also requires commercial banks to provide comprehensive disclosure of the total cost of credit to consumers, encompassing both interest charges and other applicable fees. Lenders are obligated to clearly state interest rates, fees, and the overall borrowing cost and to provide a documented rationale for their pricing calculations within the customer's loan file (Financial Consumer Protection (Disclosure of Credit Information) Regulations, 2023).

In contrast to South Africa's National Credit Act (2011), which sets a maximum interest rate for home loans at 2.2 times the repo rate plus 5%, the Financial Consumer Protection (FCP) Act 2022 in Lesotho does not impose an interest rate ceiling. The FCP Act empowers commercial banks to set interest rates without a statutory limit, provided they can substantiate their pricing methodology. Research by Ferrari et al. (2018) indicates that interest rate caps are employed by numerous African and non-African nations to protect consumers from usury or to enhance credit affordability and accessibility. African examples include Kenya and Zambia, while non-African examples include Cambodia, India and the United Kingdom.

2.6.4 Basel Accord

The Basel Accord is a set of international banking regulations developed by the Basel Committee on Banking Supervision (BCBS) located at the Bank of International Settlement in Basel, Switzerland (Hull, 2018). Many African national regulators, including Lesotho and non-African countries, adopted the Basel Accord. It sets minimum capital requirements influencing mortgage loans by allocating capital to

mortgage loans, thus impacting capital cost. The Basel Framework has become the global benchmark for banking regulation (Goodhart, 2011).

2.6.4.1 Basel I

Basel I, established in 1988, represents the inaugural capital adequacy standard (Hull, 2018). It mandates that banks maintain a minimum capital reserve of 8% of their risk-weighted assets to mitigate credit risk. Under Basel I, capital is categorised into two tiers: Tier I (core capital) and Tier II (supplementary capital). Tier I capital primarily consists of equity capital and cash reserves and is required to be at least 4% of risk-weighted assets (Thejane, 2017). Tier II capital encompasses revaluation reserves, general reserves, undisclosed reserves, hybrid debt instruments, and subordinated term debt (Seliane & Mokoatsi, 2015). It categorises assets into five classes and assigns risk weights to assets based on risk level (Basel Committee on Banking Supervision, 1988).

Assets deemed risk-free, such as cash, claims on central banks, and government securities issued by Organisation for Economic Co-operation and Development (OECD) member states, are assigned a risk weight of 0%. Short-term claims on banks, claims on public sector entities, and government-backed securities are assigned a risk weight of 20%. Residential mortgages carry a risk weight of 50%. Corporate bonds and loans to corporations are assigned a risk weight of 100%, while loans to corporations deemed to have very high risk are weighted at 150% (Balin, 2008). Under the Basel I framework, mortgages are generally categorised as assets with lower risk; however, their risk weights are subject to variation depending on factors such as credit quality, loan-to-value ratios, and borrower creditworthiness. Consequently, Basel I affects mortgage pricing by dictating the capital allocation for mortgage loans, which directly influences the cost of capital.

2.6.4.2 Basel II

To enhance the robustness and safety of the global banking system, the Basel Committee on Banking Supervision formulated Basel II, which was developed in 1999 (Seliane & Mokoatsi, 2015). This framework introduced three fundamental pillars:

minimum capital requirements, supervisory review and market discipline. Under minimum capital requirements, banks use internal rating models (credit scoring models) to assess borrowers' credit risk, determining risk premiums based on these scores (Hull, 2018). These models undergo a validation process to ensure reliability. These models rely on key inputs, including the probability of default (PD), loss given default (LGD), and exposure at default (EAD). The calculation of capital and risk-weighted assets is tailored to reflect risks identified through banks' internal rating systems (Thejane, 2017). The risk premium is determined by the individual borrower's credit score. Borrowers with high credit scores are considered low-risk and, consequently, charged a low-risk premium, while those with low credit scores are deemed high-risk and charged a high premium.

Moreover, the supervisory review component mandates that regulators evaluate banks' internal capital adequacy assessments and retain the authority to require banks to maintain capital levels exceeding the minimum regulatory requirements (Hull, 2018). The third pillar, market discipline, is intrinsically linked to the cost of funds as it pertains to how market participants evaluate and interpret risk. During periods of financial instability, these market participants typically demand elevated interest rates as a premium for bearing increased risk. Lesotho moved to Basel 2.5 in 2023 (Financial Institutions (Computation of Capital Charge for Credit, Operational and Market Risks) Regulations, 2023).

2.6.4.3 Basel III

Basel III impacts mortgage pricing by introducing liquidity requirements, notably the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). These regulations mandate that banks hold adequate liquid assets to meet their short-term financial obligations (Basel Committee on Banking Supervision, 2010). This affects funding costs in that this liquidity standard may increase funding costs for banks, which might be passed to borrowers through lending.

2.7 Mortgage Loan Pricing Strategies in Lesotho

This section examines the prevailing mortgage loan pricing strategies employed by commercial banks in Lesotho. It explores the diverse methodologies used, including Funds Transfer Pricing (FTP), competitive pricing, Return on Equity (RoE) pricing, prime-plus, and credit capacity pricing. Each approach is analysed, highlighting its underlying principles and practical applications within the Lesotho context. Particular attention is given to the transition towards risk-based pricing models, specifically prime-plus and credit capacity, and their potential to enhance financial stability and market efficiency. The section concludes by identifying the research gaps stemming from the current state of pricing strategies, thereby demarcating the scope and objectives of the present study.

2.7.1 Funds Transfer Pricing (FTP)

This method focuses more on the cost of funds (Tumasyan, 2012). It ensures that credit and liquidity risks are taken care of separately when pricing mortgage loans. The lending units bear the costs of using funds, while deposit-gathering units, such as the treasury, receive compensation. Profitability is determined at the product level, not at the customer level. This means that profit is determined by deducting interest paid and operating costs from interest income generated by a product. Liquidity premium is charged by banks considering the duration of mortgage loans, funding stress and market disruptions to account for costs of funding.

2.7.2 Competitive Pricing

This is a popular pricing method used by commercial banks in Lesotho, whereby the interest rate on a mortgage loan is set based on prices offered by competitors. To determine the average interest rate competitors charge, banks continuously research market trends, looking at different factors like loan size, term and mortgage loan type. This method is primarily used as a customer retention strategy. This is supported by (Brandao-Marques, Gelos, Kamber, & Meeks, 2021) in their study where they explain the role of competition in the banking sector.

2.7.3 Return on Equity Pricing

This method targets return on equity to ensure shareholders are appropriately compensated for their investment (Saunders & Cornett, 2018). It sets the targeted return on equity based on different components, including expected loss (EL), capital requirements, operational expenses (OE), tax (T), net interest income (NII) and non-interest revenue (NIR). The model used is as follows.

Interest rate on mortgage loan = $\frac{\text{Headline earnings} / \text{Tier 1 capital} = \text{NII} + \text{NIR} - \text{EL} - \text{OE} - \text{T}}{\text{Tier 1 capital}}$

2.7.4 Prime-Plus Pricing

This method sets interest rates by adding a spread to the prime lending rate. However, it is still unclear how the spread (margin) is calculated. For this method to qualify as a risk-based pricing model, the spread should primarily be calculated based on the creditworthiness of the borrower. Banks may also consider other factors such as operational expenses, funding costs and market conditions.

2.7.5 Credit capacity pricing

This is a type of risk-based pricing whereby the creditworthiness of borrowers is assessed to determine the appropriate pricing of mortgage loans (Schmid, 2004). The key components of this method are repayment structure, interest income, cost of funds, credit loss premium, cost of equity and cost of service taking care of interest expenses.

In summary, commercial banks in Lesotho use Funds Transfer Pricing (FTP), competitive pricing, Return on Equity (RoE) pricing, prime-plus and credit capacity pricing strategies and interest rates are fixed throughout the mortgage loan term. Prime-plus and credit capacity pricing models are risk-based pricing models, and they are used by one bank in Lesotho; most commercial banks are in the process of developing risk-based pricing models. Thus, the Lesotho banking sector is transitioning to more advanced credit risk pricing methods. This will help credit risk

management, improved loan pricing and profitability, ultimately resulting in financial stability.

2.8 Research Gaps and Demarcation of the Current Study

The review of the literature identified several knowledge gaps in existing studies concerning risk-based mortgage loan pricing, particularly within the Lesotho context. Addressing these gaps is essential to provide a comprehensive understanding of the prevailing practices, challenges, and opportunities related to risk-based pricing in Lesotho's mortgage lending market.

A significant knowledge gap lies in the absence of empirical research detailing the parameters used by commercial banks in Lesotho for mortgage loan pricing. Although the broader literature on risk-based mortgage lending pricing identifies influential factors, such as borrower creditworthiness, collateral valuation, and market dynamics, specific practices and decision-making processes of Lesotho's commercial banks remain largely unexplored. Understanding the subtleties of how Lesotho's commercial banks assess, and price mortgage-lending risks is critical for designing successful laws and regulations to enable risk-based pricing systems.

Additionally, the difficulties confronting commercial banks in Lesotho in adopting risk-based pricing on home loans highlight a considerable knowledge gap. Although the literature has highlighted the potential advantages of risk-based pricing, the pragmatic challenges and obstacles encountered by commercial banks in Lesotho, including data accessibility, regulatory constraints, and technological limitations, have not been comprehensively examined. Addressing these impediments is crucial for developing focused interventions and support mechanisms to facilitate the effective implementation of risk-based pricing within Lesotho's mortgage lending market.

Moreover, there is a lack of comprehensive understanding regarding the impact of risk-based pricing on the accessibility and affordability of mortgage financing within Lesotho. While existing literature suggests that effective risk-based pricing can broaden mortgage loan availability and affordability for a range of clients, the specific

consequences for Lesotho residents, encompassing homeownership rates, housing demand, and the broader real estate sector, remain unexplored.

Addressing the first two gaps, this study will significantly contribute to understanding risk-based pricing in Lesotho's mortgage loan market. The third research gap requires data that this study does not have. As a result, future research can attempt to address this gap. The findings of this study provide valuable insights for commercial banks, policymakers, and other stakeholders, fostering a deeper understanding of the factors influencing the implementation of risk-based pricing, the associated challenges and opportunities, and the broader economic implications of effective risk-based pricing mechanisms.

Moreover, this study can serve as a foundation for future research on Lesotho's mortgage lending market by providing a comprehensive analysis of current risk-based pricing practices and their impact on the broader financial and economic environment. This will facilitate further investigations into the evolution of the mortgage lending industry, the development of innovative financing solutions, and the long-term sustainability of Lesotho's real estate sector.

In summary, the literature review revealed various knowledge gaps that this work seeks to fill. These gaps include the factors considered by commercial banks in Lesotho when pricing mortgage loans, the impact of risk-based pricing on the accessibility and affordability of mortgage credit and the challenges faced by commercial banks in implementing risk-based pricing. This study, by addressing these identified deficiencies, has the potential to contribute to the development of a more efficient and inclusive mortgage lending market within Lesotho, thereby improving the country's economic and financial stability.

2.9 Chapter Summary

Through a comprehensive review of the literature on risk-based mortgage loan pricing, this chapter has highlighted the importance of risk-based pricing on mortgage loans for commercial banks' stability and profitability, as well as its contribution to national economic growth. It has thoroughly examined the principles and economic impacts of

risk-based pricing, detailed bank mortgage management practices, and identified Lesotho-specific research gaps. Grounded in financial intermediation and credit risk management theories, this literature review establishes the importance of accurate risk assessment and pricing in the mortgage lending market. Leveraging a theoretical framework and a detailed exploration of the Lesotho context, this study clarifies risk-based pricing mechanisms. The regulatory framework and the mortgage loan pricing methods used by commercial banks in Lesotho were also discussed. The literature shows that prime-plus and credit capacity pricing methods are types of risk-based pricing. This means that commercial banks in Lesotho use risk-based pricing on mortgage loans. The next chapter presents the methodology used to address the research objectives.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is organised into seven sections. It commences by delineating the research purpose. The discussion then progresses to the research philosophy, the methodological approach, and the research strategy. It further details the research design for primary data collection, presents the analytical methods, and concludes with a chapter summary.

3.2 Research Purpose

Research purposes are typically categorised as exploratory, descriptive, or explanatory. This study adopts a dual approach, employing descriptive and explanatory research to address its objectives. The explanatory research strategy is particularly advantageous in establishing relationships between variables of interest. It facilitates the analysis of causal mechanisms and the investigation of cause-and-effect relationships (Khalid et al., 2012). Conversely, descriptive research aims to gather quantifiable data for statistical analysis of the population sample. This methodology allows for the characterisation and description of demographic segments and is generally considered efficient and cost-effective (Manjunatha, 2019).

3.3 Research Philosophy

Research philosophies are commonly delineated into three primary paradigms: positivism, interpretivism, and pragmatism. This study adopts a positivist philosophical stance, aligning with the epistemological foundations of quantitative research. Positivism posits the existence of an objective and rationally structured reality, independent of the researcher's and participants' subjective perceptions (Saunders et al., 2009). The doctrine of positivism was articulated by the 19th-century French philosopher, mathematician, and writer Auguste Comte (Blackwell, 2018).

Positivism is considered a form of empiricism, adhering to a foundationalist approach. Foundationalism in this context advocates for knowledge free from the researcher's values and beliefs (Howell, 2013). Bryman (2008) (Bryman, *Social Research Methods*, 2008) identifies four key characteristics of positivism: phenomenalism, deductivism, objectivity, and inductivism. Phenomenalism asserts that knowledge is derived from scientifically validated evidence. Deductivism emphasises the role of theory in generating testable hypotheses, which can be either corroborated or refuted. Objectivity underscores the necessity for value-neutrality in scientific inquiry. Finally, inductivism suggests that knowledge is constructed through the accumulation of factual data, which serves as the basis for formulating generalisable laws.

3.4 Methodological Choice

Data collection methodologies employed to address research objectives typically fall within qualitative, quantitative, or mixed-methods paradigms. The quantitative approach, utilising numerical data, facilitates the summarisation, averaging, pattern identification, predictive modelling, association testing, and the generalisation of sample findings to broader populations (Rana et al., 2021). Conversely, qualitative research endeavours to provide in-depth, interpretive understandings of phenomena. Some research problems necessitate a mixed-methods strategy, integrating qualitative and quantitative data collection techniques (Khalid et al., 2012). This study adopted a quantitative data collection methodology to analyse risk-based pricing practices within Lesotho's mortgage market.

3.5 Testable Hypotheses

The hypotheses mentioned in chapter one are addressed using Pearson Correlation analysis, where each parameter that is included in the mortgage loan pricing in Lesotho is tested, how important it is in terms of being considered in the pricing structure, then its influence on the price mortgage loans and whether it aligns with international standards.

3.6 Research Strategy

The research strategies include surveys, experiments and interviews (Bryman, 2012). This study adopted the survey research strategy. A survey research strategy was used to gather primary data to address the objectives of this study. Survey methodology represents a crucial instrument in research, facilitating the collection of data from a defined population through structured questioning and subsequent analysis of the responses (Martin & Alessi, 2010).

Surveys offer a flexible data collection approach, enabling the quantitative or numerical description of trends, attitudes, or opinions within a population by examining a representative sample (Singer, 2011). The efficacy of a survey is contingent upon the meticulous execution of several stages, including the determination of participant selection, the choice of survey modality (postal, online, or face-to-face), the design of survey questions and distribution of questionnaires, and the analysis and recording of results (Anderson, 2008).

This study employed an internet-based survey, capitalising on the widespread availability of internet (Martin & Alessi, 2010). Additionally, surveys provide respondents with a robust assurance of confidentiality, which can enhance the accuracy of feedback (Singer, 2011). Online surveys are also recognised for their cost-effectiveness compared to alternative research methods (Yang et al., 2015).

3.7 Research Design for Primary Data Collection

Research design is a foundation, structure, or way of collecting, interpreting and analysing data (Bryman, 2012). It applies to quantitative, qualitative and mixed-methods strategies of research (Creswell & Creswell, 2017). There are five categories of research designs: experimental design, cross-sectional or survey design, longitudinal design, case study design and comparative design (Bryman, 2012). This study followed a cross-sectional research design where data is collected at a point in time. The process started by defining the study population, followed by sampling and then developing questions for respondents aligned with the objectives of this study.

3.7.1 Target Population

The target group is a large group that a researcher aims to study or use as a sample to make a broad generalisation about (Johnson & Christensen, 2014). Researchers define it based on various criteria, including demographic data (age, income and gender), geographical location, or specific characteristics relevant to research questions (Creswell, 2014). This study targeted mortgage commercial bank employees who are directly involved in the pricing of mortgage loans, financial advisors from private companies, finance experts, finance and economics lecturers and banking sector regulators aged between 18 and 65 years.

3.7.2 Sample and Sampling Criteria

From the above population, the researcher selected a sample (a subset of the population) of 100 individuals to infer the characteristics of that population. The sampling strategy employed in this study was informed by two principal categories of sampling methods: probability and non-probability sampling (Creswell & Creswell, 2017). Probability sampling is defined as a method where sample selection is random, and every member of the population has an equal chance of being included in a sample (Albert & Barabasi, 2002). Probability sampling techniques encompass simple random sampling, stratified sampling, and cluster sampling (Creswell & Creswell, 2017). Conversely, non-probability sampling deviates from random selection. Instead, sample members are chosen based on specific criteria or convenience. Examples of non-probability sampling methods include purposive and convenience sampling (Etikan, Musa, & Alkassim, 2016).

Given the banking sector's complexity and time constraints, this study followed non-probability sampling using purposive and convenience sampling. Respondents were selected based on their knowledge and accessibility. Additionally, the researcher used snowball sampling, where additional respondents were recruited by existing respondents using their network (Biernacki & Waldorf, 1981). Despite the benefits of probability sampling, it was considered unsuitable for the study because it is expensive and time-consuming. On the other hand, the use of non-probability sampling limits the generalisation of the sample to the entire population.

3.7.3 Data Collection Instrument

This study collected data using an online survey created on Microsoft Forms. Respondents were provided with a link to a questionnaire with 36 measurement items (see Appendix A). The survey comprised four (4) sections. Section one covers general information; section two addresses objective one; section three addresses objective two, and section four addresses objective three. A semi-structured questionnaire, which constituted more closed-ended and few open-ended questions, was used to collect information (Teddle & Yu, 2007). Open-ended questions provide response alternatives, enabling respondents to respond effortlessly, whereas closed-ended questions enable respondents to express themselves using their own words. This methodological approach was used to get rich qualitative and quantitative data (Jick, 1979).

3.8 Analytical Methods

This section outlines methods used to analyse and interpret the data collected for this research. It details the procedures employed for assessing the reliability and validity of the research instrument, the descriptive and factor analysis techniques used to explore the data, and the ethical considerations that guided the research process.

3.8.1 Reliability and Validity Tests

This study used Cronbach's alpha to test reliability. Reliability occurs when the same results are obtained when an instrument is applied repeatedly under the same conditions (Babbie, 2010). Internal consistency is the key measure of reliability in research, assessing how well the items within the test measure the same construct. One of the commonly used statistical tests of internal consistency is Cronbach's alpha (Albert & Barabasi, 2002). The scale of Cronbach's alpha ranges from 0 to 1; the interpretation is as follows:

<0.5 poor reliability; 0.6-0.69 questionable reliability; 0.7-0.79 acceptable reliability; 0.8 -0.89 good reliability and ≥ 0.9 excellent reliability.

Validity tests were also performed. Validity refers to the extent to which an instrument accurately measures what it is intended to measure (Heale & Twycross, 2015). It is associated with the quality and effectiveness of an instrument. It includes the following types:

Face validity: Assesses whether the instrument is measuring what it is supposed to measure based on judgment, not statistical testing (Robson et al., 2023).

Content validity: Determines whether the instrument, based on expert knowledge, covers all aspects of the concept being measured (Yaghmale, 2003).

Construct validity: Assesses whether the instrument measures theoretical concepts well using statistical tools such as factor analysis (Strauss & Smith, 2009).

Criterion validity: Assesses how well the instrument correlates with international standards (Law et al., 2004). Though there are different types of validity, this study used face and content validity.

3.8.2 Descriptive and Factor Analysis

To analyse data, the study used descriptive statistics. Descriptive data analysis is a statistical method used to summarise, describe, or explain the characteristics of data using numerical and visual techniques (Johnson & Christensen, 2014). This study combined numerical tools like frequencies, percentages, and the mean. Tables and graphic elements like bar charts and pie charts were also used to visualise trends and patterns.

Factor analysis was used where there are several variables measuring aspects of the same variable. Factor analysis is a statistical technique that analyses relationships among variables to determine whether a test is dimensional or multidimensional (Johnson & Christensen, 2014). Therefore, principal component analysis (PCA) has been used to analyse the relationship between challenges faced by commercial banks of Lesotho when implementing risk-based pricing on mortgage loans. The six (6) variables used are lack of credit scoring and data analytics, inconsistent borrower

credit history, regulatory constraints, insufficient staff training on risk-based models, customer resistance or misunderstanding and competition.

3.8.3 Ethical Considerations

Before conducting research, the ethics clearance certificate was obtained from the Wits Business School Ethics Committee to ensure ethical conduct (see Appendix C). The ethics clearance certificate, together with letters introducing the researcher to the four commercial banks of Lesotho, was sent. In a message accompanying the survey, respondents were guaranteed anonymity and confidentiality. Crucially, the researcher informed the respondents that participation was voluntary and by participating, they consented to their information being used for research purposes. The letters introducing the researcher to the four commercial banks of Lesotho constitute Appendix B.

3.8.4 Chapter Summary

In conclusion, this chapter has highlighted the research methodology adopted by this study. It started by outlining the research purpose, combining descriptive and explanatory research purpose to address the objectives of this study. The research philosophy followed to achieve objectives was positivism, which aligns well with the methodology choice of quantitative data collection and analysis tools.

The sampling methods were also discussed, with a focus on non-probability sampling, including purposive and convenience sampling, to ensure the inclusion of participants with knowledge and expertise in mortgage loan pricing. Snowball sampling was also used to recruit additional participants. Reliability and validity tests were also highlighted.

Finally, ethical considerations to ensure confidentiality and anonymity were highlighted. The methods used generally provide a solid foundation to achieve reliable and insightful findings that will provide a comprehensive understanding of the risk-based pricing of mortgage loans in Lesotho. The next chapter presents and discusses the results.

CHAPTER 4

PRESENTATION AND DISCUSSION

4.1 Introduction

Building on the research methodology, this chapter presents the findings of this study, detailing the analysis of data collected to address the research objectives. The chapter begins with an assessment of the research instrument's validity and reliability, followed by an overview of the survey's response rate and the demographic profile of the respondents. The main results are then presented, structured to align with the research questions, including an examination of the parameters used in mortgage loan pricing, the challenges in implementing risk-based pricing, and perceptions regarding risk-based mortgage pricing. This analysis employs both descriptive and factor analysis, as well as correlation testing, to provide a comprehensive understanding of the data. Finally, a conclusion summarises the key findings presented in this chapter.

4.2 Validity and Reliability Testing

It was important to test the reliability and validity of the instrument used to collect data before analysing data, as described in the previous chapter. For this reason, DATAtab was used to perform reliability tests by calculating Cronbach's alpha (α) for different sets of questions as presented in Table 4.1. Face validity and content validity were performed as indicated under the subsequent sections.

4.2.1 Reliability Testing

The following are the results of Cronbach's alpha test (see Table 4.1, which follows).

Table 4. 1: Reliability Results

Question	No. of Items	Cronbach's alpha (α)
P1	8	0.91
P2	8	0.99
P3	8	0.98
P4	8	0.98
P6	8	0.93
P8	6	0.81
C1	6	0.93
Rs2	5	0.89
Rs3	5	0.88
Rs5	5	0.96
Rs6	4	0.93

Note:

- *P1 measures the extent to which respondents agree that the parameter is used to price mortgage loans in Lesotho.*
- *P2 measures the extent to which respondents agree that the parameter is important in pricing mortgage loans in Lesotho.*
- *P3 measures the extent to which respondents agree that each parameter influences mortgage loan pricing in Lesotho.*
- *P4 measures the extent to which respondents agree that parameters align with international best practices.*
- *P6 measures the extent to which respondents agree that credit scoring models and risk assessment tools are used in Lesotho's mortgage pricing.*
- *P8 measures the extent to which respondents agree that external factors influence mortgage pricing in Lesotho.*
- *C1 measures the seriousness of the challenges faced by commercial banks in Lesotho in implementing risk-based pricing.*
- *Rs2 measures how respondents rank the importance of factors in mortgage loan pricing.*
- *Rs3 measures the extent to which respondents view the importance of factors in designing a risk-based pricing model.*
- *Rs5 measures the extent to which respondents agree to the risk-based pricing strategies and*
- *Rs6 measures how regulators can help commercial banks implement sustainable risk-based pricing.*

Source: Authors' computation

The Cronbach's alpha reliability test results indicate that questions P1, P2, P3, P4, P6, C1, Rs5 and Rs6 have alphas greater than 0.9, demonstrating an excellent internal consistency (Taber, 2018). P8, Rs2 and Rs3 have alpha values between 0.8 and 0.9, indicating good internal consistency. Overall, survey questions yield consistent outcomes from respondents.

4.2.2 Validity

To assess the quality of the survey, the researcher used face validity, whereby the researcher self-evaluated the survey to determine clarity, assess length and improve the flow of the questions. Thereafter, the survey was shared with the supervisor for review. This was followed by the pilot survey, in which five (5) individuals were asked to respond to ensure the correctness of the survey before it went live. Additionally, the researcher used content validity by including two experts among the five (5) selected individuals to ensure the inclusion of critical mortgage pricing information. After the assessment of the quality of the survey, the responses from five individuals were then discarded.

4.3 Response Rate and Respondents' Demographic Profile

The response rate and the demographic composition of the sample are presented and discussed in this section.

4.3.1 Response Rate

The researcher distributed a questionnaire to the targeted respondents of the study: financial advisors from private companies, finance experts, finance and economics lecturers and banking sector regulators aged between 18 and 65. The sampling methods used were convenience, purposive and snowball. The questionnaire was sent via online communication channels: email, WhatsApp and LinkedIn. The questionnaire consisted of Likert rating and ranking questions.

The response rate achieved was 63%. While more responses would have been ideal, time constraints meant the study proceeded with data analysis using the final sample size of 63. While this number is not big enough, the central limit theory recommends at least 30 observations for the sake of inferential statistics (Triola, 2017). Therefore, the sample size of 63 meets the minimum requirements for inferential statistics.

4.3.2 Demographics

a) Gender and Age Distribution

The results show that out of the 63 individuals who responded, 37 were males (59%) and 26 were females (41%), as presented in Figure 4.1, which follows. Notably, most respondents were in the 30 to 39 age group: 31 (49%), followed by 24 (38%) respondents aged 40 to 49. The ages 18 to 29 and 50 to 59 had fewer respondents, comprising 6 (10%) and 2 (3%), respectively, with no response from the age group 60 to 65 as presented in the subsequent Figure 4.1.

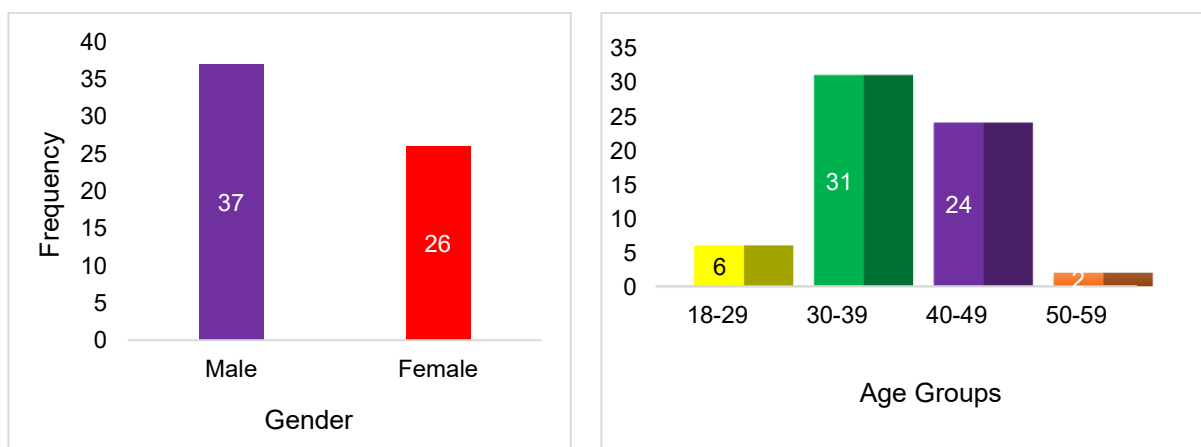


Figure 4. 1: Descriptive Statistics for Gender and Age

Source: Author's plot

b) Respondents' Roles

Figure 4.2 (below) indicates that most respondents were regulators and bank employees, with 23 being financial regulators, 23 being bank employees, 9 classified under the "other" category, three (3) lecturers in finance or economics, two (2) financial advisors, one (1) finance expert and one (1) mortgage loan borrower.

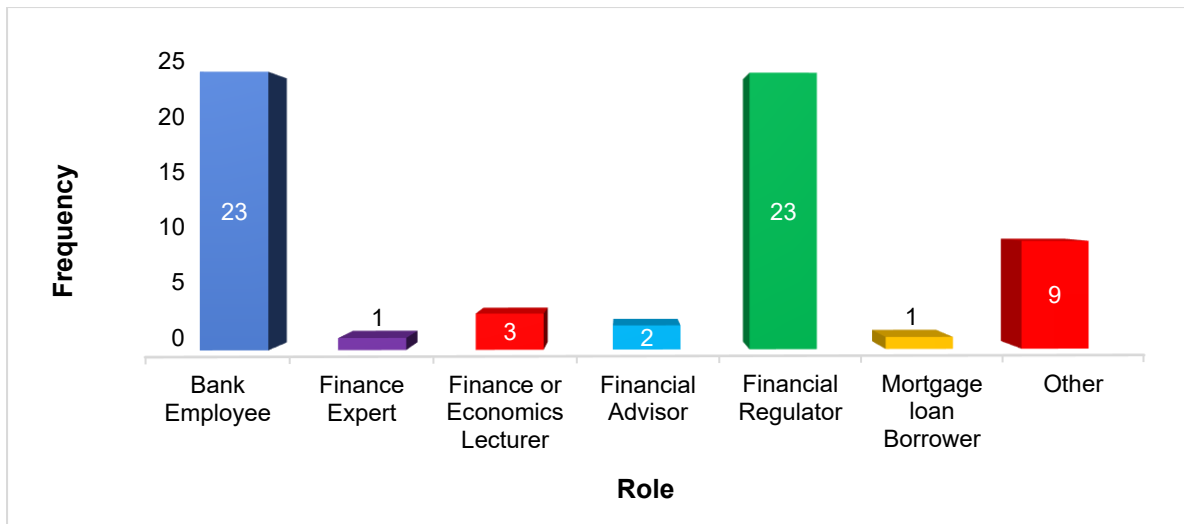


Figure 4. 2: Descriptive Statistics for Respondents' Roles

Source: Authors' plot

This composition is critical because it ensures that the sample consists of key role players in the banking sector who are well-positioned to provide quality information to address the study objectives.

c) Respondents' Experience

Regarding the experience of the respondents, Figure 4.3 (which follows) shows that the majority (34) of respondents had more than seven (7) years of experience, 16 had worked for 4-7 years, nine (9) had experience ranging from 1 to 3 years and three (3) had less than one year of experience. This experience distribution, comprising experienced respondents, is important in getting industry dynamics and well-informed perspectives that may lead to sound policy formulation and recommendations.

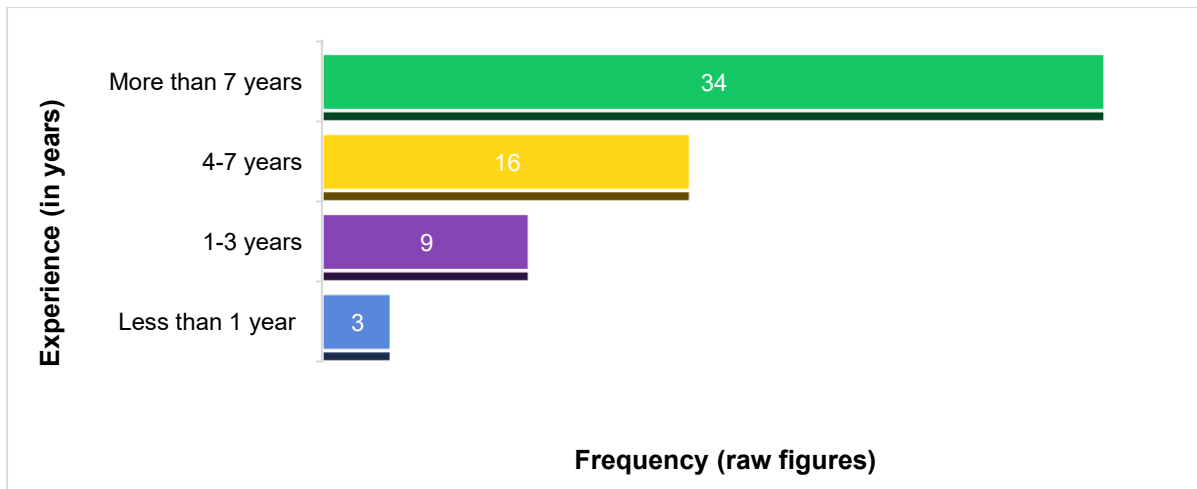


Figure 4. 3: Descriptive Statistics for Respondents' Experience

Source: Authors' plot

d) Respondents' Knowledge

Figure 4.4 (below) presents the level of knowledge of respondents regarding risk-based pricing. In terms of their knowledge of risk-based pricing, 10% showcased an excellent understanding of risk-based pricing, 33% demonstrated a good understanding of risk-based pricing, 48% had a fair understanding of risk-based pricing, and another 10% exhibited a poor understanding of risk-based pricing. This finding indicates that most of the respondents fairly understand risk-based pricing.

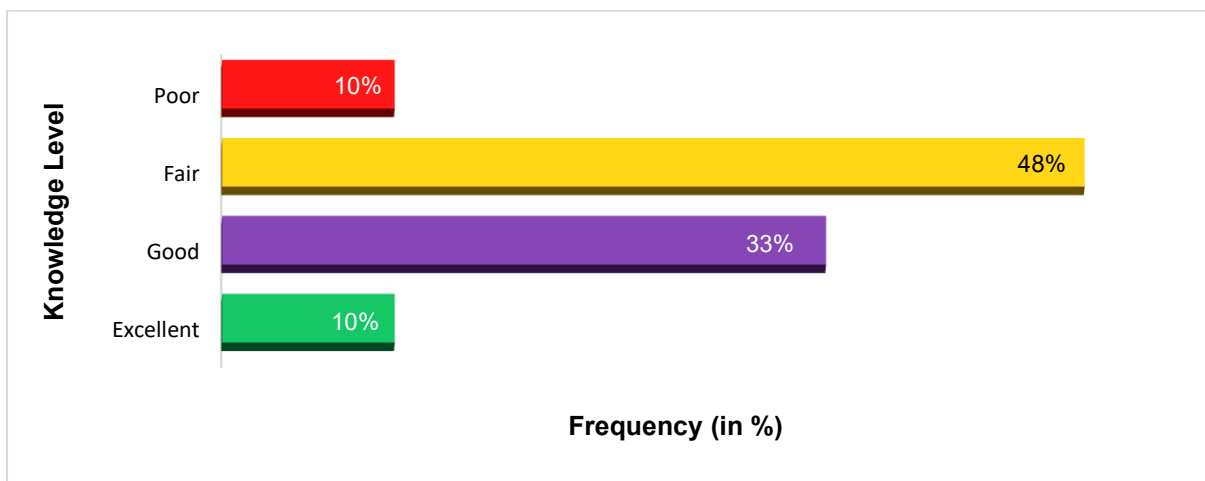


Figure 4. 4: Descriptive Statistics for Knowledge Regarding Risk-Based Pricing

Source: Authors' plot

e) *Type of Commercial Bank Used*

Furthermore, the respondents specified the type of commercial bank with which they were familiar. As shown in Figure 4.5, the results show that most (52%) used both locally owned and foreign-owned commercial banks. One-quarter (25%) use foreign-owned commercial banks, and 22% use locally owned commercial banks.

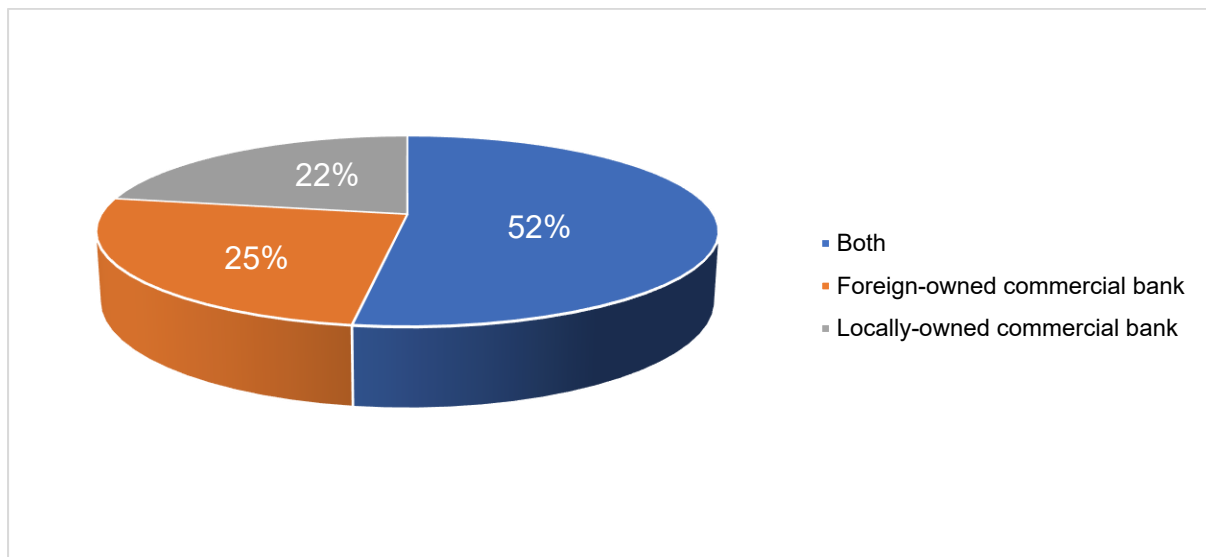


Figure 4. 5: Descriptive Statistics for the Type of Commercial Bank Used

Source: Authors' plot

In addition, they indicated their perception regarding the extent to which risk-based pricing is applied in Lesotho using a scale of 0 to 100, as presented in Figure 4.6 below. The study revealed different beliefs regarding the implementation of risk-based pricing on mortgage loans by commercial banks in Lesotho. The most frequent scores clustered around 50, 60, 70 and 90, with 50 being the most frequent score (mode). This finding suggests a mixed perspective among respondents about the implementation of risk-based pricing in Lesotho. Standard Bank Lesotho's website shows that the interest rate on mortgage loans is attached to the prime lending rate (Standard Lesotho Bank, n.d.). This shows that the commercial banks in Lesotho use a pricing strategy called prime-plus. The result would be risk-based pricing if the margin added to the prime lending rate was computed using credit-scoring methods

or internal-based rating methods. However, respondents remain uncertain about the calculation of the margin, thereby reinforcing diverse viewpoints among them.

Moreover, the respondents indicated the extent to which mortgage loan prices are high in Lesotho using a scale of 0 to 100. The most frequent scales were 70, 80, 90 and 100, as shown in Figure 4.6. On average, respondents rated mortgage loan prices in Lesotho at 68 on the scale, with a median of 75. The findings suggest that there are issues of affordability and accessibility of mortgage loans in Lesotho, potentially indicating that borrowers may be priced uniformly regardless of their risk levels. This scenario implies that risk-based pricing is not effectively applied in Lesotho. In a risk-based pricing of mortgage loans, high-risk borrowers are charged high interest rates and low-risk borrowers are charged low interest rates (Magri, 2018). This approach allows commercial banks to assess risk accurately, price risk, and charge a fair price.

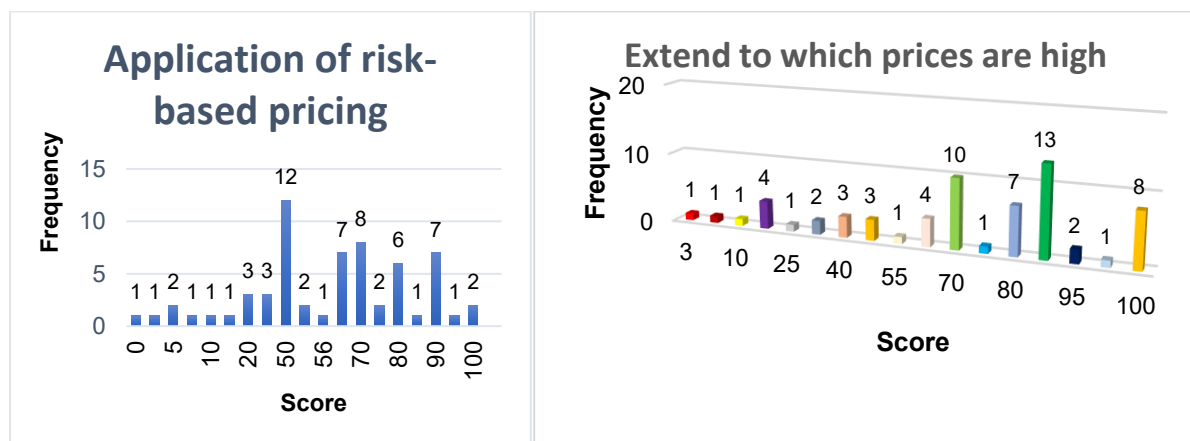


Figure 4. 6: Application of Risk-Based Pricing and Price Impact

Source: Authors' plot

The next section presents the main results of the study, structured according to the three primary research objectives (ROs) outlined previously.

4.4 Main Results

4.4.1 Mortgage Pricing Parameters (RO1)

This section presents and discusses the results of the first research objective (RO1), which investigated the parameters that Lesotho's commercial banks consider when pricing mortgage loans. Data relating to this objective has been analysed using descriptive and correlation analysis.

4.4.1.1 Descriptive Analysis

This study used mean values to analyse data relating to parameters used by commercial banks when pricing mortgage loans. Table 4.2 (below) shows the weighted averages for the Likert scale questions P1 to P4. The mean is calculated by taking the sum of the code multiplied by the frequency of a parameter divided by the total frequency (Chakrabarty, 2014). The Likert scores range from 1 to 5, with the highest score indicating greater perceived usage (P1), importance (P2), influence (P3) and alignment with international standards (P4).

Table 4.2 also shows mean values for different parameters used by commercial banks of Lesotho when pricing mortgage loan pricing.

The results indicate that the highest-rated parameter is borrower income level, with an overall average score of 4.19, a mean of 4.22 on usage, 4.27 on importance, 4.30 on influence and 3.97 on alignment with international standards. Borrower credit score is the second highest rated parameter with an overall average score of 4.05. This score is driven by a mean of 4.33 on influence, indicating a strong influence in mortgage pricing, 4.05 on importance, 3.93 on alignment with international standards and 3.90 on usage. Employment type ranks third with an overall average score of 4.02, the score of 4.22 for usage, 4.13 for importance, 3.94 for influence and 3.78 for alignment with international standards.

The mid-range rated parameters include loan-to-value ratio, cost of capital, property location and value and cost of funds with overall average scores of 3.94, 3.89, 3.88 and 3.86 respectively. These average scores lean towards 4, meaning respondents

agree that these parameters are used when pricing mortgage loans; they are important, influential and aligned with international standards.

The cost of service is the lowest-rated parameter, with an overall score of 3.65 and the lowest score of 3.45 on influence. This means that respondents view the cost of service as less influential compared to other parameters. However, its score leans towards the scale of 4, meaning respondents agree that it is used in pricing mortgage loans in Lesotho but not as a primary driver of mortgage loan pricing.

Table 4. 2: Mortgage Loan Pricing Parameters

Parameters+	P1	P2	P3	P4	Overall Average Score
	Mean	Mean	Mean	Mean	
Borrower credit score	3,90	4,05	4,33	3,93	4,05
Loan-to-value ratio	3,79	4,00	4,12	3,83	3,94
Borrower Income Level	4,22	4,27	4,30	3,97	4,19
Employment type	4,22	4,13	3,95	3,78	4,02
Property location and value	3,89	3,95	3,95	3,73	3,88
Cost of capital	3,94	4,00	3,83	3,80	3,89
Cost of funds	3,94	3,94	3,85	3,72	3,86
Cost of service	3,74	3,78	3,45	3,62	3,65
Other	3,19	3,28	3,14	2,67	3,07

Borrower income level plays a critical role in mortgage loan pricing. These results are consistent with the findings of *Campbell and Cocco (2015)*, who revealed that in the US, income level is an important parameter in mortgage loan pricing because it is used by banks to measure affordability. Additionally, the credit risk management theory indicates that banks must assess the income level of the borrower before lending. High income shows loan repayment capacity, leading to more favourable terms. Borrowers with lower incomes are often charged higher interest rates to mitigate default risks (*Joseph, 2013*). However, *McKinley & Todd (2012)* argue that assessing and pricing mortgage loans based only on income levels may lead to over-borrowing by lenders and misstatement of income by borrowers, as experienced during the 2007-2008

financial crisis, where the liar loan problem emerged because of the overstatement of income.

Credit score is also important in mortgage loan pricing. According to Thoka (2015), lenders use borrower's credit scores (FICO) to assess the creditworthiness of individual borrowers. FICO scores are widely used credit scores developed by Fair Isaac Corporation. They range from 300, which indicates high risk, to 850, which indicates low risk. Altman's Z score is used to assess the creditworthiness of corporate borrowers and estimate the probability of default. The Z-score formula is $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$ where X_1 represents working capital / total assets, X_2 retained earnings / total assets, X_3 earnings before interest and taxes (EBIT) / total assets, X_4 market value of equity/total liabilities and X_5 sales / total assets (Altman, 1968).

The credit risk management theory also emphasises the need for assessment of the probability of default and most banks use credit scores as statistical measures of the probability of default. Borrowers with lower credit scores struggle to secure favourable mortgage loan terms because of the perceived high probability of default, while borrowers with high credit scores benefit in terms of securing larger mortgage loans, smaller down payments and lower interest rates. Giacoletti, Heimer, & Yu (2021) also indicated that risk-based pricing leverages credit scoring to determine appropriate risk premiums.

Data show that the employment type is another commonly used parameter by commercial banks in Lesotho when pricing mortgage loans and it is an important and influential factor. The high mean score demonstrates this. According to LaCOUR-Little (2020), salaried employees are more likely to get favourable mortgage loan terms because their income (salary) is considered stable compared to business income.

Moreover, commercial banks in Lesotho use loan-to-value ratio (LTV) when pricing mortgage loans. LTV is the ratio of the loan amount to the value of the mortgage (loan amount/property value). Basel III assigns lower risk weights (20%) to mortgage loans with low LTV ($\leq 80\%$) and high-risk weights (35%-75%) to mortgage loans with high-risk weights ($80\% \leq$) (Basel Committee on Banking Supervision, 2010). This means

that borrowers with a loan-to-value ratio less than 80% are considered low-risk because of a 20% equity stake in the property, which acts as collateral. This condition allows banks to hold less capital against the property and offer lower interest rates to the borrowers. On the other hand, banks consider borrowers with LTVs greater than 80% as high-risk borrowers and charge them high interest rates. The credit risk management theory suggests that banks use LTV to monitor exposure through collateral, thus affecting LGD in the ECL formula (Grouchy, Galai, & Mark, 2006).

Additionally, Gosh's risk-based pricing model shows the importance of cost of capital, cost of funds and cost of service. The cost of capital reflects the expected return by shareholders of the bank and is the cost of equity to commercial banks. The cost of funds relates to the cost of debt, such as deposits and subordinated debt instruments (Ghosh, 2012). Financial intermediation theory suggests that banks act as intermediaries between surplus units (depositors) and deficit units (borrowers) (Diamond & Rajah, 2001). This theory helps in explaining the cost of funds, which is the compensation borrowers pay for the use of deposits (interest paid). Gosh's risk-based pricing model also explains the relationship between the cost of service and the operational efficiency of banks (Ghosh, 2012). The model emphasises that more efficient banks lower their cost of service, thus lowering interest rates, while less efficient banks may pass on high costs to borrowers.

a) Risk-Based Pricing in Lesotho's Banks

Figure 4.7 (below) presents the views of the experts regarding the application of risk-based pricing by commercial banks in Lesotho. The results show that 45% of respondents agree that risk-based pricing is applied by commercial banks in Lesotho, while only 18% disagree. Notably, 37% remained neutral, suggesting that commercial banks in Lesotho might not be transparent about mortgage loan pricing.

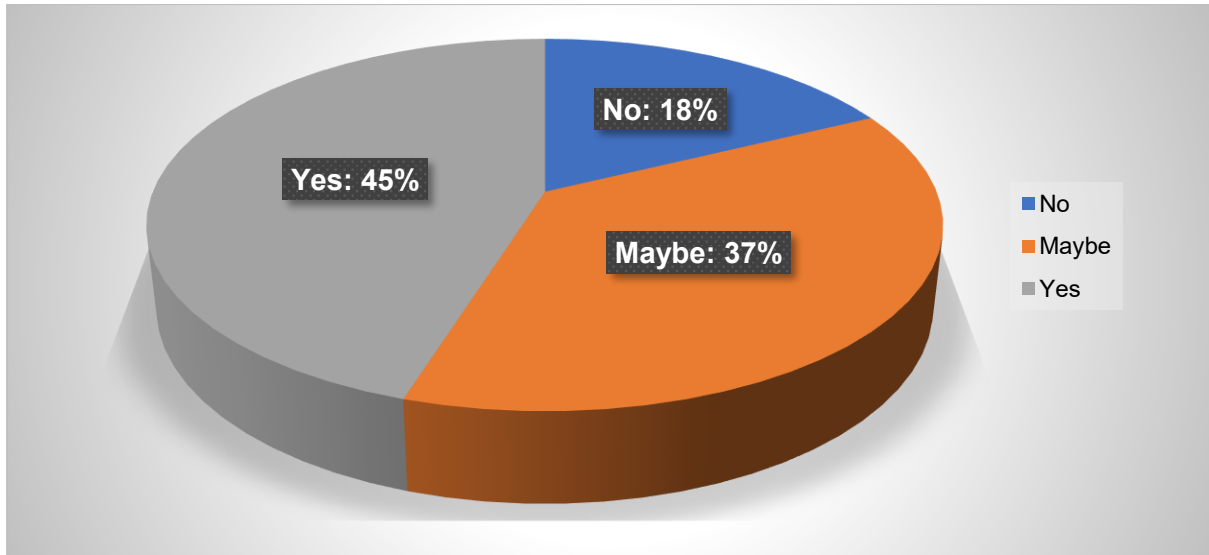


Figure 4. 7: Application of Risk-Based Pricing by Commercial Banks in Lesotho

Source: Authors' plot

This lack of transparency in the disclosure of pricing models by commercial banks stems from the fact that most banks in Africa, including Lesotho, treat their pricing models as proprietary information. Banks in Africa do not disclose their pricing methodologies because they consider them competitive strategies. In 2011, 24 African countries held the Microfinance Pricing Transparency Leadership Forum in Nairobi, Kenya, to discuss issues of pricing transparency (Micro Finance Transparency, 2011). Furthermore, in 2024, the government of South Africa considered amending the Home Loan and Mortgage Disclosure Act of 2000 to compel banks to disclose more information about their lending practices. The aim was to improve loan accessibility for previously disadvantaged citizens (Smith, 2024). Starting in April 2022, the Central Bank of Lesotho has been issuing pricing directives compelling banks to disclose prices for their products, including loans.

b) *Credit Scoring and Risk Management in Lesotho's Mortgage Market*

Table 4.3 illustrates the extent to which credit scoring models and risk management tools are used in Lesotho when pricing mortgage loans. The results show that the frequently used risk management tool is a debt-to-income ratio with a mean of 4.17. Credit bureau score and property valuation models are the second most frequently

used risk management tools in pricing mortgage loans in Lesotho, with a mean of 3.92. The internal credit scoring model is the third-rated risk management tool, with a mean score of 3.85. followed by the risk rating system and income verification tools with means of 3.78 and 3.73, respectively.

Table 4. 3: Mean Values for Risk Management Tools

Risk management tool	Never used	Rarely used	Sometimes used	Frequently used	Always used	Total	Mean Values
	1	2	3	4	5		
Internal credit scoring model	1	7	11	22	19	60	3,85
	1	14	33	88	95	231	
	2%	11%	18%	36%	31%	98%	
Credit Bureau Score	3	5	9	20	23	60	3,92
	3	10	27	80	115	235	
	5%	8%	15%	33%	38%	100%	
Automated underwriting system	3	11	22	16	8	60	3,25
	3	22	66	64	40	195	
	5%	18%	37%	27%	13%	100%	
Income Verification tools	2	4	17	22	15	60	3,73
	2	8	51	88	75	224	
	3%	7%	28%	37%	25%	100%	
Property Valuation Models	2	5	11	21	22	61	3,92
	2	10	33	84	110	239	
	3%	8%	18%	35%	37%	102%	
Debt-to-income analysis	0	3	8	25	24	60	4,17
	0	6	24	100	120	250	
	0%	5%	13%	42%	40%	100%	
Risk rating system	2	6	10	27	15	60	3,78
	2	12	30	108	75	227	
	3%	10%	17%	45%	25%	100%	
Cost of service	1	9	13	23	14	60	3,67
	1	18	39	92	70	220	
	2%	15%	22%	38%	23%	100%	

The debt-to-income ratio (DTI) is calculated by dividing monthly debt payments by monthly gross income. DTI is used by banks in Lesotho to determine whether the borrower will be able to repay the loan monthly. This is consistent with the best practice as evidenced by its use in many countries (International Monetary Fund, 2011). Consumer protection regulations such as the Lesotho Consumer Protection Act 2022 and the National Credit Act of South Africa also require that lenders consider DTI when performing an affordability assessment of the borrower (National Credit Act, 2005).

Despite the importance of credit scores in the risk-based pricing of mortgage loans, Lesotho has a challenge of limited credit information access. The country has only one credit-scoring enterprise, Experian. The credit evaluations performed include only basic loan information such as a list of loans for a borrower, the amount, name of the lender and loan term. The credit report does not include a borrower's risk score, making it difficult for one to know whether the borrower is a low-risk or high-risk. Lesotho is currently in the process of enhancing its credit information system (SADC Financial Inclusion Forum, 2024).

Property valuation models are statistical models used to calculate the market value of property considering several factors such as location factors (like proximity to amenities), physical characteristics (size, age, and others) and market conditions (demand and supply). Property valuation models help in coming up with the correct value of the property, thus enhancing the accuracy of the Loan-to-Value ratio, which is the critical ratio in mortgage lending.

The internal credit scoring model is the third-rated risk management tool, with a mean score of 3.85. Internal credit scoring models are developed by commercial banks in Lesotho to assess the creditworthiness of borrowers. Data shows that these internal credit scoring models are widely used by commercial banks (Magri, 2018). Lesotho operates under Basel 2.5, requiring banks to compute capital charges for credit risk, market risk and operational risk using the standardised approach (Financial Institutions (Computation of Capital Charge for Credit, Operational and Market Risks) Regulations, 2023). However, the three commercial banks of Lesotho are subsidiaries of South African banks, and South Africa transitioned to Basel III; this allows them to leverage internal rating models used by the parent banks. However, without internal

rating models and credit bureau scores, the local bank will find it difficult to assess the creditworthiness of borrowers, thus contributing to the problem of restructuring mortgage loans in Lesotho.

This result indicates that respondents agree that the risk rating system is used as a risk management tool by commercial banks in Lesotho to price mortgage loans. This process is particularly important in commercial mortgage loans because the banks must assess other risk types, such as liquidity risk and operational risks. Liquidity risk assessment is important as it indicates the ability of the borrower to repay the loan in the next 12 months. An operational risk assessment helps banks determine whether the borrower can generate enough income to meet repayment obligations.

Data show that respondents agree that another risk management tool that is used by commercial banks in Lesotho is the income verification tool. It involves items like pay slips, employment verification letters, tax returns and bank statements (McKinley & Todd, 2012). These tools are important as they guard against misstatement of income, which was a problem during the 2007-2008 financial crisis.

The lowest-rated risk management tools are the automated underwriting system and cost of service, with means of 3.67 and 3.25, respectively. This finding indicates that respondents do not consider these tools as important as other risk management tools mentioned above. The result suggests that commercial banks in Lesotho still rely on traditional risk management tools, with limited consideration of how technology can help enhance underwriting processes. This aligns with the previous finding that African economies struggle with technological advancement, which negatively impacts the use of automated underwriting systems.

c) Lesotho Banks' Mortgage Loan Pricing Transparency

Figure 4.8, which follows, presents how open commercial banks in Lesotho are about the parameters used to price mortgage loans. The results indicate that 10% of the respondents indicated that they are open, 69% indicated that they are somewhat open, and 21% said they are not open.

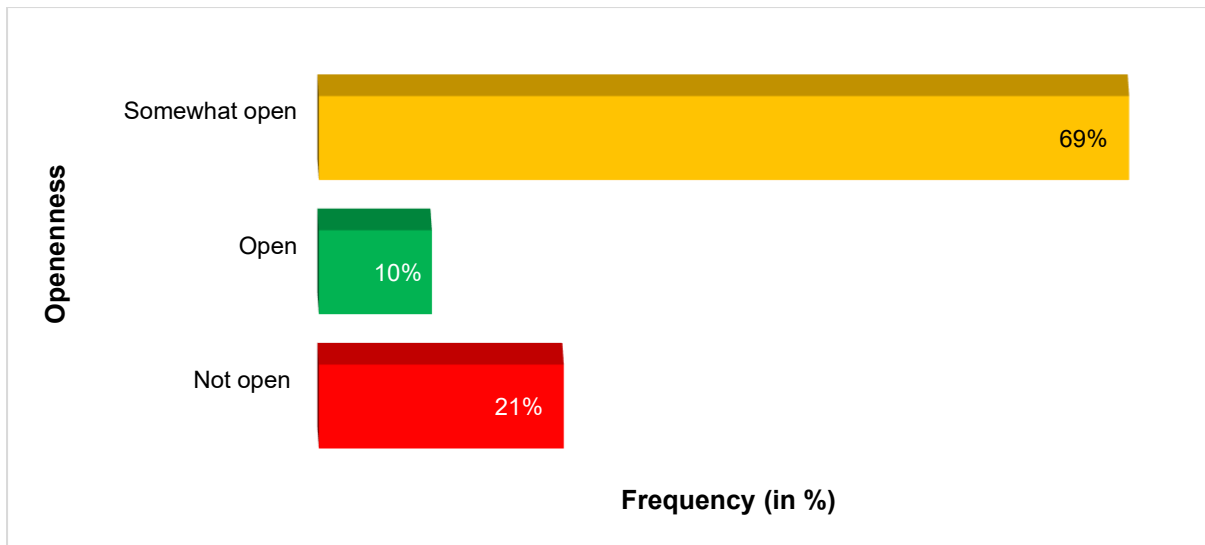


Figure 4. 8: Descriptive Statistics for Mortgage Pricing Transparency

Source: Authors' plot

The fact that most of the respondents indicate that commercial banks in Lesotho are somewhat open about the parameters used when pricing mortgage loans highlights limited transparency and information asymmetry issues in Lesotho's mortgage loan pricing (Damane, 2020).

d) Results of the analysis of the influence of external factors on mortgage loan pricing using mean values

The results in Table 4.4 indicate that three external factors have a very strong influence on mortgage loan pricing in Lesotho. These are the central bank interest rate with a mean of 4.56, inflation with a mean of 4.25 and regulatory requirements with a mean of 3.92. Economic growth rate (mean 3.70), market competition (mean 3.60) and international markets (mean 2.98) have a moderate influence on mortgage loan pricing in Lesotho. The least influential factors are property market conditions with a mean of 2.73, exchange rate fluctuations with a mean of 2.92 and other factors with a mean of 1.91.

Table 4. 4: External Factors' Influence on Mortgage Loan Pricing

Parameters	No influence	Slight influence	Moderate influence	Strong influence	Very strong influence	Total	Mean
	1	2	3	4	5		
Inflation	2	1	9	18	33	63	4,25
	2	2	27	72	165	268	
	3%	2%	14%	29%	52%	100%	
Central Bank Interest rate	0	0	5	18	40	63	4,56
	0	0	15	72	200	287	
	0%	0%	8%	29%	63%	100%	
Economic Growth Rate	3	9	12	19	20	63	3,70
	3	18	36	76	100	233	
	5%	14%	19%	30%	32%	100%	
Exchange rate fluctuations	14	9	18	12	10	63	2,92
	14	18	54	48	50	184	
	22%	14%	29%	19%	16%	100%	
Market Competition	5	5	16	21	16	63	3,60
	5	10	48	84	80	227	
	8%	8%	25%	33%	25%	100%	
Regulatory requirements	3	4	12	20	24	63	3,92
	3	8	36	80	120	247	
	5%	6%	19%	32%	38%	100%	
Property Market Conditions	13	23	8	6	13	63	2,73
	13	46	24	24	65	172	
	21%	37%	13%	10%	21%	100%	
International Markets Conditions	11	8	21	17	6	63	2,98
	11	16	63	68	30	188	
	17%	13%	33%	27%	10%	100%	
Other	7		3		1	11	1,91
	7	0	9	0	5	21	
	64%	0%	27%	0%	9%	100%	

These results support that central bank interest rate plus standard margin; prime lending is key to mortgage loan pricing mortgage in Lesotho (Financial Institutions (Banks) (Pricing) Directives, 2024). This result reflects the impact of monetary policy on mortgage loan pricing. As articulated in the literature review section, one of the functions of the Central Bank of Lesotho is to maintain price stability (Central Bank of

Lesotho, 2000). This is achieved through maintaining enough reserves to uphold the currency peg between Loti (LSL) and ZAR. To sustain this peg, the Central Bank of Lesotho aligns its monetary policy decisions with those of the South African Reserve Bank (SARB). When SARB increases the interest rate to curb inflation, the CBL must increase the interest rate in tandem with SARB and lower interest rates when SARB eases monetary policy. This is done to prevent capital flight, where investors in Lesotho can decide to invest their financial assets in South Africa or other countries.

Furthermore, this study showed that regulatory requirements also affect mortgage loan pricing. This aligns well with the Basel Accord shown in the literature. The results also indicate that the economic growth rate measured by GDP also affects the mortgage loan pricing. This is because if the economy is growing, demand for credit increases, leading to an increase in inflation. Therefore, the CBL will increase interest rates to curb inflation.

Exchange rate fluctuations are less significant in Lesotho because this pegging limits the impact of exchange rates in Lesotho. Property market conditions are also less significant because this study showed that the property market is still in its infant stage in Lesotho, and the property market is mostly financed by personal loans.

4.4.1.2 Correlation Analysis

This section presents the results to the hypotheses mention in chapter one about the parameters used in mortgage loans pricing by commercial banks in Lesotho.

Pearson correlation was used to establish relationships between each parameter's extent of use (P1) versus its importance (P2), influence (P3) and alignment with best practice (P4).

Table 4. 5: Correlations Between P1, P2, P3, and P4

		Importance of parameter (P2)	Influence of parameter (P3)	Alignment of parameter (P4)
Extent of parameter use (P1)	Parameter			
	Borrower credit score	0.86*	0.85*	0.87**
	Loan-to-value ratio	0.84*	0.74**	0.92**
	Borrower income level & stability	0.95***	0.93**	0.96***
	Employment type	0.84*	0.71*	0.64*
	Property location & value	0.96***	0.99***	0.9**
	Cost of capital	0.97**	0.95***	0.93**
	Cost of funds	0.91**	0.97***	0.99***
	Cost of service	0.91**	0.95**	0.82*

(*), (**) and (***) represent the 10%, 5% and 1% significance levels, respectively.

The results reflect that most of the Pearson correlations listed in Table 4.5. range between 0.8 and 0.9. This result suggests a strong positive correlation (r above 0.5) between the use of parameters, its importance, influence and alignment with best practices. Though the correlation analysis highlights the strong relationships, the significance levels (measured by p -values) of the extent of use of these parameters with their importance, influence and alignment with best practices differ, as shown in Table 4.5. Borrower income levels and stability, property location and value, cost of capital, and cost of funds exhibit a very strong correlation ($r > 0.9$ and p -value < 0.01).

The borrower credit score and loan-to-value ratio show a strong correlation ($r > 0.8$, p -value < 0.05). This indicates that these parameters are not only influential in mortgage loan pricing; they are also important and aligned with international standards. However, employment type has a weaker correlation of use and alignment with

international standards ($r > 0.6$, p -value < 0.1). This result suggests variability in the use of employment type in mortgage loan pricing, which may be because of differences in banks' credit policies.

Although some of the correlation coefficients are marginally significant (i.e. at 10% level), the null hypotheses are rejected and hence concluding that the (i) borrower credit score, loan-to-value ratio, borrower income level and stability, employment type, property location and value, cost of capital, cost of funds and cost of service are important considerations in Lesotho's mortgage loans pricing; (ii) all mentioned parameters have a greater influence on mortgage loan pricing in Lesotho; and (iii) all the parameters are aligned to international standards.

4.4.2 Mortgage Loan Risk-Based Pricing Challenges (RO2)

This section presents and discusses the results of the second objective (RO2) of this study, which focuses on the challenges faced by commercial banks in Lesotho when implementing risk-based pricing on mortgage loans. Descriptive statistics and factor analysis have been used to analyse data relating to this objective.

4.4.2.1 Descriptive Analysis

The results show that the biggest challenge facing commercial banks in Lesotho in implementing risk-based pricing on mortgage loans is insufficient staff training on risk-based pricing, with a mean of 3.97, followed by inconsistent borrower credit history, with a mean of 3.90 and lack of credit scoring and data analytics tools, with a mean of 3.87. Other challenges include customer resistance or misunderstanding, with a mean of 3.49, regulatory constraints with a mean of 3.33 and competition, with a mean of 3.24. This means that accessing reliable and standardised credit assessment is a problem in Lesotho. The need for a credit information sharing system in Lesotho is reflected by inconsistent borrower credit histories. Table 4.6 presents challenges for commercial banks in Lesotho in implementing risk-based pricing on mortgage loans.

Table 4. 6: Challenges of Risk-Based Mortgage Pricing in Lesotho

Challenges	Not a problem at all	Not a problem	Minor problem	Moderate problem	Serious problem	Total	Mean Value
	1	2	3	4	5		
Lack of credit scoring and data analytics tools	5	3	9	24	22	63	3,87
	5	6	27	96	110	244	
	8%	5%	14%	38%	35%	100%	
Inconsistent borrower credit history	4	3	9	26	21	63	3,90
	4	6	27	104	105	246	
	6%	5%	14%	41%	33%	100%	
Regulatory constraints	7	9	15	20	12	63	3,33
	7	18	45	80	60	210	
	11%	14%	24%	32%	19%	100%	
Insufficient staff training on risk-based models	2	3	14	20	24	63	3,97
	2	6	42	80	120	250	
	3%	5%	22%	32%	38%	100%	
Customer resistance or misunderstanding	5	6	19	19	14	63	3,49
	5	12	57	76	70	220	
	8%	10%	30%	30%	22%	100%	
Competition	4	14	14	25	6	63	3,24
	4	28	42	100	30	204	
	6%	22%	22%	40%	10%	100%	

Source: Author's computation

Insufficient staff training challenges reflect a knowledge gap in the risk-based pricing of mortgage loans, which may hinder the implementation of risk-based pricing by commercial banks in Lesotho. Therefore, the impact of insufficient staff training on the application of risk-based pricing needs further investigation.

When it comes to inconsistent borrower credit histories and credit scoring, these results contrast with the results from developed countries, where advanced credit-scoring models played a critical role in risk-based pricing (Ghosh, 2012; Magri & Pico, 2011; Phillips, 2013). Lesotho, like many other emerging economies, struggles with inconsistent borrower credit histories and credit scoring due to a lack of advanced information technology infrastructure (International Monetary Fund, 2006). This aligns with a study in Kenya where it was found that risk-based pricing models improved significantly after the introduction of credit reference bureaus (Ndarwa & Mulinge, 2023). Without proper credit scoring models, lenders find risk assessment a mammoth task that leads to inconsistent borrower credit history.

In many African countries, excluding Botswana, the financial literacy rate is low (Klapper et al., 2014). This makes it difficult for borrowers to understand why their loan terms differ and adjust their financial behaviour. Commercial Banks in Lesotho, like in other African Countries, rely on short-term deposits to fund mortgage loans (Afrane, Owusu-Manu, Donkor-Hyiaman, & Bondinuba, 2014). This reliance creates competition for retail deposits as banks try to mitigate maturity mismatches, thus leading to competitive pricing.

Regulatory frameworks such as Financial Institutions (Computation of Capital Charge for Credit, Operational and Market Risks) Regulations, (2023) can limit the application of risk-based pricing because it requires a standardised approach to capital computations for credit risk. This hinders banks from using internal ratings-based (IRB) models, thus charging interest based on various risk profiles of borrowers. The standardised approach may lead to uniform pricing because it uses fixed risk weights for different asset classes.

4.4.2.2 Factor Analysis

Table 4.7 provides a comprehensive factor analysis of the challenges commercial banks in Lesotho face when implementing risk-based mortgage pricing

Table 4. 7: Factor Analysis for Risk-Based Pricing Challenges		
Related component matrix		
Challenges	Component	
	PC1	PC2
Insufficient staff training on risk-based models	0.9602	
Lack of credit scoring and data analytics tools	0.9463	
Inconsistent borrower credit history	0.9161	
Regulatory constraints		0.7869
Competition		0.9643

Notes: PC1 stands for the first principal component (PC), while PC2 stand for the second principal component.
Source: Author's computation

The results categorise these challenges into two groups: operational (internal) factors and external factors. Insufficient staff training on risk-based models, inconsistent borrower credit history and lack of credit scoring and data analytics tools have high scores under component one, meaning they cluster together and form a group of operational factors. Operational factors are those that the bank has control over. Tiriongo et al. (2023) emphasise the importance of operational factors in risk-based pricing in Kenya. This means that before applying risk-based pricing on mortgage loans, commercial banks of Lesotho should solve these challenges.

Component two encompasses industry-level challenges beyond the direct control of the bank, external factors such as regulatory constraints and competition. Basel II requires banks to assign risk weight to different asset classes, including mortgage loans, when calculating capital (Basel Committee on Banking Supervision, 2004). Since capital charges for risky assets are higher, banks may decide to lend only to low-risk borrowers, leading to credit rationing. This is particularly the case in less competitive markets where banks do not feel pressured to retain customers.

According to Muller et al. (2024), financial markets with a low level of competition, like Lesotho, often face high interest rates, while markets with high competition have low interest rates. Overall, the results indicate that operational factors seem to be the most problematic compared to external factors challenges the commercial banks in Lesotho are facing based on their high factor analysis score.

a) *Technology Barriers to Risk-Based Pricing in Lesotho*

Figure 4.9 illustrates the role of technology as a barrier to the implementation of risk-based pricing in Lesotho. The results indicate that 7 respondents strongly agree that technology is a barrier, 16 respondents agree, 18 are neutral, 15 disagree, and 7 strongly disagree.

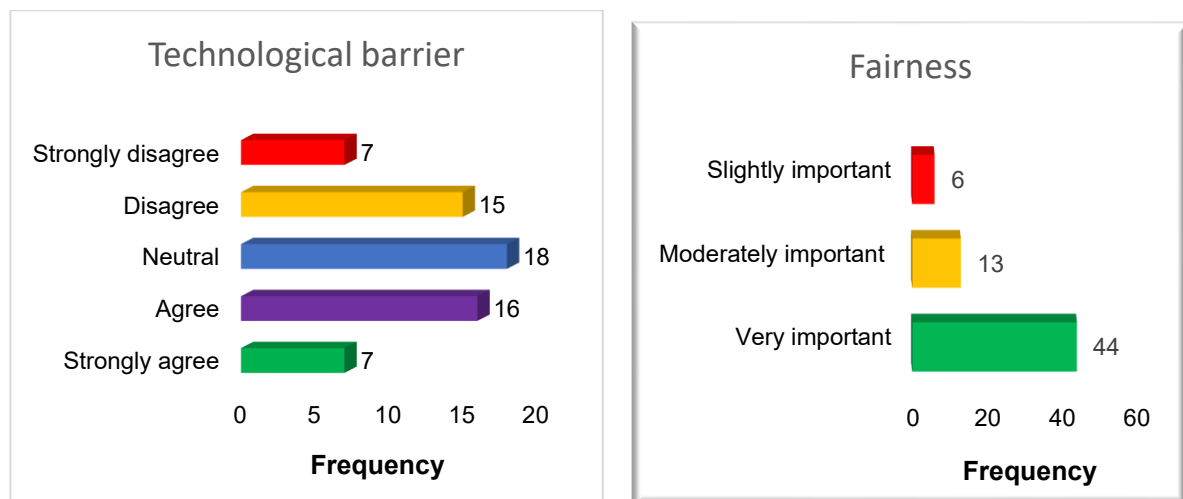


Figure 4. 9: Descriptive Statistics for Technological Barrier and Fairness
Source: Authors' plot

These results suggest that opinions are divided, and neutrality is significant about how technology is a barrier to the implementation of risk-based pricing on mortgage loans by commercial banks in Lesotho. This neutrality may be a result of the fact that the three commercial banks, which are subsidiaries of South African banks, may have access to advanced banking technology, while the local bank may be the one struggling with technological advancement. This aligns with the results of the study

conducted by Claessens and Horen (2014), which indicates that host countries benefit from foreign banks in terms of advanced technologies and risk management.

Furthermore, Figure 4.9 presents the perceived importance of fairness and non-discrimination in the risk-based pricing of mortgage loans. The majority (44 respondents) consider fairness and non-discrimination as a very critical factor in risk-based pricing of mortgage loans in Lesotho, while 13 respondents view it as moderately important and 6 consider it slightly important. The strong emphasis on fairness and non-discrimination aligns with the requirements of the Financial Consumer Protection Act 2022 of Lesotho and financial inclusion initiatives driven by the World Bank, African Development Bank Group, OECD and the United Nations (UN).

b) *Impact of Limited Access to Borrower's Data in Lesotho*

Figure 4.10 presents the impact of limited access to borrower's data in Lesotho. The results show that 24 respondents consider it a severe problem, 25 view it as a major problem, 13 say it is a moderate problem, and 1 found it a minor problem.

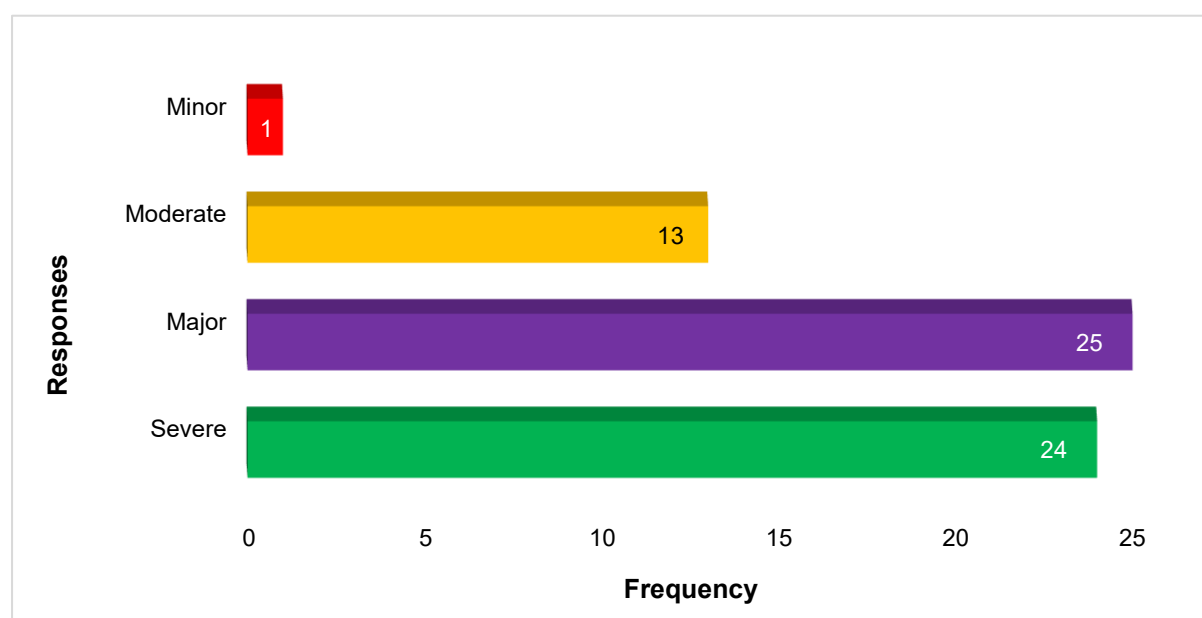


Figure 4. 10: Descriptive Statistics for Impact of Borrower Data Limits
Source: Authors' plot

Most respondents found a limited access to data a serious problem in pricing mortgage loans in Lesotho. This contradicts the financial intermediation theory, which posits that banks bridge the knowledge gap between borrowers and lenders, thus mitigating adverse selection and moral hazard. The assumption is based on the concept that banks collect financial data such as financial statements and credit histories from borrowers for risk assessment and credit scoring (Diamond & Rajah, 2001). This assumption seems inapplicable in African countries, where there is limited access to borrowers' data, rendering trend analysis on the credit histories of borrowers difficult (Afrane et al., 2014). According to the African Development Bank, most African countries face information asymmetry because of the absence of well-operating credit bureaus. Unlike in developed economies where credit bureaus are established to curb this risk, most African Countries struggle with credit scoring emanating from the challenge of limited access to borrowers' data (Triki & Gajigo, 2012). Therefore, the application of financial intermediation theory in developing countries should be investigated.

4.4.3 Risk-Based Mortgage Pricing Perceptions (RO3)

This section presents the findings for RO3 on how commercial banks in Lesotho can efficiently adopt risk-based pricing for home loans. Next is the descriptive analysis.

4.4.3.1 Descriptive Analysis

Figure 4.11 presents the responses regarding the introduction of risk-based pricing in Lesotho. The results show that 98% of the respondents agree that risk-based pricing on mortgage loans should be introduced in Lesotho. This percentage is a significant number compared to 2% of respondents who disagree.

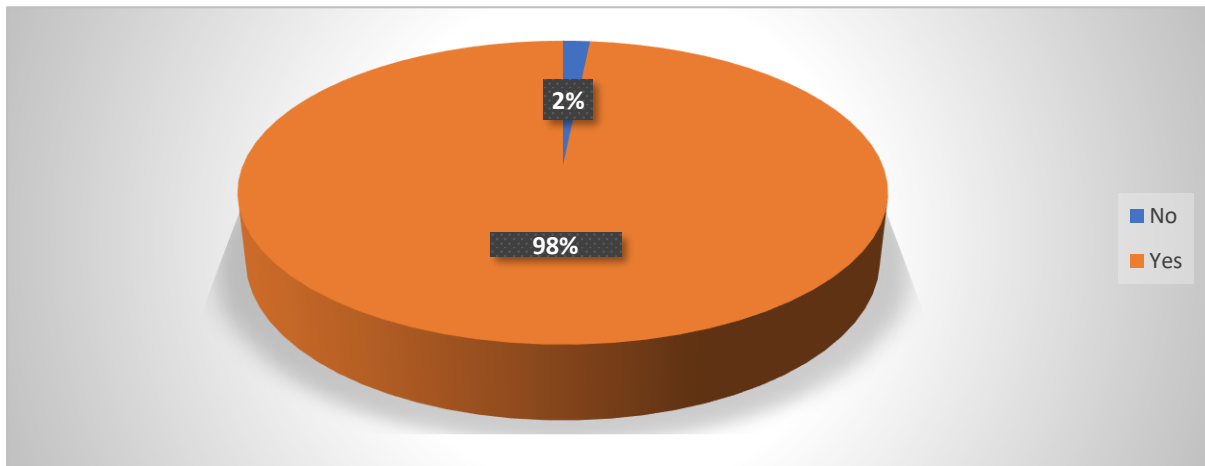


Figure 4. 11: Descriptive Statistics for the Introduction of Risk-Based Pricing

Source: Authors' plot

These results are consistent with the findings of studies conducted in the US, Italy, the Eurozone, Kenya, and South Africa, which recommend the use of risk-based pricing because of its contribution to promoting credit accessibility, financial inclusion and efficiency in risk management. In the US, Wendy (2006) found that it enhances credit accessibility. In Italy, Magri (2018) discovered that it leads to more efficient resource allocation, supporting the assumption of credit risk management theory. In Kenya, Ndarwa and Mulinge (2023) found that risk-based pricing results in interest rates adapted to the borrower's risk profile, while in South Africa, Thoka (2015) indicated that it allows more accurate pricing of risk by lenders, thus contributing to profitability and financial stability. Therefore, by introducing risk-based pricing on mortgage loans, Lesotho can leverage these proven benefits to enhance financial stability and expand access to credit. These global findings align well with the results of this study, reinforcing the need for the adoption of risk-based pricing of mortgage loans in Lesotho.

Respondents were further asked to rank the importance of factors that could be included in building a risk-based pricing model for banks in Lesotho. The results indicate that the most important factor is risk premium with a mean score of 4.55, followed by cost of capital with a mean of 4.37, affordability measured by income level with a mean of 4.35, cost of funds with a mean of 4.16, standard margin with a mean of 4.11, accessibility and cost of service with a mean of 4.00, ability to minimise

defaults with a mean of 3.98, effectiveness and efficiency with a mean of 3.92 and the lowest rates factor equality consideration with a mean of 3.61. These results are presented in Table 4.8 and Table 4.9.

Table 4. 8: Mortgage Loan Pricing Factors' Importance [1]

	Not important	Slightly important	Moderately Important	Very important	Extremely important	Total	Mean
Factors	1	2	3	4	5		
Affordability	1	2	8	14	37	62	4,35
	1	4	24	56	185	270	
	2%	3%	13%	23%	60%	100%	
Accessibility	0	3	14	25	20	62	4,00
	0	6	42	100	100	248	
	0%	5%	23%	40%	32%	100%	
Effectiveness and efficiency	0	2	20	21	19	62	3,92
	0	4	60	84	95	243	
	0%	3%	32%	34%	31%	100%	
Equality considerations	3	7	17	19	16	62	3,61
	3	14	51	76	80	224	
	5%	11%	27%	31%	26%	100%	

Source: Author's computation

Table 4. 9: Mortgage Loan Pricing Factors' Importance [2]

	Not important	Slightly important	Moderately important	Very important	Extremely important	Total	Mean
Factors	1	2	3	4	5		
Ability to minimise defaults	1	6	11	19	25	62	3,98
	1	12	33	76	125	247	
	2%	10%	18%	31%	40%	100%	
Cost of capital	1	2	8	13	38	62	4,37
	1	4	24	52	190	271	
	2%	3%	13%	21%	61%	100%	
Standard margin	0	2	9	31	20	62	4,11
	0	4	27	124	100	255	
	0%	3%	15%	50%	32%	100%	
Risk premium	0		4	20	38	62	4,55
	0	0	12	80	190	282	
	0%	0%	6%	32%	61%	100%	
Cost of service	1	3	14	21	23	62	4
	1	6	42	84	115	248	
	2%	5%	23%	34%	37%	100%	
Cost of funds	1	2	10	22	27	62	4,16
	1	4	30	88	135	258	
	2%	3%	16%	35%	44%	100%	

Source: Author's computation

The high mean score of the risk premium suggests that commercial banks in Lesotho prioritise borrower risk when pricing mortgage loans. Consequently, Afrane et al. (2014) highlight that risk premiums turn out to be high in African Countries because of maturity mismatches, and South Africa mitigated this challenge by creating pension-backed assets where pension savings act as collateral for the mortgage loans.

Moreover, the pattern above aligns well with the literature, as Gosh's risk-based pricing model outlines financial factors: risk premium, cost of capital and cost of funds as key components of risk-based pricing (Ghosh, 2012). Respondents also ranked them high in the design of Lesotho's risk-based pricing model, showing their importance. Operational factors, such as cost of service and standard margin, were also rated the second most important group in the design of risk-based pricing of mortgage loans in Lesotho. Customer-focused factors attained mixed ratings. Affordability is rated high, possibly because it directly influences the borrowers' creditworthiness. Accessibility and ability to minimise defaults are rated as mediums, which suggests that respondents view them as factors influencing policy decisions rather than direct pricing decisions.

Social factors, such as effectiveness, efficiency, and equality, form the lowest-rated group of factors. This suggests that respondents view financial factors as the most important factors in designing risk-based pricing of mortgage loans as they directly influence profitability and risk assessment. Operational factors are viewed as the second most important factors, and lastly, the social factors.

a) Respondent Views: Optimising Lesotho's Risk-Based Pricing

The results show that the highest-rated factor is educating borrowers about risk-based pricing models, with a mean of 4.53. Investment in advanced credit scoring models and training staff on risk management factors follow with a mean of 4.52. While strengthening regulatory requirements for transparency and use of mobile money records have means of 4.18 and 3.82, respectively. Table 4.9 shows what respondents believe commercial banks should do to implement better risk-based pricing in Lesotho.

Table 4. 10: Descriptive Statistics for Optimising Risk-Based Pricing

Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Mean
Invest in advanced credit scoring and data analysis	1	1	3	17	40	62	4.52
	1	2	9	68	200	280	
	2%	2%	5%	27%	65%	100%	
Educate borrowers	0	1	4	18	39	62	4.53
	0	2	12	72	195	281	
	0%	2%	6%	29%	63%	100%	
Use mobile money records	3	6	9	25	19	62	3.82
	3	12	27	100	95	237	
	5%	10%	15%	40%	31%	100%	
Strengthen regulatory requirements for transparency	3	1	5	26	27	62	4.18
	3	2	15	104	135	259	
	5%	2%	8%	42%	44%	100%	
Train staff on risk management	1	1	2	19	39	62	4.52
	1	2	6	76	195	280	
	2%	2%	3%	31%	63%	100%	

Source: Author's computation

The results show that the implementation of risk-based pricing depends on financial literacy. Financial literacy is important because it helps borrowers understand their loan terms and how they have been priced (Klapper et al., 2014). Furthermore, the Basel Committee on Banking Supervision (2000) further show the importance of advanced credit scoring models in the implementation of risk-based pricing on mortgage loans. Credit risk management theory suggests that training staff in risk management matters enhances their ability to assess borrowers' creditworthiness.

The use of mobile money records is the lowest-rated factor, suggesting that respondents may have concerns about data accuracy, reliability and integration with banking systems. Limited regulations for mobile money transactions could also contribute to this lower rating.

b) Respondent-Suggested Mortgage Pricing Weights

Figure 12 presents what respondents believe should be the weights of cost of capital, standard margin, risk premium, cost of service and cost of funds.

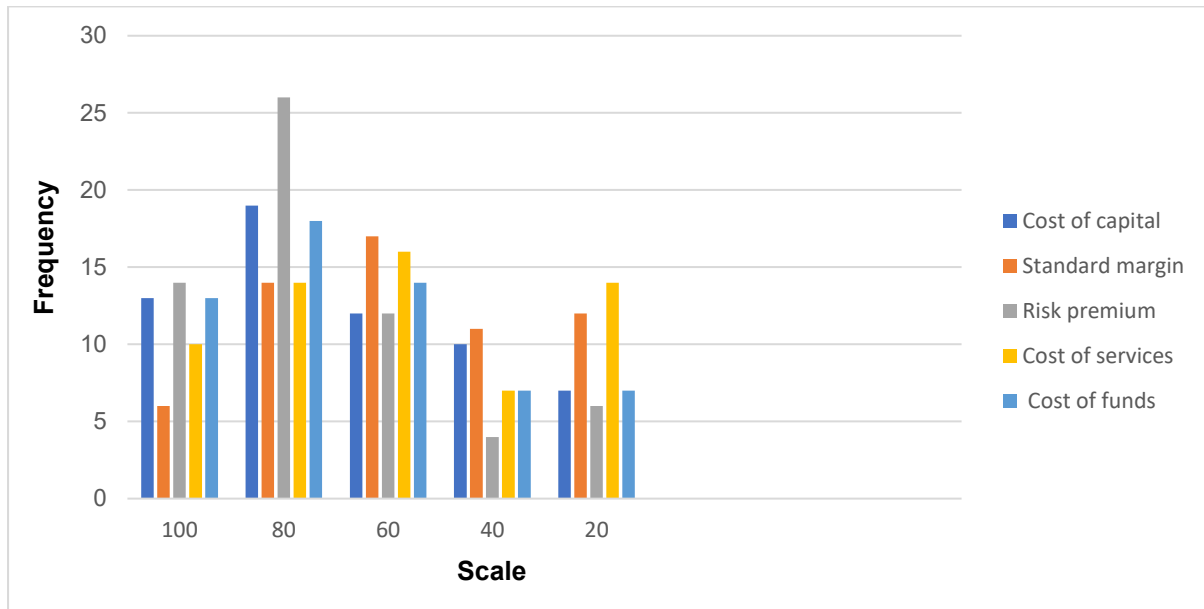


Figure 4. 12: Descriptive Statistics on Weights of Factors
Source: Authors' plot

Risk premium holds the highest percentage scales at 100 and 80. This data indicates that the risk premium should be a primary factor driving the risk-based pricing of mortgage loans in Lesotho. Cost of capital and cost of funds are the second in the 100 and 80 percentage scale. This suggests that they play a secondary role after the risk premium in the risk-based pricing model of mortgage loans in Lesotho. Standard margin dominates at a 60 percent scale, and this means that it has a moderate influence in the model, suggesting profitability considerations at this scale. The cost of service dominates at a 20 percent scale, indicating that it has the least influence in the model.

These results are consistent with the literature because in Jarrow-Turnbull's risk-based pricing theory (Zhang & Wu, 2011), risk premium plays a dominant role in compensating lenders for default risk by borrowers, especially in emerging markets like Lesotho. Saunders and Allen (2010) further indicate that in markets where access

to affordable capital is limited, like in Lesotho's mortgage market, the cost of capital and cost of funds are critical factors.

Financial intermediation theory suggests that banks play an intermediary role between depositors and borrowers (Bhattacharya & Thakor, 1993). Therefore, banks generate profit by adding a margin to deposit rates. This standard margin helps banks to balance competitive pricing and profitability (Brigham & Ehrhardt, 2013). Finally, the literature shows that the cost of service plays a minor role in pricing models for capital-based products like mortgage loans (Saunders & Ho, 1981). This conclusion aligns well with the results of this study.

4.4.3.2 Correlation Analysis

Table 4.11, which follows, illustrates the correlation among strategies to be adopted to implement the risk-based pricing better. The results indicate that a strong correlation exists between investing in advanced credit scoring and data analysis tools and educating borrowers ($r > 0.9$, $p\text{-value} < 0.01$). This is supported by a strong significance level. There is also a strong correlation between investing in advanced credit scoring and data analysis tools and training staff on risk management ($r > 0.9$, $p\text{-value} < 0.05$) the correlation has a statistically significant level, educating borrowers and training staff on risk management ($r > 0.9$, $p\text{-value} < 0.05$), use of mobile money records and strengthening regulatory requirements ($r > 0.9$, $p\text{-value} < 0.05$).

A correlation exists between strengthening regulatory requirements for transparency and training staff on risk management ($r > 0.8$, $p\text{-value} < 0.05$). Another correlation exists between strengthening regulatory requirements for transparency and educating borrowers ($r > 0.8$, $p\text{-value} < 0.1$). Finally, a correlation ($r > 0.8$, $p\text{-value} < 0.1$) exists between strengthening regulatory requirements for transparency and investing in advanced credit scoring and data analysis tools.

Table 4. 11: Correlation Analysis for Factors in Rs5

	Invest in advanced credit scoring and data analysis tools	Educate borrowers	Use mobile money records	Strengthen regulatory requirements for transparency	Train staff on risk management
Invest in advanced credit scoring and data analysis tools	1				
Educate borrowers	0.9992***	1			
Use mobile money records	0.6702	0.6955	1		
Strengthen regulatory requirements for transparency	0.866*	0.8828*	0.9515**	1	
Train staff on risk management	0.9969**	0.9979**	0.721	0.8987*	1

(*), (**) and (***) represent the 10%, 5% and 1% significance levels, respectively.

These correlations suggest that advanced credit scoring and data analytics tools will be more effective when borrowers are educated. For advanced credit scoring and data analytics tools to work effectively, staff should be trained. They also emphasise the role of regulation in leveraging mobile money transactions.

The subsequent Table 4.12 presents a correlation among actions of the regulator when helping commercial banks in implementing sustainable risk-based pricing. The actions to consider include providing guidelines for risk-based pricing, offering incentives for new pricing models, giving commercial banks access to borrower data, and monitoring strictly to prevent discrimination. The results indicate that a strong correlation exists between providing guidelines for risk-based pricing and giving commercial banks access to borrower data (0.9643). This result indicates the importance of regulatory guidance in enabling the data-driven pricing of mortgage loans in Lesotho.

In addition, a strong correlation of 0.9655 exists between giving commercial banks access to borrower data and monitoring strictly to prevent discrimination. This finding reveals that in a data-driven pricing of mortgage loans, strict monitoring of pricing by regulators is important to prevent discrimination. A moderate correlation exists between providing guidelines for risk-based pricing and monitoring strictly to prevent discrimination (0.8621), monitoring strictly to prevent discrimination and offering incentives for new pricing models (0.8658), and offering incentives for new pricing models and giving commercial banks access to borrower data (0.7109). A weak correlation of 0.5028 exists between offering incentives for new pricing models and giving commercial banks access to borrower data.

Table 4. 12: Correlation Analysis for Factors in Rs6

	Provide guidelines for risk-based pricing	Offer incentives for new pricing models	Give access to borrower data	Monitor strictly to prevent discrimination
Provide guidelines for risk-based pricing	1			
Offer incentives for new pricing models	0.5028	1		
Give access to borrower data	0.9643**	0.7109	1	
Monitor strictly to prevent discrimination	0.8621*	0.8658*	0.9655**	1

(*), (**) and (***) represent the 10%,5% and 1% significance levels, respectively.

These results indicate that commercial banks should consider investing in advanced credit scoring models, educating borrowers about risk-based pricing and training staff on risk management. On the other hand, regulators should consider helping commercial banks by providing them with access to data, providing clear guidance on how to apply risk-based pricing, and strictly monitoring the pricing of mortgage loans.

4.5 Chapter Summary

In conclusion, this chapter discusses the study's results on the use of risk-based pricing on mortgage loans by commercial banks in Lesotho. The internal consistency of the survey instrument has been confirmed using reliability and validity tests. Descriptive, factor and correlation analysis methods have been used to analyse data.

The demographic profile of respondents was mixed gender and included extensive experience in the financial sector. The findings indicated that borrower income level, credit score and employment type are the most important and influential parameters in mortgage loan pricing. The correlation analysis has supported the alignment of these parameters with international standards. The results further revealed that external factors such as central bank interest rates, inflation and regulatory requirements influence mortgage loan pricing in Lesotho.

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a comprehensive summary and conclusion drawn from the results obtained from Chapter 4 and the overall research. It consolidates the key findings and insights derived from the analysis of parameters used by commercial banks when pricing mortgage loans and challenges in implementing risk-based pricing on mortgage loans. Additionally, it discusses the broader implications of these findings, offers recommendations for better implementation of risk-based pricing in Lesotho and highlights limitations and areas for future research.

5.2 Summary of Findings

This study addresses the high restructured mortgage loan problem in the banking sector of Lesotho by focusing on risk-based pricing on mortgage loans by commercial banks in Lesotho. The purpose of the study was achieved by investigating the parameters used by commercial banks in Lesotho when pricing mortgage loans, looking at challenges faced by commercial banks of Lesotho when pricing mortgage loans and determining how best commercial banks can adopt risk-based pricing on mortgage loans.

5.2.1 Objective 1 (RO1): Banks' Mortgage Pricing Parameters

Descriptive analysis shows that borrower income level and stability, property location and value, cost of capital, cost of funds, borrower credit score, loan-to-value ratio and employment type are the most important and influential parameters of factors in mortgage loan pricing in Lesotho. Correlation analysis on the usage, importance, influence and alignment of these factors with international standards show that these parameters are statistically significant in mortgage loan pricing. In addition, the descriptive statistics results show that commercial banks of Lesotho rely on DTI, credit bureau scores, property valuation models, internal credit scoring models and cost of service to assess and manage lending risks. The results also reveal that external

factors also affect mortgage loan pricing in Lesotho. These factors are central bank interest rate, inflation, GDP, market competition and international market conditions. Most of these factors are related to the monetary policy.

5.2.2 Objective 2 (RO2): Banks' Mortgage Pricing Challenges

Through factor analysis, it was revealed that the primary challenges affecting commercial banks in Lesotho are operational factors, such as insufficient staff training, inconsistent borrower histories and lack of advanced credit scoring models. These challenges tend to group together and carry more weight. Secondary challenges which group together were external factors such as regulatory constraints and competition.

Furthermore, the study revealed a lack of standardized borrower risk assessment as the credit bureau does not conduct the credit scoring. This supports the problem statement assertion that banks may not be effectively assessing the creditworthiness of individual borrowers, as emphasised by the credit risk management theory.

5.2.3 Objective 3 (RO3): Efficient Risk-Based Mortgage Pricing

The results suggest that most of the respondents agree that risk-based pricing on mortgage loans should be introduced in Lesotho. Most of the experts are of the view that when designing the risk-based pricing model in Lesotho, risk premium, cost of capital and cost of funds should carry more weight. The other factors to be included in the model include income levels, standard margin, cost of service and ability to minimise defaults. The correlation analysis shows a strongly significant relationship between investing in advanced credit scoring and data analysis tools and educating borrowers.

Additionally, there is also a strong correlation between investing in advanced credit scoring and data analysis tools and training staff on risk management. Thus, educating borrowers on mortgage loans and training staff on risk management should be done coherently with investment in advanced credit scoring and data analysis tools.

Furthermore, educating borrowers and training staff on risk management and the use of mobile money records and strengthening regulatory requirements also have strongly significant relationships.

5.3 Implications and Recommendations

This section presents the implications of the study's findings and offers recommendations for practice and further research.

5.3.1 Implications

The results of the descriptive analysis of the challenges faced by commercial banks in Lesotho indicate a lack of advanced credit scoring in Lesotho. This means that accessing reliable and standardised credit risk assessments is a problem. Inconsistent borrower credit histories also highlight the need for a credit information sharing system in Lesotho. A lack of advanced credit-scoring models, insufficient borrower data and limited staff training on risk-based pricing imply that many mortgage loans in the country might be mispriced, possibly overpriced, leading to repayment struggles and loan restructuring.

The descriptive analysis of risk management tools revealed that commercial banks in Lesotho exhibit a deficiency in technological advancement that hinders the use of automated underwriting tools and advanced credit-scoring models. Automated underwriting tools and advanced credit scoring models use sophisticated algorithms, machine learning and artificial intelligence to assess borrowers' risk quickly. The results also highlight the limited transparency and information asymmetry, which act as a barrier to financial inclusion and effective competition in the Lesotho mortgage market.

Moreover, the lack of automated underwriting systems in Lesotho's banking sector suggests that commercial banks use manual underwriting, which may lead to inconsistencies in risk assessments of mortgage loans, thus contributing to the mortgage loan restructuring problem.

5.3.2 Recommendations

This section recommends strategies for enhancing risk-based mortgage pricing in Lesotho, targeting government, regulators, and banks. Key areas include credit infrastructure, financial literacy, regulation, and technology aimed at fostering market efficiency and economic growth. The study emphasises the need for robust risk-based pricing models.

5.3.2.1 Policymakers and Regulators

a) Implementation of Comprehensive Risk-Based Pricing Models

To foster a more competitive and equitable mortgage lending market in Lesotho, it is recommended that commercial banks implement robust risk-based pricing models. These models should incorporate key parameters such as risk premium, cost of capital, and cost of funds, which should be weighted more significantly than standard margins and service costs, as supported by international best practices (Ghosh, 2012). This approach will ensure that low-risk borrowers are not unduly penalized, promoting fairness and efficiency within the sector.

b) Development of a National Credit Scoring System

The results of this study indicated the importance of the credit score in the risk-based pricing of mortgage loans. This means that an accurate credit rating system is necessary for risk-based pricing (Tiriongo et al., 2023). The South African credit bureau industry is more advanced than Lesotho's because of the many players in the credit bureau industry (National Credit Regulator, 2024). Therefore, the government of Lesotho should consider bringing in more credit bureaus and credit rating agencies to enhance standardised credit ratings. The Government should also consider improving the IT infrastructure to allow the use of advanced credit scoring models.

c) Conduct Financial Education for Borrowers

Financial literacy programmes should be developed to educate borrowers about risk-based pricing on mortgage loans, credit scoring and financial management to improve

their understanding. Ho and Pennington-Cross (2006) show that when the level of financial knowledge improves in the country, borrowers will make informed financial decisions and that will enhance responsible lending.

d) Strengthen Regulatory Framework

The results of this study reflect that the transparency in pricing mortgage loans is a challenge, and Lesotho has the Consumer Protection Act of 2022; enforcing its provisions can enhance transparency in mortgage pricing. Furthermore, the Central Bank of Lesotho should consider strengthening the Financial Consumer Protection Act of 2022 to include interest rate caps (Thoka, 2015), restrictions on prepayment penalties and balloon payment (Ho & Pennington-Cross, 2006) to mitigate predatory lending. The development of clear risk-based pricing guidelines is critical for the prevention of predatory lending and unfair pricing discrimination in mortgage markets.

The government of Lesotho should consider developing a housing policy to improve the level of property investment. This will help in enhancing the GDP as experienced in South Africa (Afrane et al., 2014). Furthermore, the government of Lesotho should consider enacting a home loan act. This will allow the government to monitor the real estate market, thus adding more to the growth of GDP (Blanchard & Johnson, 2012). Allowing the use of pension as collateral for mortgage loans (pension-backed loans), like in South Africa, will help to reduce the risk premium associated with liquidity risk (Afrane et al., 2014). Consequently, this will address the challenge of subprime mortgage loans highlighted by Chamsisengphet and Pennington-Cross (2006).

5.3.2.2 Commercial Banks

Commercial banks are advised to invest in AI-driven credit scoring, train staff on risk-based models, integrate income verification, and adopt automated underwriting to enhance mortgage pricing.

a) Investment in AI-driven Credit Scoring and Data Analytics Tools

To solve the challenge of credit scoring, the three commercial banks of Lesotho, which are subsidiaries of South African banks, should consider leveraging the use of internal-

based ratings used by the parents to assess the creditworthiness of borrowers. The use of internal-based rating models is aligned with Basel II requirements (Basel Committee on Banking Supervision, 2004). Therefore, commercial banks in Lesotho should invest in these models to enhance their risk assessment processes.

b) Train Staff on Risk-Based Pricing Models

For the successful implementation of risk-based pricing, commercial banks should consider training staff on risk-based pricing. Staff should also be trained on how to apply risk-based pricing models. These can be achieved through comprehensive training programs, workshops, certifications on risk-based pricing or continuous personal development programmes. However, Muhammad and Fard (2013) demonstrated that formal education and training involving sending employees to colleges or universities to acquire qualifications are more impactful compared to workshops and on-the-job training programmes.

c) Income Verification Tools

Commercial banks can integrate their income verification systems with the payroll systems of the employers for verification of salaries, Revenue Services Lesotho for tax returns verifications and credit bureaus for credit score assessment.

d) Automated Underwriting Tools

Commercial banks of Lesotho should consider using automated underwriting tools to assess the applications of borrowers. This will help in mitigating the errors associated with manual underwriting processes, minimise default risk and enhance efficiency.

5.4 Limitations and areas for future research

This section outlines the limitations of the current study and proposes areas for future research.

5.4.1 Limitation

Despite addressing a knowledge gap in the risk-based pricing of mortgage loans in Lesotho, this study has limitations.

The study was based on a relatively small sample size, which may limit the generalisation of the findings to the entire banking sector. Using a non-probability sampling method, specifically purposive and convenience sampling, may further limit the generalisation of findings. These methods are prone to selection bias.

This study focused on mortgage loan pricing, relying on a survey-based data collection technique, which required constant follow-ups and reminders with the respondents. These factors impacted the timely completion of the study. Due to time constraints, the study did not extensively analyse the impact of other factors considered by commercial banks when pricing mortgage loans, including macroeconomic factors such as inflation and interest rates.

Notably, the study focused on responses from commercial banks and other players in the financial sector, omitting the borrower's perspective on risk-based pricing of mortgage loans, affordability and accessibility. This approach may have introduced response bias. Finally, this study focused on Lesotho; this may affect its applicability to other countries.

5.4.2 Suggestions for Further Research

To reduce bias and enhance the generalisation of the results, future research should consider a large sample size, including borrowers in the sample. The sampling methods, such as interviews and case studies, should be explored.

Crucially, future research could evaluate the impact of external factors such as central bank interest rate, inflation, GDP, market competition and international market conditions in risk-based pricing of mortgage loans in Lesotho. The impact of credit rate on the growth of credit rating sectors also needs to be investigated.

Lastly, the implications of risk-based pricing for Lesotho residents, including homeownership rates, housing demand, and the overall influence on the real estate sector, should be examined.

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APPENDICES

Appendix A Questionnaire



Questionnaire

ASSESSMENT OF THE USE OF RISK-BASED PRICING OF MORTGAGE LOANS BY COMMERCIAL BANKS IN LESOTHO

Dear Sir/Madam

My name is Matokoloho Masakoane. I am a master's student at the University of the Witwatersrand, Johannesburg, currently enrolled in a Master of Management in Finance and Investment. This questionnaire is designed to get feedback from you concerning the use of risk-based pricing of mortgage loans by commercial banks in Lesotho. Therefore, I am inviting you to participate in answering this questionnaire. Please note that by participating in this survey, you have consented to your information being used for research purposes. This survey will take approximately 17 minutes of your time. Participation in this survey is voluntary, and all responses will be confidential and anonymous. If you have any questions during or afterwards about this research study, feel free to contact Mrs. Matokoloho Masakoane (Email: 2839700@students.wits.ac.za; Tel: +26658928261)

SECTION A -GENERAL INFORMATION (G)

G1. Please indicate your gender

Female	1
Male	2

G2. Please select the option that best describes your age group.

18-29	1
30-39	2
40-49	3
50-59	4
60-65	5

G3. What is your main role in the banking sector?

Mortgage loan borrower	1
Bank Employee	2
Financial Advisor	3
Finance expert	4
Finance or Economics Lecturer	5
Financial Regulator	6
Other	7

G4. How long have you been in the banking sector?

Less than 1 year	1
1–3 years	2
4–7 years	3
More than 7 years	4

G5. How would you rate your knowledge of risk-based pricing?

Very poor	1
Poor	2

Fair	3
Good	4
Excellent	5

G6. What type of commercial bank are you associated with?

Locally-owned commercial bank	1
Foreign-owned commercial bank	2
Both	3

G7. On a scale of 0 to 100, please specify to what extent you believe risk-based pricing is applied by commercial banks in Lesotho when providing loans

G8. On a scale of 0 to 100, please specify to what extent you believe mortgage loan prices are high in Lesotho

SECTION B – PARAMETERS (P) USED BY COMMERCIAL BANKS IN LESOTHO TO PRICE MORTGAGE LOANS

Objective 1: To investigate the parameters used by commercial banks in Lesotho when pricing home loans.

P1. On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree, indicate to what extent you agree that the following parameters are used to price mortgage loans in Lesotho:

Parameters	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Borrower credit score	1	2	3	4	5
Loan-to-value ratio	1	2	3	4	5
Borrower income level and stability	1	2	3	4	5
Employment type (e.g., salaried or self-employed)	1	2	3	4	5

Property location and value	1	2	3	4	5
Cost of capital	1	2	3	4	5
Cost of funds	1	2	3	4	5
Cost of service	1	2	3	4	5
Other (please specify)	1	2	3	4	5

P2. On a scale of 1 to 5, where 1 = not important, 2 = slightly important, 3 = moderately important, 4 = very important and 5 = extremely important, rank the importance of the following parameters in pricing loans in Lesotho:

Parameters	Not important	Slightly important	Moderately important	Very important	Extremely important
Borrower credit score	1	2	3	4	5
Loan-to-value ratio	1	2	3	4	5
Borrower income level and stability	1	2	3	4	5
Employment type (e.g., salaried or self-employed)	1	2	3	4	5
Property location and value	1	2	3	4	5
Cost of capital	1	2	3	4	5
Cost of funds	1	2	3	4	5
Cost of service	1	2	3	4	5
Other (please specify)	1	2	3	4	5

P3. On a scale of 1 to 5, where 1 = not influential, 2 = slightly influential, 3 = moderately influential, 4 = very influential and 5 = extremely influential, suggest the level of influence (or level of weight) each of the following parameters should have in a risk-based pricing model:

Parameters	Not influential	Slightly influential	Moderately influential	Very influential	Extremely influential
Borrower credit score	1	2	3	4	5
Loan-to-value ratio	1	2	3	4	5
Borrower income level and stability	1	2	3	4	5
Employment type (e.g., salaried or self-employed)	1	2	3	4	5
Property location and value	1	2	3	4	5
Cost of capital	1	2	3	4	5
Cost of funds	1	2	3	4	5
Cost of service	1	2	3	4	5
Other (please specify)	1	2	3	4	5

P4. On a scale of 1 to 5, where 1 = not aligned, 2 = partially aligned, 3 = moderately aligned, 4 = mostly aligned and 5 = fully aligned, state how the following parameters align with international best practice:

Parameters	Not aligned	Partially aligned	Moderately aligned	Mostly aligned	Fully aligned
Borrower credit score	1	2	3	4	5
Loan-to-value ratio	1	2	3	4	5
Borrower income level and stability	1	2	3	4	5
Employment type (e.g., salaried or self-employed)	1	2	3	4	5
Property location and value	1	2	3	4	5
Cost of capital	1	2	3	4	5
Cost of funds	1	2	3	4	5
Cost of service	1	2	3	4	5
Other (please specify)	1	2	3	4	5

P5. Do you believe risk-based pricing is widely applied by commercial banks in Lesotho?

No	1
Not sure	2
Yes	3

P6. On a scale of 1 to 5, where 1 = never used, 2 = rarely used, 3 = sometimes used, 4 = frequently used and 5 = always used, indicate to what extent credit scoring models and risk assessment tools are used in Lesotho's mortgage pricing.

Credit scoring/risk assessment tools	Never used	Rarely used	Sometimes used	Frequently used	Always used
Credit Bureau score	1	2	3	4	5

Internal credit scoring model	1	2	3	4	5
Automated underwriting system	1	2	3	4	5
Income verification tools	1	2	3	4	5
Property valuation models	1	2	3	4	5
Debt-to-income analysis	1	2	3	4	5
Risk rating system	1	2	3	4	5
Cost of service	1	2	3	4	5
Other (please specify)	1	2	3	4	5

P7. How open are commercial banks in Lesotho about the parameters used to price mortgage loans?

Not open	1
Somewhat open	2
Open	3

P8. On a scale of 1 to 5, where 1 = no influence, 2 = slight influence, 3 = moderate influence, 4 = strong influence and 5 = very strong influence, indicate how much external factors (e.g., inflation, interest rates) influence mortgage pricing in Lesotho.

External factors	No influence	Slight influence	Moderate influence	Strong influence	Very strong influence
Inflation	1	2	3	4	5
Central bank interest rate	1	2	3	4	5
Economic growth rate	1	2	3	4	5
Exchange rate fluctuations	1	2	3	4	5

Market competition	1	2	3	4	5
Regulatory requirements	1	2	3	4	5
Property market conditions	1	2	3	4	5
International markets conditions	1	2	3	4	5
Other (please specify)	1	2	3	4	5

SECTION C – CHALLENGES (C) IN IMPLEMENTING RISK-BASED PRICING ON MORTGAGE LOANS

Objective 2: To investigate what challenges Lesotho's commercial banks face when implementing risk-based pricing on mortgage loans.

C1. On a scale of 1 to 5, where 1 = not a problem at all, 2 = not a problem, 3 = minor problem, 4 = moderate problem and 5 = serious problem, indicate what you think are the biggest challenges for commercial banks in Lesotho in implementing risk-based pricing.

Challenges	Not a problem at all	Not a problem	Minor problem	Moderate problem	Serious problem
Lack of credit scoring and data analytics tools.	1	2	3	4	4
Inconsistent borrower credit history	1	2	3	4	4
Regulatory constraints	1	2	3	4	4

Insufficient staff training on risk-based models	1	2	3	4	4
Customer resistance or misunderstanding	1	2	3	4	4
Competition	1	2	3	4	4
Other (please specify)	1	2	3	4	4

C2. On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree, indicate whether technology is a barrier to implementing risk-based pricing in Lesotho.

Strongly disagree	
Disagree	
Neutral	
Agree	
Strongly agree	

C3. How important are fairness and non-discrimination in risk-based pricing?

Not important at all	1
Not important	2
Slightly important	3
Moderately Important	4
Very important	5

C4. What do you think is the impact of limited access to borrower data on risk-based pricing in Lesotho?

Insignificant	1
Minor	2
Moderate	3

Major	4
Severe	5

SECTION 4: RECOMMENDATIONS (Rs) FOR BETTER IMPLEMENTATION OF RISK-BASED PRICING

Objective 3: To investigate how commercial banks in Lesotho can efficiently adopt risk-based pricing for mortgage loans.

Rs1. Do you think a risk-based pricing approach for mortgage loans should be introduced in Lesotho?

No	1
Yes	2

Rs2. On a scale of 1 to 5, where 1 = not important at all, 2 = not important, 3 = slightly important, 4 = moderately important and 5 = very important, please rank the current mortgage pricing in Lesotho in terms of the following factors:

Factors	Not important at all	Not important	Slightly important	Moderately important	Very important
Affordability	1	2	3	4	5
Accessibility	1	2	3	4	5
Effectiveness and efficiency	1	2	3	4	5
Equality considerations	1	2	3	4	5
Ability to minimise defaults	1	2	3	4	5

Rs3. On a scale of 1 to 5, where 1 = not important at all, 2 = not important, 3 = slightly important, 4 = moderately important and 5 = very important, indicate the extent of the importance each of the following factors should have when designing a risk-based pricing model for mortgage loans in Lesotho:

Factors	Not important at all	Not important	Slightly important	Moderately important	Very important
Cost of capital	1	2	3	4	5
Standard margin	1	2	3	4	5
Risk premium	1	2	3	4	5
Cost of service	1	2	3	4	5
Cost of funds	1	2	3	4	5

Rs4. Do you think there is a relationship between risk-based pricing and financial inclusion in Lesotho's mortgage market?

No	1
Yes	2

Rs5. On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree, indicate what commercial banks should do to implement risk-based pricing better.

Strategies	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Invest in advanced credit-scoring and data analysis tools	1	2	3	4	5
Educate borrowers	1	2	3	4	5
Use mobile money records	1	2	3	4	5
Strengthen regulatory requirements for transparency	1	2	3	4	5
Train staff on risk management	1	2	3	4	5
Other (please specify)	1	2	3	4	5

Rs6. On a scale of 1 to 5, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree, indicate how regulators can help commercial banks in implementing sustainable risk-based pricing.

Actions	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Provide guidelines for risk-based pricing	1	2	3	4	5
Offer incentives for new pricing models	1	2	3	4	5
Give access to borrower data	1	2	3	4	5
Monitor strictly to prevent discrimination	1	2	3	4	5
Other (please specify)	1	2	3	4	5

Rs7. On a scale of 0 to 100, please specify what you think should be the best weights of the following factors of risk-based pricing model:

Cost of capital	
Standard margin	
Risk premium	
Cost of service	
Cost of funds	

THANK YOU FOR YOUR PARTICIPATION

Appendix B: Letters to Four Commercial Banks of Lesotho

Itumeleng Matokoloho Masakoane
Ha Abia Maseru, Lesotho
+26658928261
imasakoane@centralbank.org.ls

The Managing Director
Lesotho PostBank
Private Bag A121
MASERU 100.

Dear Sir,

My name is Itumeleng Matokoloho Masakoane, a Masters of Management in Finance and Investment student at the University of the Witwatersrand, Johannesburg. As part of my studies, I am conducting a research project titled "Assessment of the use of risk-based pricing of mortgage loans by commercial banks in Lesotho". The aim of this research is to understand the factors that Lesotho commercial banks consider when pricing mortgage loans. In order to achieve this objective, I need data on the pricing model used by the bank together with the risk-scoring model which, I kindly request from your office. The data provided will be treated with the confidentiality and anonymity that it deserves, and the name of the bank will not be disclosed in the final research report. I attached the ethics clearance certificate from Wits University as a proof of confidentiality undertaking.

If you have any concerns regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical) at +27(0) 11 717 1408 or via email at hrecnon-medical@wits.ac.za.

If you have any questions during or after the research, feel free to contact me at the email provided above.

Yours Sincerely



Itumeleng 'Matokoloho Masakoane

Itumeleng Matokoloho Masakoane
Ha Abia Maseru, Lesotho
+26658928261
imasakoane@centralbank.org.ls

Chief Executive Officer
Standard Lesotho Bank
P.O. Box 1053
MASERU 100

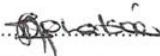
Dear Sir,

My name is Itumeleng Matokoloho Masakoane, a Masters of Management in Finance and Investment student at the University of the Witwatersrand, Johannesburg. As part of my studies, I am conducting a research project titled "Assessment of the use of risk-based pricing of mortgage loans by commercial banks in Lesotho". The aim of this research is to understand the factors that Lesotho commercial banks consider when pricing mortgage loans. In order to achieve this objective, I need data on the pricing model used by the bank together with the risk-scoring model, which I kindly request from your office. The data provided will be treated with the confidentiality and anonymity that it deserves, and the name of the bank will not be disclosed in the final research report. I attached the ethics clearance certificate from Wits University as a proof of confidentiality undertaking.

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Yours Sincerely

.....


Itumeleng Matokoloho Masakoane

Itumeleng Matokoloho Masakoane
Ha Abia Maseru, Lesotho
+26658928261
imasakoane@centralbank.org.ls

Chief Executive Officer
First National Bank of Lesotho
P.O. Box 11902
MASERU 100

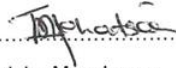
Dear Madam,

My name is Itumeleng Matokoloho Masakoane, a Masters of Management in Finance and Investment student at the University of the Witwatersrand, Johannesburg. As part of my studies, I am conducting a research project titled "Assessment of the use of risk-based pricing of mortgage loans by commercial banks in Lesotho". The aim of this research is to understand the factors that Lesotho commercial banks consider when pricing mortgage loans. In order to achieve this objective, I need data on the pricing model used by the bank together with the risk-scoring model, which I kindly request from your office. The data provided will be treated with the confidentiality and anonymity that it deserves, and the name of the bank will not be disclosed in the final research report. I attached the ethics clearance certificate from Wits University as a proof of confidentiality undertaking.

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If you have any questions during or after the research, feel free to contact me at the email provided above.

Yours Sincerely

.....
Itumeleng Matokoloho Masakoane

Itumeleng Matokoloho Masakoane
Ha Abia Maseru, Lesotho
+26658928261
imasakoane@centralbank.org.ls

Managing Director
Nedbank Lesotho
P.O. Box 1001
MASERU 100.

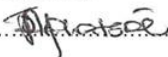
Dear Sir,

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If you have any questions during or after the research, feel free to contact me at the email provided above.

Yours Sincerely


.....

Itumeleng Matokoloho Masakoane

Appendix C: Ethics Clearance Certificate

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg



Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/FI2839700/118

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title Assessment of the use of risk-based pricing of mortgage loans by commercial banks in Lesotho

Investigator / Researcher Mrs Matokoloho Masakoane

Nature of Project MM in Finance and Investment

Decision of the Committee Approved, provided stakeholders and participants are guaranteed anonymity and confidentiality.

Issue Date of Certificate 02/09/2024

Expiry date Date of submission of the project / research report

Chairperson Dr Ayanda Magida
☎ +27 11 717 3953
✉ ayanda.magida@wits.ac.za

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

03/09/2024

Date: