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MASTER OF SCIENCE (ACCOUNTING & FINANCE)

TOPIC: IMPACT OF CREDIT RISK ON THE FINANCIAL PERFORMANCE
OF COMMERCIAL BANKS IN GHANA

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

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DEDICATION

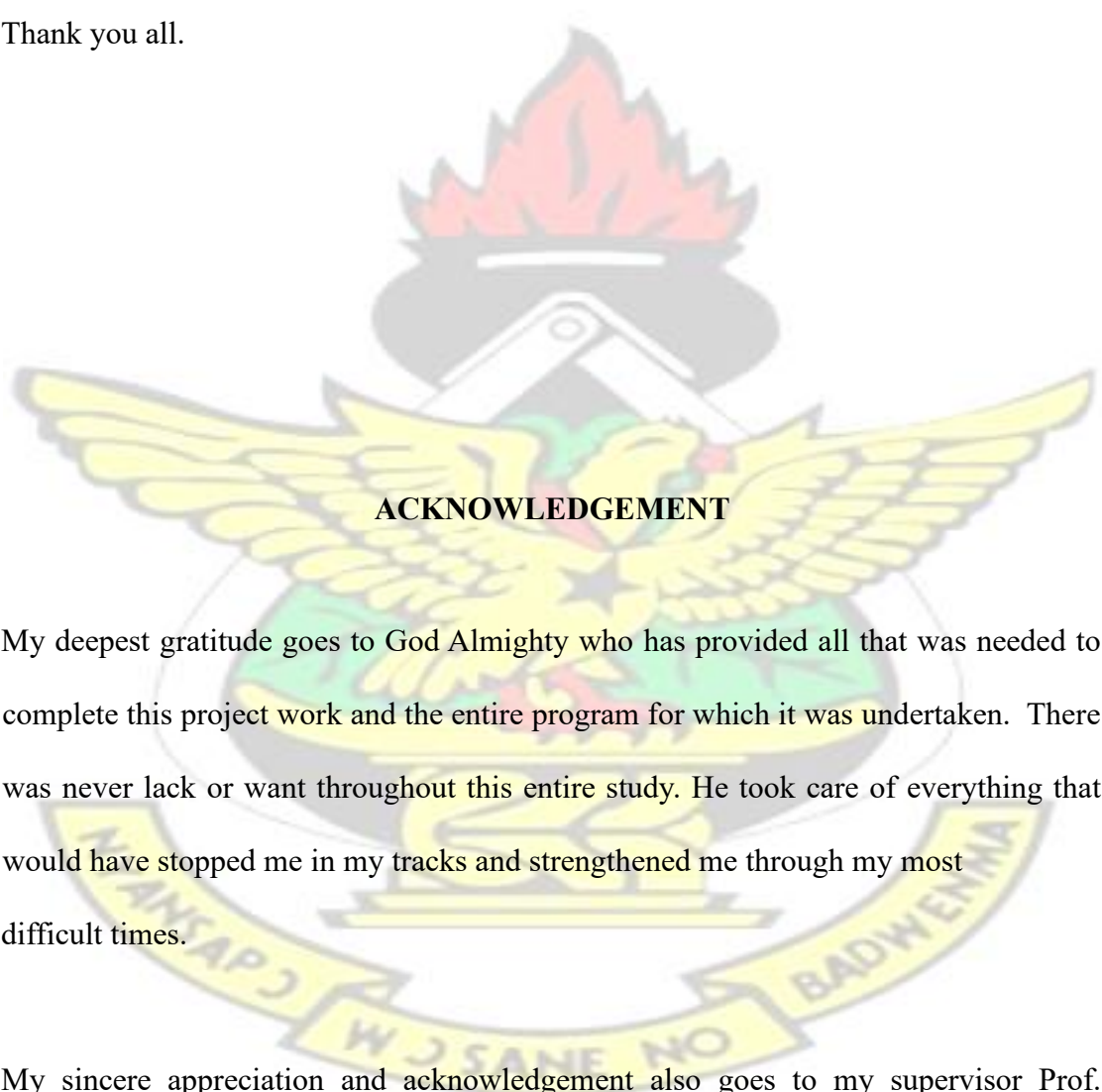
I dedicate this project to God Almighty my creator, my strong pillar, my source of motivation, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on His wings only have I soared.

I also dedicate this work to my immediate family members who has encourage me all the way.

I also dedicate this work to Mr. Kwasi Oduro for all he has done for me God richly bless you and your family.

Finally, I dedicate this project work to my wife Mss. Patience Neinaja Lardi and my two daughters Rhoda Jabade N-nadomor and Jessica Jabade Npopin who have been affected in every way possible by this quest.

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ABSTRACT

The survival of financial institutions lies in their ability to strike a balance between their deposits and credit portfolios. For this reason, the attention of extant literature is focused on examining the interplay between credit risk and the performance of banks. The current study contributes to knowledge by investigating the impact of different credit risk variables on the financial performance of commercial banks in Ghana. It also assesses the trend of credit risk among the GSE-listed banks. NPL, capital adequacy ratio, and loan and advance ratios are used to proxy credit risk, while profitability is measured with ROA and ROE. The study data is gleaned from the annual reports of the nine listed commercial banks over a period of 11 years (2010-2020). With the purposive sampling technique, 99 observations are used to perform a static regression model. After the Hausman test, the RE model is employed using the Eviews version 10. The outcome of the study shows that there are boom and bust trends in the credit risks of banks due to several prevailing bank-specific, environmental and economic conditions. As such, during the periods of 2015 and 2016, banks experienced heightened NPL ratios. Likewise, between 2019 and 2020, banks recorded significant increases in all their credit risk variables. The study further reveals that the capital adequacy ratio positively

impacts bank performance (ROA), and TLAR also relates positively to the performance of banks (ROA and ROE). Meanwhile, NPL relates negatively to bank performance (ROA and ROE). These findings support the pecking order theory, signalling theory and capital buffer theory. Thus, it is recommended that banks should endeavour to meet the statutory CAR requirement of the BOG to remain resilient to any economic slowdowns. Banks should also ensure a reasonably low rate of NPL is maintained while increasing TLAR with the aim of increasing bank performance.

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CHAPTER ONE

INTRODUCTION

1.0 Background of Study

The powerhouse of every economy depends on how well the financial sector performs. A well-performing financial sector means that the circulation of money in the economy is seamless, businesses have access to credit, and investors have trust in the financial system (Araka, Mogwambo, and Otieno, 2018; Baidoo and Akoto, 2019; Baidoo et al., 2020; Sakyi et al., 2021). Commercial banks, the major players in the financial sector play an essential, irreplaceable role in every economy (Lysiak et al., 2022). Through commercial banks, the government is able to utilise its monetary policy tools to implement contractionary and expansionary measures in the economy. Likewise, as a mediatory institution between loan seekers and depositors, commercial banks connect the surplus entities to the deficit ones through the acceptance of deposits and issuance of credit (loans) (García-Pérez et al., 2018; Lopatta et al., 2017; Pucheta-Martínez et al., 2019). This role alone is the primary reason why commercial banks are regarded as the major drivers of the expansion of economies and they are the foundation for a thriving industrial economy (Illmiani and Meliza, 2022).

Despite their crucial role in linking borrowers to lenders, commercial banks have several issues that restrict their ability to optimally reduce barriers between business, government, and people. The main risks banks face are credit, market, and operational (Turgut, 2018). Credit risk is the most important issue in policy and scholarship (Asiama and Amoah, 2019; Bhattarai, 2016). Loan defaults continue to endanger financial institutions and the industry in Ghana (Amuakwa-Mensah et al., 2017; Bank of Ghana, 2016 and 2017; Marouli et al., 2015).

Credit risk occurs when loan applicants cannot repay their loans (Turgut, 2018). Credit risk may be the worst risk for banks (Kwashie, Baidoo and Ayesu, 2022). This risk is unique since banks invest in such loans expecting profits, but neither the principle nor the interest is returned, lowering their soundness. However, financial professionals utilise loan quality to assess financial institutions' health (Araka, Mogwambo, and Otieno, 2018). Unsustainable loan defaults hurt commercial banks' credit-giving position. The outcome is a renegeing economic outlook due to high-interest rates on private sector loans, making credit availability harder.

Araka, Mogwambo, and Otieno (2018) say lending drives the banking industry. Most banks' biggest income source is lending, which amounts to 50-70% of total loans but threatens their financial health. Commercial banks impose high-interest rates on loans and credit to cover unanticipated loan defaults (Baidoo et al., 2019). In order to increase income via this channel, most loans are offered without creditworthiness checks. Thus exposing banks to loan default, which weighs down their balance sheets. Banks' capacity to operate is greatly impacted by credit risks since even a few major customers may default on loans (Rehman, et al., 2019). Thus, unsustainable nonperforming loans may cause bank insolvency. The banking system in Ghana had a major crisis between 2017 and 2019 due to large nonperforming loans (Bank of Ghana, 2018; Baidoo et al., 2020). This led to seven commercial banks losing their regulator licence (Baidoo and Akoto, 2019). Poor credit management, inadequate loan terms and conditions, bank interest rate restrictions, inflation, and poor credit facility monitoring are countryspecific reasons for high loan non-payment (Araka, Mogwambo, and Otieno 2018). Credit risks are currently the focus of regulators, policymakers, international organisations like the Basel Committee, IMF, and World Bank, and researchers due to their devastating consequences on bank and financial sector performance. Basel III,

implemented following the Global Financial Crisis, requires central banks to reduce bank credit risk. Scholarly studies like (Baidoo, Yusif and Ayesu 2020; Baidoo and Akoto 2019; Araka, Mogwambo, and Otieno, 2018; Sakyi et al., 2021; Saeed and Zahid 2016; Asiamah and Amoah, 2019; Bhattarai, 2016; Kwashie et al., 2022) examine how credit risk affects bank performance. Thus, to add to the field, this research examines how credit risk affects Ghanaian commercial banks.

1.1 Problem Statement

Loaning money is the essence of commercial banking. However, the results of giving out loans result in a two-prong outcome; on one hand, banks engage in profit-lending activities to increase their revenue and operations. Likewise, through this, funds move to finance the deficit sectors in the economy. On the other hand, banks are exposed to the incidence of credit risk which obliterates their efficient operations (banks' profit and capital) and intends to destabilise the financial sector (Kwashie et al., 2022). Thus, banking, in general, is regarded as a risk-management business in the sense that banking activities, products and services alone can be a source for profitability or collapse (Duho and Onumah, 2019).

In the Ghanaian financial sector, the excruciating effects of credit risk were vividly felt between 2016 to 2019. This period, especially in 2017, witnessed the highest NPL value of 21.59% even higher than the world NPL average of 3.74%. This, according to the Bank of Ghana (2019), leads to the rise of NPL from Ghc4.4 billion to Ghc8.58 billion as losses due to the non-payment of loans. Several studies analyse how loan losses affect bank performance. Thus, Araka, Mogwambo, and Otieno (2018) examine how credit risk affects Kenyan bank profitability. The panel structure of the numerous banks in their analysis was ignored while using OLS regression, despite revealing a negative

relationship between banks' performance and NPL. Thus, consistency and endogeneity are ignored.

Farooq, Khan, and Gilal (2020) similarly find a negative relationship between credit risk and bank performance, but they exclude macroeconomic factors like GDP and inflation. The present research addresses these gaps. Foreign studies (e.g., Alshebmi et al., 2020; Ekinici and Poyra, 2019; Bhattarai, 2017; Collaku and Aliu, 2021; Farooq, Khan, and Gilal, 2020; Hamza 2017; Saeed and Zahid, 2016) evaluate the economies of Saudi, Turkey, Nepal, Kosovo, Bangladesh, Pakistan, and the UK. All these research except Saeed and Zahid (2016) and Rwayitare, Shukla, and Ruhara (2016) show a negative association between credit risk and bank performance.

Credit risk management and banking performance have been studied from various perspectives in the context of Ghanaian studies by Boateng (2018) and Akomeah, Agumeh and Siaw (2020). In this regard, Boateng (2018), examined credit risk management's influence on banks but did not consider NPL ratio as a variable.

Financial stability depends highly on NPLs, especially in the banking sector and hence Morina (2002). Such ratios lead to significant loss-making for the banks against economic progress. It is important to ensure that the NPL ratio improves to promote the sustainability of the bank's profitability and prevent possible bank insolvency (Morina, 2020). Similarly, Boateng (2020) analysed credit risk management and bank performance; however, his findings were restricted to savings and lending institutions. Similarly, Nyarko-Bassi (2018) studied four top-performing Ghana Stock Exchangelisted banks which also showed a negative relationship between NPL and bank performance. However, this implies that the results cannot be applied to all commercial banks in Ghana due to the limited sample size for the survey.

Since banks are critical for economic development, one must undertake an analysis of what contributes to credit risk because this type of risk directly affects the performance of banks adversely. To close the gap, this study draws on together with the relationship between credit risk (NPL) and banks' performance in terms of indicators like ROE, among others. Incorporating NPL and ROE into analysis gives a better appreciation for how credit risk influences banks' performance.

1.2 Objectives of the Study

The overarching aim of the current study is to assess the influence of credit risk on the performance of commercial banks in Ghana.

The specific objectives of the study are:

1. To analyse the trend of credit risk in the commercial banking industry.
2. To examine the effect of non-performing loans on the listed banks' performance in Ghana.

1.3 Research Questions

1. What is the trend of credit risk in the commercial banking industry?
2. What is the effect of non-performing loans on the listed banks' performance in Ghana?

1.4 Significance of the Study

The findings contribute to academia, policymaking, and scholarship. The study's results initially help the management of listed and non-listed banks whose purpose is to maximise shareholder value and earnings by using available resources. The results influence future choices and regulations and broaden awareness of credit risk's effect on financial institutions. This study also indicates whether commercial banks' NPLs rise or fall in 2017–2019. The findings also inspire further research on similar topics.

1.5 Scope of the Study

Data is collected from solely listed and unlisted commercial banks in Ghana during a 12-year period (2010-2022) since the study's objective is to determine how credit risks affect the performance of commercial banks in the country.

1.6 Summary of Methodology

All commercial banks, whether publicly traded or not, make up the study's population. The study's data comes from public audit accounts and annual reports from 23 commercial banks.

The goal of the research is reached by using a quantitative approach. As a result, the researcher's worldview is informed by an explanatory study design based on the premises of the positivist research philosophy. A panel dynamic regression mode was used. Both the fixed effect model and the random effect model are used to provide a precise description of the current dynamic. The latest version of Eviews, a programme used for statistical analysis, was used for this study. The ROI and ROE are surrogates for the true dependent variable, which is the profitability of the banks. Nonperforming loans, capital adequacy ratio, loans and advances ratio, and company leverage are the independent factors to consider. Bank size (BSize), firm age (FAge), and macroeconomic indicators (Inflation, Gross Domestic Product (GDP), and the Monetary Policy Rate (MPR)) are the aforementioned control variables.

1.7 Organisation of the Study

This research is structured into five main sections to provide a coherent and comprehensive analysis. Chapter 2 focuses on the literature review, where relevant studies and theories related to the impact of credit risk on the financial performance of commercial banks in Ghana are discussed. Chapter 3 delves into the methodology of the research. It outlines the research design, sample selection process, data collection

methods, data analysis techniques, model formulation, and diagnostic tests used in the study. The findings of the research and their subsequent discussion are presented in Chapter 4. This section presents the results obtained from the analysis of the data and provides an in-depth discussion and interpretation of these findings in relation to the research objectives and existing literature. Chapter 5 concludes the study by summarizing the main findings and their implications. It also offers recommendations based on the research findings and suggests areas for further research. Additionally, this chapter provides a concise overview of the entire research, highlighting its contributions and significance.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The literature review section provides a comprehensive overview of existing knowledge and research related to the impact of credit risk on the financial performance of commercial banks in Ghana. This section aims to examine the conceptual and theoretical foundations of credit risk and its relationship to bank performance. Additionally, it presents an analysis of previous empirical studies conducted in this field.

2.1 Conceptual Review

This section provides definitions, operationalisations, and an explanation of how the notions were utilised in this research. The model's primary components are Credit Risk, Financial Performance, and Defaulting Loans. The portions that followed rendered these buildings usable (2.1.1 - 2.1.3).

2.1.1 Credit Risk

Credit risk is the chance that a creditor won't pay their bills, which might cause a financial crisis (Naili and Lahrichi, 2022). Borrowers run the danger of losing their initial investment, having their retained profits disrupted, and incurring additional costs due to collections in the first instance (Breedon, 2021). There is a chance of complete or partial loss. Credit risk is the chance that a borrower won't pay back a loan. Interest and principal payments owed to creditors pose a risk of nonpayment for borrowers (Umar et al., 2021). The incapacity of a debtor to repay a loan or perform as promised is the source of credit risk (Giudici et al., 2020). A borrower's future earnings might be hampered and enforcement costs could rise if they don't get the promised principal income (Bao et al., 2019). The most common forms of credit risk are Loan Default

Probability, Accumulation Danger, Negative Impact of Nonpayment, Nonpayment Probability, and Nonpayment Suppression (Bannier et al., 2022). Borrower miscalculations of risk are the primary cause of default. Most financial institutions make their lending decisions based on thorough risk assessments of prospective borrowers (Hassan et al., 2019). The vast majority of creditors prefer to deal just with select borrowers (Giudici et al., 2020).

Credit risk is evaluated by lenders using a variety of proprietary methods; these may differ by lender, geographic region, and whether or not the borrower is a person or a corporation (Bannier et al., 2022). Investors looking to lend money for a personal loan will want to know the borrower's whole financial picture, including whether or not they own any other assets, how much money they bring in each month (after paying bills), and their credit history. Personal loans often include the use of personal guarantees and collateral from the borrower. Lending to a single entity, group of interconnected debtors, business, or division leads to a concentration of credit (Moradi & Mokhatab Rafiei, 2019). When compared to personal loans, business loans are often for larger amounts and involve more red tape. Rating the risk associated with a company's borrowing requires a mix of quantitative and qualitative methods. Some examples of qualitative risk assessment subcategories include familiarity with the company's surroundings and the economy at large. (Naili and Lahrichi, 2022). Examining and understanding the management and ownership structures (if the firm is privately held) is important, as is knowing the borrower's industry, the company's strengths and weaknesses in the market, and the owner's development objectives (Breedon, 2021). The company's history and the proprietor's financial standing will both be considered throughout the review. This research will use Naili and Lahrichi's (2022) concept of credit risk as its

own. It claims that the definition of credit risk is an elementary knowledge of finance and the ability to do elementary arithmetic.

2.1.2 Financial Performance

The efficiency with which a corporation generates revenue and uses its resources in its core business is reflected in its financial performance (Okafor et al., 2021). The word is sometimes used more generally to measure a business's capacity to weather economic storms. There are many different types of people who have an interest in a company's success, including investors, employees, managers, and customers (Atz et al., 2022).

Every business cares about its financial status, therefore keeping tabs on it is a priority. Profitability is an indicator of a company's capacity to generate revenue, manage its assets and commitments, and prioritise the financial well-being of its stakeholders and consumers (Shabbir and Wisdom, 2020). A company has several different parts, including current obligations, creditors, owners, employees, and leadership (Cho et al., 2019). The financial performance of a company is of interest to a variety of stakeholder groups. Measurable measures are used to establish, monitor, and anticipate a company's financial health, critical success elements are also known as financial performance indicators (Kyere and Ausloos, 2021). Both insiders (such as the company's management and key shareholders) and outsiders (such as market financial analysts) may use these metrics to assess the company's performance relative to its competitors. Key financial performance indicators are measures used by businesses to assess and monitor progress in crucial areas of the firm's performance (Kornilova & Szykh, 2019). The financial health of your business may be gauged via a variety of metrics. Companies may prevent potentially catastrophic losses by using the information offered by financial performance indicators to proactively execute the modifications that are needed in underperforming areas. How well a company generates profit and manages

its assets, liabilities, and the interests of its owners and investors is a key indicator of its financial performance (Ichsan et al., 2021).

Numerous interested parties are affected by an organisation's financial success. The analytical approach shifts when one moves from one set of objectives to another. Involved: Concerned with the overall amount of cash and cash equivalents (evaluation of liabilities) (Shabbir and Wisdom, 2020). Private creditors care about the company's ability to generate cash flow (including factors such as an evaluation of working capital, major suppliers and uses of money, competitiveness over time, and a projection of future profits). The long-term viability of the company's income stream is of paramount importance to the shareholders (Ekinci and Poyraz, 2019). Management is open to suggestions that lead to better internal control, a stronger economic position, and enhanced performance (such as analysing the company's current financial situation, evaluating the possibilities related to this position, calculating the return on invested capital offered by the various resources available to the business, etc.). As cited in (Kyere & Ausloos, 2021). The definition of financial performance provided by Okafor et al. (2021) will be used for the purposes of this research. A company's ability to generate revenue from its core business is reflected in its financial performance.

2.1.3 Non-Performing Loans

Non-performing mortgages are late because the debtor has missed payments for a certain period (Khairi et al., 2021). While "no contribution" may signify different things depending on the terms of a certain loan, in general, it indicates that neither principle nor interest has been paid on the loan (Manz, 2019). A nonperforming loan is one that is late on its payments or is nearing that point. When debt becomes behavioural and organisational, the chances of a full repayment decrease dramatically (Boumparis et al.,

2019). Once the creditor resumes making payments on the debt, it will become productive even though the borrower has not yet repaid all of the bounced checks. The main reasons for the high non-performing loan rate include inadequate credit policies, inexperienced credit personnel, high premium margins, loose credit rules, and a lack of debtor monitoring (Khan et al., 2020). The quantity of mortgages in delinquent is a major credit asset pricing model that affects the American financial sector. Nonperforming debt slows down a country's fast industrialisation since it lowers financial stability (Radivojevi et al., 2019), as Serrano (2021) points out. When there are few overdue mortgages, a country's economic and financial authority is strong, but when there are many, the situation is perilous. The growing rate of non-performing mortgages will have an effect on the economy's banks and then on the country's financial status in the long run (Nugroho et al., 2021). Non-performing loans are becoming more widespread, which can only spell disaster for the economy and accounting practises (Partovi and Matousek, 2019).

2.2 Theoretical Literature Review

Knowledge and information abound in the realm of innovation, which makes the study process tough, time-consuming, and hard (El-Chaarani et al., 2022). As a result, three guiding hypotheses were employed as a research foundation to provide support for and address the void, and as a compass to point this study in the right path. In this section, the researcher delves further into the topic at hand, looking at how credit risk affects the bottom lines of Ghana's commercial banks. The inquiry is predicated on the Credit Risk Theory. In order to study a topic thoroughly, it is helpful to have a theoretical framework that sets the scene and explains how all the different parts relate to one another.

2.2.1 The Credit Risk Theory

In 1974, Robert Merton presented his nucleus credit risk idea. The risk that company funds may be misused due to a decrease in the other party's credibility is known as credit risk (Naili and Lahrichi, 2022). Default risks provide the backbone of the credit risk ratio. If one party does not fulfil its obligations, it might be considered in default. The majority of the risk, which includes the potential for loss of both principal and interest, rests with the borrower. In certain cases, such as when a bank is having financial troubles and is having trouble reimbursing a creditor for their investment (due to poor financial performance), a risk premium may be required, either in whole or in part (Al Zaidanin and Al Zaidanin, 2021). When a company's stock is treated as a put option on inventory, Robert (1974) advises using this method to quantify the company's credit risk. Two important credit risk approaches, the multidimensional approach and the concentration technique (also known as the reduced form approach), were both heavily influenced by him (Ganbat et al., 2021). Rossi, drawing on Merton's theory (Bhatore et al., 2020), developed three essential methods for assessing credit risks. Loan extensions, credit risk management, and loss distribution are all described by the Monte Carlo model. A customer may try to obtain a better deal on their loan by doing things like researching the borrower, insisting that the lender has liability coverage (like an insurance premium), or looking for indemnification or a third-party say with assurance. Robert Merton's 1974 default hypothesis introduced the world to the central concept of credit risk theory. To lose money in a commercial transaction because one party has become less reliable is known as credit risk (Rishehchi Fayyaz et al., 2021). Insolvency concerns form the nucleus of the credit risk equation. If one party does not fulfil its

obligations, it might be considered in default. The lender assumes the greater portion of the risk, which includes the potential for loss of both principal and interest income (Wang et al., 2022). Total or partial default risk may occur in unusual situations, such as when a bank runs into financial trouble and can't pay back a creditor who loaned it money. Borrowers will often be required to pay a higher interest rate if the risk associated with lending them money is greater. According to the concept of credit risk, there should be a negative correlation between credit risk and economic growth. This indicates the negative relationship between creditworthiness and capital sufficiency, as more capital risk results in a lower net interest margin and vice versa (Liu, 2022).

In order to reduce credit risk, regulatory control is emphasised by the Credit Risk Theory. Banks have minimum capital requirements imposed by regulators to protect them from losses on loans. Moreover, regulators may mandate stress tests for financial institutions to see how their loan portfolio would fare in a recession. According to Credit Risk Theory, commercial banks' bottom lines are significantly impacted by how well they handle their credit risks. A bank's capacity to weather economic downturns, keep profits up, and meet the demands of its clients depends on how well it manages its credit risk.

2.3 Empirical Literature Review

This part provided an evaluation of the literature of previous studies that had addressed the aim of the current investigation. Among them is the effect that credit risk has on the bottom lines of Ghana's commercial banks. This study reviewed the relevant literature in an effort to better understand how credit risk affects the bottom lines of Ghana's commercial banks.

The effects of credit risk, and in particular non-performing loans, on the financial stability of financial institutions in Ghana are investigated by Kwashie et al. (2022). The study also made use of secondary data collected from 15 banks in Ghana between 2013 and 2018. In addition, the timeline and scope of the present study were set by the resources available to collect the necessary data. Bank-level data such as return on assets, economic benefit created, non-performing loan ratio, ratio of appropriate capital, mortgages and advances ratio, capitalisation, age, and size are collected annually from the financial results of the selected institutions. Fixed and random estimation methods provide similar results. Moreover, the inflation rate has a negative effect on both financial performance metrics, although a small one for the economic value-added metric. Furthermore, non-performing loans impact both efficiency and profitability negatively.

The efficiency of several Ghanaian financial institutions is investigated by Akomeah et al. (2020), who focus on the impact of credit risk management on that efficiency. In addition, the research employed secondary data collected from seven (7) banks listed on the Ghana Stock Exchange, with a total of seventy (70) observations spanning ten (10) years, from 2007 to 2016. Additionally, bank size served as a controlling variable while nonperforming loans, loan loss provision, and capital adequacy were employed as credit risk management indicators (independent variables). Commercial banks' financial health was measured (using a dependent variable) by their return on assets. The data was analysed using descriptive statistics, and the hypothesis was tested using a fixed effect model. Testing the collected data and analysing the results, this research found a significant relationship between the credit risk management variables (NPL, CAR, and SIZE) and the profitability of Ghana's listed banks. In order to avoid financial difficulties in meeting their obligations, absorb any unexpected financial shocks, protect

the investments of their depositors, and contribute to the stability of the financial system, banks must maintain an ideal level of CAR in accordance with regulatory requirements.

Oduro et al. (2019) investigate factors that influence the level of bank credit risk and assess the effects of bank credit risk on the financial performance of corporations. Data covering a decade was collected from companies trading on the Ghana Stock Exchange. The 2SLS method revealed a negative correlation between creditworthiness and metrics including capital adequacy, operational efficiency, top-line growth, and interest margins. On the other side, capital sufficiency and budget deficits are often closely related to credit risk. Inflation adjustments on a quarterly basis also have a generally positive effect on credit risk. Consistent with the Basel agreement, an increase in the risk of bankruptcy for banks was observed to have a negative effect on business performance once again.

Gadzo et al. (2019) examine how operational and economic risk affects universal banks' economies. Data from all 24 Ghanaian universal banks were obtained without missing variables. Unlike the empirical investigation, the PLS-SEM showed that credit risk hurts financial performance, supporting the lemon theory's asymmetric information principle. Ghana's universal banks' financial performance was also hurt by risk management. The study also shows that asset quality, bank leverage, expense-to-revenue ratio, and liquidity improved universal banks' economic situation, creditworthiness, and strategic risk.

In 2019, Al-Eitan and Bani-Khalid studied how credit risk affects the accounting information of Jordanian commercial banks listed on the Amman Stock Market from 2008 to 2017. The efficacy of 16 Jordanian banks is evaluated using panel data, fixed and random-effect models, and GLS. They also found that credit risk (measured as the

ratio of uncollectible accounts to outstanding debt, non-performing loans, and credit risks to total loans) significantly reduces the return on assets and equity. Although the size and assets of Jordanian commercial banks positively affect their financial stability. Mei et al. (2019) examine how credit risk leadership affects Ghana Stock Market-listed banking organisations' financial performance. The research quantified credit risk using the non-performing loan ratio, cost per mortgage asset, capitalisation reserving 0.1 ratios, and higher investment ratio, and estimated performance using return on asset. Diagnostic and defining experiments challenged the linear regression method's fundamental assumptions. The non-performing loan ratio significantly reduced a bank's return on investment [$= -0.1671$, ($p=0.1360$) >0.05]. Cost per mortgage asset favourably affected a bank's return on asset [$= 0.0249$, $p=0.8252$) > 0.05]. Other credit risk indicators include asset growth ratio, capital reserving ratio, and others. Return on assets and capital reserve ratio were positively connected [$= 0.2867$, $p = 0.0095$]. 0.05. ROA showed a statistically significant negative association between asset growth ratio and firm profitability [$= -0.3835$, $p = 0.0004$, 0.05].

Adjei et al. (2020) examine how credit risk reduction influenced Ghanaian banking performance. This study employed a descriptive design. A census sample was used to choose four banks for this study. Bank Limited, Republic Bank, Ghana Commercial Bank, and Agricultural Development Bank were these financial entities. The research relied only on secondary data from institutions' verified financial statements and the Ghana Banking Survey. The inquiry employed regression analysis. Success in banking is adversely connected with credit risk. Creditworthiness is negatively connected with capital sufficient, managerial efficiency, competency, earnings, competitiveness, and liquidity. More creditworthiness causes inadequate credit risk management, and vice versa. Thus, credit risk management improves economic circumstances.

Siddique et al. (2021) examine how financial sector and bank-specific characteristics affect South Asian financial institutions' economic health. From 2009 to 2018, 19 financial institutions (10 from Pakistan and 9 from India) provided supplementary data. To offset dependent variables, the generalised approach of examples is used to determine coefficients. The ratio of capital to revenues and ordinary cost of borrowing was positively correlated with Asian commercial banks' economic condition, but nonperforming loans, cash flow rate, and capital to assets were significantly inversely correlated with financial effectiveness.

Saleh and Abu Afifa (2020) use empirical data from a developing country (2010–2018) to analyse the link between credit risk, liquidity risk, bank capital, and profitability across nine years. This study uses GMM models and econometric panel data. The findings show that loan, liquidity, and bank capital determinants affect bank profitability. Bank managers worldwide must understand Basel laws and their importance in protecting the organisation, increasing revenues, and streamlining operations. Banks need more capital and liquidity to withstand future storms that threaten profitability. However, the statistics show that profitability and bank-specific features have different effects.

Lai (2019) looks at how different types of investors' personalities affect their propensity to buy stocks. Attitude perceived behavioural control, and perceived attitude are all significantly affected by the use of a partial subjective norm. Those with friendly, outgoing personalities tend to have a greater impact on subjective standards. Anxious people are less likely to see investing in stocks as a positive long-term strategy. Individuals' assessments of their own behavioural control when it comes to stock investments are influenced by their levels of agreeableness, extroversion, conscientiousness, and openness to experience. Intention to invest in stocks,

extroversion, and subjective norms, as well as the relationship between attitude and perceived behavioural control, are all heavily impacted by one's history of stock trading.

The theory and management ramifications of the study's results are examined.

Personality, financial literacy, behaviour, and family support are studied by Aren and

Ham Indonesiaamci (2020) for their direct and indirect influences on investing intentions. The research is also meant to add to the little data on student investment in Indonesia that already exists. This research framework's approach is centred on

cooperation between theory and past research to increase the rationale of the results.

341 students represented the whole country of Indonesia in the sample. Data was collected by online questionnaire and analysed using Smart-PLS. Conclusions drawn

from this research show that individual differences in personality, financial knowledge and behaviour all have a role in shaping investing intentions among Indonesian

university students. In addition, students in Indonesia do not benefit from familial reinforcement when it comes to their level of financial literacy or their desire to make investments, whereas financial behaviour reveals the importance of intermediaries.

Investment goals are influenced by a number of factors that might be better understood by students completing financial management courses.

2.4 Conceptual Model/ Framework

Two fundamental elements of the theoretical approach are Credit Risk Theory (Figure 2.1). The rise in non-performing loans would affect financial institutions and the nation's finances (Jathurika, 2019). Non-performing loans' growing drift will cause economic problems (Vouldis and Louzis, 2018). Non-performing loans will reduce retained profits, venture capital, and financial market stability, causing bankruptcy and a shaky economic model. Thus, understanding non-performing loan characteristics is essential to reducing them and meeting financial and economic goals (Nugroho, Arif,

and Halik, 2021). This research included three factors. Non-performing loans, bank size, company age, and macroeconomic indicators (inflation, GDP, monetary policy) are independent and control factors in financial performance. Credit risk is expected to affect Ghanaian commercial banks' financial performance.

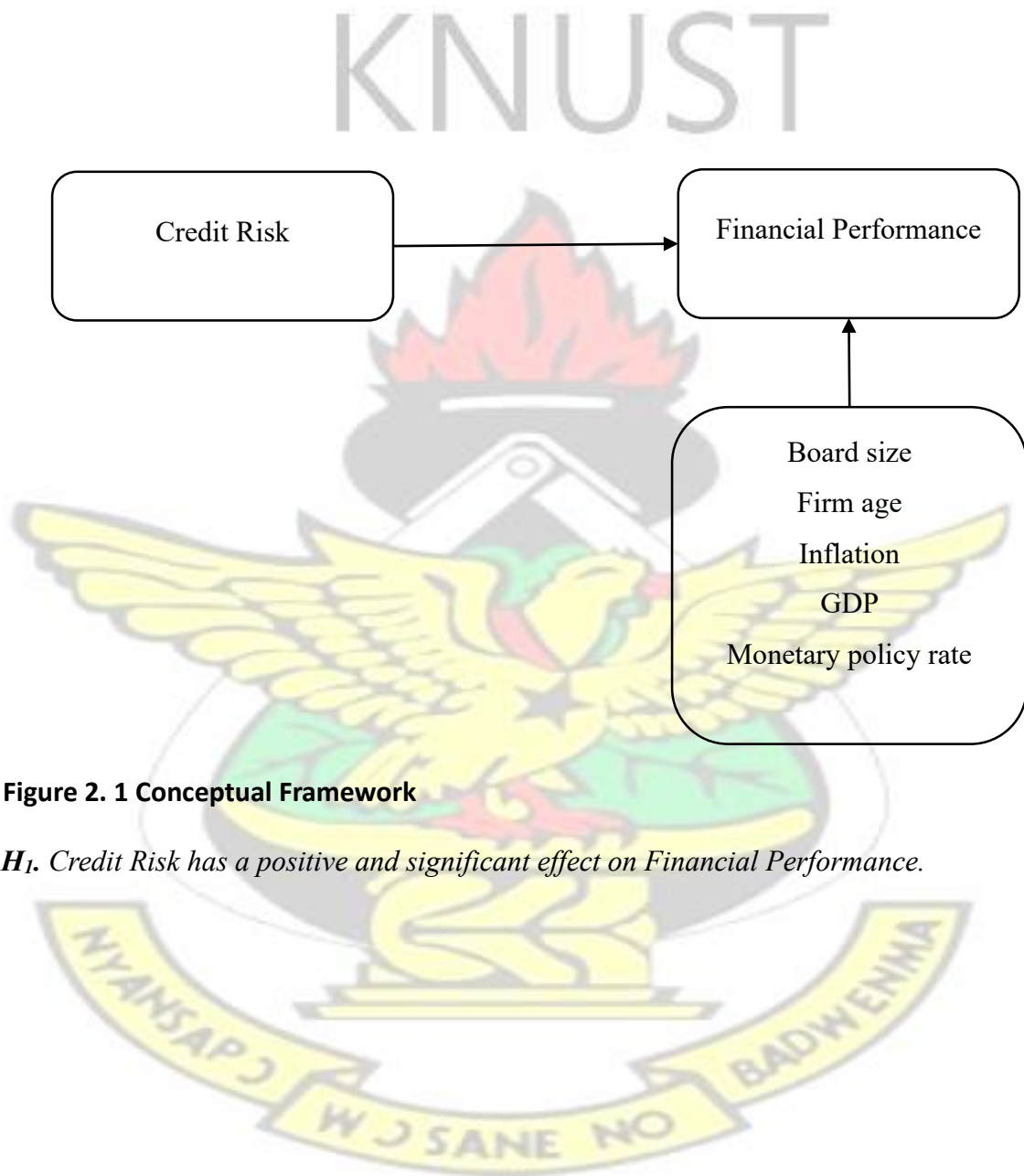


Figure 2. 1 Conceptual Framework

H₁. Credit Risk has a positive and significant effect on Financial Performance.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter outlines the methodology employed in the study, including the research design, sample selection, data collection and sources, data analysis techniques, model formulation, and diagnostic tests. The methodology section provides a clear and systematic approach to address the research objectives and answer the research questions effectively.

3.1 Research design

This study uses quantitative methods, explanatory research design, and positivism. How these strategies acquire and assess data and how much they use mathematics and computer data to solve issues differ (Allwood, 2012). This study should employ quantitative research since it allows systematic collection and analysis of numerical data to find patterns and develop conclusions regarding previously undiscovered relationships between variables. Quantitative research is connected with natural sciences, qualitative research with social sciences, and mixed techniques with both qualitative and quantitative approaches (Khaldi, 2017). The positivist paradigm emphasises objectively analysing interactions using statistics to identify causes and effects to test the claim that credit risk affects business financial performance (Kivunja and Kuyini, 2017). The positivist worldview explains events, predicts based on patterns, and identifies causes and consequences (Patten & Newhart 2017). An explanatory design analyses the context to explain the study's variables' interactions and evaluates the impact of particular adjustments on previous standards and different processes (Cresswell, 2013).

3.2 Sample

The study population is Ghanaian commercial banks. Only listed organisations are chosen for data collection due to the ease of collecting secondary credit risk and

financial performance data. Since listed banks on the Ghana Stock Exchange publish extensive and organised yearly reports, this research uses them to represent Ghanaian banks owing to their data availability. The quantitative underpinning of this research allows for generalisation of its conclusions, hence using listed banks as a sample does not change it. Thus, this research sampled nine banks.

3.3 Data

This research uses secondary data. Secondary data is useful for this investigation since the banks under consideration provide data on the variables of interest. Secondary sources also reduce the cost of original data. The financial accounts of Ghana Stock Exchange-listed firms are used for this investigation. Panel data was used for this investigation due to the factors. This is done by compiling 2010-2021 data. Panel data allows the researcher to conveniently assemble important secondary data from these banks' annual reports as certified by PWC between 2010 and 2021.

The Ghana Stock Exchange website has the yearly report. From these reports, the ROA and ROE proxy bank performance, the study's dependent variable. The independent variables are NPL, CAR, and firm leverage. The control variables include bank size (BSize), firm age (FAge), and macroeconomic indices (Inflation, GDP, MPR). These criteria help assess credit risk's impact on banks' financial management and profits. Thus, Return on Assets (ROA) is better than other commercial bank performance indicators since it adjusts for financial leverage fluctuations and minimises biases. Return on equity (ROE) measures how well a firm utilises its equity to make money. This research uses company size as a control variable because economies of scale and diversification possibilities make bigger banks perform better. For credit risk management, more competence means less cost to a bank's bottom line. If everything else stays equal, growth in GDP will raise banks' financial performance by increasing

loan demand and deposits. Suddenly rising inflation may lead interest rates to rise. Banks increase the volume of loans they make at higher rates as interest rates rise because they anticipate their financial performance to improve. Because high-interest rates increase loan losses and vice versa. High-interest rates discourage new loans, damaging a bank's financial line. High loan interest rates may increase credit risk by attracting mainly risk-averse borrowers.

3.4 Data Analysis

The secondary data is organised in Excel. Kwashie, Baidoo, and Ayesu (2022) employ panel static regression models to analyse credit risk and bank financial performance. This research requires the panel regression model since it can handle time series and cross-sectional data. The link is specified using the fixed effect and random effect models. This research uses Eviews 10 data analysis software. ROA and ROE represent bank performance, the study's dependent variable. The independent variables are NPL, CAR, and firm leverage. The control variables include bank size (BSize), firm age (FAge), and macroeconomic indices (Inflation, GDP, MPR). This research mostly uses inferential statistics, although descriptive statistics are also employed to evaluate the variables' raw nature. The mean and standard deviation describe these data.

3.5 Model Specification

A panel regression model as used by Kwashie, Baidoo, and Ayesu (2022) is used for this study. This model is appropriate for this study due to its ability to examine the variables of firms over time.

$$FP_{it} = \beta_0 + \beta_1 LAR_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 LEV_{it} + \beta_5 Bsize_{it} + \beta_6 Fage_{it} + \beta_7 I + \beta_8 MPR_{it} + \beta_9 GDP_{it} + \epsilon_{it}$$

Where FP= financial performance; LAR=loans and Advances ratio; NPL= Nonperforming loans; CAR= capital adequacy ratio, LEV=leverage, Bsize=Bank size, Fage= bank age, I=inflation, MPR= monetary policy ratio, GDP= Gross domestic product and ϵ_{it} is the error term unique for each equation, i is the firm and t is time.

3.6 Diagnostic test

3.6.1 Heteroscedasticity and Autocorrelation

Economic issues like heteroscedasticity and autocorrelation, which could introduce errors in the estimate, undermine the credibility of the results when using time-series data. This is because most indicators of the financial and economic climate are inherently unpredictable. It is common for panel data sets to exhibit heteroscedasticity, a statistical phenomenon in which the variance of the error term varies over time. Statisticians address these worries by employing the Breusch-Godfrey and Breusch-Pagan tests, which assess autocorrelation and heteroscedasticity, respectively. Alternatively, the Breusch-Pagan test accepts the null hypothesis that heteroscedasticity does not exist and rejects the alternative hypothesis that it does. It is crucial for Breusch-Godfrey that the error terms be assumed to be unconnected. If the results of these tests are statistically significant at the 5% level, the null hypothesis is rejected; otherwise, it is accepted.

3.6.2 Hausman Test

A Hausman Specification Test chooses fixed or random effects. Researchers commonly utilise the Hausman specification test to determine whether to employ fixed effect or random effect model estimates before panel data regression. The fixed effect is employed in model estimation if the probability value is less than 0.05 (p 0.05), showing a relationship between error terms and explanatory factors. Otherwise, the random

effect is a better estimator of the parameters. Hausman tests are used to pick between the two estimators.

3.7 Variable Measurement and Description

Variable	Measurement	Sign	Reference
Dependent (financial performance).			
ROA	Net income/total assets.		Kwashie, Baidoo, and Ayesu (2022)
ROE	Net income/ Shareholders' Equity.		Kwashie, Baidoo, and Ayesu (2022)
Independent Variable (Credit Risk)			
Leverage	The ratio of debt to equity.	+/-	Kwashie, Baidoo, and Ayesu (2022)
Loan and advances ratio.	Total loans to total deposits	+/-	Kwashie, Baidoo, and Ayesu (2022)
Non-performing loan.	Loan defaults/ loans *100.	+/-	Kwashie, Baidoo, and Ayesu (2022)
Capital Adequacy Ratio.	The portion of a bank's riskadjusted credit exposures is expressed as a percentage.		Kwashie, Baidoo, and Ayesu (2022)
Control Variables			
Monetary policy rate	The pace at which the central bank extends credit facilities to commercial banks.	+/-	Kwashie, Baidoo, and Ayesu (2022)
GDP	Monetary value of final goods and services.	+/-	Kwashie, Baidoo, and Ayesu (2022)
Inflation	Consumer price index	+/-	
Bank size	The natural log of the total assets of the bank.	+/-	Kwashie, Baidoo, and Ayesu (2022)
Bank age	“How long a bank has been in existence.”	+/-	Kwashie, Baidoo, and Ayesu (2022)

CHAPTER FOUR RESULTS AND DISCUSSION

4.0 Introduction

The chapter implements the various methods, techniques and tools mentioned in the preceding chapter to achieve the results of the study. It is structured into preliminary analysis, main analysis and the post-estimation section. The preliminary section consists of descriptive statistics and correlational analysis. The main analysis is tailored toward providing results for the various specific objectives aimed to be achieved by the study. The post-estimation subsection provides the various model assumptions (diagnostic tests) that must be satisfied to fortify the model from errors.

4.1 Preliminary Analysis

4.1.1 Descriptive Statistics

Researchers use descriptive statistics to summarise research data to understand its extent and kind. Because descriptive statistics summarise data effectively, Kaur, Stoltzfus, and Yellapu (2018) recommend starting inferential studies with them. These summary findings show dataset gaps, inconsistencies, and outliers. Thus, the researcher calculates the mean and SD to characterise the dataset's central tendency and dispersion. To find outliers, the variables' maximum and minimum values are determined. The findings are shown in Table 1.

Table 1: Results of Descriptive Statistics

	<u>Obs.</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Maximum</u>	<u>Minimum</u>
ROA	99	2.971	1.954	7.500	-3.700

ROE	99	20.140	13.467	49.100	-27.400
TLAR	99	5.604	3.391	15.400	0.300
NPL	99	14.453	10.819	49.290	0.400
MPR	99	15.991	1.683	18.072	13.059
LNGDP	99	24.698	0.245	24.972	24.195
LEV	99	1.013	0.397	1.540	0.001
INF	99	11.784	3.412	17.455	7.144
CAR	99	20.392	11.623	115.000	6.520
BSIZE	99	21.790	0.884	23.488	19.098
BAGE	99	39.889	32.940	124.000	1.000

Source: Author's computation (2023), where *NPL* is non-performing loans, *CAR* is capital adequacy ratio, *MPR* is monetary policy rate, *LNGDP* is the natural log of gross domestic product, *LEV* is the bank's leverage, *TLAR* is total loan and advance ratios, *BSIZE* is bank size, *BAGE* is bank age, *INF* is inflation.

Over 11 years and nine banks, 99 observations were made. The nine banks have an average return on assets of 2.971% and an SD of 0.108%. The maximum ROA these banks achieve is 7.5%, while the lowest is -3.7%. The businesses' return on equity (ROE) averages 20.14% with an SD of 13.467%. The range of ROE is -27.4% to 49.10%. The negative minimum ROA and ROE values indicate solid losses. The total loan and advance ratio averages 5.604% ($-SD = 3.391\%$). The loan-to-advance ratio varies widely across banks. The minimum bank loan and advance ratio is 0.3%, and the highest is 15.4%. The large difference between TLAR's maximum and lowest value suggests that commercial banks issue loans inconsistently. Nonperforming loans show an average of 14.453% ($SD = 10.819\%$) for bank loan default, ranging from 49.290% to 0.4%. This high NPL variation rate indicates that most banks have riskier loan portfolios. The capital adequacy ratio ($M = 20.392\%$ $SD = 11.623\%$) reveals that Ghanaian commercial banks are more solvent to safeguard depositors during financial downturns. Banks also have greater CAR than the 10% Bank of Ghana threshold for commercial banks. The most liquid bank even records 115% of CAR, which is the highest, and the lowest CAR of 6.52%. The size of banks is ($M = 21.790\%$,

$SD = 0.884\%$) indicating that the variation in the sizes of Ghanaian banks is uniform.

4.1.2 Correlational Analysis

The proxies of firm financial performance (ROA and ROE) have a strong positive correlation, ($r(98) = 0.835, p < .001$). Also, the ROA has a positive weak correlation, ($r(98) = 0.260, p < .01$) with TLAR indicating that both variables move in the same direction. However, with, $r(98) = -0.368, p < .001$, ROA correlates negatively with NPL. Indicating that both move in an inverse direction. That is while NPL is increasing, ROA is decreasing. ROE poses a positive correlation with TLAR. Thus, at $r(98) = 0.354, p < .001$, there exists a weak correlation between ROA and TLAR. However, the results showed that ROA relates negatively with NPL as shown by the correlation coefficient of $r(98) = -0.410, p < .001$. This indicates that both variables move in the inverse direction. BAge also has a positive weak correlation with ROE. This shows that both variables are weakly moving in the same direction.

The Total loan and advance ratio (TLAR) has a very weak negative correlation with NPL, $r(98) = -0.299, p < .001$. However, it relates positively with CAR at a weak correlation of $r(98) = 0.429, p < .001$. Likewise, BAge relates positively with TLAR at a very weak Pearson correlation coefficient of $r(98) = 0.214, p < .05$. NPL on the other hand also relates positively with Bank age. From the results, $r(98) = 0.327, p < .001$, shows that there exists a weak correlation between the two variables.

Table 2: Results of Correlational Analysis

	ROA	ROE	TLAR	NPL	CAR	Bsize	INF	Lev	Bage	MPR	LNGDP
ROA	—										
ROE	0.835***	—									
TLAR	0.260**	0.354***	—								
NPL	-0.368***	-0.410***	-0.183	—							
CAR	0.189	-0.014	0.299***	0.053	—						
Bsize	0.074	0.223*	0.429***	0.028	-0.266 **	—					
INF	0.014	-0.033	-0.094	0.140	-0.141	-0.058	—				
LEV	-0.005	0.043	0.082	0.173	-0.098	0.189	-0.071	—			
Bage	0.188	0.290**	0.214*	0.327 ***	-0.127	0.288 **	-0.014	0.068	—		
MPR	0.024	0.017	-0.101	0.023	-0.094	-0.503 ***	0.627 ***	-0.043	-0.069	—	
LNGDP	-0.030	-0.057	0.072	0.126	-0.089	0.681 ***	-0.103	0.055	0.085	-0.720***	—

Source: Author's computation (2023), where NPL is non-performing loans, CAR is capital adequacy ratio, MPR is monetary policy rate, LNGDP is the natural log of gross domestic product, LEV is the bank's leverage, TLAR is total loan and advance ratio, BSIZE is bank size, BAGE is bank age, INF is inflation, C is the regression constant term. Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

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4.2 Trend Analysis of Credit Risk in the Commercial Banking Industry The study adopts three proxy variables to measure credit risk among the sampled commercial banks. The variables include; NPL, CAR, and total loan and advance ratio (TLAR). Consider Figure 1 for the pictorial view of the variables.

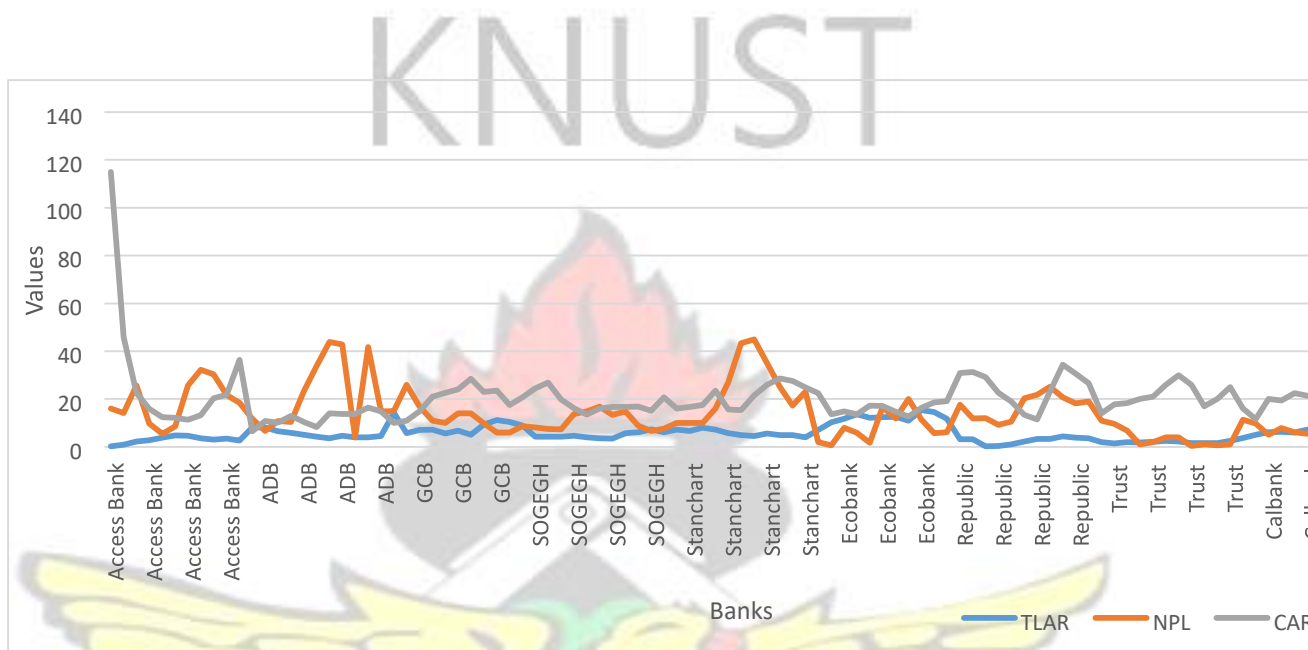


Figure 1: Trend Analysis of Credit Risk of Listed Commercial Banks in Ghana

Source: Author's computation (2023)

The credit performance of banks determines their risk exposure level. This is also used by investors to gauge the health of banks for investment. Figure 1 shows the trajectory of three credit risk factors (NPL, CAR, TLAR) for each of the nine listed commercial banks from 2010 to 2020. The pattern demonstrates bank credit risks vary. After starting operations in Ghana in 2009, Access Bank had its maximum capital adequacy level of 115% in 2010. This rate is predicted since the bank was one of the first commercial banks to satisfy the 60 million universal bank capital standard in 2009, raising their CAR. After lending to clients, the bank's CAR drops. The bank's lowest CAR value in 2016 was 11.29%, which is greater than the Bank of Ghana's 10% universal bank criteria.

Access Bank managed its capital adequacy ratio better than the other eight banks. Access Bank has a 0.3% total-loan-to-advancement ratio, one of the lowest. The NPL on the other hand is persistent in nature, with the highest loan default of 32.3% and the lowest of 5.4%. Thus, on average, Access Bank is operating beyond the industry aggregate NPL of 14.8% in December 2022. The agriculture development bank also posits a mixed trend in the variables. For instance, it started off in 2010 with a low CAR of 6.52% and marginally shows an increasing trend from 2010 through to 2020 with a CAR value of 14.8%. Likewise, the NPL of the bank over the 10-year period witnessed an increasing trend from 6.69% in 2011 to a peak of 49.29% in 2018 and then decreased to 14.8% in 2020, a rate that was within the aggregate industry NPL rate. It is worthy of note that the 49.29% NPL of the bank experienced in 2018 was the highest among the nine listed banks for the study period. The TLAR of ADB, however, started off so high from 8.2% in 2010 and 2011 down to 4.5%. This is predictable because in the earlier years of the bank, its share of the loans-to-agriculture sector was high, and subsequently it lost track of its mandate.

The CAR of GCB also started off from an increasing trajectory at 10%, it then peaked at 28.48 in 2016. The ratio started to decrease after 2016 till it reached 20.67% in 2020. The Bank is also noted to have maintained a streak of double-digit NPL rates from 15% in 2010 to 14% in 2016. Thereafter, a decreasing trend of NPL was maintained from 9.93% in 2017 to 8.71% in 2020. The TLAR of GCB on the other hand, experienced a boom and bust single-digit TLAR of 5.8% to 8.9%. The figure shows that GCB, the bank with the largest market share has managed its NPL better than Access Bank and ADB. After recording a little above 20% in 2010 and 2011 CAR, Societe General (SOGEGH) Bank has a decreasing streak of double-digit from 19.79 to 15.06% and then peaked again at 20.79% in 2020. The NPL on the other started with low values

such as 8.15% in 2010 and 7.5% in 2011. It then attained the highest value of 16.9% in 2015 and then decreased to 7.58% in 2020. The bank however performed poorly in issuing loans, as it recorded single-digit TLAR from 4.2% to 6.1% despite the marginal increases over the years.

The figure shows that Standard Chartered Bank is in the spotlight for its performance in all three credit risks. The bank, despite recording a low CAR of 16% in 2010 picked up on an increasing trend to the peak of 28.59% in 2018 and decreased marginally thereafter to 24.9% in 2020. Meanwhile, the bank has enjoyed a streak of 10% from 2010 to 2012 in NPL. The NPL got out of control from 2013 at 16% to a peaked value of 45% in 2016. This NPL value is the highest rate among all nine listed banks. This value is not surprising, since this value was recorded at a time when the country's financial sector was recording poor performance with high-risk levels in 2016. Despite the high and dangerous values of NPL, the bank retained a single-digit TLAR over the study period. The figure revealed that EcoBank Ghana was the only institution that had retained high TLAR values over the study period. As such from 7.1% in 2010, the TLAR increased to a peak of 15.4% in 2018, then marginally decreased to 11.7% in 2020. However, the bank was part of the financial institutions with a low NPL of 0.66% in 2011. However, by 2017, the NPL had peaked at 20.04% and thereafter declined to 6.2% in 2020. The bank's CAR was confined below 20% over the entire study period as shown in the diagram.

One of the banks that recorded consistent CAR over the study period is the Republic Bank. This bank started off with CAR of 30.92%, it experienced a decline and thereafter peaked at 34.44%. This peaked CAR value is second to Access Bank. The NPL was double-digit throughout (except in 2013), peaking at 25.14% in 2017 and falling to

9.28%. The bank has the lowest TLAR, 0.3% in 2012, and 4.4% in 2020. The Trust Bank of Gambia had the lowest NPL in 2017 and 2018, 0.4% and 0.6%. After Access Bank, the bank had a dismal loan-to-advancement ratio. Calbank boomed and busted during the study. Its highest CAR was 22.9% and its lowest was 11.6%.

4.3 Impact of Credit Risk on the Performance of Commercial Banks in Ghana The paper estimates how credit risk affects commercial bank financial performance using static regression models (Fixed Effect and Random Effect). Table 3 shows findings from nine listed commercial banks. The dependent variables for bank financial success are ROA and ROE. Three proxies for bank credit risk include non-performing loans, capital adequacy ratio, and loan and advance ratio. The research tests model resilience to choose the most efficient fixed effect or random effect model. The findings show $\chi^2(8)$, $p = 1.00$ for ROA and ROE. This rejects the null hypothesis, validating the Random Effect model's efficiency. In the research, only random effect model findings are interpreted. Both FE and RE models use the robust Estimated Generalised Least Square method to control heteroskedasticity.

Table 3: Results of Pooled OLS Model on the Relationship between Credit Risk and ROA

Dependent Variable: ROA				
Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.081	0.017	-4.665	0.000***
CAR	0.047	0.016	2.988	0.004***
MPR	0.172	0.238	0.720	0.473
LNGDP	2.013	1.443	1.395	0.167
LEV	0.004	0.002	2.259	0.026**
INF	0.022	0.081	0.274	0.785
TLAR	0.165	0.059	2.782	0.007***
BSIZE	-0.445	0.320	-1.389	0.168
BAGE	0.022	0.006	3.789	0.000***
C	-41.664	35.691	-1.167	0.246
R-squared	0.384			

Adjusted R-squared	0.321
F-statistic	6.159
Prob(F-statistic)	0.000***
Durbin-Watson stat	1.376

Source: Author's computation (2023), Where *NPL* is non-performing loans, *CAR* is capital adequacy ratio, *MPR* is monetary policy rate, *LNGDP* is the natural log of gross domestic product, *LEV* is the bank's leverage, *TLAR* is the total loan and advance ratio, *BSIZE* is bank size, *BAGE* is bank age, *INF* is inflation, *C* is the regression constant term. **Note: $p < 0.1^*$, $p < 0.05^{***}$ and $p < 0.01^{***}$.**

Table 3 shows R-squared, Adjusted R-squared, and F-statistic regression summary statistics. The adjusted R-squared, a better indicator of model goodness-of-fit than Rsquared, was 0.28. The RE1 model explains 28% of ROA changes. The RE2 model in Table 3 explains return on equity fluctuations with an Adjusted R-squared value of 0.33. The two models (RE1 and RE2) are statistically significant (F-stat = 5.72, $p < 0.01$ and F-stat = 7.05, $p < 0.01$), making them suitable for usage. The two models' first-order autocorrelation is tested using Durbin-Watson statistics. The D-W value of 1.50 is within the permitted range of 1.5-2.0, indicating that RE1 is not autocorrelated. The second model (RE2) fails the D-W test because D-W = 1.34 is below 1.5 to 2.0. Thus, a positive autocorrelation indicates that independent variables are tied to their passed values.

4.3.1 Impact of Credit Risk on the Financial Performance (ROA) of Commercial Banks

The research measures bank credit risk using NPL, CAR, and TLAR proxy variables. Table 4 shows that the RE1 model nonperforming loan (NPL) coefficient was negative and statistically significant at 1% with a coefficient of -0.082 and SE = 0.017. Any unit rise in NPL decreases firm performance by 0.082 units. CAR, which gauges banks' capital relative to their risk-weighted assets, positively correlated with bank return on assets. Thus, with a coefficient of 0.04, SE = 0.014, each unit rise in banks' CAR, other

factors kept constant, would boost financial performance by 0.04% at a statistically significant level of 1%. This implies banks have adequate capital to weather any storm without losing depositors' money. It increases the firm's return on assets.

Table 4: Results of the Random Effect Model on the Relationship between Credit Risk and ROA

Dependent Variable: ROA				
Method: Panel EGLS (Cross-section random effects)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.082	0.017	-4.895	0.000***
CAR	0.040	0.014	2.547	0.013***
MPR	0.190	0.132	1.451	0.150
LNGDP	2.310	1.152	2.005	0.048**
LEV	0.004	0.001	2.705	0.008***
TLAR	0.140	0.065	2.059	0.042**
BSIZE	-0.540	0.328	-1.657	0.101
BAGE	0.020	0.007	3.283	0.002***
C	-46.530	26.112	-1.782	0.078*
R-squared	0.337			
Adjusted R-squared	0.278			
F-statistic	5.720			
Prob(F-statistic)	0.000***			
Durbin-Watson stat	1.492			
Hausman	1.000			

Source: Author's computation (2023), Where NPL is non-performing loans, CAR is capital adequacy ratio, MPR is monetary policy rate, LNGDP is the natural log of gross domestic product, LEV is the bank's leverage, TLAR is the total loan and advance ratio, BSIZE is bank size, BAGE is bank age, INF is inflation, C is the regression constant term. **Note: p<0.1* p<0.05***, p<0.01*****

The findings indicate a favourable correlation between banks' performance and the total loan and advance ratio (TLAR) ($\beta=0.14$, $SE=0.07$). Other factors being equal, every unit rises in TLAR increased bank return on assets by 0.14% at a statistically significant level of 5%. When banks lend to the private sector or government, they receive interest, which boosts their return on assets. In contrast, the risk-taking behaviour hypothesis

argues that loan volume increases credit risk and lowers loan portfolio quality (Saha and Neogy, 2021). Thus, large loan and advance ratios may increase default rates and loan loss provisions, hurting banks' profits.

Table 5: Results of the Fixed Effect Model on the Relationship between Credit Risk and ROA

Dependent Variable: ROA

Method: Panel EGLS (Cross-section Fixed Effect SUR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.060	0.005	-11.234	0.000***
CAR	0.034	0.005	6.832	0.000***
MPR	-0.094	0.079	-1.194	0.236
LNGDP	2.880	0.539	5.345	0.000***
LEV	0.005	0.000	22.173	0.000***
INF	0.007	0.027	0.244	0.808
TLAR	-0.056	0.040	-1.389	0.169
BSIZE	0.685	0.190	3.612	0.001***
BAGE	-0.429	0.048	-8.930	0.000***
C	-64.091	13.533	-4.736	0.000***
R-squared	0.930			
Adjusted R-squared	0.916			
F-statistic	63.484			
Prob(F-statistic)	0.000***			
Durbin-Watson stat	2.309			

Source: Author's computation (2023), Where *NPL* is non-performing loans, *CAR* is capital adequacy ratio, *MPR* is monetary policy rate, *LNGDP* is the natural log of gross domestic product, *LEV* is the bank's leverage, *TLAR* is the total loan and advance ratio, *BSIZE* is bank size, *BAGE* is bank age, *INF* is inflation, *C* is the regression constant term. **Note: $p < 0.1^*$, $p < 0.05^{***}$, $p < 0.01^{***}$.**

RE controls internal and external ROA variables. The influence of internal control factors including bank leverage, size, and age on ROA is calculated. The data demonstrate that only leverage and age positively affect banks' return on assets. Using $\beta = 0.004$, $SE = 0.001$, and $\beta = 0.02$, $SE = 0.007$, we found that increasing bank size

increases ROA by 0.004%, whereas increasing bank age increases ROA by 0.02% at a 1% statistical significance level. The model also accounts for economic circumstances' impact on ROA. The inflation, GDP, and monetary policy rates were analysed. However, only the natural logarithm of GDP (LNGDP) negatively affects the bank's ROA at 5%. With a regression coefficient of 2.31, SE = 1.152, GDP increases ROA by 2.31% per unit. This indicates that as the economy grows, banks' return on assets increases, everything else being equal.

4.3.2 Impact of Credit Risk on the Financial Performance (ROE) of Commercial Banks

The return on equity is also used as a proxy for the financial performance of commercial banks in Ghana.

Table 6: Results of Pooled OLS Model on the Relationship between Credit Risk and ROE

Dependent Variable: ROE				
Method: Panel Least Squares				
Variable	Coefficient -	Std. Error	t-Statistic	Prob.
NPL	0.628	0.117	-5.387	0.000***
CAR	0.125	0.104	1.199	0.234
MPR	1.115	1.602	0.696	0.488
LNGDP	-1.735	9.697	-0.179	0.858
LEVERAGE	-0.004	0.011	-0.329	0.743
INF	-0.015	0.543	-0.027	0.979
TLAR	0.625	0.399	1.566	0.121
BSIZE	2.249	2.152	1.045	0.299
BAGE	0.165	0.039	4.273	0.000***
C	-7.193	239.802	-0.03	0.976
R-squared	0.415			
Adjusted R-squared	0.355			
Adjusted R-squared	0.355			
F-statistic	7.003			
Prob(F-statistic)	0.000***			
Durbin-Watson stat	1.31			

Source: Author's computation (2023), Where NPL is non-performing loans, CAR is capital adequacy ratio, MPR is monetary policy rate, LNGDP is the natural log of gross domestic product, LEV is the bank's leverage, TLAR is the total loan and advance ratio,

BSIZE is bank size, BAGE is bank age, INF is inflation, C is the regression constant term. Note: $p < 0.1^$, $p < 0.05^{***}$, $p < 0.01^{***}$*

Table 7 shows that NPLs hurt banks' finances. Banks with $\beta = -0.63$ and $SE = 0.099$ see a 0.63% decline in ROE at a 1% statistical significance level. When bank loans fail, revenue ROE drops considerably. The capital adequacy ratio (CAR) is positively but statistically insignificantly related to bank ROE. However, banks' ROE is positively correlated with their total loan and advance ratio. With a coefficient of 0.17, $SE = 0.035$, raising the loan and advance ratio increases return on equity by 0.17% at a statistically significant threshold of 1%. This supports the traditional banking literature that lending generates interest revenue and boosts bank profitability (Simatupang et al., 2019).

Table 7: Results of the Random Effect Model on the Relationship between Credit Risk and ROE

Dependent Variable: ROE

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.628	0.099	-6.361	0.000***
CAR	0.106	0.089	1.192	0.236
MPR	1.177	0.959	1.227	0.223
LEVERAGE	-0.003	0.01	-0.361	0.719
INF	-0.04	0.395	-0.1	0.921
TLAR	0.621	0.351	1.77	0.08***
BSIZE	1.726	1.677	1.029	0.306
BAGE	0.166	0.035	4.809	0.000***
C	-38.974	45.55	-0.856	0.394
R-squared	0.385			
Adjusted R-squared	0.331			
F-statistic	7.049			
Prob(F-statistic)	0.000***			
Durbin-Watson stat	1.335			
Hausman	1.000			

Source: Author's computation (2023), Where NPL is non-performing loans, CAR is capital adequacy ratio, MPR is monetary policy rate, LNGDP is the natural log of gross domestic product, LEV is the bank's leverage, TLAR is the total loan and advance ratio, BSIZE is bank size, BAGE is bank age, INF is inflation, C is the regression constant term. Note: $p < 0.1^*$, $p < 0.05^{***}$ and $p < 0.01^{***}$

The model also accounts for macroeconomic and bank-specific variables. Results demonstrate banks' leverage boosts ROE. With $\beta=0.62$ and $SE=0.35$, increasing bank leverage by a unit leads to a 0.62% rise in ROE, everything else being equal. The data ($\beta=-0.004$ and $SE=0.01$) indicate a negative correlation between return on equity and GDP. Unexpected because companies and investors thrive when the economy grows, other things being equal.

Table 8: Results of the Fixed Effect Model on the Relationship between Credit Risk and ROE

Dependent Variable: ROE

Method: Panel EGLS (Cross-section Fixed Effect SUR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NPL	-0.401	0.016	-25.546	0.000***
CAR	0.136	0.017	7.905	0.000***
MPR	-1.736	0.425	-4.086	0.000***
LNGDP	17.27	2.887	5.982	0.000***
LEVERAGE	0.001	0.001	1.575	0.119
INF	0.265	0.137	1.938	0.056*
TLAR	-0.709	0.149	-4.759	0.000***
BSIZE	14.164	0.46	30.797	0.000***
BAGE	-5.186	0.214	-24.248	0.000***
C	-476.529	71.033	-6.709	0.000***
R-squared	0.944			
Adjusted R-squared	0.932			
F-statistic	80.061			
Prob(F-statistic)	0.000***			
Durbin-Watson stat	2.337			

Source: Author's computation (2023), Where NPL is non-performing loans, CAR is capital adequacy ratio, MPR is monetary policy rate, LNGDP is the natural log of gross domestic product, LEV is the bank's leverage, TLAR is the total loan and advance ratio, BSIZE is bank size, BAGE is bank age, INF is inflation, C is the regression constant term. **Note: $p<0.1^*$ $p<0.05^{***}$, $p<0.01^{***}$**

4.4 Diagnostic Tests

4.4.1 Residual Cross-sectional Dependence Test

Before beginning any panel estimate study, it is necessary to first determine whether or not there is a cross-sectional dependency (Tugcu, 2018). This is one of the most critical diagnostic tests that must be performed. This test estimate determines how typically the multiple cross-sectional research entities (banks) are connected. It's used to evaluate the model's success by assessing if the bank's actions affect other banks. The Pesaran scaled LM, Breusch-Pagan LM, bias-corrected scaled LM, and CD are four tests. This study uses nine people for cross-sectional data, hence the Breusch-Pagan LM test is best (Tugcu, 2018). The following hypotheses were tested:

Null hypothesis: No cross-section dependence (correlation) in residuals.

Alternative hypothesis: There is cross-section dependence (correlation) in residuals.

Table 9: Results of Cross-sectional Dependence for RE2

RE2	Statistic	d.f.	Prob.
Breusch-Pagan LM	50.817	36	0.052
Pesaran scaled LM	1.746		0.081
Pesaran CD	4.131		0.000
RE1			
Breusch-Pagan LM	45.451	36	0.134
Pesaran scaled LM	1.114		0.265
Pesaran CD	1.316		0.188

Source: Author's computation (2023)

Based on the three tests contained in model RE1, the results indicate that RE1 passed the test for no cross-sectional dependence in the residuals. Thus, the study fails to reject the null hypothesis since all the p-values of the three tests statistics, especially the Breusch-Pagan LM test are greater than the 5% significance level. Likewise, in model RE2, the probability values of Breusch-Pagan LM and Pesaran scaled LM are statistically greater than 5%, hence the results conclude that there exists no crosssectional dependence in residual.

4.5 Discussion of Results

4.5.1 Trend Analysis of Credit Risk in the Commercial Banking Industry

The profitability of individual banks depends on several factors, including risk exposure, risk management, and the economy. Fahmi (2013) states that loan portfolio management, asset allocation, and cost control have the greatest influence on a company's profitability. The overall loan-to-advancement ratio and nonperforming loans vary between institutions. The research suggests that Access Bank, Trust Bank, and Republic Bank have low lending rates due to their stable loan and advance ratios.

The asset quality index (nonperforming loans) decreased from 2015 to 2016. In 2015–2016, practically all banks' NPL percentages set new highs. A quick look indicates that Access Bank, ADB, GCB, SOGEGH, Standard Chartered Bank, Republic Bank, and Ecobank increased between 2015 and 2016. This is why Standard Chartered Bank had the highest NPL percentage of 45% in 2016. The BoG (2017) banking survey found that banks' NPL ratio climbed from Ghc 4.4 billion in December 2015 to Ghc 6.2 billion in December 2016. It ascribed this to sluggish economic growth and slowing loan and advance growth. Thus, effective credit risk management is essential to maintaining loan portfolio quality (Sriulina Dedek, 2022). Before the COVID-19 outbreak, banks' NPL dropped 5.2% to Ghc 6.50 billion at the end of 2019. This is due to the write-off and higher loan recovery, according to the BoG (2020).

Despite asset quality declines from 2015 to 2016, banks have remarkable solvency rates. Solvency is a significant indicator of a bank's capacity to withstand credit and operational losses (Bank of Ghana, 2020). The figure shows that in spite of the financial crunch experienced between 2015 and 2016, all the banks remain highly solvent with capital adequacy ratios above the statutory rate of 10%. Trust Bank, Ghana was found to be the most solvent between 2015 and 2016. The Bank of Ghana (2017) report

confirmed this, by indicating that overall, the industry attained a capital adequacy ratio of 17.8%. The highest CAR over the entire study period was experienced in 2010, in the early years of Access Bank Ghana. Which corresponded to a 0.3% low loan and advances ratio in the same year. Likewise, all other years, including the COVID-19 era attained a CAR value that was above the 10% statutory threshold and the Basel I and III 3% buffer. The rise in the CAR of all the banks between 2019 and 2020 can also be attributed to the policy of the BoG that reduced the CAR of universal banks to create more liquidity to cushion the banks against the global pandemic.

4.5.2 Impact of Credit Risk on the Financial Performance of Commercial Banks in Ghana

Financial firms may make money by lending money to customers. Interest payments on loans and other credit products help banks make money. Mogga et al. (2018) estimate that commercial banks hold 50–75% loans. Loans may also cause financial organisations to collapse, especially if they oversee poor credit management. Due to the significant influence of credit facilities on banks' performance, credit risk management is the most essential part of bank administration. To evaluate how credit risk affects bank performance, NPL, CAR, and loan-to-advancement ratios were employed. The RE model shows a declining relationship between credit risk (NPL) and bank performance (ROA and ROE). This result confirms the findings of (Hassan, Khan, & Paltrinieri, 2019; Mendoza, & Rivera, 2017; Mogga, et al., 2018; Saleh, Abu Afifa, 2020; Siddique, Khan, & Khan, 2022) that credit risk (NPL) negatively impacts banks' performance.

Saleh and Abu Afifa (2020) and Cucinelli and Marchionne (2020) note that credit risk from NPLs hurts banks' performance. This study confirms the findings of other

Ghanaian studies (Akomeah, Agumeh & Siaw, 2020; Kwashie, Baidoo & Ayesu, 2022; Ofosu-hene & Amoh, 2016; and Nyarko-Bassi, 2018) that NPL hurts Ghanaian commercial banks. Desah and Agyei (2012) found that nonperforming loans improve bank performance, contrary to this study.

The research also shows that the capital adequacy ratio enhances bank profitability. According to the capital buffer hypothesis, banks with larger capital ratios can absorb losses and manage risk, increasing profitability (Kanella et al., 2021). This contradicts Agyei (2018) and Tutu (2020), who found that Ghanaian banks' capital adequacy ratios negatively affect their return on assets. Kimeu (2020) and Hanifa et al. (2015) revealed that CAR negatively affected ROA in Kenya and Bangladesh, respectively. The study also found a favourable correlation between a bank's loan-to-advance ratio and its ROA and ROE. These findings confirm the conventional banking literature's assumption that lending activities generate interest income and boost bank profitability (Simatupang et al., 2019).

The results have major theoretical implications for credit risk and bank success literature. First, the findings support the signalling theory notion that credit risk negatively affects bank profitability. The findings support the idea that banks with better loan portfolios convey lower risk to investors and lenders, lowering financing costs and increasing profitability. The study provides actual evidence of how bank credit risk signals bank dependability and impacts profitability. Second, the study supports the risk-taking behaviour theory by examining how total loan advancement affects bank profitability. The favourable association between TLAR and return on equity and return on assets suggests that banks' lending activities will boost profitability.

Thirdly, the study examines how the capital sufficiency ratio affects bank profitability, adding to the knowledge. The capital buffer theory states that enough capital increases profitability (return on assets and equity). Another idea that supports this research is the pecking order theory. This theory states that banks with higher capital ratios can fund their operations and investments internally, reducing their need for external borrowing. This may cut borrowing costs, boost financial stability, and improve bank performance.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.0 Introduction

The results of the research are summarised in this section and presented in the order in which they are revealed. It then draws conclusion based on these findings and proffers suggestions recommendations.

5.1 Summary of Findings

5.1.1 Trend Analysis of Credit Risk in the Commercial Banking Industry

The study finds a boom-and-bust growth pattern on all three credit risk measures. Notable trends in the variables occurred between 2015 and 2016. During this period, most of the banks (except Trust Bank, Ghana) experienced a weak asset quality (thus, a rise in their nonperforming loans) despite the decline in loan and advance ratios within that period. Also, throughout the study period (2010-2021), most of the banks remained solvent with capital adequacy ratios way above the statutory 10% requirement of the Bank of Ghana. Within the study period, the bank that recorded the highest solvency was Access Bank in 2010, while ADB experienced the lowest rate in 2010. Likewise,

the bank that experienced the highest NPL over the study period was Standard Chartered Bank in 2016, while Trust Bank Ghana was the institution with the lowest NPL value in 2017. EcoBank Ghana is also noted for having the highest share in loan and advances ratio throughout the 10-year period with the highest recorded in 2018, while Access Bank and Republic Bank hold the lowest TLAR in 2010 and 2012 respectively.

5.1.2 Impact of Credit Risk on the Financial Performance of Commercial Banks in Ghana

The RE findings show that the three credit risk metrics affect bank profitability (ROA and ROE) differently. The capital adequacy ratio favourably affects ROA but not ROE, whereas the loan and advance ratio positively affects ROA and ROE. However, NPL negatively impacts commercial bank ROE and ROA.

5.2 Conclusion

The research uses data from the 2010–2020 annual reports of nine listed commercial banks. Using Eviews 10, the RE model was used with 90 observations. The study finds that bank credit risks flourish and bust according to bank-specific and economic variables. Thus, all credit risk factors increased significantly for banks in 2015, 2016, 2019, and 2020. The research also shows that CAR and TLAR improve bank performance, whereas NPL hurts it. Thus, a healthy capital ratio boosts banks' profits and resilience. Banks earn more with an optimal TLAR, improving their profitability. Poor asset quality (high NPL) may hurt bank profits. Thus, banks should fulfil the Bank of Ghana (BOG) CAR criterion to withstand economic slowdowns. Banks should also maintain a low NPL rate while boosting TLAR to improve performance.

5.3 Recommendations

First, the study emphasises the importance of high-quality assets (low NPL values).

Financial institutions must prioritise credit risk management and protect their loan portfolios. Banks may improve their profitability while also lowering the likelihood of loan defaults if they place more emphasis on enhancing the quality of their assets. This may be accomplished by implementing stringent procedures for evaluating loans, maintaining consistent monitoring of loan performance, and taking proactive steps to resolve possible credit concerns. The implementation of rigorous regulatory frameworks that encourage banks to maintain high asset quality standards and give advice on safe lending practices is one way in which policymakers may lend their support to this endeavour.

Second, the research emphasises the need to adopt a well-rounded strategy towards the expansion of loans (TLAR). Even while increasing loan to advancement ratio can potentially lead to improved profitability as shown by the positive link between TLAR and ROE and ROA, financial institutions must carefully manage the risks that come along with it. In the long term, rapid loan growth may have a detrimental influence on profitability by increasing the risk of credit default and lowering the quality of assets held by the company. Banks need to implement efficient risk management systems and keep a close eye on the expansion of their loan portfolios to ensure that the increase is both sustainable and in line with their stomach for risk. Policymakers have a responsibility to provide standards and laws that encourage appropriate lending practices and prevent excessive loan growth, both of which may put a bank's capacity to earn a profit in jeopardy.

Thirdly, the research highlights the need to ensure that there is a healthy equilibrium between enough capital and sufficient liquidity. The statutory capital adequacy criteria of 10% should be met by banks, but these obligations should be fulfilled with an eye

towards profitability. The capacity of banks to withstand shocks and protect themselves from potential losses is directly correlated to the degree of capital adequacy they maintain. Financial institutions should also consider the risk-return tradeoff and its impact on return on assets.

For effective risk management and profitability, liquidity must always be available. It is the responsibility of policymakers to develop appropriate capital and liquidity laws that achieve a balance between financial stability and economic profitability. These regulations should take into consideration the specific qualities of each individual bank as well as the features of the whole financial system.

Regarding the trend of credit risk over the past decade, the increases in CAR, NPL and TLAR witnessed during the 2015-2016 financial and economic slowdown, and the global pandemic that engulfed the country implies that the Ghanaian financial sector is highly susceptible to economic, market and environment factors, hence managers should establish shock absorbers such as adequate CAR to protect their customers' deposits and shareholders' funds.

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