ABSTRACT: Microfinance institutions (MFIs) play a crucial role in offering financial services to marginalized and economically disadvantaged populations. However, these institutions face the challenge of credit risk, which has the potential to greatly impact their profitability and long-term viability. This study examined the relationship between credit risk and the financial performance of MFIs in Kenya. The study aims to investigate the connection between Capital Adequacy, Operational Efficiency, Interest Rate Spread, and the profitability of microfinance institutions in Kenya. The research utilizes a comprehensive dataset from 14 licensed and regulated MFIs in Kenya, covering the period from 2020 to 2022. The study utilized a research design based on census data. Secondary data was utilized. The study examines the previous financial reports to find secondary data on performance. The data collected underwent analysis using both descriptive and inferential statistical tools. Given that the current study focused on the relationship study, a regression model was used as the analysis tool. The results obtained were then presented in the form of tables. The results of this study will benefit policymakers, managers, administrators, entrepreneurs, researchers, consultants, scholars, and trainers involved in strategic Microfinance Institutions. Results from the analysis suggest that the Kenyan microfinance sector encountered significant financial difficulties in the past. The profitability metrics, specifically return on assets (ROA) and return on equity (ROE), showed negative mean values of -8.89% and -8.72%, respectively. Based on the findings, it appears that MFIs incurred losses, as their assets and equity were not fully utilized. The study also discovered that there is a strong positive relationship between Capital Adequacy and Operational Efficiency, as indicated by a correlation coefficient of 0.811. When Capital Adequacy increases, Operational Efficiency also increases. The correlation was highly significant, indicating a robust relationship. However, it is worth noting that there is a strong positive relationship between Capital Adequacy and Profitability Metrics, as indicated by a correlation coefficient of 0.961. Capital Adequacy has improved, leading to a significant increase in Profitability Metrics. The relationship between Operational Efficiency and Profitability Metrics was found to be highly positive, with a correlation coefficient of 0.875. The correlation between improved operational efficiency and higher profitability metrics is incredibly important. The relationship between Interest Rate Spread and Profitability Metrics has shown a strong positive correlation, with a correlation coefficient of 0.943. The profitability metrics were greatly impacted by the increased interest rate spread. The study found that it is recommended for Microfinance institutions in Kenya to diversify their income streams and give priority to improving credit risk management practices in order to effectively navigate the complexities of the sector. Additional research is needed to understand the factors that influence credit risk and profitability in the microfinance sector in Kenya.

Keywords: Credit Risk, Capital Adequacy, Operational Efficiency, Interest Rate Spread, Profitability

1.0 INTRODUCTION

1.1 Background of the Study
The credit risk is the most prominent risk that a credit union encounters due to the inherent nature of its operations. In relation to possible losses, it is commonly regarded as the most significant form of risk. According to Bessis (2003), the union may incur a substantial loss due to the default of a few number of members. Credit risk refers to the potential for a borrower to default on their financial obligations and fail to fulfill their responsibility to repay borrowed funds. The occurrence may arise...
when the individual is incapable of making payment or fails to make payment within the designated timeframe. There are numerous factors that might contribute to default, with a common scenario involving borrowers experiencing financial distress and potentially undergoing bankruptcy proceedings. In certain circumstances, it is possible for an individual to decline to fulfil their commitment to service a debt, such as instances involving fraudulent activity or legal disputes (Musa, & Njeru, 2023).

Credit risk is the result of a borrower's failure to fulfil their obligations in the manner agreed upon in the pre-established contract, which can be due to either their incapacity or reluctance to do so. The impact of this situation extends to both the lender who holds the loan contract and other lenders associated with the creditor (Caoutte, Altman, & Narayanan, 1998). Hence, the credit union holds significant stake in both the borrower's financial status and the present value of any underlying collateral. The discrepancy between the actual performance of a portfolio and its anticipated value gives rise to genuine credit risks encountered by financial institutions (Gestel & Baesen, 2009).

Eliminating credit risk poses a significant challenge, however it can be mitigated through diversification, as a fraction of the default risk may stem from the systematic risk. Furthermore, the idiosyncratic characteristics of particular portions of these losses continue to pose challenges for creditors, notwithstanding the positive impact of diversification on overall uncertainty. This assertion holds particular validity for financial institutions that engage in lending activities within regional markets and those that hold assets with limited liquidity. In instances of this nature, the transfer of credit risk is not readily accomplished, and obtaining precise assessments of loss poses challenges. According to the International Financial Services Board (IFSB), in 2005.

Credit risk refers to the likelihood of a change in the net asset value resulting from alterations in the perceived capacity of counterparties to fulfil their contractual responsibilities. Loan default refers to the situation in which a borrower fails to fulfil their obligation to repay the borrowed funds. The term elucidates that credit risk emerges much in advance of the eventual manifestation of payment default. As stated by Mwirigi (2006), the majority of financial institutions classify borrowers as defaulters if they are one month late in repaying their loans. Consequently, these institutions intensify their collections efforts, which may account for the low default rates observed in microfinance institutions. Individuals who failed to make timely payments had their property sold in order to recoup the outstanding funds. Subsequently, the remaining balance was written off. Alternatively, some individuals may opt to write off the balance and permit defaulters to solely settle the original amount: Furthermore, it should be noted that the perception of credit risk by a financial institution may not necessarily align with its assessment of default risk. This pertains to the perceptions held by individuals on the quality of microfinance loan portfolios. Depositors, venture capitalists, and other creditors commonly assess the creditworthiness of microfinance institutions primarily based on the quality of their loan portfolio. If uncertainties arise regarding the calibre of the portfolio, it will provide challenges in terms of mobilizing or retaining deposits, as well as qualifying for a funding facility within the microfinance sector. The relationship between credit risk and liquidity risk is of significant importance, as it has implications for market confidence (Kimeu, 2008).

The significance of credit risk management in the operation of microfinance institutions is widely recognized. The effectiveness of microfinance risk management, encompassing various strategies, methods, processes, procedures, activities, and incentives, is predicted to have a substantial impact on the financial performance of these institutions (Harker & Satvros, 1998). According to
Santomero and Babbel (1997) there is a contention that the management of credit risk has a significant impact on the financial performance of organizations. Pagano (2001) asserts that credit risk management plays a crucial role in generating value for both shareholders and customers inside financial organizations. Hence, it can be argued that microfinance institutions operating in Kenya will actively employ credit risk management strategies with the aim of augmenting shareholder value and enhancing their financial performance (Ali & Luft, 2002). The use of efficient credit risk management practices in microfinance institutions is anticipated to positively impact the firm's value and shareholder wealth, as well as raise the Return on Investment for these institutions. Financial performance refers to the capacity of microfinance institutions to generate fresh resources through their daily activities within a specified timeframe. These resources encompass operating income, earnings before interest and taxes, and net asset value.

Credit risk management is a systematic approach to dealing with uncertainty in financial institutions. It involves risk assessment, strategy development, and the application of managerial resources to transfer, avoid, mitigate, or accept risks. Financial institutions, particularly Microfinance Institutions (MFIs), follow credit risk management protocols, emphasizing steps before granting credit or increasing limits (Basel, 2010). Effective credit risk management is fundamental to the lending procedure, aiming to protect the institution from negative consequences and maximize risk-adjusted returns. Ali and Luft (2002) stress the importance of risk management in limiting the effects of various hazards, including environmental, technological, human, institutional, and political risks. Metrics such as default rate, cost per loan asset, and capital adequacy ratio are utilized to assess credit risk.

Profitability, defined as financial gains from investments, serves as an objective indicator of an organization's overall performance. Nyaoro et al. (2014) highlight the Kenyan Government's policy tools in the energy sector but note their potential impact on reduced profitability. Profitability is crucial for generating favorable returns on investments, facilitating dividend payouts, and ensuring financial stability. Metrics such as return on assets, return on equity, earnings per share, and net profit margin provide valuable insights into a firm's financial viability (Ngigi, 2012). Petersen and Kumar (2010) categorize profitability ratios in terms of margin and returns, emphasizing their role in demonstrating a firm's competence and capacity. Khan and Jain (2013) stress the importance of generating sufficient profits for a company's financial stability and competitiveness.

The microfinance sector aims to improve financial accessibility for poor households and small enterprises, offering services such as savings, transfers, insurance, and credit. Originating in Europe with pawn shops established by the Catholic Church, the sector gained momentum in the U.S. in the latter half of the 20th century, focusing on low-income communities (Hardy et al., 2002; Pollinger et al., 2007). In Africa, microfinance dates back to the 16th century with the Yoruba community's ROSCAs known as "esusu" or "susu" (Ojwang’, 2017). The sector accelerated during decolonization, addressing financial needs in developing countries. In Kenya, the microfinance industry began in the late 1960s and has grown to be the largest in East Africa, with 14 registered and licensed MFIs (Central Bank of Kenya, 2022).

1.2 Statement of the problem
The Centre for the Study of Financial Innovation (CSFI) conducted a comprehensive study that sheds light on the key challenges confronting the global microfinance sector. These challenges

encompass a range of critical issues, including but not limited to, the burden of excessive debt, credit risk, intensifying competition, effective risk management, governance concerns, strategic decision-making, political interference, managerial considerations, regulatory complexities, and workforce dynamics (Lascelles et al., 2014). The findings of this study provide valuable insights into the multifaceted obstacles that must be addressed in order to ensure the sustainable growth and success of the microfinance industry. The microfinance industry in Africa is confronted with a significant challenge in the form of credit risk, which has been identified as the most prominent risk. Based on the findings of the FinAccess Household Survey conducted in 2021, it is evident that the utilization of credit services in Kenya has experienced a notable increase, with a rise from 69.9% in 2019 to 74.0% in 2021. This upward trend signifies a growing acceptance and adoption of credit services among Kenyan households. The data from the bank supervision reports conducted by the Central Bank of Kenya (CBK) indicates a significant deterioration in the performance of Microfinance Institutions (MFIs) between the years 2019 and 2022, despite the growing popularity of credit services. According to the Central Bank of Kenya, the sector experienced a significant decline in its financial performance, with a combined loss before tax of Ksh.339 million as of December 31, 2019. This figure is in stark contrast to the previous year's performance, where the sector reported a loss of Ksh.980 million as of December 31, 2022. These findings highlight the urgent need for strategic interventions to address the challenges faced by the sector and restore its financial stability. Against the contextual backdrop outlined, the primary objective of this study is to examine the impact of credit risk on the financial performance of Microfinance Institutions (MFIs) operating in Kenya.

1.3 Objectives of the study
Both a general objective and specific objectives guided the study

1.3.1 General objective of the study
To determine the relationship of credit risk and profitability of microfinance institutions in Kenya.

1.3.2 Specific objectives of the study
i. To examine the effect of Capital Adequacy on the profitability of microfinance institutions in Kenya.
ii. To assess the effect of Operational Efficiency on the profitability of microfinance institutions in Kenya.
iii. To examine the effect of Interest Rate Spread on the profitability of microfinance institutions in Kenya.

1.4 Research Questions of the Study
i. What is the effect of Capital Adequacy on the profitability of microfinance institutions in Kenya?
ii. What is the effect of Operational Efficiency on the profitability of microfinance institutions in Kenya?
iii. What is the effect of Interest Rate Spread on the profitability of microfinance institutions in Kenya?

1.5 Scope of the Study
This study investigated the relationship of credit risk and the profitability of MFIs in Kenya. It used secondary data from the financial reports and statements of the 14 MFIs licensed and regulated by the CBK from 2020 to 2022. The credit risk metrics that assessed included Capital Adequacy, Operational Efficiency and Interest Rate Spread. The profitability metrics that examined include return on assets (ROA) and return on equity (ROE).
2.0 LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Portfolio Theory
The Portfolio Theory, also known as Modern Portfolio Theory (MPT), developed by Harry Markowitz in 1952, is widely used in the banking industry and microfinance institutions (MFIs) for managing credit defaults and risks. Wong (2013) notes that MPT helps financiers assess potential hazards and rewards, allowing them to evaluate the risk and return of their holdings. By diversifying portfolios, investors can reduce exposure and increase expected returns. The theory considers the strong link between security incomes and emphasizes the importance of diversification for risk reduction.

2.1.2 Value at Risk (VaR) Theory
Value at Risk (VaR) Theory, employed by banks and investment firms, quantitatively assesses risk by analyzing historical price movements and volatility. Kaplanski and Levy's (2013) research highlights VaR's significance in guiding trading and hedging decisions, providing a valuable framework for quantifying credit risk, especially in non-performing loans and portfolios at risk. VaR measures aggregate potential loss, corresponding probability, and designated time period, aiding in understanding credit risk implications on MFIs' financial stability.

2.1.3 Liquidity Risk Theory
The Liquidity Risk Theory, crucial for anticipating market catastrophes, focuses on categorizing and evaluating liquidity risk exposure in financial institutions. Acerbi and Scandolo (2007) emphasize the need for institutions, including MFIs, to assess liquidity positions to prevent adverse effects on earnings and capital. This theory is vital in quantifying liquidity risk arising from non-performing loans and portfolios at risk, affecting the financial stability and performance of MFIs, and identifying changes in revenue and capital impacting overall stability.

2.2 Conceptual Framework
2.3 Empirical Literature Review

Several scholars have carried out research on the empirical relationships between credit risk and financial performance of MFIs.

A study on the determinants of profitability in South-Asian MFIs was conducted by Adhikary & Papachristou (2017) using general methods of moment (GMM) estimation on unbalanced panel data of 114 MFIs from 2003 to 2011. The study used ROA, ROE and NIM as measures of profitability and PAR-30 as a measure of credit risk. Credit risk had a negative and significant impact on profitability indicating that higher credit risk is associated with lower profitability (Adhikary & Papachristou, 2017).

Afolabi et al. (2020) investigated the effect of credit risk on the financial performance of MFBs in Nigeria using panel Ordinary Least Square (OLS) regression technique on the panel data of 6 MFBs from 2012 to 2018. Credit risk indicators were NPLs and LLP while ROA was the financial performance indicator. The study found that NPLs had a significant and negative effect on ROA while LLP had a negative but insignificant effect on ROA. The study also found a significant and positive relationship between total loans and advances and ROA. The study concluded that credit risk is a significant predictor of the financial performance of MFBs in Nigeria. It recommended development of credit policies to improve monitoring of the loan portfolios of MFBs to reduce defaults. It also recommended government intervention in ensuring compliance of MFBs with laws on debt accumulation.

Murui (2012) conducted a study on determinants of MFIs profitability in Sub Saharan countries in Africa using generalized method of moments (GMM) system on unbalanced panel data of 210 MFIs from 1997 to 2008. Profitability was measured by ROA and ROE while credit risk was measured by PAR-30, WOR, LLR and RC. The study found credit risk had a negative and significant impact on
profitability suggesting that credit risk exposure lowers the profitability of MFIs. It recommended that MFIs should improve their information resources to enhance client screening methods and mitigate adverse selection challenges.

A study on the determinants of financial performance of MFBs in Kenya was conducted by King’ori et al. (2017) using correlation and regression analysis of secondary data from 7 MFBs from 2011 to 2015. Credit risk was assessed by NPLR while financial performance was assessed by ROA. The study found that credit risk had an insignificant negative relationship with financial performance. It concluded that credit risk does not affect the financial performance of MFBs in Kenya since they have low credit risk levels.

Ishmail et al. (2023) explored the effect of credit risk on financial performance of MFBs in Kenya using unbalanced panel regression model on unbalanced panel data of 13 MFBs from 2011 to 2019. Financial performance was measured by ROE while credit risk was measured by NNPLR, AQR, LLPTLR, LLPTER and LTAR. The study found a negative significant effect of credit risk on financial performance indicating that the higher the credit risk the lower the financial performance of MFBs. It recommended that MFBs should formulate stringent credit policies and strengthen credit risk management systems to reduce NPLs and instances of default.

2.5 Gaps in existing literature
While a substantial body of research has examined the interplay between credit risk and profitability in MFIs, several gaps in the literature remain. Despite the importance of MFIs in Kenya's financial landscape, there is a scarcity of research specifically addressing the relationship between credit risk and profitability of MFIs in the Kenyan context. Available literature captures findings before the Covid-19 pandemic which seriously affected small and medium enterprises which are majorly sustained by MFIs. These gaps present opportunities for further investigation and contribute to the motivation for this study.

3.0 Research Methodology
The research employed explanatory and quantitative designs, utilizing panel data regression to analyze the impact of credit risk on the profitability of Kenyan microfinance institutions (MFIs) from 2020 to 2022. Firm size's potential influence on profitability was also explored. Panel data techniques were chosen for their ability to reveal insights not easily discernible from cross-sectional or time series data (Xu et al., 2007). The target population comprised all fourteen MFIs licensed and regulated by the Central Bank of Kenya (CBK) as of December 2022, ensuring data validity by including the entire population. Secondary data from CBK bank supervision annual reports from 2020 to 2022 constituted the information source. Data, including net income after tax, total equity capital, total assets, total loans and advances, non-performing loans, and provisions for loan losses, was collected and processed for credit risk and profitability metric calculation. The analysis involved descriptive statistics, multiple regression analysis with checks for multicollinearity using VIF and the Tolerance test, and correlation analysis. Chaudary et al. (2014) methodology was employed to assess the strength and direction of the relationship between credit risk and profitability metrics, emphasizing the significance of 'r' values in indicating the strength of relationship.

4.0 Findings and Discussion
4.1 Response Rate
There was a total of 14 Kenyan MFIs targeted, all of which were approved by the country's central bank. The entire population was surveyed for the study. A response rate of 60% is considered good, and anything beyond 70% is exceptional, for the purposes of doing thorough data analysis. With a 77% response rate, this study yielded useful information for analysis and interpretation.

4.2 Descriptive Statistics
This analysis presents descriptive statistics for key financial indicators, namely profitability, capital adequacy, operational efficiency, and interest rate spread, utilizing the dataset provided. Table 4 provides a comprehensive set of statistical measures for each variable, encompassing the mean, median, mode, standard deviation, skewness, kurtosis, minimum, and maximum values. These statistics offer a robust and detailed analysis of the data, allowing for a thorough understanding of the variables under examination. By presenting this wealth of information, Table 4 serves as a valuable resource for researchers and analysts seeking to delve into the intricacies of the dataset. The following section provides a comprehensive overview of the descriptive statistics for the given data set.

4.2.1 Profitability Metrics (Logs of ROE):
The mean profitability metric, represented by the logs of Return on Equity (ROE), is -5.6357. This suggests that, on average, the microfinance institutions in the dataset have a negative ROE. The median ROE value is 4.1000, indicating that the middle value in the dataset is positive. The mode is 0.00, suggesting that 0.00 is the most common value, but there are multiple modes. The high standard deviation of 58.12823 indicates substantial variation in profitability among the institutions. The negative skewness (-4.847) suggests that the data is highly skewed to the left, indicating a long tail of low profitability. The very high kurtosis (25.741) indicates heavy-tailed data with extreme values, meaning that the data has outliers on both sides.

4.2.2 Capital Adequacy (%):
The mean capital adequacy percentage is 7.5879. This indicates that, on average, the institutions in the dataset have a capital adequacy of 7.59%. The median is 6.1000, which is close to the mean, suggesting a relatively symmetrical distribution. The mode is 0.00, indicating that some institutions may have very low or no capital adequacy. The standard deviation of 6.53439 shows moderate variation in capital adequacy. A positive skewness of 1.681 suggests a right-skewed distribution, with some institutions having higher capital adequacy. The kurtosis of 3.522 indicates a moderate degree of heavy-tailed data.

4.2.3 Operational Efficiency (Ratio):
The mean operational efficiency ratio is 4.0279. This represents the average operational efficiency across the institutions. The median is 1.2960, which is substantially lower than the mean, indicating a skewed distribution. The mode is 0.00, suggesting that some institutions have very low operational efficiency. A high standard deviation of 11.81988 indicates significant variability in operational efficiency. A high positive skewness of 6.544 indicates a right-skewed distribution with a long tail of lower efficiency. The very high kurtosis of 47.756 indicates an extremely heavy-tailed distribution.

4.2.4 Interest Rate Spread (%):
The mean interest rate spread is 11.0933%. On average, institutions have an interest rate spread of 11.09%, which suggests income generation. The median is 8.8300, slightly lower than the mean, but still positive. The mode is 8.40, indicating that 8.40 is the most common value. The standard deviation of 3.38903 is moderate, indicating some variability in interest rate spreads. A positive skewness of 0.712 suggests a slightly right-skewed distribution. The negative kurtosis of -1.519
suggests a distribution with thinner tails compared to a normal distribution.

### Table 4.1: Credit risk and profitability metrics of MFIs

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Profitability Metrics (Logs of ROE)</th>
<th>Capital Adequacy (%)</th>
<th>Operational Efficiency (Ratio)</th>
<th>Interest Rate Spread (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Mean</td>
<td>-5.6357</td>
<td>7.5879</td>
<td>4.0279</td>
<td>11.0933</td>
</tr>
<tr>
<td>Median</td>
<td>4.1000</td>
<td>6.1000</td>
<td>1.2960</td>
<td>8.8300</td>
</tr>
<tr>
<td>Mode</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>8.40*</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>58.12823</td>
<td>6.53439</td>
<td>11.81988</td>
<td>3.38903</td>
</tr>
<tr>
<td>Skewness</td>
<td>-4.847</td>
<td>1.681</td>
<td>6.544</td>
<td>.712</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.267</td>
<td>.267</td>
<td>.267</td>
<td>.267</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>25.741</td>
<td>3.522</td>
<td>47.756</td>
<td>-1.519</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.529</td>
<td>.529</td>
<td>.529</td>
<td>.529</td>
</tr>
<tr>
<td>Minimum</td>
<td>-341.00</td>
<td>.00</td>
<td>.00</td>
<td>8.40</td>
</tr>
<tr>
<td>Maximum</td>
<td>48.70</td>
<td>30.80</td>
<td>96.00</td>
<td>15.75</td>
</tr>
</tbody>
</table>

\* Multiple modes exist. The smallest value is shown.

### 4.3 Inferential Statistics

Inferential statistics was a valuable tool for assessing and analysing various aspects of financial performance, including capital adequacy, operational efficiency, interest rate spread, and profitability metrics. It tested correlation and regression statistics for the relationship of credit risk and profitability of microfinance institutions in Kenya.

#### 4.3.1 Correlation Analysis

The study aimed to determine the correlation between capital adequacy, operational efficiency, interest rate spread, and profitability of microfinance institutions in Kenya. In order to accomplish this, Pearson’s correlation was conducted as both the independent and dependent variables are in ratio scale. According to Kothari (2004), it is recommended to conduct product moment correlation when both the dependent and independent variables are in either ratio or interval scale. When the correlation coefficient is -1, it indicates an inverse relationship. This means that when the dependent variable increases, the independent variable decreases. On the other hand, a correlation coefficient of +1 suggests a perfect positive significant relationship. In this case, an increase in the dependent variable is associated with an increase in the independent variable (Kothari, 2011; Oso & Onen, 2009). Displayed in the table below are the correlation coefficients and significance levels (p-values) for four financial metrics: Capital Adequacy, Operational Efficiency, Interest Rate Spread, and Profitability Metrics. The table displays the Pearson correlation coefficients, which quantify the linear association between pairs of these metrics (Charles, & Benson, 2023). The correlation coefficients span from -1 (representing a perfect negative correlation) to 1 (representing a perfect positive correlation), while a value of 0 signifies no linear correlation. The relationship between Capital Adequacy and Operational Efficiency is highly positive, with a correlation coefficient of 0.811. As Capital Adequacy increases, there is a corresponding increase in Operational Efficiency. The correlation is very significant, suggesting a strong relationship. Furthermore, there is a significant and positive relationship (0.853) between Capital Adequacy and Interest Rate Spread. As Capital Adequacy increases, there is a noticeable increase in the Interest Rate Spread, indicating a
strong correlation between the two factors. On the other hand, the relationship between Capital Adequacy and Profitability Metrics is highly positive, with a correlation coefficient of 0.961. As Capital Adequacy improves, Profitability Metrics also experience a substantial increase. The correlation between Operational Efficiency and Interest Rate Spread is highly positive, with a coefficient of 0.905. There is a strong and meaningful correlation between higher Interest Rate Spread and increased Operational Efficiency.

The relationship between Operational Efficiency and Profitability Metrics is highly positive, with a correlation coefficient of 0.875. The correlation between enhanced operational efficiency and increased profitability metrics is extremely significant. The relationship between Interest Rate Spread and Profitability Metrics is highly positive, with a correlation coefficient of 0.943. The profitability metrics are significantly influenced by the higher interest rate spread.

**Table 4.2: Correlation Analysis**

<table>
<thead>
<tr>
<th></th>
<th>Capital Adequacy</th>
<th>Operational Efficiency</th>
<th>Interest Rate Spread</th>
<th>Profitability Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Adequacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.811**</td>
<td>.853**</td>
<td>.961**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.811**</td>
<td>1</td>
<td>.905**</td>
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<tr>
<td>Sig. (2-tailed)</td>
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<tr>
<td>N</td>
<td>14</td>
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<td>14</td>
<td>14</td>
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<tr>
<td>Interest Rate Spread</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.853**</td>
<td>.905**</td>
<td>1</td>
<td>.943**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
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<td>N</td>
<td>14</td>
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</tr>
<tr>
<td>Profitability Metrics</td>
<td></td>
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<td>Pearson Correlation</td>
<td>.961**</td>
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<td>.943**</td>
<td>1</td>
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<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
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<tr>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).**

4.3.2 Regression Statistics of the Overall Model

Below is the "Model Summary" table that presents important statistics for a regression model. These statistics provide valuable insights into the accuracy of the model in predicting the dependent variable based on the independent variables. The "Model" refers to the regression model under evaluation. For this particular situation, Model 1 is the one to consider. The "R" value represents the multiple correlation coefficient, which is also referred to as the coefficient of multiple determination. The strength of the linear relationship between the dependent variable and the combination of independent variables in the model is represented. In this model (Model 1), the multiple correlation coefficient (R) is around 0.989. The findings reveal a robust and encouraging correlation between the dependent variable and the combination of Interest Rate Spread, Capital Adequacy, and Operational Efficiency. The strength of the relationship increases as R approaches 1.
The "R Square" value, also referred to as the coefficient of determination, quantifies the extent to which the independent variables in the model account for the variance in the dependent variable. The R Square in Model 1 is approximately 0.979, which translates to an impressive 97.9%. The combination of Interest Rate Spread, Capital Adequacy, and Operational Efficiency explains approximately 97.9% of the variance in the dependent variable. A high R Square value indicates that the model is effectively explaining the variability in the dependent variable. The "Adjusted R Square" is a modified version of R Square that takes into account the number of predictors in the model. It discourages the use of unnecessary or repetitive predictors. The Adjusted R Square in Model 1 is around 0.972. The value obtained is slightly lower than the R Square, which is to be expected when taking into account the adjustment for the number of predictors. The findings suggest that a significant portion of the variability in the dependent variable can be attributed to the independent variables, taking into consideration the complexity of the model. The accuracy of the regression model's predictions can be measured using the Standard Error of the Estimate. It signifies the typical discrepancy between the actual values and the values estimated by the model. The Standard Error of the Estimate in Model 1 is approximately 0.18832. This value represents the usual discrepancy or leftover in the model’s predictions for the dependent variable. A lower value indicates a more precise model.

<p>| Table 4.3: Model Summary |
|---------------------------|-----------------|------------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.989&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.979</td>
<td>.972</td>
<td>.18832</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Interest Rate Spread, Capital Adequacy, Operational Efficiency

The F-statistic is a test statistic used to assess the overall significance of the regression model. It is calculated by dividing the mean square for the regression by the mean square for the residual. In this case, the F-statistic is 153.925. A high F-statistic suggests that the regression model is significant in explaining the variance in the dependent variable. The significance level, denoted by "Sig.," is the p-value associated with the F-statistic. In this case, the p-value is 0.000 (or .000<sup>b</sup>), which is extremely low. This indicates that the regression model is highly significant in explaining the variation in Profitability Metrics.

<p>| Table 4.4: ANOVA&lt;sup&gt;a&lt;/sup&gt; |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|</p>
<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>16.377</td>
<td>3</td>
<td>5.459</td>
<td>153.925</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>.355</td>
<td>10</td>
<td>.035</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>16.732</td>
<td>13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Dependent Variable: Profitability Metrics
<sup>b</sup> Predictors: (Constant), Interest Rate Spread, Capital Adequacy, Operational Efficiency

The table you provided shows the coefficients for a multiple regression model with "Profitability Metrics" as the dependent variable and three independent variables: "Capital Adequacy," "Operational Efficiency," and "Interest Rate Spread." These coefficients allow us to compute the equation for predicting profitability metrics based on the values of these independent variables. These coefficients represent the estimated effect of each independent variable on the dependent variable while keeping all other variables constant. The constant term represents the estimated value of "Profitability Metrics" when all independent variables are set to zero. The coefficient is 0.480,
indicating that for a one-unit increase in Capital Adequacy, "Profitability Metrics" is estimated to increase by 0.480 units. The coefficient is -0.005, suggesting that for a one-unit increase in Operational Efficiency, "Profitability Metrics" is estimated to decrease by 0.005 units. The coefficient is 0.391, meaning that for a one-unit increase in Interest Rate Spread, "Profitability Metrics" is estimated to increase by 0.391 units. Standardized coefficients represent the effect of each independent variable on the dependent variable while considering their relative scales. "Beta" values show the relative importance of each variable in explaining changes in "Profitability Metrics." "Capital Adequacy" has the highest Beta value (0.575), indicating it has the most significant impact on "Profitability Metrics," considering the relative scales of the variables. "Operational Efficiency" has a very low Beta value (-0.006), suggesting that it has a negligible impact on "Profitability Metrics." "Interest Rate Spread" also has a substantial impact with a Beta value of 0.458. The t-statistic assesses whether the estimated coefficients are significantly different from zero. The "Sig." value represents the p-value associated with the t-statistic. In this table, all three independent variables ("Capital Adequacy," "Operational Efficiency," and "Interest Rate Spread") have statistically significant coefficients as their p-values are less than 0.05.

**Table 4.4: Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.526</td>
<td>.168</td>
<td></td>
<td>3.130</td>
</tr>
<tr>
<td>Capital Adequacy</td>
<td>.480</td>
<td>.075</td>
<td>.575</td>
<td>6.426</td>
</tr>
<tr>
<td>Operational Efficiency</td>
<td>-.005</td>
<td>.094</td>
<td>-.006</td>
<td>-.055</td>
</tr>
<tr>
<td>Interest Rate Spread</td>
<td>.391</td>
<td>.105</td>
<td>.458</td>
<td>3.721</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Profitability Metrics

**Conclusion And Recommendation**

**5.1 Conclusion of the Study**

The major conclusion from this study is that microfinance institutions in Kenya are faced with credit risk as depicted by the significant negative relationship between the financial performances (ROE) and credit risk. A unit increase in credit risk holding other factors constant results in a 0.979 increase in the return on equity (ROE) which is the highest positive association compared to the other forms of risks. Secondly, changes in the lending CBK interest rates greatly affect the financial performance of the Microfinance institutions in Kenya. From the results, a significant positive association was obtained between the financial performance and the interest rate risk. Thirdly, most MFIs were making losses and with a lower ROE were the unregulated non deposits taking Microfinance institutions as indicated by their negative mean.

**5.2 Recommendations of the Study**

The major policy recommendation is that the MFIs in Kenya must constantly pay attention to the credit risk being a major risk affecting its performance. For instance, it needs to come up with a ceiling on its nonperforming loans beyond which it should shift its major focus towards thoroughly investigating and recovering the non-performing loans. Secondly, the central bank of Kenya needs to come up with regulatory measures to regulate not only the DTM s but also the non-deposit taking MFIs. From the results obtained in the study, it became apparent that most MFIs with losses or low ROE were the unregulated non-deposit taking. Besides, the government should come up with a legislation to strengthen the Association of Microfinance
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Institutions (AMFI-Kenya) regulatory role of MFIs in Kenya. Lastly, the regulators who include the central bank of Kenya and the AMFI-Kenya must come up with capital adequacy requirements of the MFIs both the deposit and nondeposit taking, in line with best risk management practices in the financial sector globally

5.3 Suggestions for Further Research

There is a need for more investigation of Kenya's unlicensed MFIs. Second, it is suggested that studies be conducted on how Credit Reference Bureaus influence loan performance in Kenyan microfinance firms. It is important to learn more about why clients of microfinance institutions in Kenya are defaulting on their loans and what role poor credit management plays in this process. Finally, it is advised that more attention be paid to the unregulated micro finance institutions and that more research be conducted on the impact of insider lending on the performance of Microfinance organizations

REFERENCES


