

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

**THE EFFECT OF CREDIT RISK ON BANK PERFORMANCE: A CASE OF
SELECTED LISTED BANKS IN GHANA**

By

Daniel Appiah-Otoo (Bachelor of Commerce)

**A Thesis Submitted to the Institute of Distance Learning, Kwame Nkrumah University
of Science and Technology in Partial Fulfilment of the Requirement for the Degree of**

MASTER OF SCIENCE IN ACCOUNTING AND FINANCE

NOVEMBER, 2023

DECLARATION

I hereby declare that this is my own work towards the award of Master of Science Degree in Accounting and Finance and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree in this University, except where due acknowledgement has been made in the text.

Daniel Appiah-Otoo
(PG9369621)

.....
Signature

.....
Date

Certified by:

Dr Joseph Oscar Akotey
(Supervisor)

.....
Signature

.....
Date

Certified by:

Prof. Kingsley Opoku Appiah
(Head of Department)

.....
Signature

.....
Date

DEDICATION

To my family

KNUST



ACKNOWLEDGEMENT

I would like to express my sincere gratitude and admiration to my outstanding research supervisor, Dr. Joseph Oscar Akotey. Under his exceptional guidance, I have been fortunate to experience an unparalleled student-supervisor relationship that has truly shaped my academic

journey. The development of this thesis has been made possible by Dr. Akotey's unwavering patience, constructive criticism, and genuine passion for my success. I am truly grateful for the time and dedication he has invested in me, and I consider myself fortunate to have had the privilege of being his student.

I would also like to express my sincere thanks to all the lecturers at the Institute of Distance Learning (IDL) for their valuable guidance and support throughout my studies. Their competence and dedication have been crucial in forming my knowledge and comprehension of the subject matter. I am deeply grateful to my family for their unwavering prayers, patience, understanding, and constant encouragement. Their support has been an immense source of strength and motivation throughout this academic journey. May God continue to bless them abundantly and reward their sacrifices with multiplied blessings.

ABSTRACT

The study examines the effect of credit risk factors on financial performance. Selected listed banks in Ghana were chosen as the demographic for this research. Purposive sampling was used in this study to sample 9 listed banks in Ghana. Secondary data was gathered through annual reports submitted by companies for the period (2010-2021). A Pooled OLS and Random effect method of estimation were adopted to estimate the parameters involved in the study objectives. This finding supports the hypothesised negative relationship between nonperforming loans and financial performance. Due to the negative correlation between NPLs and financial performance, commercial banks would rather fund long-term investments with clean loans. According to the results, financial institutions prefer to invest retained earnings in the acquisition of new assets, and they want the total number of loans to be sizable and free of defects. The implications of this research for researchers, professionals, and policymakers are extensive. By conducting a thorough analysis of client data and information throughout the credit analysis process, bank management can reduce the possibility of information mismatch. Similarly, management should invest in robust credit information systems to eliminate

knowledge gaps and enhance access to complete, accurate, and trustworthy borrower data. Moreover, bank management must employ efficient methods for managing the loans they currently hold. To ensure operational efficiency ratios and capital adequacy, however, authorities must closely monitor changes in cost-to-income ratios and the capital position of banks. In particular, regulators must create laws and tracking mechanisms that sound the alarm when the proportion of non-performing loans at a bank reaches an unsustainable level and the bank is likely to fail.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
LIST OF FIGURES	vii
ACRONYMS	vii
CHAPTER ONE	1
INTRODUCTION	1
1.0 Background of the Study	1
1.2 Problem Statement	4
1.3 Objectives of the Study	6
1.4 Research Questions	6
1.5 Significance of the Study	6
1.6 Scope of the Study	7
1.7 Brief Methodology	7
1.8 Organisation of the Study	8
CHAPTER TWO	8
LITERATURE REVIEW	8
2.0 Introduction	8

2.1 Conceptual Review	8
2.1.1 Credit Risk.....	8
2.1.2 Bank Credit or Credit Facilities.....	9
2.1.3 Loan Loss Provision (LLP)	10
2.1.4 Asset Quality	11
2.1.5 Bank Performance	11
2.1.6 Credit Risk and Bank Performance	12
2.2 Theoretical Review	12
2.2.1 Pricing Theory.....	13
2.2.2 Anticipated Income Theory	14
2.2.3 Information Asymmetry	15
2.3 Empirical Review.....	16
2.3.1 Asset Quality on Bank Performance	16
2.3.2 Loan Loss Provision on Bank Performance	17
2.3.3 Capital Adequacy on the Performance of Banks.....	18
2.4 Conceptual Framework	20
2.5 Summary	21
CHAPTER THREE	21
METHODOLOGY	21
3.1 Introduction	21
3.2 Research Design.....	21
3.3 Population of the Study	22
3.4 Sample Size and Sampling Technique	22
3.5 Data Collection.....	22
3.6 Data Analysis.....	23
3.7 Model Specification	23
3.7.1 Diagnostic Testing	24
3.8 Variables Description and Measurement.....	25
3.9 Chapter Summary.....	27
CHAPTER FOUR	28
RESULTS AND DISCUSSION	28
4.0 Introduction	28
4.1 Descriptive Statistics	28
4.2 Correlation Analysis.....	30
4.3 Diagnostics Test	34

4.4 Regression Analysis	35
4.5 Discussion	37
4.5.1 The Effect of Non-Performing Loans (NPL) on Financial Performance	38
4.5.2 The Effect of Capital Adequacy Ratio (CAR) on Financial Performance	39
4.5.3 The Effect of Loan Loss Provision (LLP) on Financial Performance.....	40
CHAPTER FIVE	41
SUMMARY, CONCLUSION AND RECOMMENDATION	41
5.0 Introduction	41
5.1 Summary of the Study	41
5.1.1 The Effect of Non-Performing Loans (NPL) on Financial Performance	41
5.1.2 The Effect of Capital Adequacy Ratio (CAR) on Financial Performance	42
5.1.3 The Effect of Loan Loss Provision (LLP) on Financial Performance.....	42
5.2 Conclusion.....	43
5.3 Recommendation.....	44
5.4 Limitations for Future Study	45
REFERENCES	45

LIST OF TABLES

Table 4.1 Descriptive Statistics	29
Table 4. 2 Correlation Results	32
Table 4. 3 Diagnostics Test	35
Table 4. 4 Pooled OLS Estimates	35
Table 4. 5 Random Effect Estimates.....	36

LIST OF FIGURES

Fig. 2.1 Conceptual Framework.....	21
------------------------------------	----

ACRONYMS

BIS	Bank for International Settlements
CAR	Capital Adequacy Ratio
CR	Credit Risk
CV	Coefficient of Variation
GDP	Gross Domestic Product
GLS	Generalised Least Squares

GSE	Ghana Stock Exchange
KPMG	Klynveld Peat Marwick Goerdeler
LAR	Loans and Advances Ratio
LLP	Loan Loss Provision
NIM	Net Interest Margin
NPA	Non-Performing Assets
NPL	Non-Performing Loans
OLS	Ordinary Least Squares
ROA	Return on Asset
ROAE	Return on Average Equity
ROE	Return on Equity



CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

The primary source of income for the banking sector is interest on bank-issued loans (Caruso Gattone, Fortuna and Battista, 2021). However, there is always a risk involved when precautions are loosened to the point where (any and all) customers are given loans without the essential precautions to recover the loans (Caruso et al., 2021). Credit risk is one of the greatest threats a bank faces when providing customers with financial services (Noomen and Abbes, 2018; Caruso et al., 2021). Globally, banks have resorted to credit risk management in order to safeguard their balance sheets and depositors' funds. Relaxed regulatory procedures naturally lead to a perception of institutional governance failure or, more generally, systemic market failure (Jackson and Tamuke, 2022).

However, the risks associated with credit become especially high during times of crisis because of non-performing loans (NPL). Countries were worried about persistently high NPL ratios following the 2008-2012 crisis, and the covid-19 pandemic has the potential to bring that problem back (Ari, Chen, and Ratnovski, 2020). The covid-19 pandemic, according to other scholars (Žunić, Kozarić and Dželihodžić, 2021; Apergis, 2022), will likely cause or has already caused a surge in non-performing loans at financial institutions. Feyen, Gispert, Kliatskova and Mare (2021) attribute this development to the relaxation of monetary and fiscal policies following the covid-19 event.

Credit risk is the propensity for total or partial loan loss due to the incapability to make timely payments (Buchory, 2021). Typically, a risk is an uncertain occurrence that could affect the business plan. In other words, the risk is the possibility that quantifiable damage, injury, liability, loss, or any other negative occurrence may occur as a result of external or internal

exposure that could be avoided if the appropriate precautions are taken. (Boateng, 2020). The instability of governance and a general absence of a credit monitoring system are contributors to banks' elevated credit risk (Munangi and Bongani, 2020; Gana and Abubakar, 2022).

The inability of customers to fulfil contractual obligations by the due date can significantly hinder the banks' operations (Manz, 2019). Moreover, a high credit risk increases the likelihood that a bank will fail, putting depositors' funds at risk (Gana and Abubakar, 2022). The growing rate of bad loans is hurting Ghana's economy. When it comes to high NPLs, Ghana is placed in the top eight worldwide. In addition, a financial systemic meltdown is a distinct possibility in the event of a significant increase in nonperforming loans (NPLs) (Amoah, Asiamah and Korle, 2023).

Through the capital adequacy ratio, banks' risk can be determined. Capital adequacy is a measure of a bank's financial health that reveals the extent to which its capital can provide a cushion for its risky loans (John and Okika, 2019). The capital adequacy ratio, as stated by Mendoza and Rivera (2017), strengthens the financial security of banks and their ability to protect depositors' money. Capital adequacy consequently influences the performance of banks (Kwado, 2019). In addition, the Financial Intermediary Mechanism determines whether to accept or reject a proposal by calculating the amount of credit risk latent above and below the credit application's limits. An efficient credit management system provides the necessary framework for such decisions (Nigussie, 2021).

The stability of the financial sector is essential for the economic development of every nation. The global economic crisis (Pandemics in the 20th and 21st centuries) posed a threat to global financial stability (Wullweber, 2020; Kapustian, Petlenko, Ryzhov and Kharlamova, 2021). The vital function of banks might be jeopardised by internal and external factors including incompetent management, lax oversight, and economic downturns (Naili and

Lahrichi 2022). The most significant danger to a bank's long-term viability and profitability comes from credit risk (CR) (Caruso et al. 2021).

As the percentage of non-performing debt increases, many banks start to struggle. In the fourth quarter of 2017, the Ghana Commercial Bank acquired Capital and UT Banks in part because of the increasing rate of non-performing loans. Unibank was acquired by the Bank of Ghana and entrusted to the management of Klynveld Peat Marwick Goerdeler (KPMG) in the first quarter of 2018. The Central Bank of Ghana merged five financial institutions into one in the second quarter of 2018. Increasing numbers of NPLs were a primary factor in these violations. The high rate of non-performing loans (NPLs) in Ghana is a major factor in the country's financial institutions being in distress (Amuakwa-Mensah et al., 2017).

The financial sector of Ghana contributes remarkably to the country's GDP and the global competitive economy (Dunyoh, Ankamah and Kosipa, 2022). The creation of credit is the primary source of income for banks, but both parties involved face enormous risks in this operation. By providing loans to individuals and businesses, Ghana's financial sector boosts economic growth (Dunyoh, Ankamah and Kosipa, 2022). Compared with the Nigerian banking sector which has also attained great importance, the economic environment and its effects play a preponderant role in the provision of credit facilities (Soyemi and Olawale, 2019). Banks in Nigeria are particularly vulnerable to credit risks, or the possibility of financial loss as a result of borrowers' failure to repay loans or other types of credit (AkinboBalogun, 2022; Binawa and Ihendinihu, 2018). Long-term non-performance of banks is experienced when the ratio of non-performing loans held by banks continues to rise with no sign of abating (Wan, 2018).

Some researchers find positive and some negative relationships between credit risk and the performance of banks which proves incoherent findings. Studies have shown that credit risk and bank performance are positively related (Gadzo, Kportorgbi and Gatsi, 2019; Ghenimi, Chaibi and Omri, 2017; Ekinici and Poyraz, 2019), while others indicate a reverse (Taiwo et al.

2017; Li, K., Niskanen and Niskanen, 2018). Due to the recent covid-19 pandemic, it has become incumbent to identify the various credit risk indicators and how it impacts bank performance while deciding on maximising profitability and minimising the risk of the banks.

1.2 Problem Statement

Banks, like other financial organisations, are vulnerable to a wide range of threats, including those related to currency, credit, operations, liquidity, interest rates, and politics. A bank's potential for failure may be largely attributed to credit risk (Ekinci and Poyraz, 2019). The asset-liability structure of economies, whether small or large, makes credit risk the primary driver of systemic crises (Uquillas and Tonato, 2022). The health of the banking sector is vital to sustaining economic stability since it is a primary engine of economic growth and development (Abdelaziz et al., 2020). Banks provide a significant portion of the economy's funding, so it's important for policymakers to understand what it takes to keep the banking industry healthy while still making a profit (Ghosh, 2017). Due to the significance of bank stability, numerous studies have examined the significant relationship between credit risk and bank performance in various countries (Abdelaziz et al., 2020; Ghenimi et al., 2017; Taiwo et al., 2017; Chi and Li, 2017; Gadzo, Kportorgbi, and Gatsi, 2019).

Bank failures have been caused by both external (macro) reasons like deregulation, lack of knowledge among bank clients, banking industry homogeneity, and government and political interferences, and internal (micro) ones including irresponsible lending, corruption, fraud, strong competition, and management flaws (Isik, and Uygur, 2021; Feghali, Mora, and Nassif, 2021; Danaan, 2019). According to the available literature, the leading causes of business failure are ineffective risk management and the inability to use prudential categorisation and risk assessment techniques (Danaan, 2019; Zekos, 2021). A good credit risk assessment and the necessity to accurately anticipate financial failure have been highlighted by the current covid-19 epidemic.

According to Amoah, Asiama, and Korle, (2023), the major causal factor which led to the confiscation of Capital and UT Banks by the Ghana Commercial Bank, as well as the collapse of five banking institutions into the consolidated bank by the Central Bank of Ghana infringements was rising levels of NPLs. Unibank was given to Klynveld Peat Marwick Goerdeler (KPMG) to manage. Other scholars have proposed that non-performing loans due to covid-19 possess a threat to higher non-performing loans in various economies (Ari et al., 2020; Žunić, Kozarić and Dželihodžić, 2021; Apergis, 2022).

Although several studies have concluded that the pandemic has worsened either nonperforming loans or loan defaults (Ari et al., 2020; Žunić, Kozarić and Dželihodžić, 2021; Apergis, 2022; Koulouridi et al., 2020; Aldasoro et al., 2020; Korzeb, and Niedziółka, 2021). Ra'fat and Al-Qatu (2020) discovered that a rise in credit risk during the covid-19 pandemic has a negligible impact on the profitability of banks and recommended that banks increase their lending levels because the pandemic has a negligible impact on borrowers' credit risk. Furthermore, Katusiime (2021) also finds that the covid-19 pandemic has a significant negative effect on bank profitability only in the long run.

As a result, Ra'fat and Al-Qatu (2020) recommended that banks increase their lending levels because the covid-19 pandemic has a negligible impact on the credit risk of borrowers.

Consequently, the purpose of this study is to examine the credit risk variables in light of COVID-19 and bank performance in order to enhance the Ghanaian bank's ability to make accurate customer classifications and credit risk assessments, thereby enhancing management decisions to either increase lending activities as recommended by Ra'fat and Al-Qatu (2020) or not.

In order to appropriately categorise, differentiate, and analyse a customer's or applicant's credit risk in the wake of the pandemic, the research also evaluated the influence of credit risk on

banking performance. In addition, evidence regarding the pandemic's effect on the net income margins of banks is scant. Although Mohammad, Fatima, and Imran (2022) made use of net income margin, their study was not focused on credit risks but on bank spread. In order to determine how the pandemic influenced the effect of credit on bank performance, this study includes, among other proxies for measuring bank performance, Net Income margin.

1.3 Objectives of the Study

The objective of this study is to examine the impact of credit risk (Non-performing loans, loss loan provision and capital adequacy ratio) on the bank performance of selected listed banks in Ghana for the period of 2010 to 2021, while specific objectives are as follows;

1. To examine the effect of credit risk on banks' equity returns.
2. To evaluate the effect of credit risk on banks' asset returns.
3. To evaluate the effect of credit risk on banks' net interest margin.

1.4 Research Questions

1. What is the effect of credit risk on banks' equity returns?
2. What is the effect of credit risk on banks' asset returns?
3. What is the effect of credit risk on banks' net interest margin?

1.5 Significance of the Study

The purpose of this study is to analyse the relationship between credit risk and bank performance. The findings provide education to bank managers on the impact of credit risk on bank performance in light of covid-19. Additionally, the study aid banks in making datadriven decisions regarding their risk-taking behaviours. Finally, the study fills the void in existing literature regarding the influence of covid-19 and credit risks on net income margin.

1.6 Scope of the Study

The main purpose of the study is to examine the impact of credit risk (Non-performing loans, loss loan provision and capital adequacy ratio) on the bank performance of selected listed banks in Ghana for the period of 2010 to 2021. A Panel dataset was drawn from the financial reports of nine (9) listed banks on the Ghana Stock Exchange (GSE) between 2010 - 2021. This is due to the fact that panel data provide a chance to investigate these changes. The nine (9) listed banks were conveniently chosen based on the accessibility and availability of their annual financial reports within the period under study.

1.7 Brief Methodology

This study used a panel research design, utilising quantitative approaches. A panel study design is mostly ideal for this study because of its ability to measure some variable or variables of interest at more than one point in time Butt and Butt (2018) which is in line with the population of the study (financial reports of 9 listed banks on the Ghana stock exchange over the period of 2010 - 2021). Quantitative approaches have been employed in this study due to the aim of the study which is to establish the effect of credit risk on bank performance in Ghana. Furthermore, Nardi (2018), ascertains those quantitative approaches are used to establish relationships. The data source for this study includes secondary data. A Panel dataset was drawn from the financial reports of nine (9) listed banks on the Ghana Stock Exchange (GSE) between the period of 2010 - 2021. This is due to the fact that panel data provide a chance to investigate these changes. The nine (9) listed banks were conveniently chosen based on the accessibility and availability of their annual financial reports within the period under study (2010 - 2021).

Financial performance and credit risk indicators were included as variables in the investigation. Three accounting indicators, including Return on Asset (ROA), Net Interest Margin (NIM), and Return on Equity (ROE), are used to operationalise financial performance. The research used a panel regression model, which combines data from many periods on a single cross-

sectional unit to get reliable and accurate estimations (Hsiao, 2022). In order to examine the connection between the credit risk factors and the bank performance variables utilised in the research, the generalised least squares (GLS) panel regression model is used. This method eliminates the issues of heteroscedasticity and autocorrelation (VO, 2019).

1.8 Organisation of the Study

The study is organised into five chapters. The first chapter introduces the study by providing a detailed background, a statement of the problem, objectives, the significance of the study, and a brief literature review. Furthermore, a detailed literature review was provided in the second chapter. The third section heightens the methodology of the study, which study design used, the source of data, and the analysis. The fourth and fifth chapter presents the findings and discussion with other studies and conclusion with recommendations respectively.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This study articulates the key concepts, theories, or models and scholarly contributions relevant to the theme under discussion. The literature is centred on credit risk and bank performance and other studies done in this context. The literature review encompasses the following; the conceptual definitions and framework, theoretical literature, and empirical studies.

2.1 Conceptual Review

2.1.1 Credit Risk

Credit risk is a financial risk that, if not managed properly, can lead to the downfall of a bank (Wang, Ding, Yu and Zhao, 2020). Therefore, according to the Bank for International Settlements (BIS), credit risk must be identified, monitored, measured, and appropriately

handled to guarantee that the credit risks on loans are adequately valued to attain the planned goals of returns from the information gathered during loan documentation (Kithinji, 2010). Credit risk, according to Khafid and Anisykurlillah (2020), is the potential for financial loss resulting from credit customers' failure or inability to make timely payments in full. When a customer (borrower) fails to pay back the debt when it is due, the bank is exposed to credit risk. Any inadequacy in the management of this risk, often known as "counterparty risk," might lead to financial hardship for the bank. According to Naomi (2011), credit risk is reflected in the potential for a negative impact on net income due to customers' failure to or delay in making payments on a credit facility. The risk that a bank counterparty may not live up to its obligations under the terms of an agreement is what the Basel Banking Supervision

Committee calls "credit risk" (Ekinci and Poyraz, 2019).

2.1.2 Bank Credit or Credit Facilities

Overdrafts and loans are the two most common kinds of bank lending, but Abdullahi Rufai's (2013) definition of credit facilities expands this to include all the different loan portfolios offered to customers of commercial banks. Additionally, he divided these credit lines into four distinct types: short-term, medium-term, long-term and secured or unsecured credits.

Short-term - This sort of credit facility has a one-year payback period. The money is put to good use by being put toward the company's working capital needs, which in this case means growing the firm as it is now. Commercial credits, overdrafts, and call/demand credits are all kinds of such examples.

Medium-term- When referring to bank loans, Samuel (2015) defined "medium-term" as those with maturities of more than a year but less than five years. Investment or acquisition of capital assets that provide an appropriate return during the credit period is obligatory. This can be seen in Funding for Expenditures and Letters of Credit.

Long-term - The growth of fixed assets can be financed using this loan arrangement, as per Rufai (2013). It's a big chunk of money that's normally due back after five years. Commercial credit, leasing credit for machinery and equipment, and stock replacement credit are all instances of this type of credit.

Secure and unsecured- Credit is extended by financial institutions in exchange for collateral in the form of physical assets pledged by borrowers in favour of lenders. Collateral securities' are the pledged assets. Secured Credits are credits extended in exchange for the supply of collateral security. Credits extended to consumers without requiring collateral are referred to as "Unsecured Credits." Further, Samuel (2015) argues that these credit categories will ultimately be divided into two groups: performing loans and non-performing loans. He defined performing loans as those that have been repaid in full and on time by the borrowers without any defaults. Loans that are not repaid by their due date, as defined by Abdullahi Rufai (2013), are considered non-performing loans. He classified these troubled loans as either dubious debts, bad debts, or losses.

2.1.3 Loan Loss Provision (LLP)

Ajekwe et al. (2017) define LLP as a non-cash expenditure that banks incur in order to consider the potential for future losses due to poor loans. The bank anticipates that a certain percentage of the loans will default. When a bank fails, this procedure ensures that its assets will be liquidated and its capital will be preserved (Ajekwe et al., 2017). The financial institution plans to account for reserve losses by treating losses as costs. The term "loan loss provision" is used to describe the percentage of a bank's net revenue that is set aside in case a loan goes bad or the bank can't make good on a loan. Taking into account potential loan losses is a standard part of financial reporting and is typically authorised by banking laws. Management employs this technique to control costs and increase revenues in future endeavours. A number of studies

have shown that banks may improve their profit margins by using loan loss provisions (Shawtari, Saiti, Razak and Ariff, 2015; Leventis and Dimitropoulos, 2011).

2.1.4 Asset Quality

Asset quality, also known as loan quality, is the level of risk associated with a person's or a business's holdings of different types of property as described by Ombaba (2013). Financial institutions frequently employ this word when calculating the amount of their assets that might be lost due to unforeseen circumstances. Loans and advances are the most prevalent types of bank assets that need an exact assessment of asset quality. Banks may increase their return on loans and decrease their failure costs by focusing on improving loan quality, but doing so comes with a cost that must be carefully managed (Khalid, 2012). Non-Performing Assets (NPAs) are a big problem in the banking industry. Non-Performing Assets are Loans whose borrowers have not repaid their loans. Digal and Kanungo (2015) stressed that NPA in loan portfolios affect operational efficiency which in turn affects the profitability, liquidity and solvency position of banks (Ombaba, 2013). Asset quality is a major predictor of financial institution performance since it impacts interest income while lowering the cost burden of bad debt management as required by law. Cash reserves are an allowable business expenditure that banks must maintain to cover potential losses due to loan defaults. Asset quality is low when the NPA ratio to gross/net assets book is high and vice versa; this indicates a negative trade-off between asset quality and financial performance (Ombaba, 2013).

2.1.5 Bank Performance

The concept of bank performance is usually focused on the grounds of profitability, competitiveness, concentration (market share), and efficiency (Saleh et al, 2020). These are largely grouped into financial and non-financial performance. Whilst the financial performance of banks empirically entails the Return on Asset (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), the non-financial performance is usually proxied with service quality

and Board leadership (Tao, Su, Yaquooob and Hammal, 2021). Financial performance thus becomes the profitability measure of a bank's efficiency per its ability to generate earnings relative to operating cost, shareholder dividend requirement, and prevailing macroeconomic fundamentals. The non-financial performance probes more into how well the leadership of the bank is structured and composed to positively affect change in growth.

2.1.6 Credit Risk and Bank Performance

Banks make money by extending huge amounts of credit to customers. Nonetheless, there is a substantial level of credit risk involved in this endeavour. Credit risk occurs when a financial institution's debtors do not pay their bills when they are supposed to (Accornero et al., 2018). The profitability of the banking industry suffers when there are a high number of loan defaulters. Siddique, Khan and Khan (2021) warned that a lack of efficient credit risk management might trigger banking instability and perhaps a financial crisis. According to Siddique et al. (2020), Non-Performing Loans (NPL) are connected to information asymmetry theory, main agency theory, and credit default theory. There is a danger that banks or financial institutions may be declared bankrupt if asymmetric information, such as unequal distribution of knowledge regarding large NPLs, is disseminated. It has been suggested by Pickson and Opare (2016) that the governing body makes a clear distinction between corporate ownership and management interest. There is competition for promotions, raises in compensation, and stock options for management since each company has different priorities. Profitability in the banking industry is improved by the prudent management of credit risk and non-performance exposure. Ensuring that businesses have access to sufficient working capital, promotes the growth of the banking sector (Ghosh, 2015).

2.2 Theoretical Review

The study was underpinned by information asymmetry theory, loan pricing theory and anticipatory income theory.

2.2.1 Pricing Theory

Ross (1976) pricing theory provides an intriguing look into the topic of credit risk assessment. Loan pricing is the process of establishing the interest rate that will be charged for the granting of a loan. This is done by the book-runners and is often expressed as an interest spread (margin) over the base rate (Tanimori, 2019). For the purpose of assigning a price to a syndicated loan, the arrangers need to analyse the credit risk that is inherently associated with the loans and determine the appetite of the lenders for taking on that risk. The notion of loan pricing in the banking sector proposes that banks maintain permanently high lending rates. Given the difficulty in identifying a borrower's profile at the outset of a banking relationship, Olokoyo (2011), banks should think about the issues of adverse selection and moral hazard. According to Chodecal (2004), most borrowers exhibit moral hazard after receiving loans or advances and begin engaging in riskier endeavours. Loan pricing affects the total amount of loans made available. Credit risk is increased in the event of loan default if sufficient due diligence is not performed to identify moral hazard activities. High-interest rates on loans have the potential to create an adverse selection problem by luring only the most risk-averse borrowers to the market. This might lead to fewer loan products being offered and more client concentration, both of which considerably raise credit risk. Banking institutions use credit default spreads to evaluate borrowers' credit risks to set market-based lending interest rates. To determine the interest rate to use in financing a loan, it is a common practice to first compare the loan in question to other loans that have closed recently ("comps"). Borrowers in the same sector, nation, and size with a similar credit rating are used to define a comparable agreement that requires a standard market rate of return. The cost of funding for a bank, and consequently the interest rates that it charges on loans, are directly influenced by the bank's credit rating. Banks that have a high credit rating typically have easier access to money at lower costs in the debt markets, as well as reduced counterparty margins in the swap and foreign exchange markets.

Borrowers might benefit from cheaper loan pricing as a result of the decreased cost of financing, which could be passed on to them.

2.2.2 Anticipated Income Theory

The Anticipated Income Theory was created in 1944 by H.V. Prochnow utilising the practise of US commercial banks. The idea behind this concept is that banks should plan the repayment of a term loan (a loan with a maturity of one to five years) based on the borrower's projected revenue, independent of the form and character of the business. This idea places an emphasis on the bank's capacity to advance a loan based on the amount of income that the borrower anticipates receiving either in the short term or in the long term (Mann, 2022). The bank will often base its loan terms, especially the long term, on the borrower's projected income. The borrower repays the bank over time rather than all at once by foregoing some of his or her future income. A higher loan amount is approved by the bank if repayments are consistent and will be made when due. Since bank management can now plan its credit based on predicted income, the bank will be better able to manage its credit risk. The "cash flow approach" to financing is another common name for this method. Because it achieves all three of these goals liquidity, safety, and profitability this theory has replaced the commercial loan theory and the shiftability theory. Also according to this theory, financial institutions should be able to make available long-term credit, wherein both the loan's principal and interest are paid back over a certain period. Bank performance demands might be met thanks to the customer's payback plan. The Anticipated Income Theory's flaw is that it does not account for the likelihood of debtor failure on credit owing to external or internal circumstances, assuming instead that all loans can be invoiced at the planned time.

Mismanagement or lack of qualified workers is examples of internal causes.

2.2.3 Information Asymmetry

George Akerlof introduced the term information asymmetry in 1970. The theory of asymmetric information indicates that sellers may hold more information than buyers, which can distort the price of the commodities that are sold. In a credit relationship, the bank has a problem with information asymmetry because it is hard to figure out the credit risk. Stiglitz (2002) defines information asymmetry as a scenario in which one participant in an economic transaction has more information than the other. Spence (1973) suggests an assumption that is better grounded in reality as a means of supporting the notion of asymmetric information. According to his point of view, one side of a transaction almost always has more information than the other. It is not uncommon for a borrower to be more knowledgeable than the lender on the borrower's capacity to repay a loan that has been obtained. In a similar vein, the person selling the goods has a better understanding of the level of quality it possesses compared to the one purchasing the thing. The directors of a firm have access to more information than the shareholders do on the real performance of the company. Additionally, consumers have a greater awareness of the risks they face than the insurance provider. It is far easier for a bank to evaluate the likelihood of a borrower defaulting on a loan by looking at past data. This is possible that a lack of information might cause a bank to make poor lending decisions right from the beginning of the loan application procedure. There is a possibility that the presence of asymmetric information will lead to an influence on the financial performance of banks caused by credit risk. Both borrowers and financial institutions view information asymmetry differently. Quality borrowers, for instance, worry that adverse selection may result in their loan applications being turned down. The actions of borrowers and the information that they conceal are primary contributors to the rise in the amount of credit risk that banks are exposed to.

2.3 Empirical Review

2.3.1 Asset Quality on Bank Performance

Robin, Salim and Bloch (2018) compare the profitability of Bangladeshi commercial banks before, during, and after a period of financial reform from the period 1983-2012 and a panel data regression approach. It appears from the data that the Net Interest Margin (NIM) of banks has grown, but the Return on Assets (ROA) and Return on Equity (ROE) have not changed much as a result of financial reform. These findings also show that strong capitalisation and high-quality assets are primary contributors to financial performance. Consequently, a healthy banking system in Bangladesh requires an effective banking strategy focused on increasing capital base and asset quality.

Vighneswara (2015) evaluated the factors of bank asset quality and profitability in India from 1997 to 2009 using panel data techniques. The study's results provide a distinct interpretation that runs counter to common wisdom. Priority sector credit was shown to not significantly influence non-performing assets, and the same was true for rural branches, suggesting that aversion to rural lending is a poorly founded belief. The rate of bad debts is more closely tied to the health of the industry than any other economic factor. In addition, the quantity of a bank's assets has no bearing on its profitability, although capital adequacy and investment activity do.

Lucky and Nwosi (2015) investigated the link between asset quality and profitability for the fifteen (15) listed commercial banks in Nigeria from 1980 to 2013. The data was analysed using multiple regressions from the econometric view statistical software. According to the regression result, commercial banks' ROE improves as the share of non-performing loans to total loans and non-performing loans to total customer deposits increases, but ROE decreases when the share of loan loss provisions to total loans and ROA decreases. This shows that there is a considerable association between asset quality and the profitability of the commercial banks.

Khalid (2012) investigated the influence of asset quality on the profitability of private banks in India using Return on Asset as a profitability variable from 2006 to 2011. The sample banks' operating performance is calculated using financial measures. The study used multiple regression models to test the hypothesis that a positive relationship exists between a bank's asset quality and its operational performance. After accounting for the impact of operational size, conventional banking business concentration, and the idle fund ratio, the conclusion demonstrated that a poor asset ratio is inversely related to banking operating performance. The findings provide further evidence for the assumptions that the quality of pre-approval loan processing activities has a direct correlation to the quantity of non-value-added activities needed to resolve problematic loans and, by extension, the efficiency with which banks operate. Abata (2014) investigated the asset quality and bank performance of the six main banks listed on the Nigerian stock market during a fifteen-year period using secondary data gathered from commercial banks' annual reports (1999 – 2013). Ratios were chosen as an objective indicator of bank performance and asset quality, and data were evaluated with SPSS 17.0's Pearson correlation and regression functions. The results showed that there is a statistically significant association between asset quality and bank performance.

2.3.2 Loan Loss Provision on Bank Performance

Ahmad, Tahir and Aziz (2014) analysed how loan loss provision has affected the profitability and viability of Pakistani financial institutions. Based on the findings, the loan loss provision is a critical component in determining a bank's stability and profitability under normal circumstances. Also for their hypothesis, two results were significant and three were not when bank profitability was the dependent variable in their study.

Ahmad, Tahir and Aziz (2014) influence the effect of LLP on the stability and performance of banks operating in Pakistan. According to the findings of their research, the loan loss provision is an important factor that affects the profitability of banks. Also, a bank should have a lower

loan loss provision and higher profitability. In addition, bank deposits and their advances play an important role in the stability and profitability of banks.

Ul Mustafa, Ansari, and Younis (2012) analyse how banks in Pakistan fared after accounting for loan loss provisions. Also, their research covered the other aspects that have an impact on the profitability of the banking industry. Based on their findings, highlighted the critical role that the banks' loan loss provision plays in determining their profitability. A well-managed bank is regarded to have a reduced loan loss provision, which translates into increased profitability. Furthermore, bank deposits and loans play a key part in deciding a bank's profitability. Finally, when it comes to non-financial variables, the political instability of the preceding era has a larger impact on the profitability of present-day banks than the political instability of the present-day period.

The authors' article compares and contrasts the policies of Islamic and traditional banks with regard to the use of discretionary loan/finance loss provisions. Shawtari, Saiti, Razak and Ariff (2015) examine the potential impact of efficiency on the behaviour of discretionary loans and financing loss provisions, controlling for a variety of micro and macro factors using panel data for 16 banks (4 Islamic) used in their study, covering the years 1996-2011. The study's results demonstrate that Islamic financial institutions use loan loss provisions and financing loss provisions at their discretion to control their profitability. Also, the data revealed that efficiency had a good effect on both Islamic and conventional banks' provision for losses on discretionary loans.

2.3.3 Capital Adequacy on the Performance of Banks

Dao (2020) uses 128 data from 16 Vietnamese commercial banks from 2010 to 2017 to investigate the determinants that affect Capital Adequacy Ratio and Bank Performance as well as the connection between these two dependent variables. The results demonstrate a statistically significant relationship between the Capital Adequacy Ratio and Bank Performance, as well as

the substantial influences of loan growth, GDP growth, the equity-to-deposit ratio, and the cost-to-income ratio on two dependent variables. The research also suggests that commercial banks should take control over the important components in order to retain a suitable quantity of capital while also attaining effective performance.

In the context of the Basel II Accord's implementation in Vietnam, Nguyen (2020) looks at how capital adequacy affects bank performance. The research uses panel data regression analysis on data from 22 Vietnamese commercial banks from 2010 to 2018 to show that measures of capital adequacy, net interest margin, and non-interest revenue are positively connected with profitability indicators, whereas measures of non-performing loans and state ownership have a negative influence on bank profitability. For smaller banks in Vietnam, they show that higher capital adequacy correlates with higher returns on assets, but for larger banks, it has no discernible effect on profitability. Another key finding of the article is that the Basel II implementation has no statistically significant effect on the return on assets or return on equity of major banks, but does have such an effect on the condition of small banks.

Using a panel data model to assess their connection, Ogboi and Unuafé (2013) examine the impact of credit risk management and capital adequacy on bank financial performance (ROA) in Nigeria. The findings showed that effective credit risk management and capital adequacy impacted favourably on banks' financial performance, with the exception of loans and advances, which were shown to have a negative impact on banks' profitability over the study period. Therefore, it is suggested that Nigerian banks implement proper credit risk management measures, such as performing thorough credit evaluations prior to loan distribution and drawdown, in light of the findings.

Adu (2019) determines if and how capital adequacy affects bank performance and lending. Results from a sample of 14 financial institutions, covering the years 2008–2018, are reported using the Pearson Correlation coefficient and other bivariate descriptive statistics. According

to the results, there was a positive correlation between capital adequacy and both profitability and lending, however, this result was statistically significant only for profitability.

2.4 Conceptual Framework

The figure below (fig 2.1) diagrammatically presents the relationship between credit risk measures (Asset quality, loss loan provision and capital adequacy) independent variable section whilst Bank's financial performance is measured with Return on Asset, Return on Equity, and Net Interest Margin and forms the dependent/ regress and variable. Intuitively, credit risk and its associated measures have largely exhibited inverse but significant impact on financial performance measures since it increases the cost of operation and reduces bank's operational efficiency (Gadzo, Kportorgbi and Gatsi, 2019; Yu *et al*, 2019; Quoc Trung, 2021; Madugu *et al*, 2020) however, few studies of similar proxies have found positive and no relationship between the variables under study (Abbas, Iqbal and Aziz, 2019; Madugu, Ibrahim and Amoah, 2020). Conceptualising the link between the variables under study based on the researcher's own construct, fig. 2.1 is presented below.

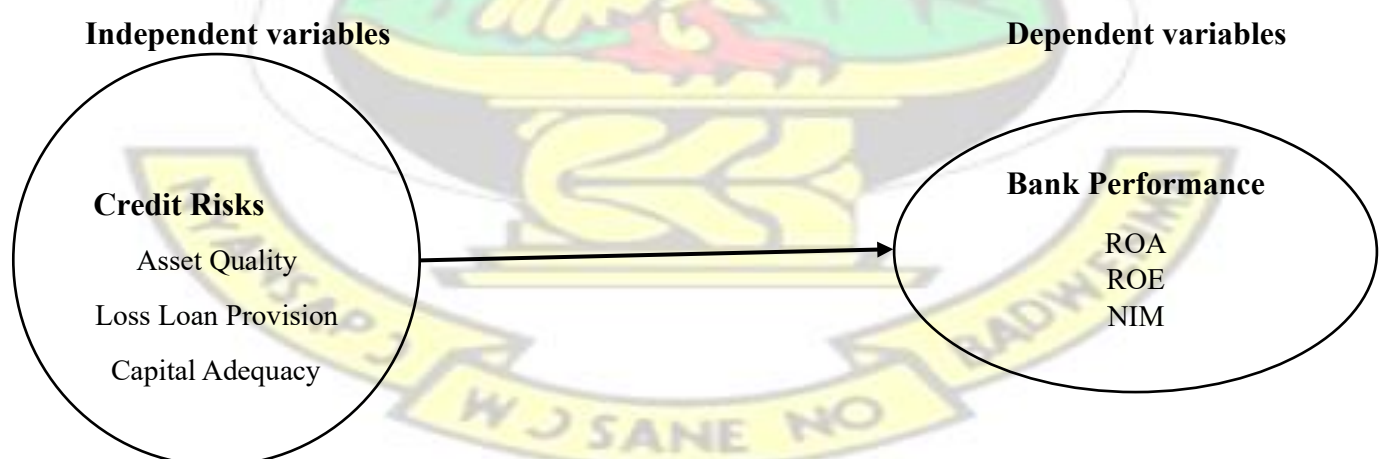


Figure 2.1 Conceptual Framework

Source: Author's construct (2023)

2.5 Summary

The study examines the influence of credit risk on banking performance. A bank's capacity to make money and grow can take a hit if its credit risk is not properly managed, which can lead to a slew of negative consequences including higher loan losses and non-performing loans. The research was underpinned by information asymmetry, pricing theory and anticipated theory. In order to determine how the pandemic influenced the effect of credit on bank performance, this study will include, among other proxies for measuring bank performance, Net Income margin.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the techniques used for data collection and analysis in order to meet the study's goal of determining how credit risk affects the performance of Ghana's listed banks from 2010 to 2021. This section begins with an exposition on the research design, data, methods, model specification, diagnostic testing, robustness checks, variables description, and measurement.

3.2 Research Design

This study used a panel research design and quantitative methods. A panel research design is generally appropriate for this investigation because of its capacity to assess some variable or variables of interest at more than one moment in time Butt (2018), which corresponds to the study's population (financial reports of nine (9) listed banks on the Ghana stock exchange over the period of 2010 - 2021). A panel design is used when researchers take measurements from the same group of people (the panel) at different times to examine changes through time (Chris, 2018). The researcher examines the identical financial reports of nine listed banks on the Ghana stock market from 2010 to 2021 in this panel study. The panel design has the benefit of allowing

the researcher to explain and draw conclusions between the years 2010 and 2021. Because the study's goal is to determine how credit risk influences the performances of banks in Ghana, quantitative methodologies were applied. According to Nardi (2018), those quantitative methodologies are utilised to build associations.

3.3 Population of the Study

The population under investigation for this study comprises the entirety of Ghana's commercial banking sector, encompassing all 23 commercial banks operating within the country. This comprehensive population forms the basis for the research's question into various variables.

3.4 Sample Size and Sampling Technique

The study's sample comprises nine (9) listed banks on the Ghana Stock Exchange, drawn from the total population of 23 commercial banks in Ghana. The sampling technique employed for this research is purposive sampling, a non-probability method chosen due to the specific focus on listed banks and their financial reports from 2010 to 2021. Purposive sampling enables the selection of banks that align with the study's objectives and allows for an in-depth investigation into the relationship between credit risk and bank performance within the chosen time frame. This targeted approach ensures the inclusion of relevant cases while maintaining the study's feasibility and focus.

3.5 Data Collection

The study utilized a secondary data from the Ghana Stock Exchange (GSE) and bank reports. The data was a processed panel data derived from the financial reports of nine (9) listed banks on GSE between 2010 and 2021. This is because panel data provides a good chance to examine these transition processes. The nine (9) mentioned banks were chosen since their yearly financial reports were easily accessible and available during the study period (2010-2021). The problems that Ghana's banking sector has had to deal with over the years, especially between 2010 and 2021, inspired this study's geographic concentration on

the nation.

3.6 Data Analysis

Financial performance and credit risk (non-performing loans) indicators were among the variables examined in the investigation. Net Interest Margin (NIM), Return on Asset (ROA) and Return on Equity (ROE) is the three regularly utilised accounting indicators that operationalise financial performance. The study used a panel regression model that pools observations on a cross-sectional unit over many periods to provide unbiased and consistent results (Hsiao, 2022). The results of the fixed effects of the panel data model were estimated using pooled ordinary least squares (OLS) regression, which could evaluate the average impact of explanatory variables on the dependent variable since all the observations are aggregated into one regression model (Kazemzadeh, Fuinhas and Koengkan, 2022).

3.7 Model Specification

According to Angela et al. (2022), the study provides a panel model for an estimate. Following the panel form of the data, the panel estimate approach is acceptable, considering the variability across different banks. The equation is specified below:

$$FP_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 LAR_{it} + \beta_4 SIZE_{it} + \beta_5 AGE_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \varepsilon_{it} \quad (1)$$

Where,

FP = Net Interest Margin (NIM), Return on Asset (ROA) and Return on Equity (ROE) are financial performance metrics.

NPL = Non-Performing Loans, CAR = Capital Adequacy Ratio, and LAR = Loans and Advances Ratio.

Control variables

SIZE = Banks' Size, AGE = The age of Bank (Years of Existence), GDP = Gross Domestic Product, and INF = Inflation

β_0 = intercept, β_i s ($i = 1, 2, 3, \dots, 8$) are the coefficients of the respective explanatory variables to be estimated, ε = error term. i = the i^{th} bank in year t .

3.7.1 Diagnostic Testing

Hausman Test: The research employs the Hausman specification test to determine if the prediction equation has fixed or random effects (1). In the Hausman test's null hypothesis, the random effect is assumed to be correct, whereas, under the alternative hypothesis, the fixed effect is assumed to be correct. A fixed effect estimate is appropriate if and only if the test statistic is significant at the conventional significance level (5%). Nonetheless, if the test statistic is small, the null hypothesis is not rejected, demonstrating that the random effect estimator is adequate.

Multicollinearity: When there is a significant degree of correlation between two or more independent variables in a regression model, a condition known as multicollinearity is said to exist (Jensen, and Ramirez, 2013). For a regression model to be accepted, it must satisfy the assumption that the predictor variables must not show multicollinearity (Daoud, 2017). The Variance Inflation Factor (VIF) is used to evaluate the level of multicollinearity in a regression model. A high VIF indicates that there is multicollinearity and therefore the model is not valid (Daoud, 2017). The Pearson correlation coefficient is also used to establish whether or not there is a high correlation between the variables in a regression model. This study used both the VIF and the Pearson correlation coefficient to ascertain the linear relationship between the independent variables in the OLS regression model.

Heteroscedasticity and Autocorrelation: The accuracy of the estimates depends on the elimination of econometric issues such as heteroscedasticity and autocorrelation. This is because of the inherent unpredictability of financial and economic data over extended periods

of time. When the variance of the error term in a panel data set changes with time, we say that the data is heteroscedastic. When there is a non-zero correlation between error terms across various time intervals, we get autocorrelation. The Breusch-Godfrey and Breusch-Pagan tests, for demonstrating autocorrelation and heteroscedasticity, respectively, are applied to address these problems. Contrast this with the Breusch-Pagan test, where the null hypothesis asserts that there is no heteroscedasticity and the alternative hypothesis asserts that there is. The hypothesis that there is a zero correlation between the error terms is the basis of the Breusch-Godfrey test. The null hypotheses are rejected if these tests' statistics are significant at the 5% level, and accepted otherwise.

3.8 Variables Description and Measurement

“Net Interest Margin” (NIM), “Return on Asset” (ROA), and “Return on Equity” (ROE) are used to assess the dependent variable, financial performance, in this analysis. For this reason, this investigation makes use of these signs. Return on Asset (ROA) is less susceptible to the type of short-term innovation or manipulation that may occur on income statements since many assets involve long-term asset decisions that are more difficult to modify in the near term. The rate of ROA, asserted by Mohammed and Samuel (2017), is the most reliable indicator of future profits. The Return on Assets (ROA) is the most used metric for judging a business's performance, and for good reason (Mohammed and Samuel, 2017). Net interest income (NIM) (the gap between interest revenue and interest expense) is compared to average earning assets to determine the net interest margin. It has been shown by Shelagh and Xiaoqing (2010) that NIM is a superior measure of profitability compared to other common metrics like ROA and Return on Average Equity (ROAE). It is possible to quantify the return on equity (ROE) throughout the course of each fiscal period. Profit made on the bank's equity (capital) may be evaluated by its shareholders through ROE (net income/equity) ratio (Samir, et al., 2020).

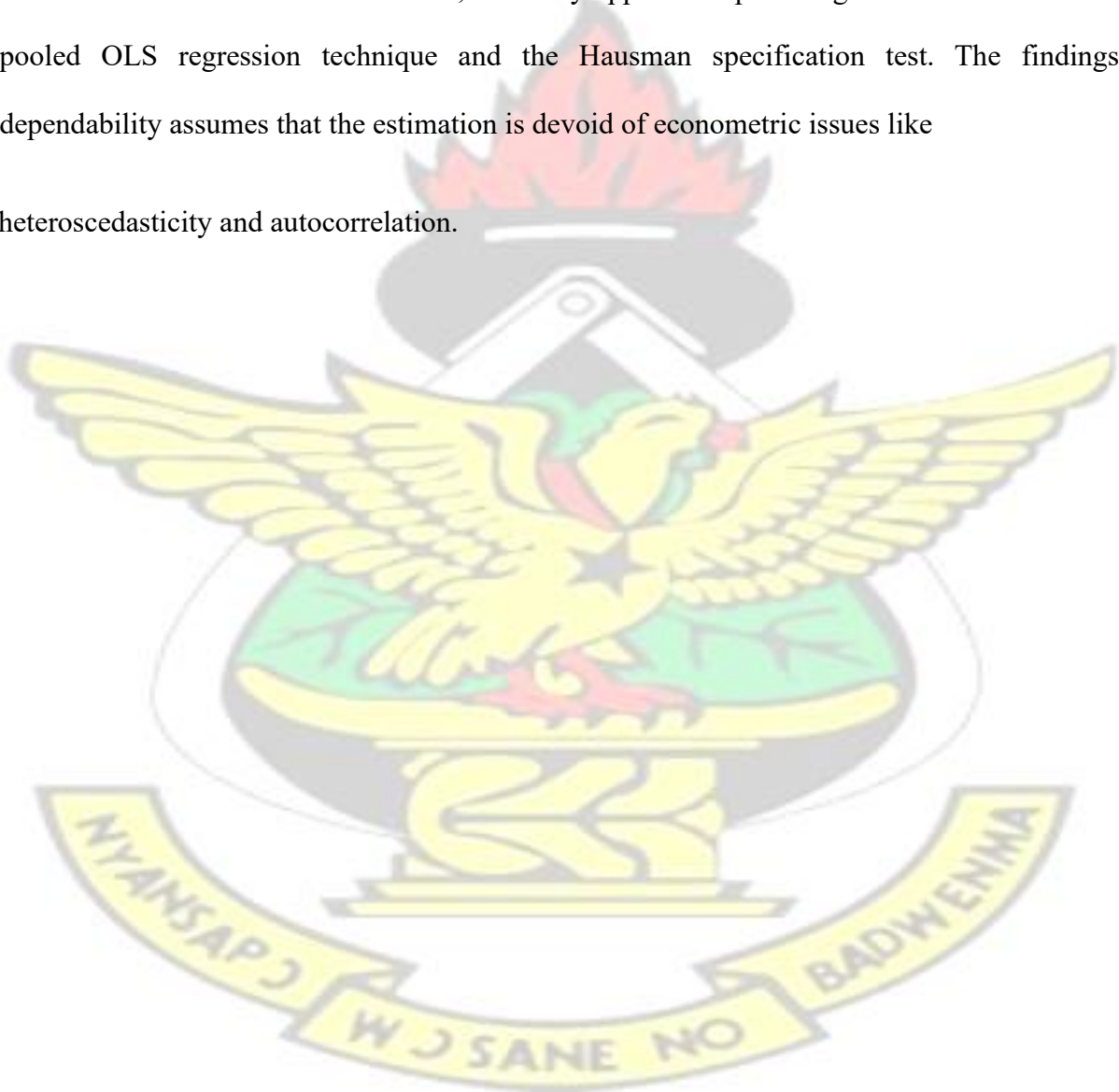
Independent factors suggest that non-performing loans are a primary measure of credit risk for commercial banks. You may get the percentage of non-performing loans by dividing the entire volume of a bank's loans by the percentage of defaults. This study suggests that banks' bottom lines suffer when they have non-performing loans. This is because the bank's financial performance looks to be negatively affected by the increased percentage of loans that go unpaid.

One way to quantify a financial institution's size is to take the natural logarithm of its total assets. There is a prevalent practice in the banking industry of referring to a bank's size as a proxy for the possible benefits or drawbacks of economies of scale. The study found that larger banks fared better financially. This is due to the fact that larger banks are more likely to reap the performance benefits of economies of scale and diversification possibilities. A bank's age may be estimated based on how long it has been in business. That's a reflection of the bank's years of service, too. The positive correlation between age and a bank's financial success has been predicted by studies (Angela, et al., 2022).

Interest rates set by the central bank or other monetary authority to influence the growth of important monetary variables in the economy are collectively referred to as the Monetary Policy Rate or the Policy Interest Rates such as exchange rate or credit expansion, and consumer prices, among others. All other interest rates in the economy follow the policy interest rate, which is the cost for private players, mostly private banks, to borrow money from the central bank. Thereafter, the banks would provide their clients with a selection of financial products, the interest rates of which would normally be tied to the policy rate. Inflation refers to the average annualised rate of growth in prices across a broad range of goods and services (IMF, 2022).

3.9 Chapter Summary

The study aims to investigate the influence of credit risk on the performance of Ghana's listed banks from 2010 to 2021. This study used a panel research methodology, quantitative techniques, and secondary data from the financial reports of nine (9) listed banks on the Ghana Stock Exchange (GSE) from 2010 to 2021. ROA, NIM, and ROE, as well as credit risk indicators, were used to analyse financial performance (non-performing loans). To pick between the fixed and random effects, the study applies the panel regression model with the pooled OLS regression technique and the Hausman specification test. The findings' dependability assumes that the estimation is devoid of econometric issues like heteroscedasticity and autocorrelation.



KNUST

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter addresses the presentation and interpretation of the results of the research analysis. Following are variable descriptions, correlations between variables, diagnostic tests, and model estimates. This is followed by a discussion of the findings in the context of current literature and theories.

4.1 Descriptive Statistics

Descriptive statistics were chosen because they enable data to be summarised based on frequency and percentage. Using frequency and percentage distributions, descriptive statistics have been shown to give researchers confidence and insight into the nature of their raw data (Garson, 2012). Danso et al. (2019) argue that researchers can also utilise other types of descriptive statistics such as histograms, box plots, frequency polygons, bar charts, pie charts, and scatter diagrams to elaborate on the ideas behind their studies. The researcher in this study, however, made use of measures of central tendency (mean, coefficient of variation (CV), and standard deviation) to classify the variables.

Table 4.1 Descriptive Statistics (The sample size was nine (9) banks in the Ghana stock exchange with 108 observations)

Variables	Mean	Std. Dev.	Coefficient of Variations	Minimum	Maximum	Observation
ROA	2.143	6.939	3.238	-3.70	7.50	108
ROE	15.738	13.533	0.859	2.01	28.90	108

NIM	0.210	0.408	1.942	0.86	30.20	108
NPL	1.290	1.025	0.794	0.41	49.29	108
LLP	0.368	0.183	1.313	3.29	12.84	108
CAR	0.539	0.499	0.925	6.52	18.94	108
SIZE	30.717	6.824	0.221	15.95	29.04	108
AGE	15.731	1.403	0.089	4.00	70.00	108
INFL	2.9172	0.1390	0.047	7.144	17.45	108
GDP	3.068	0.746	0.243	0.514	14.05	108

Note: where ROA is the return on assets, ROE is the return on equity, NIM is the net interest margin, NPL is the non-performing loans, LLP is the loans lost provision, CAR is the capital adequacy ratio, SIZE is the bank size, AGE is the bank age, INFL is the inflation, and GDP is the gross domestic product.

Table 4.1 contains summaries for every criterion evaluated. The above table contains data for all dependent and independent variables, including mean, standard deviation, coefficient of variation (CV), and several observations. The high value of the coefficient of variation indicates significant dispersion among the possible explanations. The average level of the NPL is 1.290 with a standard deviation of 1.025. The results imply that financial institutions prefer to invest retained earnings in the purchase of new assets, and they want the total number of loans to be sizable and defect-free. According to the non-performing loan portfolio theory, if a firm is to be built to make a profit, the finance will most likely come from inside the company rather than from outside investors. As a consequence, commercial banks face a high rate of non-performing loans, which has a negative impact on their bottom line.

Numerous scholars concur with the findings that NPLs lead to dismal financial outcomes (Mueni, 2019; Mustafa, 2019).

The average level of the CAR is 0.539 and a standard deviation of 0.499, this means that banks with sufficient capital obtain higher returns, reducing their borrowing costs and their vulnerability to bankruptcy. Lower capital ratios, on the other hand, are associated with greater leverage, risk, and interest rates in the banking sector. We expect financing costs to go down for banks if an increase in equity allows them to cut their debt levels. So, it is reasonable to expect higher profits from better-capitalised institutions. Also, the average level of LLP is

0.368, and the standard deviation of 0.183. This indicates that a higher loan volume is associated with a higher probability of achieving higher profitability, albeit the magnitude of this association is low, making the influence uncertain. Research like that of Kosmidou (2008), for example, does not find support for these results.

4.2 Correlation Analysis

The correlation establishes a relationship between the dependent and independent variables. In addition, it searches for and identifies potential multicollinearity between any of the study's independent variables. Table 4.2 summarises the correlation results for several of the credit risk factors that contribute to financial performance. The correlation coefficient quantifies the strength and direction of the association between two variables. The absolute values of the coefficient indices indicate the magnitude of the relationship between the variables, while the sign (positive or negative) indicates the direction of the relationship. In addition, the correlation matrix revealed the possible multicollinearity of independent variables. In a situation where the independent variables are strongly correlated ($r=0.7$ or higher), it is impossible to separate the effects of the independent variable from the dependent variable. In other words, one of the predictor variables may be predicted almost perfectly by another predictor variable (Akuoko, Aggrey, and Arhen, 2020; Agyekumet al., 2016).

Table 4. 2 Correlation Results

S/N	Variables	1	2	3	4	5	6	7	8	9	10
1	ROA	1									
2	ROE	0.0389*	1								
3	NIM	0.4904*	0.0922	1							
4	NPL	0.5033*	0.0240	0.1809*	1						
5	LLP	-0.083	0.0198*	-0.0398	-0.026*	1					
6	CAR	0.0342	0.0894*	0.0099	0.0389*	0.0994*	1				
7	SIZE	0.0499*	0.4781*	0.3398*	0.4904*	0.2094*	0.3920*	1			
8	AGE	0.0299*	0.0298*	0.0230	0.0893*	-0.148*	0.2640*	0.091*	1		
9	INFL	0.9904*	0.1442*	0.0209*	-0.0639	0.0304	-0.094*	0.3093*	0.0944*	1	
10	GDP	0.3949*	0.1360*	0.0849*	0.0409*	0.5099*	0.0928	-0.294*	0.0994	-0.0939	1

Note: where ROA is the return on assets, ROE is the return on equity, NIM is the net interest margin, NPL is the non-performing loans, LLP is the loans lost provision, CAR is the capital adequacy ratio, SIZE is the bank size, AGE is the bank age, INFL is the inflation, and GDP is the gross domestic product.

KNUST

32



The results of the examination of the correlations are shown in Table 4.2. Some of the highlights of the Table are as follows: The results of the correlation show that the Capital Adequacy Ratio (CAR) is positively related to financial performance, suggesting that wellcapitalised banks earn higher returns and suffer less from the high financing costs and high failure risk associated with being undercapitalised. As a counterpoint, rising leverage, risk, and borrowing costs are all reflected in lower capital ratios in the banking sector. We expect financing costs for banks to go down if a boost in equity allows them to lower their debt levels. So, it stands to reason that banks with bigger capitalisation would also have higher profits. Capital strength positively affects profitability in the Ghanaian banking system, as shown by the positive and statistically significant regression coefficients for the capital ratio.

Both ROE and ROA are positively correlated with the variable loan loss provision. While the link is weak, the effect is not definitive, but it does seem to indicate that a larger number of loans enhance the possibility of achieving higher profitability. This finding contradicts the results of other studies; for example, Kosmidou (2008) found that the proportion of loans lost provision of Ghanaian banks had a negative influence on profitability. Consistent with Chang et al. (2022), the study finds that NPL has a negative correlation with financial performance. Non-Performing Loans (NPLs) are associated with the reduction of profit in financial institutions. Commercial banks would rather finance long-term investments with good loans than risk funding them with NPLs because of the negative correlation between the two. Based on the data gathered, it is clear that lending institutions prefer to invest retained earnings in the purchase of new assets and that the total number of loans should be sizable and without flaws. According to the portfolio theory of non-performing loans, it's more probable that a business would use funds generated internally rather than seek funding from outside sources if its goal is to grow and become profitable. As a consequence, commercial banks have a tough time making ends meet because of the large number of loans that aren't being repaid.

There is a consensus that NPLs lead to subpar financial outcomes (Mueni, 2019; Mustafa, 2019).

Furthermore, the correlation matrix identified the potential multicollinearity of independent variables. In a circumstance in which the independent variables are strongly linked ($r=0.7$ or more) such that it is impossible to disentangle the effects of the independent on the dependent variable. In other words, one of the predictor variables may be predicted with near-perfect accuracy by another predictor variable (Lambey, 2021; Bukair, 2019). Therefore, the study reveals that there is no multicollinearity among the study variables.

4.3 Diagnostics Test

The first diagnostic analysis was to ascertain whether the fixed effect or random effect model was useful for the model. The results of the Hausman test, together with the chi-square statistics, are shown in Table 4.3. The fixed effect model is the alternative to the null hypothesis of a random effect for the test. The chi-square result was 14.875 and the p-value was 0.6819. As a result, the model used the random effect model. Before the model is estimated, a diagnostic analysis was done to determine the appropriateness and robustness. Some assumptions needed to be conducted in a panel regression analysis to establish the impact of the credit risk on financial performance are summarised in Table 4.3. The table presents three pre-diagnostic and post-analysis tests. The panel unit root test was used to test for the assumption of stationarity in the panel data using the Levin-Lin-Chu Unit-Root Test. This was required before the estimation of the model. The null hypothesis for the Levin-LinChu Unit-Root Test is non-stationarity. The results of the test indicate that the variables included in the panel data are stationary at a 5% level of significance ($Z=-1.4584$, $pvalue=0.0276$).

Table 4. 3 Diagnostics Test

Fixed-Random Effect Hausman Test		Heteroscedasticity studentized Breusch-Pagan test		Panel Unit Root Test Levin-Lin-Chu nit-Root Test	
P-value	14.875	BP	17.620	Z	1.4584
Chi-square	0.6819	P-value	0.7251	P-value	0.0276

Source: Author Computation (2023)

By considering the heteroscedasticity of the regression model using the studentized Breusch-Pagan test one can see that the residual analysis shows a constant variance of the error. This is because the studentized Breusch-Pagan test has the null hypothesis as errors are constant (homoscedasticity of error), and the resulting p-value of 0.7251 was greater than 0.05. Thus, the model presented was robust for the analysis.

4.4 Regression Analysis

Financial performance and credit risk indicators were among the variables examined in the investigation. NIM, ROA and ROE are the three regularly utilised accounting indicators that operationalise financial performance. The study employs static panel estimating techniques to get a rough estimate of the model. In the beginning, the model is estimated using crosssection pooled OLS. All of the coefficients have the expected signs, and most of them are significant at the 1% level. Similarly, the bulk of the RE model's coefficients are statistically significant at the 5% level or above, and the estimated findings have the expected signs.

Table 4. 4 Pooled OLS Estimates

Variables	Model1 (ROA)	Model2 (ROE)	Model3 (NIM)
Constant	0.236*** (0.0611)	0.239*** (0.0719)	0.0120*** (0.0032)
NPL	-0.0201*** (0.0065)	-0.0231** (0.0098)	-0.236*** (0.0601)
LLP	-0.0256*** (0.0061)	-0.0184** (0.0085)	0.0201*** (0.0064)
CAR	0.0299*** (0.0084)	0.0367** (0.0125)	-0.0256*** (0.0063)
SIZE	0.0344 (0.0112)	0.0176 (0.0123)	-0.0123 (0.0198)

AGE	-0.0151** (0.0077)	-0.0254*** (0.0067)	0.0344 (0.1110)
INFL	-0.0206 (0.0228)	-0.0162 (0.0198)	0.0141*** (0.0032)
GDP	-0.0181 (0.2119)	0.0183*** (0.0063)	0.340*** (0.0676)
R-Squares	0.67	0.59	0.76
R-adjusted Square	0.51	0.44	0.69

Note: The values outside the bracket are the coefficient and inside the bracket are the standard error of the estimated variables.

NB: where ROA is the return on assets, ROE is the return on equity, NIM is the net interest margin, NPL is the non-performing loans, LLP is the loans lost provision, CAR is the capital adequacy ratio, SIZE is the bank size, AGE is the bank age, INFL is the inflation, and GDP is the gross domestic product.

Further, the goodness-of-fit tests demonstrate that both models are well-fitted, with R² values greater than 0.20. However, the Breusch-Pagan LM test rejects the FE null hypothesis, suggesting the RE model yields more trustworthy estimate findings than the cross-section pooled OLS. The Hausman specification test is then used to provide a direct comparison between the RE and FE models. The results show that the null hypothesis of the RE model is effectively and repeatedly refuted by the data. This study concludes that the RE model yields more reliable results. The diagnostic tests all show that the FE model was incorrectly selected. In particular, the residuals are serially correlated and the error variance is unequal.

Table 4. 5 Random Effect Estimates

Variables	Model1 (ROA)	Model2 (ROE)	Model3 (NIM)
Constant	0.0186*** (0.0063)	0.0299*** (0.0084)	0.0221*** (0.0049)
NPL	-0.0299*** (0.0084)	-0.0201*** (0.0071)	-0.0439** (0.0161)
LLP	0.0299*** (0.0084)	-0.0954*** (0.0295)	0.0411** (0.0251)
CAR	-0.0123 (0.0202)	-0.284 (0.0263)	-0.0391*** (0.0109)
SIZE	-0.0254*** (0.0067)	0.0105* (0.0055)	0.0163*** (0.0019)
AGE	0.0257*** (0.0069)	0.0212*** (0.0073)	0.0446** (0.0227)

INFL	0.0344 (0.0112)	0.0214** (0.0091)	-0.0457** (0.0182)
GDP	0.0335* (0.0188)	-0.0208** (0.0089)	0.0383** (0.0146)
R-Squares	0.45	0.58	0.51
R-adjusted Square	0.39	0.41	0.50

Note: The values outside the bracket are the coefficient and inside the bracket are the standard error of the estimated variables.

NB: where ROA is the return on assets, ROE is the return on equity, NIM is the net interest margin, NPL is the non-performing loans, LLP is the loans lost provision, CAR is the capital adequacy ratio, SIZE is the bank size, AGE is the bank age, INFL is the inflation, and GDP is the gross domestic product.

The study confirms Chang et al. (1922) conclusion that NPL has a negative impact on financial performance indicators (ROA, ROE, and NIM). Nonperforming loans (NPLs) are related to the decline in financial institution profits. Due to the negative correlation between financial performance and nonperforming loans, commercial banks would rather finance long-term investments with good loans than risk funding them with nonperforming loans. It is evident from the collected data that lending institutions prefer to invest retained earnings in the acquisition of new assets and that the total number of loans should be sizable and errorfree. According to the portfolio theory of non-performing loans, if a company's objective is to grow and become profitable, it is more likely that it will use internally generated funds rather than seek funding from outside sources. As a result, commercial banks have a difficult time making ends meet due to a large number of non-repaid loans.

4.5 Discussion

The effect of credit risk on financial performance among the commercial banks listed on the GSE is still uncertain. According to the NPL portfolio theory, it is more probable that funding for a company's internal growth rather than its acquisition of external capital would be the driving factor in the company's ability to make profits. As a consequence, commercial banks face a high rate of nonperforming loans, which has a negative impact on their financial

performance. Numerous scholars concur with the findings that NPLs result in subpar financial performance (Mueni and Mustafa 2019).

4.5.1 The Effect of Non-Performing Loans (NPL) on Financial Performance

This finding is in line with the conclusion of Chang et al. (2022) that the decline of profit in financial institutions is related to NPLs and thus supports the hypothesised negative relationship between NPLs and financial performance. Commercial banks would rather support long-term investments with clean loans due to the negative correlation between NPLs and financial performance. According to the data collected, financial institutions prefer to invest retained earnings in the purchase of new assets, and they want the total number of loans to be sizable and defect-free. The non-performing loan portfolio theory suggests that inhouse capital is preferable to external funding when it comes to developing a business to make a profit. As a consequence, commercial banks face a significant amount of nonperforming loans, which has a negative impact on their financial performance. Other empirical findings agree with these findings, saying that NPLs lead to dismal financial outcomes (Mueni, 2019; Mustafa, 2019). Bad loan appraisal, insufficient collateral, and lax commercial bank credit standards also play a role in the high volume of NPL, which ultimately leads to the demise of commercial banks. Yet, some studies have shown the opposite to be true, claiming that poor loan products and borrower traits are the main reasons for NPLs. If the bank fails due to non-performing loans, the country's economy would suffer.

The results of this research have far-reaching implications for researchers, professionals, and policymakers. Bank management may reduce the potential for information mismatch by conducting a thorough examination of client data and information throughout the credit analysis process. Similarly, management should invest in robust credit information systems to close knowledge gaps and improve access to complete, accurate, and reliable borrower data. More than that, however, the bank management has to use efficient methods for handling the

loans they have on hand. Yet, authorities need to pay close attention to cost-to-income ratio changes and the capital position of banks to ensure operational efficiency ratios and capital adequacy. In particular, regulators need to create laws and tracking mechanisms that sound the alarm when non-performing loan levels at banks go too high and a bank is likely to fail.

4.5.2 The Effect of Capital Adequacy Ratio (CAR) on Financial Performance

Capitalisation is an important factor in how much a bank can lend and how much of a hit it can take financially. To help a country prosper and compete globally, its currency is revalued under the BIS. Under the assumption that Ghanaian banks maintain a CAR of 8%, etc. Capitalisation in banking refers to the money that banks use to conduct their business. The ability of banks to increase their lending capacity is hindered if they do not have access to sufficient machine capacity. Even though a bank's main purpose is to collect funds and repay them in the form of loans, those with a CAR below 8% are ineligible for a loan. If the CAR ratio is satisfactory, the bank will be able to function financially. The higher a bank's CAR, the more successful it is. Financial performance will rise in the absence of default because optimum lending will increase profitability. The level of confidence the public has in a bank's ability to succeed is directly related to the size of its capital.

The results of the tests of hypotheses show a positive relationship between capital ratio (CAR) and financial performance across all models, suggesting that banks with higher CAR enjoy higher returns, which in turn reduces their cost of financing and insolvency risk. Low capital ratios, on the other hand, are associated with elevated levels of leverage and risk in the banking sector, as well as higher interest rates on loans. We expect financing costs for banks to go down if an increase in equity allows them to lower their debt levels. Thus, it stands to reason that banks with bigger capitalisation would also have higher profits. The positive and highly significant regression coefficients for the CAR point to a favourable impact on financial performance in Ghana's banking sector.

4.5.3 The Effect of Loan Loss Provision (LLP) on Financial Performance

An insignificant positive relationship exists between the variable loan loss provision and ROE and ROA. Given the small magnitude of the link, it is difficult to draw any firm conclusions about the effect of increasing the number of loans. This result is at odds with the conclusions of other studies; for example, Kosmidou (2008) found that the proportion of loan loss provision of Ghanaian banks had a negative effect on profitability. In contrast, this positive correlation is true whether or not the NIM interest net margin is used as the dependent variable. Naceur (2003) demonstrates that the provision for loan losses has a positive effect on the NIM that is statistically significant at the 0.01% level. As a larger share of deposits is turned into loans, this finding is in line with the idea that Ghanaian banks function as middlemen between lenders and borrowers. More lending results in more earnings in this case. Under this strategy, delinquent obligations may be written off in reverse chronological order, starting with the oldest. Earnings for the current fiscal year may be reduced to raise the provision if the amount of real provision maintained is not enough to be written off. Efforts to recoup the foreclosed-upon debts must continue unabated. Such debts need legal procedures before being forgiven. A separate debt collection agency should be responsible for recovering forgiven debts. Appointing a third party that is not a bank may speed up the resolution of litigation and the collection of bad debts. Written-off loans and advances should be recorded in a separate ledger and tallied in the bank's annual report, with a distinct section devoted to the current year's write-offs in the "notes to the accounts." The customer will still be considered a defaulter under applicable law, even though all of their loans and advances have been cancelled. Debts that have been forgiven must be reported in Ghana just like any other loans or prospective loans.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents a summary of the results and findings of the studies. Subsequently, conclusions for the study were drawn and recommendations are made. The summary of the findings of the research looks at the link between working capital management strategies and financing and investments. The summary of the study focuses on the overall overview of the study, which includes short explanations of the study's variables, a description of the research methods, an overall summary of the study, and as well a discussion of the findings.

5.1 Summary of of the study

The study sought to evaluate the effect of NPL on the financial performance of banks listed on the GSE, examine the impact of capital adequacy ratio on the financial performance of banks listed on the GSE, and investigate the impact of loan loss provision on the financial performance of banks listed on GSE. The Ghanaian-listed banks were chosen as the demographic for this research. Purposive sampling was used in this study to sample 9 listed banks in Ghana. Secondary data was gathered through annual reports submitted by companies for the period (2010-2021). A Pooled OLS and Random effect method of estimation were adopted to estimate the parameters involved in the study objectives.

5.1.1 The Effect of Non-Performing Loans (NPL) on Financial Performance

This finding is consistent with other scholars that the decline of profit in financial institutions is related to non-performing loans, and thus supports the hypothesised negative relationship between non-performing loans and financial performance. Due to the negative correlation between NPLs and financial performance, commercial banks would rather fund long-term investments with clean loans. According to the collected data, financial institutions prefer to

invest retained earnings in the acquisition of new assets, and they want the total number of loans to be sizable and free of defects. The non-performing loan portfolio theory suggests that internal funding is preferable to external funding when it comes to profit-driven business development. As a result, commercial banks are confronted with a substantial number of nonperforming loans, which has a negative impact on their financial performance. Other empirical findings concur that NPLs are associated with dismal financial outcomes. Inadequate collateral and lax commercial bank credit standards also contribute to the high volume of non-performing loans, which ultimately leads to the failure of commercial banks. Some studies, however, have found the opposite to be true, claiming that poor loan products and borrower characteristics are the primary causes of non-performing loans. If the bank were to fail due to non-performing loans, the country's economy would be negatively affected.

5.1.2 The Effect of Capital Adequacy Ratio (CAR) on Financial Performance

The results indicate a positive relationship between capital Adequacy Ratio (CAR) and financial performance, indicating that banks with a higher CAR enjoy higher returns, which in turn reduces their cost of financing and insolvency risk. Conversely, low capital ratios are associated with elevated leverage and risk in the banking sector, as well as higher loan interest rates. We anticipate that banks' financing costs will decrease if an increase in equity enables them to reduce their debt levels. Consequently, it stands to reason that banks with greater capitalisation would also generate greater profits. Positive and highly significant regression coefficients for the CAR indicate that financial performance has a positive impact on Ghana's banking sector.

5.1.3 The Effect of Loan Loss Provision (LLP) on Financial Performance

There is a negligible positive correlation between the variable loan loss provision and ROE and ROA. Given the insignificance of the correlation, it is difficult to draw definitive conclusions about the impact of increasing the number of loans. This result contradicts the findings of other

studies, such as Kosmidou (2008), who discovered that the provision of lost loans by Ghanaian banks had a negative impact on profitability. This positive correlation holds regardless of whether the NIM interest net margin is the dependent variable. Scholars have demonstrated that the provision for loan losses has a statistically significant positive effect on the NIM at the 0.01% level. As a greater proportion of deposits are converted to loans, this finding is consistent with the notion that Ghanaian banks serve as intermediaries between lenders and borrowers. In this case, more lending results in greater earnings.

5.2 Conclusion

The study sought to evaluate the effect of NPLs on the financial performance of banks listed on the GSE, examine the impact of capital adequacy ratio on the financial performance of banks listed on the GSE, and investigate the effect of loan loss provision on the financial performance of banks listed on GSE. This finding supports the hypothesised negative relationship between non-performing loans and financial performance. Due to the negative correlation between NPLs and financial performance, commercial banks would rather fund long-term investments with clean loans. According to the results, financial institutions prefer to invest retained earnings in the acquisition of new assets, and they want the total number of loans to be sizable and free of defects. The non-performing loan portfolio theory suggests that internal funding is preferable to external funding when it comes to profit-driven business development. As a result, commercial banks are confronted with a substantial number of nonperforming loans, which has a negative impact on their financial performance. Other empirical findings concur that NPLs result in dismal financial outcomes, confirming these findings. Inadequate collateral and lax commercial bank credit standards also contribute to the high volume of NPLs, which ultimately leads to the failure of commercial banks. Some studies, however, have found the opposite to be true, claiming that poor loan products and borrower characteristics are the primary causes of

non-performing loans. If the bank were to fail due to non-performing loans, the country's economy would be negatively affected.

The implications of this research for researchers, professionals, and policymakers are extensive. By conducting a thorough analysis of client data and information throughout the credit analysis process, bank management can reduce the possibility of information mismatch. Similarly, management should invest in robust credit information systems to eliminate knowledge gaps and enhance access to complete, accurate, and trustworthy borrower data. Moreover, bank management must employ efficient methods for managing the loans they currently hold. To ensure operational efficiency ratios and capital adequacy, however, authorities must closely monitor changes in cost-to-income ratios and the capital position of banks. In particular, regulators must create laws and tracking mechanisms that sound the alarm when the proportion of non-performing loans at a bank reaches an unsustainable level and the bank is likely to fail.

5.3 Recommendation

Recommendation to the appropriate authorities as such, commercial banks in Ghana need clear guidelines from the Bank of Ghana to increase capital adequacy, reduce non-performing loans, and make loan loss provisions. Previous studies have shown that BOG's supervision of non-performing loans (NPLs), capital adequacy, and loan loss provisions (LLP) is inadequate, implying that the supervision of Ghana's commercial banks needs to be bolstered. Advice for policymakers: Authorities, such as parliament and councillors, should implement laws and regulations that lead financial institutions to work properly to boost banks' financial performance. Hence, the legislators and council members of Ghana should draft new laws and regulations for commercial banks. Recommendation for Global Financial Institutions Banks in Ghana may benefit greatly from adopting the recommendations made by the Basel I and II

Committee on Bank Supervision. To what extent NPLs, CAs, and LLPs are controlled is evident from the IMF and WB framework. Because of this, commercial banks are responsible for ensuring that all financial institutions adhere to the international framework.

5.4 Limitations for Future Study

One significant disadvantage sometimes cited for panel studies is that they frequently generalise for cross-sections, which may result in incorrect conclusions and may not be firmspecific. Additionally, it notes that such a method is susceptible to measurement and statistical mistakes. However, this study used a technique known as panel data estimation, which gives accurate findings. As a result, this research assumes that it has solved this constraint. Nonetheless, one might presume that the outcome of the causal link for firms listed on GSE does not necessarily apply to other firms. In this scenario, it is feasible that the usage of both static and dynamic model estimation will provide some firm-specific data. As a result, future studies may use both estimations for similar studies.

REFERENCES

- Abata, M. A., 2014. Assets Quality and Bank Performance: A Study of Commercial Banks in Nigeria. *Research Journal of Finance and Accounting*, 5 (18), 39 – 44
- Abbas, F., Iqbal, S. and Aziz, B., 2019. The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of US and Asia. *Cogent Economics and Finance*, 7(1), p.1605683.

- Accornero, M., Cascarino, G., Felici, R., Parlapiano, F. and Sorrentino, A.M., 2018. Credit risk in banks" exposures to non-financial firms. *European Financial Management*, 24(5), pp.775-791.
- Adu, J.A.N., 2019. Role of Capital Adequacy on Bank Lending and Performance in Ghana (Doctoral dissertation, University of Ghana).
- Ahmad, F., Tahir, S.H. and Aziz, B., 2014. Impact of loan loss provision on bank profitability in Pakistan. *TIJ's Research Journal of Social Science and Management*, 3(12), pp.34-41.
- Ajekwe, C., Ibiamke, A. and Silas, M.F., 2017. Loan loss provisions, earnings smoothing and capital management under IFRS: The case of deposit money banks in Nigeria. *American Journal of Management Science and Engineering*, 2(4), pp.58-64.
- Akinbo-Balogun, E.O., 2022. *Evaluating the impact of credit risk management on the financial performance of commercial banks in Nigeria* (Doctoral dissertation, Business Administration Program, School of Economic Sciences and Business, Neapolis University Pafos).
- Aldasoro, I., Fender, I., Hardy, B. and Tarashev, N., 2020. Effects of Covid-19 on the banking sector: *the market's assessment* (No. 12). Bank for International Settlements.
- Amoah, A., Asiamah, R.K. and Korle, K., 2023. Applying the breaks to non-performing loans in Ghana. *International Journal of Emerging Markets*, 18(8), pp.1978-1993.
- Angela, A. K., Samuel, T. B. and Enock, K. A., 2022. Investigating the impact of credit risk. *Cogent Economics and Finance*, pp. 5-15.
- Apergis, N., 2022. Convergence in non-performing loans across EU banks: The role of COVID-19. *Cogent Economics and Finance*, 10(1), p.2024952.
- Ari, A., Chen, S. and Ratnovski, L., 2020. COVID-19 and non-performing loans. *Research Bulletin No, 71*.
- Asiamah, R.K. and Amoah, A., 2019. Non-performing loans and monetary policy dynamics in Ghana. *African Journal of Economic and Management Studies*, 10(2), pp.169-184.
- Binawa, M.J. and Ihendinihu, J.U., 2018. Effect Of Risk Assets Management On The Post Consolidation Financial Performance Of Commercial Banks In Nigeria. In *The 8th AFRA International Conference was held at University of Calabar International Conference Centre, Calabar* (p. 610).
- Boateng K., 2018. Credit Risk Management and Performance of Banks in Ghana: the „Camels“ Rating Model Approach. *International Journal of Business and Management Invention*, 8(02).

- Buchory, H.A., 2021. Banking Profitability: How does the Credit Risk and Operational Efficiency Effect?
- Caruso, G., Gattone, S.A., Fortuna, F. and Di Battista, T., 2021. Cluster Analysis for mixed data: An application to credit risk evaluation. *Socio-Economic Planning Sciences*, 73, p.100850.
- Chi, Q. and Li, W., 2017. Economic policy uncertainty, credit risks and banks' lending decisions: Evidence from Chinese commercial banks. *China Journal of Accounting Research*, 10(1), pp.33-50.
- Chris, S., 2018. *Panel design. Encyclopedia of research design*. s.l.:SAGE Publications Inc..
- Danaan, V.V., 2019. Risk management in microfinance: *identities, perceptions, behaviours and interests of microfinance stakeholders in Plateau State, Nigeria*. University of Salford (United Kingdom).
- Dao, B., 2020. Bank capital adequacy ratio and bank performance in Vietnam: A simultaneous equations framework. *Journal of Asian Finance, Economics and Business*, 7(6), pp.039-046.
- Daoud, J. I. (2017, December). Multicollinearity and regression analysis. In *Journal of Physics: Conference Series* (Vol. 949, No. 1, p. 012009). IOP Publishing.
- Digal, S.K. and Kanungo, E., 2015. Non-Performing Assets and Banking Stress: Some Issues. *ASBM Journal of Management*, 8(2).
- Dunyoh, M., Ankamah, E.T. and Kosipa, S.J.K., 2022. The impact of credit risk on financial performance: Evidence from rural and community banks in Ghana. *Hybrid Journal of Business and Finance*, 3(1).
- Ekinci, R. and Poyraz, G., 2019. The effect of credit risk on financial performance of deposit banks in Turkey. *Procedia Computer Science*, 158, pp.979-987.
- Feghali, K., Mora, N. and Nassif, P., 2021. Financial inclusion, bank market structure, and financial stability: International evidence. *The Quarterly Review of Economics and Finance*, 80, pp.236-257.
- Feyen, E., Gispert, T.A., Kliatskova, T. and Mare, D.S., 2021. Financial sector policy response to COVID-19 in emerging markets and developing economies. *Journal of Banking and Finance*, 133, p.106184.
- Gadzo, S.G., Kportorgbi, H.K. and Gatsi, J.G., 2019. Credit risk and operational risk on financial performance of universal banks in Ghana: A partial least squared structural equation model (PLS SEM) approach. *Cogent Economics and Finance*, 7(1), p.1589406.

- Gana, U. and Abubakar, S., 2022. Effect of Credit Risk on Financial Performance of Listed Deposit Money Banks in Nigeria. *Gusau International Journal of Management and Social Sciences*, 5(1), pp.17-17.
- Ghenimi, A., Chaibi, H. and Omri, M.A.B., 2017. The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. *Borsa Istanbul Review*, 17(4), pp.238-248.
- Ghosh, A. 2015, "Banking-industry specific and regional economic determinants of nonperforming loans: evidence from US states," *Journal of Financial Stability*, 20, pp. 93-104.
- Good and Healthy South Dakota, 2019. *Secondary Data Collection*. [Online] Hsiao, C., 2022. *Analysis of panel data*. Cambridge university press.
<https://web.archive.org/web/20190419010315/http://abs.gov.au/websitedbs/a3121120.nsf/ome/s+statistical+language+-+what+are+data>
- IMF. (2022). Retrieved 30 August 2022, from <https://www.imf.org/external/pubs/ft/fandd/basics/30-inflation.htm>.
- Isik, I. and Uygur, O., 2021. Financial crises, bank efficiency and survival: Theory, literature and emerging market evidence. *International Review of Economics and Finance*, 76, pp.952-987.
- Jackson, E.A. and Tamuke, E., 2022. Credit Risk Management and the Financial Performance of Domiciled Banks in Sierra Leone: An Empirical Analysis. *Journal of Economic Policy Researches*, 9(1), pp.139-164.
- Jensen, D. R. and Ramirez, D. E., 2013. Revision: Variance inflation in regression. *Advances in Decision Sciences*, 2013.
- Kapustian, O., Petlenko, Y., Ryzhov, A. and Kharlamova, G., 2021. Financial sustainability of a Ukrainian university due to the COvId-19 pandemic: A calculative approach. *Investment Management and Financial Innovations*, 18(4), pp.340-354.
- Katusiime, L., 2021. COVID 19 and bank profitability in low income countries: the case of Uganda. *Journal of Risk and Financial Management*, 14(12), p.588.
- Kazemzadeh, E., Fuinhas, J. A. and Koengkan, M., 2022. The impact of income inequality and economic complexity on ecological footprint: an analysis covering a long-time span. *Journal of Environmental Economics and Policy*, 11(2), 133-153.
- Khafid, M. and Anisykurlillah, I., 2020. Investigating the determinants of non-performing loan: Loan monitoring as a moderating variable. *Kne social sciences*, pp.126-136.
- Khalid, A.C., 2012. The impacts of Assets Quality on Profitability of Private Banks in India:

- A case study of JK, ICICI, HDFC and YES Banks: *Journal of African Microeconomic Review* 2 (1), 1 – 22
- Kithinji, A.M., 2010. Credit risk management and profitability of commercial banks in Kenya.
- Korzeb, Z. and Niedziółka, P., 2021. Determinants of Differentiation of Cost of Risk (CoR) among Polish Banks during COVID-19 Pandemic. *Journal of Risk and Financial Management*, 14(3), p.110.
- Koulouridi, E., Kumar, S., Nario, L., Pepanides, T. and Vettori, M., 2020. Managing and monitoring credit risk after the COVID-19 pandemic. *Risk and Resilience*, 31.
- Leventis, S., Dimitropoulos, P.E. and Anandarajan, A., 2011. Loan loss provisions, earnings management and capital management under IFRS: The case of EU commercial banks. *Journal of Financial Services Research*, 40(1), pp.103-122.
- Li, K., Niskanen, J. and Niskanen, M., 2018. Capital structure and firm performance in European SMEs: Does credit risk make a difference? *Managerial Finance*, 45(5), pp. 582-601.
- Lucky, A.L. and Nwosi, A.A., 2015. Asset quality and profitability of commercial banks: evidence from Nigeria. *Research Journal of Finance and Accounting*, 6(18), pp.26-34.
- Madugu, A.H., Ibrahim, M. and Amoah, J.O., 2020. Differential effects of credit risk and capital adequacy ratio on profitability of the domestic banking sector in Ghana. *Transnational Corporations Review*, 12(1), pp.37-52.
- Mann, R.J., 2022. Explaining the pattern of secured credit. In *The Creation and Interpretation of Commercial Law* (pp. 347-405). Routledge.
- Mendoza, R.R. and Rivera, J.P.R., 2017. The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines. *Scientific Annals of Economics and Business*, 64(1).
- Mohammad, K.U., Fatima, N. and Imran, M., 2022. The Moderating Role of Covid-19 on Determinants of Bank Spread. *Pakistan Social Sciences Review*, 6(2), pp.538-553.
- Mohammed, I. and Samuel, A., 2017. Role of macroeconomic variables on firms' performance: Evidence from the UK. *Cogent Economics and Finance*, 5(1), pp. 2-18.
- Munangi, E. and Bongani, A., 2020. An empirical analysis of the impact of credit risk on the financial performance of South African banks. *Academy of Accounting and Financial Studies Journal*, 24(3), pp.1-15.

- Naili, M. and Lahrichi, Y., 2022. Banks' credit risk, systematic determinants and specific factors: recent evidence from emerging markets. *Heliyon*, 8(2), p.e08960.
- Nardi, P.M., 2018. Doing survey research: *A guide to quantitative methods*. Routledge.
- Nguyen, T.H., 2020. Impact of bank capital adequacy on bank profitability under Basel II accord: evidence from Vietnam. *Journal of Economic Development*, 45(1).
- Nigussie, h., 2021. *Assessment Of Credit Management Practice At Dashen Bank* (Doctoral dissertation, ST. MARY'S UNIVERSITY).
- Noomen, N. and Abbes, M.B., 2018. The Determinants of Credit Risk Management of Islamic Microfinance Institutions. *IUP Journal of Financial Risk Management*, 15(1).
- Ogboi, C. and Unuafé, O.K., 2013. Impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking*, 2(3), pp.703-717.
- Olokoyo, F.O., 2011. Determinants of commercial banks' lending behavior in Nigeria. *International Journal of Financial Research*, 2(2), p.61.
- Ombaba, K.B.M., 2013. Assessing the Factors Contributing to Non-Performance Loans in Kenyan Banks.
- Quoc Trung, N.K., 2021. The relationship between internal control and credit risk—The case of commercial banks in Vietnam. *Cogent Business and Management*, 8(1), p.1908760.
- Ra'fat, T. and Al-Qatu, A.J., 2020. The moderating effect of the Covid 19 on Credit Risk of Islamic and Conventional Bank in Emerging Markets: Evidence from Palestine.
- Robin, I., Salim, R. and Bloch, H., 2018. Financial performance of commercial banks in the post-reform era: Further evidence from Bangladesh. *Economic Analysis and Policy*, 58, pp.43-54.
- Rufai, A.S., 2013. Efficacy of credit risk management on the performance of banks in Nigeria a study of Union Bank Plc (2006-2010). *Global Journal of Management And Business Research*.
- Saleh, I. and Abu Afifa, M., 2020. The effect of credit risk, liquidity risk and bank capital on bank profitability: Evidence from an emerging market. *Cogent Economics and Finance*, 8(1), p.1814509.
- Samir, B., Naif, A. and Stefan, F. v. H., 2020. Financing modes, risk, efficiency and profitability in Islamic banks: Modeling for the GCC countries. *Modelling for the GCC Countries Economics and Finance*, 8(1).

- Samuel, O.L., 2015. The effect of credit risk on the performance of commercial banks in Nigeria. *African Journal of Accounting, Auditing and Finance*, 4(1), pp.29-52.
- Shawtari, F.A., Saiti, B., Razak, S.H.A. and Ariff, M., 2015. The impact of efficiency on discretionary loans/finance loss provision: A comparative study of Islamic and conventional banks. *Borsa Istanbul Review*, 15(4), pp.272-282.
- Shelagh, A. H. and Xiaoqing, F., 2010. Determinants of financial performance in Chinese banking. *Applied Financial Economics*, 20(20), pp. 1585-1600.
- Siddique, A., Khan, M.A. and Khan, Z., 2021. The effect of credit risk management and bank-specific factors on the financial performance of the South Asian commercial banks. *Asian Journal of Accounting Research*.
- Siddique, A., Masood, O., Javaria, K. and Huy, D.T.N. 2020. *A comparative study of performance of commercial banks in ASIAN developing and developed countries*. Insights Into Regional Development.
- Soyemi, K.A. and Olawale, L.S., 2019. Firm characteristics and financial reporting quality: Evidence from non-financial firms in Nigeria. *International Journal of Economics, Management and Accounting*, 27(2), pp.445-472.
- Stiglitz, J., 2002. Transparency in government. *The Right to Tell*, p.27.
- Taiwo, J.N., Ucheaga, E.G., Achugamonu, B.U., Adetiloye, K. and Okoye, O., 2017. Credit risk management: Implications on bank performance and lending growth. *Saudi Journal of Business and Management Studies*, 2, pp.584-590.
- Tanimori, M., 2019. Relationship-Based Costing with Capacity-Estimation.
- Tao, R., Su, C.W., Yaqoob, T. and Hammal, M., 2021. Do financial and non-financial stocks hedge against lockdown in Covid-19? An event study analysis. *Economic Research-Ekonomska Istraživanja*, pp.1-22.
- Ul Mustafa, A.R., Ansari, R.H. and Younis, M.U., 2012. Does the loan loss provision affect the banking profitability in case of Pakistan? *Asian Economic and Financial Review*, 2(7), pp.772-783.
- Uquillas, A. and Tonato, R., 2022. Inter-portfolio credit risk contagion including macroeconomic and financial factors: A case study for Ecuador. *Economic Analysis and Policy*, 73, pp.299-320.
- Vigneswara, S., 2015. Determinants of Assets Quality and Profitability: An empirical assessment. Available in www.ibsindia.org.
- VO, Q.T., 2019. Export performance and stock return: A case of fishery firms listing in Vietnam Stock markets. *The Journal of Asian Finance, Economics and*

Business, 6(4), pp.37-43.

Wang, F., Ding, L., Yu, H. and Zhao, Y., 2020. Big data analytics on enterprise credit risk evaluation of e-Business platform. *Information Systems and e-Business Management*, 18(3), pp.311-350.

Wullweber, J., 2020. The COVID-19 financial crisis, global financial instabilities and transformations in the financial system. *Global Financial Instabilities and Transformations in the Financial System (September 7, 2020)*.

Yu, A., Shao, Y., You, J., Wu, M. and Xu, T., 2019. Estimations of operational efficiencies and potential income gains considering the credit risk for China's banks. *Journal of the Operational Research Society*, 70(12), pp.2153-2168.

Zekos, G.I., 2021. Risk Management Developments. In *Economics and Law of Artificial Intelligence* (pp. 147-232). Springer, Cham.

Žunić, A., Kozarić, K. and Dželihodžić, E.Ž., 2021. Non-performing loan determinants and impact of covid-19: Case of Bosnia and Herzegovina. *Journal of Central Banking Theory and Practice*, 10(3), pp.5-22.

