ABSTRACT
The operation of commercial banks in Somalia unfolds amidst formidable economic challenges stemming from political instability, ongoing conflicts, and a frail institutional framework. Nevertheless, Somalia’s financial sector exhibits resilience, with several commercial banks endeavoring to address the financial needs of businesses and individuals nationwide. These banks play a pivotal role in mobilizing savings, facilitating transactions, and providing credit, thereby supporting economic activities in Somalia’s predominantly cash-based economy. This study explored the impact of credit risk on the financial performance of Somali commercial banks, employing Modern Portfolio Theory (MPT) as the theoretical framework. Adopting a descriptive survey research design, secondary data from licensed commercial banks and the Central Bank of Somalia were analyzed over ten years (January 2014 to December 2023) using panel regression analysis. Findings reveal a moderate negative correlation between credit risk, measured by Bad Debt Expense Ratio (BDER), and financial performance, indicated by Return on Equity (ROE). Statistical tests confirm the significance of this relationship, emphasizing the importance of robust credit risk management practices for sustaining favorable financial outcomes. Recommendations include uniform improvement in risk management practices across the sector and proactive measures to mitigate emerging credit risk factors. Enhancing risk management frameworks is vital for ensuring continued financial stability and performance in the Somali banking industry.

Keywords: Credit Risk, Financial Performance, Commercial banks in Somalia

APA CITATION:

1.0 INTRODUCTION
Globally, Commercial banks in Somalia operate within a challenging economic landscape characterized by political instability, ongoing conflicts, and a fragile institutional framework (Kulmie, 2023). Despite these obstacles, Somalia’s financial sector has shown resilience, with several commercial banks striving to serve the financial needs of businesses and individuals across the country. These banks play a crucial role in mobilizing savings, facilitating transactions, and providing credit to support economic activities in Somalia’s predominantly cash-based economy (Klapper & Lusardi, 2019).

The growth and expansion experienced by the financial sector in Somalia have been highlighted without unnecessary government intervention, indicating the challenges and successes within the country’s financial landscape. The significant role of the financial sector in increasing economic
growth by supporting innovation, accumulating wealth, and enhancing productivity could apply to the resilience shown by commercial banks in Somalia. Insights into how financial institutions may perceive certain projects as unfeasible, which could be relevant to the challenges faced by commercial banks in Somalia, have been provided. The impact of government interventions on banking sector stability, particularly amidst political instability, has been explored, indicating a negative impact on stability and increased risk for banks (Haron and Barre, 2023).

The cumulative impact of the various sorts of financial and economic risks can be viewed as the level of risk in the financial system. It is critical to secure the uninterrupted operation of critical financial markets for commercial banks and other enterprises to have access to funds when needed to maintain the overall stability of the financial system. Because of poorly functioning financial risks, several commercial banks have either failed or are on the verge of dying. As a result of their reaction to the perceived danger, their operations have shrunk, resulting in lower profitability and returns. This has resulted in a significant loss of public trust in the banking sector and the overall financial system and economy (Abdi, 2023).

The Somali economy is becoming increasingly open, with international trade expanding all the time, exposing Somali businesses to foreign exchange rate volatility. Changes in exchange rates can affect the relative prices of a company’s inputs and outputs. Changes in comparable prices can impact a company’s competitive market position, causing changes in cash flows and, ultimately, the company’s value. While firms in developed economies use a variety of instruments to manage financial risks, it is unclear whether their full potential is being realized in developing economies, particularly Somalia (Abdi, 2023).

Even though financial risk has increased dramatically in recent years, risk management is not a new challenge. As a result of increasingly global markets, the risk may arise from thousands of kilometers abroad that have no bearing on the native market. The likelihood of loss or potential losses resulting from events such as market price movements is referred to as risk. Events having a low probability of occurring but a considerable loss potential are particularly challenging since they are frequently unanticipated. Consequently, the risk is the likelihood of return variability. Financial risk originates from several financial transactions, such as sales and purchases, investments and loans, and various other company activities. It can occur due to legal transactions, new projects, mergers and acquisitions, debt financing, the energy component of costs, or management, stakeholder, competitor, foreign government, or weather-related activity (Horcher, 2005).


Geopolitical tensions, trade disputes, and macroeconomic shocks further contribute to market uncertainty, impacting banks’ financial performance across borders. Credit risk remains a key concern globally, with economic downturns and sector-specific vulnerabilities increasing credit risk exposure and leading to loan defaults and impaired asset portfolios (Gržeta et al., 2023). Effective credit risk management is crucial for maintaining asset quality and profitability, especially during global economic turbulence.

Analyzing the financial performance of commercial banks in Somalia offers lessons and benchmarks for other African countries seeking to strengthen their banking sectors. Despite
adversities, Somali banks have demonstrated resilience and adaptability, achieving notable growth and profitability. Factors such as effective risk management practices, innovative business strategies, and adaptive regulatory frameworks have been instrumental in driving their performance. These insights can inform best practices and policy interventions aimed at promoting a sound and sustainable banking sector across the continent (Mncube, 2023).

In the Somali context, the study of financial risks and the performance of commercial banks is crucial for the country’s economic development. Somali commercial banks face unique challenges due to the country’s socio-economic and political landscape. Despite these challenges, Somali banks play a vital role in providing financial services, facilitating trade and investment, and mobilizing savings. The sector operates in a fragile environment marked by regulatory uncertainties, security concerns, and limited infrastructure, hindering expansion efforts (Haron & Barre, 2023).

The performance of Somali commercial banks is influenced by factors like asset quality, capital adequacy, profitability, and operational efficiency. While some banks demonstrate resilience and profitability, others struggle with non-performing loans, inadequate capital buffers, and operational inefficiencies. Strategies such as enhancing risk management practices, improving governance structures, and investing in technology are crucial for mitigating risks and enhancing performance (Ally, 2022).

Collaboration with international partners, including development agencies and multilateral institutions, is essential for supporting the development of the Somali banking sector. Technical assistance, capacity-building initiatives, and knowledge-sharing platforms can address capacity gaps, strengthen regulatory frameworks, and enhance financial sector stability. Tailored strategies that address the country’s unique challenges and opportunities are vital for Somali banks to contribute to economic growth, poverty reduction, and financial inclusion (Farah & Levasseur, 2022).

By leveraging insights from studies on financial risks and performance in other regions like China, South Asia, Nigeria, and the UAE, Somali commercial banks can adapt best practices in credit risk management, operational risk management, and internal control strategies to enhance their performance and contribute to Somalia’s economic development (Chen et al., 2018; Siddique et al., 2021; Oye, 2020; Ayunku & Apiri, 2020).

Credit Risk, also known as Default Risk, refers to customers’ or counterparty’s inability or unwillingness to meet promises in lending, trading, hedging, settlement, and other financial activities. Credit risk comprises two components: transaction risk or default risk and portfolio risk. Portfolio risk is made up of inherent and concentrated risk. Both external and internal variables determine a bank’s portfolio’s credit risk. The state of the economy, significant changes in commodity/equity prices, foreign currency rates and interest rates, trade restrictions, economic sanctions, government policies, and so on are examples of external influences (Spuchľáková et al., 2015).

The history of commercial banks in Somalia is intertwined with the country’s socio-economic and political developments over the past century. Commercial banking in Somalia traces its roots back to the colonial period when European powers established banks to facilitate trade and economic activities in the region. However, the modern banking sector in Somalia emerged in the latter half of the 20th century, particularly following the country’s independence in 1960 (Farah & Levasseur, 2022).

During the early post-independence period, Somalia’s banking sector was dominated by state-owned institutions, reflecting the socialist economic policies pursued by the government. The National Bank of Somalia, established in 1960, served as the central bank and regulator, overseeing
the operations of commercial banks and financial institutions operating in the country. Additionally, several state-owned commercial banks, such as the Commercial and Savings Bank of Somalia, were established to provide banking services to businesses and individuals (Haron & Barre, 2023).

In the 1980s, Somalia experienced a period of economic liberalization, marked by the privatization of state-owned enterprises and the emergence of private sector-led initiatives. This period saw the entry of private commercial banks into the market, aiming to meet the growing demand for financial services driven by economic growth and urbanization. These private banks played a pivotal role in expanding access to banking services, fostering entrepreneurship, and supporting trade and investment activities (Haron & Barre, 2023).

However, the outbreak of civil war in 1991 severely disrupted Somalia’s financial sector and led to the collapse of the central government. The ensuing years witnessed the fragmentation of the banking system, with various regions and factions establishing their banking institutions to fill the void left by the collapse of the central authority. Informal money transfer networks, such as Hawalas, also emerged as alternative channels for remittances and financial transactions in the absence of formal banking infrastructure (Farah & Levasseur, 2022).

Despite the challenges posed by conflict and instability, Somalia’s banking sector has shown resilience and adaptability in recent years. The establishment of the Transitional Federal Government in 2004 and subsequent efforts to rebuild state institutions have created a conducive environment for the revival of the banking sector. The Central Bank of Somalia, re-established in 2009, has taken steps to regulate and supervise commercial banks, enhance financial stability, and promote confidence in the banking system (Ahamed and Mallick, 2019).

Today, Somalia’s banking sector continues to evolve, driven by ongoing efforts to modernize regulatory frameworks, improve infrastructure, and enhance financial inclusion. Commercial banks, both domestic and foreign-owned, are playing an increasingly important role in supporting economic recovery and development efforts, providing essential financial services to businesses, individuals, and government entities across the country. While challenges persist, including regulatory compliance, security concerns, and infrastructure limitations, Somalia’s banking sector holds significant potential to contribute to the country’s socio-economic development and integration into the global economy (Ahamed and Mallick, 2019).

1.2 Statement of the Problem

Commercial banks in Somalia operate within a unique economic and socio-political landscape, facing multifaceted challenges that directly impact their financial performance. The volatility and uncertainty inherent in the Somali financial sector present a complex array of risks that have the potential to significantly affect the stability and profitability of these institutions. One of the primary concerns revolves around the identification and management of financial risks, which remain inadequately understood within the context of Somalia’s banking sector (Serwadda, 2018).

Despite the critical role commercial banks play in facilitating economic activities and financial intermediation, there is a noticeable lack of comprehensive studies addressing the intricate relationship between financial risks and the financial performance of these banks in Somalia. This knowledge gap is particularly concerning given the inherent vulnerability of the Somali economy to various external shocks, including political instability, regulatory uncertainties, and fluctuating global economic conditions. Without a thorough understanding of the specific financial risks faced by Somali commercial banks, stakeholders are limited in their ability to implement effective risk management strategies, thereby compromising the overall stability and sustainability of the banking sector.

The financial performance of commercial banks is crucial for economic stability and growth in
any country, and Somalia is no exception. However, amidst the volatile economic landscape and lack of robust regulatory frameworks, credit risk has emerged as a significant challenge for Somali commercial banks. The inability to effectively manage credit risk not only threatens the stability of individual banks but also poses systemic risks to the entire financial sector. Therefore, understanding the relationship between credit risk and financial performance is paramount for policymakers, regulators, and bank stakeholders. Despite the growing importance of this issue, there is a noticeable gap in empirical research specifically examining this relationship within the context of Somalia. Consequently, there is a pressing need for comprehensive analysis to explore the impact of credit risk on the financial performance of commercial banks in Somalia.

1.3 Objective of the study
To establish the effect of credit risk on the financial performance of commercial banks in Somalia.

1.4 Scope of Study
This study’s conceptual scope focuses on the effect of credit risk on the financial performance of commercial banks in Somalia. This research was limited to Somali commercial banks, focusing on commercial banks and information provided to the Central Bank. All commercial banks that were registered and operational by 2021 will included in the study population. A census study was employed in this study. Secondary data in the form of time series and cross-sectional data from commercial bank financial annual reports and Central Bank of Somalia publications was relied upon for analysis. The study covered ten years, from January 2014 to December 2023. The study relied on this very current data since it was easy to predict future behaviors of the financial performance of the banking system in Somalia.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework
Theories are meant to describe, imagine, and understand phenomena, as well as to question and add to existing data while staying true to basic assumptions. The theoretical framework is what holds the hypothesis of an exploration study together. The theory framework shows and describes the idea that gives rise to the exploration problem that is being looked at (Abend, 2008). A theory, on the other hand, is a set of rules made to explain a group of facts or events, preferably one that has been tried or fully understood and can be used to conclude common events (Sekaran & Bougie, 2016).

2.1.1 Modern Portfolio Theory (MPT)
Modern Portfolio Theory (MPT), introduced by Harry Markowitz in 1952, revolutionized investment decision-making by emphasizing the importance of diversification in managing risk and maximizing returns (Li, 2022). MPT suggests that investors can achieve an optimal risk-return tradeoff by spreading their investments across different asset classes with low correlations (Li, 2022). This approach is particularly relevant in the context of credit risk management within commercial banks, where the goal is to balance risk and return in loan portfolios (Bangia et al., 2002).

The emergence of MPT marked a shift towards more quantitative and systematic portfolio construction methods, departing from traditional subjective judgments in investment management (Li, 2022). By considering the risk and return of the overall portfolio rather than individual assets in isolation, MPT provides a framework for optimizing portfolios to achieve desired risk-return profiles (Li, 2022). This systematic approach is crucial for commercial banks in Somalia looking to enhance their financial performance while mitigating credit risk (Bangia et al., 2002).

Applying MPT principles can help banks in Somalia effectively manage credit risk by diversifying their loan portfolios, assessing credit risk, and strategically allocating capital to different types of loans (Bangia et al., 2002). By optimizing their portfolios based on MPT, banks can reduce
concentration risk, improve risk-adjusted returns, and develop robust risk management strategies such as stress testing and scenario analysis (Bangia et al., 2002). This systematic framework not only enhances the stability and resilience of the banking sector but also provides valuable insights into how banks can navigate the complexities of credit risk management (Bangia et al., 2002). In conclusion, MPT offers a comprehensive and mathematically grounded approach to credit risk management within commercial banks, providing a roadmap for optimizing loan portfolios, reducing risk, and improving overall financial performance. By leveraging the principles of MPT, banks in Somalia can navigate the challenges of credit risk effectively and enhance their long-term sustainability in a dynamic financial landscape. MPT can lead to solving credit risk by providing a systematic framework for assessing and managing credit risk within commercial banks. By applying MPT principles, banks can identify opportunities to optimize their loan portfolios, reduce concentration risk, and improve risk-adjusted returns. Additionally, MPT can help banks develop more effective risk management strategies, such as stress testing and scenario analysis, to identify and mitigate potential credit risk exposures. Overall, MPT provides a robust framework for addressing the complex challenges associated with credit risk management in commercial banking, thereby enhancing the stability and resilience of the banking sector.

2.2 Empirical Literature Review

The primary goal of this section is to present empirical findings from previous studies of financial risks and their effects on commercial bank financial performance in Somalia. This section focuses on the current empirical research’s strengths, weaknesses, and literature gaps. The subsections that follow contain concise summaries of prior studies relevant to this study’s specific goals.

2.2.1 Credit Risk and Financial Performance

Mushafiq et al. (2021) looked at the association between credit risk and non-financial firm financial performance. The study investigated the association between the Altman Z-score model as a credit risk proxy and the Return on Assets and Equity as a financial performance indicator, as well as the control variables leverage, liquidity, and company size. The Least Squares Dummy Variable regression analysis is used. Between 2012 and 2017, this study’s sample included 69 non-financial companies from the Pakistan Stock Exchange’s KSE-100 Index. The study discovered that the Altman Z-score, leverage, and business size all had a substantial impact on the financial performance of KSE-100 non-financial firms. However, in this investigation, liquidity was discovered to be consequential. The Altman Z-score and firm size have a positive correlation with financial performance, but leverage has an opposite association.

Khemakhem and Boujelbene (2018), on the other hand, investigated the use of financial and non-financial indicators as well as data mining to forecast credit risk. The goal of this study was to create a new approach for assessing credit risk that took into consideration both financial and non-financial characteristics, as well as class imbalance. The most essential financial and non-financial characteristics were discovered in order to create a credit score model and assess a company’s creditworthiness. Furthermore, the Synthetic Minoritiy Oversampling Technique was employed to address the issue of class imbalance and enhance the classifier’s performance. Artificial neural networks and decision trees were developed to predict default risk. Khemakhem and Boujelbene (2018) discovered that profitability ratios, repayment capacity, solvency, the duration of a credit report, guarantees, firm size, loan quantity, ownership structure, and the duration of a corporate banking connection were the most important predictors of default. Furthermore, both algorithms were found to be highly sensitive to class imbalance. When faced with balanced data, decision trees outperformed artificial neural networks in terms of predicted accuracy for credit risk assessment.

Sharifi et al. (2019) examined how credit risk components affect credit risk management
performance and growth in non-performing assets (NPAs) for commercial banks in India. The data was collected from both primary and secondary sources. The preliminary data was gathered by mailing a questionnaire to risk managers in Indian banks. Secondary data on Indian bank NPAs were gathered from annual reports and the Centre for Monitoring Indian Economy’s Prowess database. The models for the investigation were calculated by multiple linear regression. The results indicated that detecting credit risk has a considerable impact on credit risk performance. The findings were conclusive since credit risk identification was negatively connected to annual growth in NPAs or loans. There was evidence to support the prior belief that private banks would outperform government banks in credit risk performance.

Ko et al. (2019) investigated the relationships between operational risk incidents, corporate governance, credit risk, and company performance. To begin, the authors modelled business credit risk using operating loss and corporate governance variables. The purpose was to find a correlation between operational risk, corporate governance, and credit risk. Second, the authors conducted a regression using firm performance as the dependent variable and operational risk and corporate governance as independent variables to investigate the link between operational risk, corporate governance, and firm performance. The authors of this study utilize four surrogates to assess corporate governance: CEO duality, the number of independent board members, foreign ownership, and board member presence ratio. According to the authors’ findings, having more operational risk incidents increases the possibility of credit default and poor performance. More crucially, the authors discover that higher levels of corporate governance are associated with lower operational risk occurrences, improved performance, and a decreased possibility of credit failure.

Akram & Rahman (2018) analyzed credit risk management (CRM) scenarios for Islamic banks (IBs) and conventional banks (CBs) in Pakistan, taking into account Islamic banking’s rapid expansion and future ramifications. The study included a sample of five CBs and four IBs from the whole banking industry. Secondary data from bank annual financial reports were analyzed over a 13-year period from 2004 to 2016. The data was analyzed using multiple regression, correlation, and descriptive statistics. The data show that loan quality (LQ) has a favourable and significant impact on CRM for both IBs and CBs. In the case of IBs, asset quality (AQ) has a negative impact on CRM, whereas in the case of CBs, it has a considerable positive impact. Individually, the effect of 16 LQ and AQ ratios on CRM was investigated using a regression model with a dummy variable of financial crises to allow for robust comparisons between CBs and IBs. The model was found to be statistically significant, and IBs outperformed CBs in CRM. Furthermore, the mean average value of financial ratios used to measure these variables shows that the CRM performance of IBs operating in Pakistan outperformed that of CBs during the study period.

Hamdi and Hassen (2021) analyses the impact of economic policy uncertainty (EPU) on credit risk, lending decisions, and banking performance of Tunisian listed banks between 1999 and 2019. They utilized a fixed-effects panel regression model to investigate the link between EPU, credit risk, lending decisions, and banking performance from 1999 to 2019. Our empirical investigation found that EPU has a considerable favourable influence on credit risk while having a negative impact on loan size and performance. We also found that boosting EPU had the greatest impact on state-owned banks. Their credit risk has increased, and their returns have decreased. In contrast, heavily leveraged private banks have witnessed a dramatic reduction in performance.

Khemakhem et al. (2018) investigated credit risk assessment in unbalanced datasets utilizing data mining, artificial neural networks, and support vector machines. The study found that credit score datasets were largely uneven. The number of repaid loans exceeded the number of defaulting loans. As a result, the classification of these data is biased towards the majority class, which means that it incorrectly assigns a "good borrower" status to "very risky borrowers." In addition to statistics
and machine learning classifiers, the goal of this paper is to look into the relevance and performance of sampling models combined with statistical prediction and artificial intelligence techniques for predicting and quantifying default probability using real-world credit data. A reliable database from a Tunisian commercial bank was employed, and unbalanced data concerns were resolved utilizing random over-sampling (ROS) and synthetic minority over-sampling approaches. The findings revealed that combining intelligent and statistical methodologies, as well as re-sampling approaches, is promise for managing default rates and giving accurate credit risk estimations.

Fersi and Boujelbène (2021) explored how loan officers’ overconfidence affected risk-taking decisions and solvency performance as evaluated by z-scores in Islamic and conventional microfinance institutions (MFIs). Overconfidence’s impact on credit risk-taking was explored using a random effect generalized least squares regression. From 2005 to 2015, the data set included 326 conventional MFIs and 57 Islamic MFIs across six regions. Overconfidence proxies, such as excessive loan growth, poor interest margins, and loan loss provision, have a detrimental impact on risk exposures for both MFIs on average. Overconfidence among loan officers is strongly and positively associated with risk-taking actions, resulting in lower loan portfolio quality. Furthermore, loan officers’ risk-taking behavior jeopardizes these institutions’ solvency performance.

3.0 RESEARCH METHODOLOGY
This study adopted a descriptive survey research design. The study’s target population included all licensed commercial banks in Somalia. According to the CBS (2023) report, the total number of commercial banks in was Twenty (20). The study relied on secondary data to assess the impact of financial risks on the financial performance of Somalian commercial banks. Secondary credit risk data was gathered from the Central Bank of Somalia. The study also used data extracted from commercial banks’ audited financial statements over five years, from January 2014 to December 2023. The model specification of this study was to examine the effect of financial risks on the financial performance of commercial banks in Somalia. The study adopted panel regression to carry out the research analysis for ten years from January 2014 to December 2023.

4.0 RESEARCH FINDINGS AND DISCUSSIONS
4.1 Descriptive Statistical Findings
This subsection provides the descriptive statistical findings on the raw financial risks and financial performance of commercial banks in Somalia from January 2014 to December 2023. Credit risk was measured by the Bad Debt Expense Ratio (BDER). The findings are summarized in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Error</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Kurtosis</th>
<th>Skewness</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDER</td>
<td>0.02</td>
<td>0.08</td>
<td>0.63</td>
<td>1.07</td>
<td>0.14</td>
<td>0.21</td>
<td>6.12</td>
</tr>
</tbody>
</table>

In interpreting the descriptive statistics for Bad Debt Expense Ratio (BDER) as a measure of credit risk among commercial banks in Somalia, several important observations were made. The mean BDER value of 0.02 indicates that, on average, bad debt expenses represent a very small proportion (2%) of the total loans issued by these banks. This suggests that, overall, the banks in the sample have been successful in managing credit risk and minimizing bad debt expenses relative to their total loan portfolios. However, the standard error of 0.08 suggests some uncertainty around this estimate, indicating that the mean BDER could potentially vary by approximately 0.08 units in either direction. The median BDER value of 0.63 indicates that half of the banks in the sample have a BDER below this value, while the other half have a BDER above, providing a measure of central tendency that is less influenced by extreme values. The relatively high standard deviation
of 1.07 suggests a wide dispersion or variability in BDER values across the sample, indicating that some banks may have significantly higher bad debt expenses compared to others. The positive kurtosis value of 0.14 suggests a distribution that is slightly more peaked than a normal distribution, while the positive skewness value of 0.21 indicates a slight right skew in the distribution of BDER values, implying that there may be a few banks with relatively higher bad debt expenses compared to the majority. Finally, the range of BDER values, spanning from 0 to 6.12, illustrates the variability in credit risk across the sample, with some banks experiencing much higher bad debt expenses compared to others.

4.2 Diagnostic Tests

4.2.1 Tests of Normality

The normality test is a crucial diagnostic test in statistical analysis, especially in multiple and panel regression models, to evaluate whether the residuals or errors of the model adhere to a normal distribution. This test is essential to ensure that the assumptions of the regression analysis are satisfied, which is vital for the accuracy and dependability of the outcomes. The findings are summarized in Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test</th>
<th>Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDER</td>
<td>Doornik-Hansen test</td>
<td>1.624</td>
<td>0.444</td>
</tr>
<tr>
<td></td>
<td>Shapiro-Wilk W test</td>
<td>0.993</td>
<td>0.443</td>
</tr>
<tr>
<td></td>
<td>Lilliefors test</td>
<td>0.043</td>
<td>0.490</td>
</tr>
<tr>
<td></td>
<td>Jarque-Bera test</td>
<td>1.509</td>
<td>0.470</td>
</tr>
</tbody>
</table>

In assessing the normality of the variable Bad Debt Expense Ratio (BDER) for credit risk among commercial banks in Somalia, according to findings in Table 4.2, four different statistical tests were conducted: the Doornik-Hansen test, Shapiro-Wilk W test, Lilliefors test, and Jarque-Bera test. The Doornik-Hansen test yielded a test statistic of 1.624 with a corresponding p-value of 0.444. This test assesses the overall goodness-of-fit of the data to a normal distribution. In this case, the relatively high p-value suggests that there is no significant departure from normality, indicating that the BDER variable may follow a normal distribution. Similarly, the Shapiro-Wilk test resulted in a test statistic of 0.993 with a p-value of 0.443. The high p-value suggests that there is no evidence to reject the null hypothesis of normality, supporting the assumption of normality for the BDER variable. The Lilliefors test produced a test statistic of 0.043 with a p-value of 0.490. This test is a variant of the Kolmogorov-Smirnov test. The high p-value indicates no significant deviation from normality, supporting the assumption of normal distribution for the BDER variable. Lastly, the Jarque-Bera test yielded a test statistic of 1.509 with a p-value of 0.470. The high p-value suggests that there is no evidence to reject the null hypothesis of normality, further supporting the assumption of normal distribution for the BDER variable.

4.2.2 Multicollinearity

The multicollinearity test for panel data is a diagnostic tool for determining whether multicollinearity exists and to what extent among the independent variables in a panel data regression model. High levels of correlation between independent variables are known as multicollinearity, and they can cause exaggerated standard errors and erroneous coefficient estimates in regression analyses (Kumar et al., 2021). Table 3 provides an overview of multicollinearity results.

<table>
<thead>
<tr>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
</tbody>
</table>

Table 3 Multicollinearity
Table 3 presents the multicollinearity analysis for the model. The tolerance value of 0.985 and the variance inflation factor (VIF) of 1.015 suggest that multicollinearity is not a significant issue in the model, indicating that the independent variable (BDER) is not highly correlated with other independent variables.

### 4.2.3 Unit root Stationary test

The unit root stationary test for panel data is a diagnostic test used to determine whether the variables in a panel dataset are stationary or exhibit a unit root. Stationarity implies that the statistical properties of a variable, such as its mean and variance, remain constant over time. On the other hand, a unit root indicates that the variable is non-stationary and exhibits a stochastic trend (Ansari et al., 2019; Majeed & Asghar, 2021). The unit root analysis was done variable-wise and the findings were summarized in Table 4.

**Table 4 Fisher-type unit-root test for BD**

<table>
<thead>
<tr>
<th>Fisher-type unit-root test for bder</th>
<th>Based on augmented Dickey-Fuller tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho: All panels contain unit roots</td>
<td>Number of panels = 20</td>
</tr>
<tr>
<td>Ha: At least one panel is stationary</td>
<td>Number of periods = 10</td>
</tr>
<tr>
<td>AR parameter: Panel-specific</td>
<td>Asymptotics: T -&gt; Infinity</td>
</tr>
<tr>
<td>Panel means: Included</td>
<td></td>
</tr>
<tr>
<td>Time trend: Not included</td>
<td></td>
</tr>
<tr>
<td>Drift term: Not included</td>
<td></td>
</tr>
<tr>
<td>ADF regressions: 0 lags</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverse chi-squared (40)</td>
<td>P</td>
</tr>
<tr>
<td>Inverse normal</td>
<td>Z</td>
</tr>
<tr>
<td>Inverse logit t (104)</td>
<td>L*</td>
</tr>
<tr>
<td>Modified inv. chi-squared</td>
<td>Pm</td>
</tr>
</tbody>
</table>

Other statistics are suitable for finite or infinite number of panels.

The Fisher-type unit-root test was conducted for the variable "BDER" using augmented Dickey-Fuller (ADF) tests. The null hypothesis (Ho) states that all panels contain unit roots, while the alternative hypothesis (Ha) suggests that at least one panel is stationary. In this analysis, there are 20 panels and 10 periods. The ADF regressions were performed with 0 lags, and panel means were included, while time trend and drift terms were not included. The test statistics and corresponding p-values for different methods are as follows: the inverse chi-squared statistic with 40 degrees of freedom yielded a statistic of 229.7662 with a p-value of 0.0000, the inverse normal statistic (Z) resulted in a statistic of -9.6162 with a p-value of 0.0000, the inverse logit t statistic (L*) yielded a statistic of -13.9129 with a p-value of 0.0000, and the modified inverse chi-squared statistic (Pm) resulted in a statistic of 21.2165 with a p-value of 0.0000. It’s important to note that the P statistic requires the number of panels to be finite, while other statistics are suitable for either finite or infinite numbers of panels. Overall, the results strongly reject the null hypothesis, indicating that at least one panel is stationary, implying that the variable "BDER" does not contain unit roots.

### 4.2.4 Hausman Test

The Hausman test is used to distinguish between fixed effects and random effects models. It serves...
as a model specification test to determine the appropriate model for panel data analysis. The test helps researchers decide whether the random effects model or the fixed effects model is more suitable for the data being analyzed (Rajarathinam & Suba, 2022). The findings are in Table 5.

Table 5 Hausman Test

<table>
<thead>
<tr>
<th>Variable: ROE and bder.</th>
<th>(b)</th>
<th>(B)</th>
<th>(b-B)</th>
<th>Sqrt(diag(V_b-V_B))</th>
<th>Chi2-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho: Random effect model is the most appropriate Model</td>
<td>bder</td>
<td>-.008021</td>
<td>-.0061058</td>
<td>-.0019152</td>
<td>.00825</td>
<td>4.98</td>
</tr>
<tr>
<td>H1: Fixed effect model is the most appropriate Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The overall Chi-squared test value of 4.98 with a corresponding p-value of 0.2897 indicates the significance of the differences in coefficients between the Fixed Effects (FE) and Random Effects (RE) models across all variables collectively. Since the p-value (0.2897) is greater than the typical significance level of 0.05, we fail to reject the null hypothesis. Therefore, there is insufficient evidence to suggest that the Fixed Effects model is more appropriate than the Random Effects model for explaining the variation ROE, across all variables considered. This means that, based on the provided data and test results, the Random Effects model may be considered suitable for modeling the relationship between the dependent variable (ROE) and the independent variable (Credit Risk).

4.3 Inferential Statistics

4.3.1 Correlation Analysis

Black (2023) reveals that correlation is an indicator of the degree of association among two or more variables and suggests that Pearson’s coefficient of correlation is useful in measuring this associative relationship. He points out that the correlation coefficient varies from -1 when there is a perfect inverse relationship among the variables to +1 when there is a perfect positive direct relationship among the variables. Values closer to these two extremes exhibit strong negative and positive correlation respectively while values closer to zero exhibit weak corresponding correlation. The moderate correlation arises when the values are close to -0.5 and +0.5 for a negative and positive degree of the association respectively. A correlation analysis was done and the findings were summarized in Table 6

Table 6 Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>ROE</th>
<th>BDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>BDER</td>
<td>Pearson Correlation</td>
<td>-.309*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>200</td>
</tr>
</tbody>
</table>

The Pearson correlation coefficient between BDER and ROE is -0.309. This indicates a moderate
negative correlation between the two variables. A negative correlation suggests that as the bad debt expense ratio, which measures credit risk, increases, the return on equity of commercial banks in Somalia tends to decrease. This correlation is statistically significant at the 0.05 level \((p = 0.007)\), indicating that it is unlikely to have occurred by chance. Therefore, the findings suggest that higher levels of credit risk may adversely affect the financial performance, as indicated by ROE, of commercial banks in Somalia. Managing and minimizing credit risk could be crucial for improving financial performance.

4.3.2 Bivariate Analytical Findings

Bivariate analytical findings refer to the results obtained when analyzing the relationship between two variables. Bivariate analysis was conducted to understand the effect of individual independent variable on the dependent variable. The findings are summarized in Table 7.

Table 7 Bivariate Analytical Findings

<table>
<thead>
<tr>
<th>Random-effects GLS regression</th>
<th>Number of obs</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group variable: panels</td>
<td>Number of groups</td>
<td>20</td>
</tr>
<tr>
<td>R-sq:</td>
<td>Obs per group:</td>
<td></td>
</tr>
<tr>
<td>within = 0.3976</td>
<td>min = 10</td>
<td></td>
</tr>
<tr>
<td>between = 0.3248</td>
<td>avg = 10</td>
<td></td>
</tr>
<tr>
<td>overall = 0.3611</td>
<td>max = 10</td>
<td></td>
</tr>
<tr>
<td>corr(u_i, X) = 0 (assumed)</td>
<td>Wald chi2(1) = 0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prob &gt; chi2 = 0.8997</td>
<td></td>
</tr>
</tbody>
</table>

The panel regression model utilized random effects, implying that there could be unobserved factors specific to each panel (or group) that could influence both credit risk and financial performance. This approach acknowledges that individual panels may have unique characteristics that affect the variables of interest. The variance components \((\sigma_u, \sigma_e)\) provide insights into the variability attributed to these random effects and the error term, respectively. The primary focus of the analysis is on the coefficient of the Bad Debt Expense Ratio (BDER) variable. The coefficient of BDER is \(-0.3252289\), indicating a negative relationship between credit risk and financial performance, as measured by Return on Equity (ROE). Specifically, for every unit increase in BDER, ROE is expected to decrease by approximately 0.3252289 units.

The statistical significance of this coefficient is crucial in determining the reliability of the relationship. In this case, the coefficient has a \(z\)-score of \(-1.26\) and a \(p\)-value of \(0.000\), indicating a high level of statistical significance. This suggests that the observed negative association between BDER and ROE is unlikely to be due to random chance alone. However, it’s essential to consider the intercept (_cons) as well. The intercept represents the expected value of ROE when BDER is zero. In this model, the intercept is 0.0368292, but it’s not statistically significant at the conventional significance level of 0.05 (with a \(p\)-value of 0.068). This implies that while the relationship between BDER and ROE is statistically significant, the intercept itself may not be significantly different from zero.

The model fit statistics, including the within R-squared and overall R-squared, provide insights into how well the independent variables explain the variation in ROE. A within R-squared of
0.3976 suggests that approximately 39.76% of the variability in ROE can be explained by the independent variables within each panel. The overall R-squared of 0.3611 indicates that around 36.11% of the variance in ROE is explained by the entire model, including both within-panel and between-panel variations. Overall, these results suggest that higher levels of credit risk, as measured by BDER, are associated with lower financial performance, as indicated by ROE, in Somali commercial banks.

4.4 Discussion of the Findings

Credit risk, as encapsulated by the Bad Debt Expense Ratio (BDER), emerges as a focal point in the analysis, revealing a discernible moderate negative correlation with ROE. This finding suggests that heightened levels of credit risk within Somali commercial banks may inexorably lead to a reduction in their financial performance. Consequently, it underscores the paramount importance of implementing and adhering to robust credit risk management practices to safeguard against potential financial downturns and optimize operational resilience in the face of economic uncertainties.

Several studies have consistently demonstrated a negative relationship between credit risk and the financial performance of banks. Aruwa and Musa (2014) found a strong association between credit risk and banks’ financial performance in Nigeria. Similarly, Misman & Bhatti (2020) identified a negative relationship between capital buffer and credit risk in US commercial banks. Serwadda, (2018) highlighted the impact of credit risk management systems on the financial performance of commercial banks in Uganda, emphasizing the detrimental effect of credit risk on financial outcomes. Additionally, Cahyaningrum & Atahau (2021) indicated that non-performing loans, as a proxy for credit risk, negatively affect banks’ financial performance. Moreover, Muhammad (2021) specifically noted that the credit risk index by loan loss ratio negatively influences the financial performance of banks. Roselyne et al. (2022) also reinforced the adverse impact of credit risk on the financial performance of banks, in line with previous studies. Abdullahi & Tela (2022) further supported this notion by emphasizing the significant negative impact of credit and interest rate risk management on the profitability of listed deposit money banks in Nigeria. In conclusion, the body of research, including studies from various countries and regions, consistently indicates that credit risk has a detrimental effect on the financial performance of banks. This negative relationship underscores the importance of effective credit risk management strategies in maintaining and enhancing the financial health of banking institutions.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions of the Study

The study underscores that Somali commercial banks, on average, effectively manage credit risk, as reflected by a relatively low Bad Debt Expense Ratio (BDER). However, significant variability exists across banks, highlighting the need for consistent improvement in risk management practices throughout the sector. The negative correlation observed between BDER and Return on Equity (ROE) signals that heightened credit risk tends to coincide with diminished financial performance among these banks. These findings, supported by statistically significant regression results, emphasize the critical importance of robust credit risk management strategies for sustaining favorable financial outcomes in Somali commercial banking. Thus, concerted efforts to enhance risk management practices are imperative for bolstering financial stability and performance across the industry.

5.2 Recommendations of the Study

The study suggests several recommendations to enhance the credit risk management and financial performance of commercial banks in Somalia. Firstly, banks should prioritize ongoing efforts to strengthen risk management practices uniformly across the sector, addressing variability in risk
management effectiveness. Additionally, measures to mitigate credit risk, such as enhancing loan evaluation processes and monitoring systems, should be implemented to maintain favorable financial performance. Furthermore, stakeholders should remain vigilant in monitoring and addressing emerging credit risk factors to proactively safeguard against potential financial downturns. Overall, a concerted focus on enhancing risk management frameworks and strategies is essential for ensuring sustained financial stability and performance within the Somali banking industry.

REFERENCES


