UNIVERSITY OF EDUCATION, WINNEBA

THE ANTECEDENTS OF CREDIT RISK IN GHANA'S BANKING SECTOR: A ROBUST LEAST SQUARES ESTIMATION APPROACH

PEACE AFUA ASEM

MASTER OF BUSINESS ADMINISTRATION

2023

UNIVERSITY OF EDUCATION, WINNEBA

THE ANTECEDENTS OF CREDIT RISK IN GHANA'S BANKING SECTOR: A ROBUST LEAST SQUARES ESTIMATION APPROACH

PEACE AFUA ASEM

(220025845)

A Dissertation in the Department of Accounting, School of Business, submitted to the School of Graduate Studies, in partial fulfillment of the requirements for award of the degree of Master of Business Administration (Accounting) in the University of Education, Winneba

NOVEMBER, 2023

DECLARATION

Candidate's Declaration

I hereby declare that this is the result of my original research and that no part of it has been presented for another degree at this university or elsewhere.

Candidate's Signature …….. Date …….

Name: Peace Afua Asem

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised following the guidelines on supervision of thesis/dissertation laid down by the University of Education, Winneba.

Supervisor's Signature ……..…… Date ……..……

Name: Mr. Edward Quansah

ABSTRACT

The purpose of this study is to investigate the antecedents of credit risk in Ghana's banking sector within the context of policy rate, inflation rate, exchange rate, and cost efficiency. The study relied on 10-year secondary data from 18 Ghanaian-resident universal banks spanning from 2012 to 2021. The study adopted an explanatory research design and quantitative approach together with a panel robust least squares estimation technique. The results indicated that policy rate and cost efficiency have negative and significant impacts on credit risk whereas exchange rate and inflation positively predict credit risk. The study concludes that directing policy interventions towards policy rate, exchange rate, inflation and cost efficiency is the surest way of curbing credit risk in Ghana's banking sector. It was therefore recommended to the Bank of Ghana to ensure an optimum policy rate that will protect the banking sector, control inflation and promote business activities in the country. Additionally, radical industrialization programmes should be embarked on to reduce the massive importation so as to curb the debilitating currency depreciation. Finally, banks should also ensure stringent internal control measures to enhance operational efficiency.

DEDICATION

To my late mother, my children and loved ones

ACKNOWLEDGEMENT

I wish to express my utmost gratitude to my supervisor, Mr. Edward Quansah for his invaluable contribution to this research piece. His counsel and support towards this work are top-notch. I also thank all my friends, coursemates and family not forgetting Mr. David Kwabla Adegbedzi who stood by me throughout this rough but interesting journey. I say Ayekoo! I also wish to thank the University of Education, Winneba for providing an enabling environment for completing this piece. I say a big thank you to you all.

TABLE OF CONTENTS

DECLARATION	iii
ABSTRACT	iv
DEDICATION	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the Study	1
1.2 Statement of the Problem	3
1.3 Purpose of the study	5
1.3.1 Research Objectives	6
1.4 Research Hypotheses	6
1.5 Significance of the Study	6
1.6 Limitation and Delimitation of the Study	7
1.7 Organization of the Study	8
1.8 Definition of Terms	8
CHAPTER TWO: LITERATURE REVIEW	10
2.1 Introduction	10
2.2 Theoretical Review	10
2.2.1 Theory of Prudential Regulation	10
2.2.2 Financial intermediation theory	12
2.2.3 Information Asymmetry theory	13

2.3 Conceptual Review 15

2.3.1 Credit Risk 15

2.3.2 Inflation 15

2.3.3 Exchange Rate 15

2.3.4 Efficiency of Banks 16

2.3.5 Policy Rate 17

2.4 Empirical Review 17

2.4.1 The impact of policy rate on the credit risk of Ghana's banking sector 17

2.4.2 The impact of inflation rate on the credit risk of Ghana's banking sector. 21

2.4.3 The impact of exchange rate on the credit risk of Ghana's banking sector. 29

2.4.4 The impact of efficiency on the credit risk of Ghana's banking sector. 34

2.5 Gap Identification 47

2.6 Conceptual Framework 48

CHAPTER THREE: RESEARCH METHODOLOGY 50

3.1 Introduction 50

3.2 Research Design 53

3.3 Research Approach 52

3.4 Research Philosophy 50

3.5 Population of the Study 54

3.5 Sampling and Sampling Technique 54

3.6 Data and Sources of Data 55

3.7 Data Analysis 56

3.7.1 Estimation Technique 56

3.7.2 Model Specification 56

3.8 Description and Measurement of Variables 58

3.8.1 Credit Risk 58

3.8.2 Policy Rate 59

3.8.3 Inflation 59

3.8.4 Efficiency 60

3.8.5 Exchange Rate 60

3.8.6 Return on Asset 60

3.8.7 Operational Risk 61

3.9 Ethical Consideration 61

CHAPTER FOUR: RESULTS AND DISCUSSIONS 63

4.1 Introduction 63

4.2 Descriptive Analysis 63

4.3 Correlation Analysis and Multicollinearity 65

4.4 Regression results 68

4.6 Post Estimation Diagnostics 70

4.6 Discussion of Results 71

4.6.1 Effect of Policy Rate on credit risk among commercial banks operating in Ghana 71

4.6.2 Effect of Inflation on credit risk among commercial banks operating in Ghana 73

4.6.3 Effect of exchange rate on credit risk among commercial banks operating in Ghana 75

4.6.4 Effect of cost efficiency on credit risk among commercial banks operating in Ghana 76

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS 80

5.1 Introduction 80

5.2 Summary of the Study 80

5.2.1 The impact of policy rate on credit risk of Ghana's banking sector. 81

5.2.2 The effect of inflation rate on credit risk of Ghana's banking sector. 81

5.2.3 The impact of exchange rate on credit risk of Ghana's banking sector. 82

5.2.4 The effect of efficiency on the credit risk of Ghana's banking sector. 82

5.3 Conclusion 83

5.3.1 The impact of policy rate on credit risk of Ghana's banking sector. 83

5.3.2 The effect of inflation rate credit risk of Ghana's banking sector. 83

5.3.3 The impact of exchange rate on credit risk of Ghana's banking sector. 83

5.3.4 The effect of efficiency on the credit risk of Ghana's banking sector. 83

5.4 Recommendations of the study 84

5.4.1 The impact of policy rate on credit risk of Ghana's banking sector. 84

5.4.2 The effect of inflation rate credit risk of Ghana's banking sector. 84

5.4.3 The impact of exchange rate on credit risk of Ghana's banking sector. 85

5.3.4 The effect of efficiency on the credit risk of Ghana's banking sector. 86

5.5 Recommendation for further studies 86

REFERENCES 87

LIST OF TABLES

Table	Page
4. 1:Descriptive Statistics	64
4. 2:Correlation Matrix	66
4. 3:Regression result	68
4. 4:Correlogram test	70

LIST OF FIGURES

Figure	Page
1. 1:Trend Analysis of Non-performing Loans in Ghana	4
2. 1:conceptual framework	48

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The banking sector plays a crucial role in the modern economy, acting as the backbone of financial systems in most countries (Wubin et al., 2022), especially in developing nations where the capital market is weak (Matthew & Laryea, 2012). It is worth conceding that banks play significant roles in economic growth and stability by providing a stable source of financing for businesses and individuals and facilitating savings, investments, and capital allocation (Havidz & Obeng-Amponsah, 2020; Obuobi et al., 2020), financial intermediation between savers and borrowers (Cecchetti & Schoenholtz, 2021) and monetary policy transmission by influencing interest rates, credit availability, and money supply which impact inflation, economic growth, and employment (Cecchetti & Schoenholtz, 2021).

When banks fail to play their meaningful role due to their insolvent or illiquid state, it has a considerable negative effect on the development of the economy (Ministry of Finance [MoF], 2022; Mohd, 2016). Banks could be insolvent or illiquid due to many factors, notable among which are: credit risk characterized by many cases of non-performing loans (Louzis et al., 2012; Castro, 2013), the government's debt exchange programmes having a debilitating effect on the banks (Ahinsah-Wobil, 2023) and other exogenous factors (Kuzucu & Kuzucu, 2019). Access to credit by businesses and individuals becomes difficult and trust in the banking system is eroded when banks and other deposit-taking institutions fail to meet depositors' demands (Acharya & Mora, 2015). As a result, the

Bank of Ghana spells out monetary policy prescriptions to ensure the banking sector is robust enough to effectively play its role as intermediaries.

To ensure a robust banking system that seeks to protect depositors and safeguard the trust and confidence in Ghana's financial system, the Ministry of Finance directed in 2017 that failing banks and other deposit-taking institutions be resolved. In line with the above, the Bank of Ghana (BoG) revoked, between 2017 and 2019, the licenses of four hundred and twenty (420) financial institutions in an exercise dubbed the Banking Sector Clean-up. By emphasis, the Banking Sector Clean-up was aimed at ensuring the orderly exit of insolvent institutions to protect depositors' funds and also ensure the safety and soundness of the banking sector which was in a state of distress at the time. Despite the massive job losses in the banking sector, the exercise has chalked some successes among which is an improvement in the financial position and, by extension, the capital adequacy ratios of the banks (Bank of Ghana [BoG], 2019).

However, due to the current harsh and worsening economic situation, Ghana was compelled to access the 3 billion IMF's Extended Credit Facility which comes with conditionalities, among which is to reduce government debt to a sustainable level. As a result, the government embarked on a debt restructuring programme (famously known as DDEP). As the largest holder of the government's domestic debts, the implementation of the DDEP had significant implications for the banking sector, resulting in a net impairment loss on financial assets in the sector of a colossal GH₵19.5 billion in 2022 as compared to GH₵1.43 billion in 2021 which negatively impacted the sector's financial performance and position. Consequently, the industry slipped from profitability of GH 4.99 billion in 2021 to a loss of GH 6.02 billion by the end of the 2022 financial year (PwC, 2023). This incident

is indicative of the fact that depositors and other investors in the banking sector are at high risk of losing their investment if drastic measures are not taken.

The banking sector is indeed struggling, despite the government's measures to revamp the sector through the famous recapitalization exercise in 2017. It is more worrying to note that the banking sector is also faced with a soaring rate of non-performing loans in recent times. Increasing incidents of non-performing loans is detrimental to the banks since the banks are at high risk of facing serious liquidity and solvency challenges. It is, therefore, imperative to swiftly address the issue of increasing rates of non-performing loans by asking the question: "What drives non-performing loans in Ghana's banking sector?"

1.2 Statement of the Problem

Despite the significance and the superior contribution of this sector to the economic growth of Ghana, the sector has suffered huge losses over the years. For instance, net impairment losses on financial assets in the sector surged from GH₵1.43 billion in 2021 to a colossal GH₵19.5 billion in 2022 as a result of the famous Ghana's Domestic Debt Exchange Programme (DDEP)(PwC, 2023), which negatively impacted the sector's financial performance and position. The sector, consequently, recorded a mammoth loss of GH₵ 6.02 billion by the end of the 2022 financial year. The industry's return on assets (ROA) and return on equity (ROE) also slipped by 5.68% and 48.5%, respectively in 2022 due to the huge impairment loss incurred by the banks. Liquidity and solvency were also negatively impacted (PwC, 2023).

The situation was further exacerbated when the sector was faced with soaring rates of non-performing loans since October 2022. For instance, the recent press release by the Monetary Policy Committee (MPC) of Ghana's central bank revealed that the non-

performing loans (NPLs) in Ghana's banking sector have surged to 20% of all loans, hitting a peak not witnessed in half a decade, and there is no indication of the ratio slowing down (Bank of Ghana [BoG], 2023) (See Figure 1.1). This revelation is worrying since its implications are dire for the overall well-being of the banks and the country. For instance, high levels of non-performing loans (NPLs) could erode a bank's capital base, lowering its ability to absorb unexpected losses and impacting its capital adequacy ratios (Berger & Bouwman, 2013; Acharya et al., 2017). This leads to increased provisioning expenses, negatively affecting profitability and reducing returns for shareholders (Ahmad et al., 2019; Ekinci & Poyraz, 2019). Consequently, banks become more risk-averse and less willing to extend new loans, potentially causing a credit crunch that limits access to credit for individuals and businesses (Jimenez et al., 2014), ultimately hindering economic growth (Mensi et al., 2020).

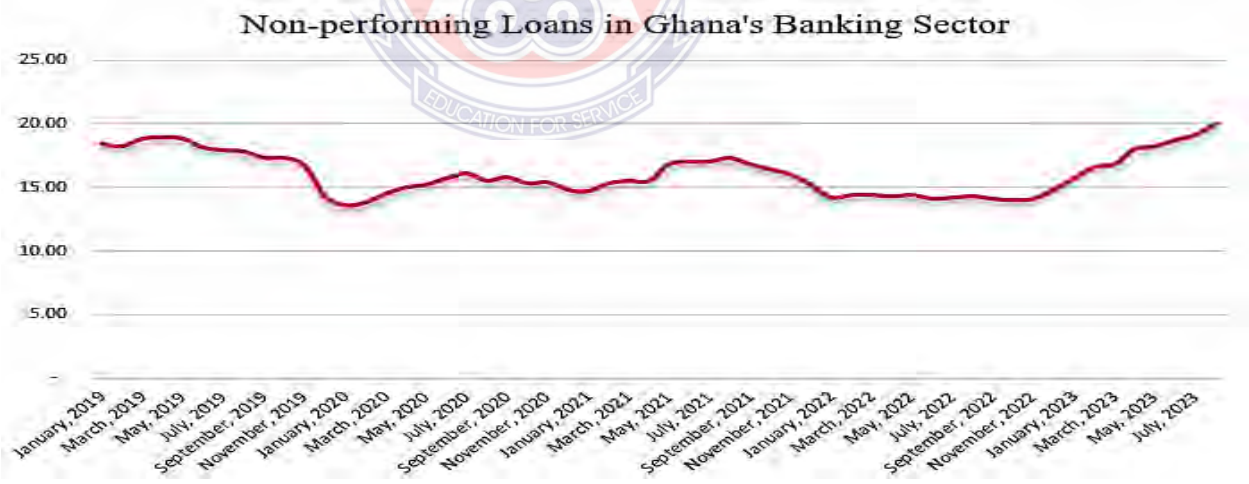

Figure 1. 1:Trend Analysis of Non-performing Loans in Ghana
Source: Bank of Ghana (2023)

The empirical literature trends on investigating the impact of credit risk on performance (Boussemart et al., 2019; Ekinci & Poyraz, 2019; Gadzo et al., 2019; Lawrence et al., 2020; Al Zaidanin & Al Zaidanin, 2021; Sharma, 2021; Kwashie et al., 2022), climate change on

credit risk (Capasso et al., 2020; Birindelli et al., 2022), internal controls on credit risk (Aliani et al., 2021; Zhou & Xiong, 2017). Despite a handful of empirical evidence on the determinants of credit risk among which are interest rate, inflation rate, GDP, credit growth, exchange rate, and cost efficiency with varying results (Havidz & Obeng-Amponsah, 2020; Tanasković & Jandrić, 2015; Kuzucu & Kuzucu, 2019; Radivojević et al., 2019; Rachman et al., 2018; Vouldis & Louzis, 2018; Zhou & Tewari, 2018), the researcher could not sight any known study on the determinants of credit risk in the Ghanaian context. Meanwhile, it was posited that the capability of these determinants to explain the changes in credit risk might differ from one country to another as well as from one industry to the other (Havidz & Obeng-Amponsah, 2020).

Due to the country's ever-increasing incidents of non-performing loans and the dearth of literature on comprehensively addressing this problem in Ghana, this study seeks to investigate the drivers of credit risk with a specific focus on policy rate (Castro, 2013; Louzis et al., 2012; Nkusu, 2011), inflation rate (Tanasković & Jandrić, 2015; Kuzucu & Kuzucu, 2019; Radivojević et al., 2019), exchange rate (Castro, 2013; Nkusu, 2011; Havidz & Obeng-Amponsah, 2020) and cost efficiency (Berger & DeYoung, 1997). The result of this study will help fashion out prudent policy prescriptions toward mitigating the rising incidents of non-performing loans and the general vulnerabilities in the banking sector.

1.3 Purpose of the study

The purpose of this study is to investigate the antecedents of credit risk in Ghana's banking sector within the context of policy rate, inflation rate, exchange rate and cost efficiency.

1.3.1 Research Objectives

To address the purpose of the study, the study seeks to;

1. Investigate the impact of policy rate on the credit risk of Ghana's banking sector
2. Assess the effect of inflation rate on the credit risk of Ghana's banking sector
3. Ascertain the impact of exchange rate on the credit risk of Ghana's banking sector
4. Examine the effect of efficiency on the credit risk of Ghana's banking sector

1.4 Research Hypotheses

Considering the research objectives in question, the study seeks to hypothesize that:

H_1: Policy rate has a significant positive impact on the credit risk of Ghana's banking sector

H_2: Inflation rate has a significant positive impact on the credit risk of Ghana's banking sector

H_3: Exchange rate has a significant positive impact on the credit risk of Ghana's banking sector

H_4: Cost efficiency has a significant positive impact on the credit risk of Ghana's banking sector

1.5 Significance of the Study

Investigating the drivers of rising non-performing loans (NPLs) in the banking sector is of significant importance, with far-reaching implications for the body of knowledge, policy formulation, and banking practices. Such investigations contribute to a deeper understanding of the factors behind NPLs, enabling informed decision-making and risk management. The findings of this study will contribute to the body of knowledge by providing insights into the various risk factors affecting banks' loan portfolios (Berger and

DeYoung, 1997) which will in turn improve risk assessment models, enhancing the ability to predict and manage NPLs (Altunbas et al., 2009). This knowledge is essential for academics and policymakers seeking to grasp the systemic implications of NPLs on the broader economy (Laeven & Valencia, 2018).

For policy, the findings of this study will inform the development of prudent regulatory policies aimed at mitigating the risks associated with rising NPLs (Anginer et al., 2018). As a result, policymakers can tailor regulatory measures to address specific risk factors, thus fostering a more resilient banking sector (Acharya et al., 2017). Furthermore, Investigating NPL drivers helps policymakers design targeted interventions during economic downturns (Jimenez et al., 2014).

For practice, banks can use insights from this study to improve their risk management practices, including credit underwriting standards and loan origination (Hull, 2018). This could lead to better loan portfolio quality and resilience to economic shocks (Berger & Bouwman, 2013) as well as optimizing their loan portfolio diversification strategies (Shim, 2019). Understanding these dynamics could assist banks in reducing concentration risk by diversifying their lending across various sectors, geographies, or customer segments.

1.6 Limitation and Delimitation of the Study

The study seeks to explore the antecedents of credit risk in Ghana's banking sector, an indication that the study is delimited to commercial banks in Ghana. As a result, the study is limited in jurisdictional scope, an indication that the application of the study's findings should be done with caution since the dynamics of Ghana could differ from other economies. Additionally, the study is delimited to four (4) potential antecedents of credit risk such as policy rate, inflation rate, exchange rate and cost efficiency. This implies that

policy direction regarding mitigating credit risk is limited to the variables in question. Additionally, the study used secondary data and adopted a quantitative approach in its data collection and analysis. This also alludes to the fact that other qualitative perspectives on credit risk were ignored. This notwithstanding, the validity of the study's findings was not compromised since the findings are capable of informing policy directions towards mitigating the many incidents of non-performing loans. The study covers a 10-year period from 2013 to 2022.

1.7 Organization of the Study

This study seeks to investigate the antecedents of credit risk with a specific focus on policy rate, inflation rate, exchange rate and cost efficiency. This study is split into five chapters. Chapter one is concerned with the general introduction of the study including the background to the study, statement of the problem, research objectives and hypotheses and the limitations and delimitations of the study. Chapter two discusses the relevant theoretical and empirical evidence on the antecedents of credit risk. Chapter three focuses on the methodology of the study which includes research philosophy, research design and approach, population and sample size, data and data source and data analytical techniques. Chapter four presents results and discussions whereas chapter five focuses on the summary, conclusions, and recommendations.

1.8 Definition of Terms

Credit risk: Credit risk, also known as default risk, refers to the potential that a borrower or debtor will fail to meet their financial obligations by not repaying the principal or interest on a loan or debt as agreed upon.

Policy rate: A policy rate, also known as a key policy rate or benchmark interest rate, is the central bank's primary tool for implementing monetary policy. It is the interest rate at which a central bank lends money to commercial banks and other financial institutions in its jurisdiction

Inflation rate: The inflation rate is a measure of the percentage increase in the general price level of goods and services in an economy over a specific period, typically a year. It reflects the rate at which the purchasing power of a currency is declining, meaning that, on average, prices for goods and services are rising.

Exchange rate: An exchange rate is the rate at which one currency can be exchanged for another. It represents the value of one country's currency in terms of another currency

Cost Efficiency: Cost efficiency measures how well a bank manages its operating expenses relative to its income. Lower operating costs indicate higher cost efficiency. Common metrics include the cost-to-income ratio, where lower values are preferable

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on review of literature which is categorized into theoretical review where related theories that underpins topic under study is reviewed. Again, the study reviews empirical studies that has been conducted on the topic and their findings as well as to know the extent the topic has been explored and the methods used to explore it to give better understanding about the concepts. Also, the chapter construct the conceptual framework to show the interrelationships among the variables under study.

2.2 Theoretical Review

This section presents a review of theories that underpin the concepts under discussion. These theories are theory of prudential regulation, financial intermediation theory and information asymmetry theory.

2.2.1 Theory of Prudential Regulation

The Theory of Prudential Regulation and Supervision is a key framework in the field of banking and finance that focuses on the role of regulatory authorities and central banks in overseeing and controlling the activities of financial institutions, particularly banks (Rossi, 1999; Dragomir, 2010). This theory is highly relevant when exploring the determinants of credit risk in Ghana or any other country's banking system. Prudential regulation and supervision refer to the set of rules, policies, and practices put in place by regulatory authorities (such as the central bank) to ensure the stability, safety, and soundness of the banking sector (Botha & Makina, 2011). The primary goal is to prevent systemic failures and protect depositors and the broader financial system. In the context of antecedent of

credit risk in the banking industry in Ghana, the prudential regulation plays a critical role in diverse ways in explaining the nexus and the role played by regulatory bodies in relation to credit risk of banks (Dragomir, 2010). In the first place, the interest rate charged on loans by banks are mostly influenced by the reference rate or the policy rate issued by the regulator of bank which is bank of Ghana in the context of Ghana. Therefore, the higher the rate pegged by the central banks gives the commercial banks the vacuum to raise their lending rate which may affect the chances of borrowers defaulting and consequently leading to high profile of non-performing loans. Regulatory bodies establish minimum capital requirements that banks must maintain to absorb unexpected losses (Giordano, 2009). Higher capital buffers reduce the likelihood of bank insolvency and can mitigate credit risk. Regulatory authorities provide guidelines on risk management practices, including credit risk assessment, loan portfolio management, and provisioning for potential losses. Banks that adhere to these guidelines are better equipped to manage and mitigate credit risk. Regulatory authorities often conduct Asset Quality Requirements (AQRs) to assess the quality of a bank's assets, including loans. This review helps identify potential credit risk issues and non-performing loans.

The capital adequacy requirements set by the central bank in Ghana directly influence a bank's ability to absorb credit losses. Banks with higher capital ratios are better positioned to withstand economic downturns and higher credit risk (Dragomir, 2010; Cappucci, 2014). The theory emphasizes the importance of robust risk management practices. Banks in Ghana that effectively assess and manage credit risk, implement prudent lending standards, and regularly review their loan portfolios are more likely to keep credit risk in check. The effectiveness of Ghana's regulatory authorities, such as the Bank of Ghana, in monitoring

and supervising banks plays a significant role in controlling credit risk. Their policies and interventions can impact a bank's lending practices and exposure to risky assets.

2.2.2 Financial intermediation theory

The financial intermediation theory, often associated with modern banking practices, suggests that the composition and diversification of a bank's loan portfolio play a critical role in determining its credit risk and vulnerability to financial shocks (Allen & Santomero, 1997; Allen & Gale, 2000). The framework as furthered by Gorton (2010), Boot and Thakor (2010) focuses on how financial intermediaries facilitate the flow of funds, reduce transaction costs, and provide liquidity and risk management services. The postulates of the theory demonstrate that as banks performs their intermediary roles, they use loan portfolio diversification as a risk management strategy to reduce the potential impact of credit risk. Banks that have a concentrated loan portfolio, meaning a large portion of their loans is extended to a specific sector, industry, or type of borrower, are more vulnerable to economic shocks that affect that sector (Boot & Thakor, 2010; Scholtens, 2003). For example, if a bank predominantly lends to a single industry like real estate and the real estate market experiences a downturn, the bank's NPLs can rise significantly.

Loan portfolio diversification involves spreading loans across various sectors of the economy (Scholtens, 2003). This approach can help mitigate credit risk because economic downturns in one sector may not affect the bank's entire loan portfolio. For instance, if a bank lends to agriculture, manufacturing, and services sectors, a downturn in manufacturing may be offset by stability in other sectors. Geographic diversification involves lending across different regions or countries (Scholtens, 2003; Philippon, 2015). Banks that are geographically diversified are less exposed to regional economic shocks.

For example, a bank operating in multiple regions in Ghana may be less vulnerable to localized economic difficulties in a specific region. In the context of Ghana's banking industry, understanding how loan portfolio diversification affects credit risk is crucial. Banks in Ghana may face sector-specific risks such as exposure to the agricultural sector or real estate market and most especially international trade where trader would be exposed to exchange rate risk which has been found in literature as a cause of credit risk among commercial banks. Additionally, regional economic disparities within Ghana could impact credit risk, making geographic diversification a relevant consideration. By examining how Ghanaian banks manage these aspects of loan portfolio diversification, policymakers and financial institutions can gain insights into the determinants of credit risk in the country.

2.2.3 Information Asymmetry theory

Information Asymmetry; This theory, often associated with information economics, focuses on the unequal distribution of information between borrowers and lenders in financial transactions as initially advanced by (Akerlof, 1970). Information asymmetry is a critical concept in the field of credit risk management and plays a significant role in understanding the determinants of credit risk among banks. In the context of Ghanaian banks, it sheds light on how information asymmetry can contribute to credit risk. In Ghana, information asymmetry can lead to adverse selection issues. Borrowers who are more likely to default on their loans may seek financing, knowing that lenders may not have perfect information about their creditworthiness. This adverse selection can result in higher credit risk for banks, as they may end up lending to riskier borrowers without the means to accurately assess their creditworthiness (Akerlof, 1970; Berg et al., 2019). Information asymmetry can also create moral hazard problems among borrowers. When borrowers

believe that lenders lack complete information about their financial behavior, they may be tempted to engage in risky financial activities, assuming that lenders won't be able to monitor their behavior effectively (Martínez-Ferrero et al., 2016). This moral hazard behavior can lead to an increase in non-performing loans as borrowers take on excessive risks.

As espoused by the proponent of the theory and applying it to the context of this discussion, Ghanaian banks may face difficulties in assessing the creditworthiness of borrowers, particularly those in the informal sector or with limited financial histories. Information on income, employment stability, and past credit behavior may be lacking or unreliable. As a result, banks may rely on less accurate information for lending decisions, contributing to credit risk (Martínez-Ferrero et al., 2016; Akerlof, 1970). The regulatory environment in Ghana can also impact information asymmetry. Stricter regulations and better credit reporting systems can help mitigate information gaps by requiring borrowers to provide more comprehensive financial information and enabling lenders to access credit histories.

Conversely, weak regulatory oversight can exacerbate information asymmetry issues. Ghanaian banks' risk management practices, including their ability to conduct thorough credit assessments and employ effective risk mitigation strategies, are essential in managing information asymmetry which support the elucidation adduced by (Fosu et al., 2017). Banks with robust risk management practices are better equipped to handle the challenges posed by information asymmetry. This framework has been applied in studying the credit risk and its association with other bank variables in the context of Ghana making its applicable to this study.

2.3 Conceptual Review

2.3.1 Credit Risk

Credit risk is a fundamental concern in the banking sector, affecting both financial institutions and the broader economy. It refers to the potential for borrowers to default on their loan obligations, leading to potential financial losses for banks (Havidz & Obeng-Amponsah, 2020). Several factors influence credit risk, including exchange rates, the efficiency of banks, and policy rates. This conceptual review aims to explore the relationships between these variables and credit risk.

2.3.2 Inflation

In literature and according to previous studies inflation as a concept refers to the general increase in price of goods and services in an economy (Havidz & Obeng-Amponsah, 2020). The concept of inflation has been high in Ghana and turns to be higher when the Ghanaian economy experiences shocks which turns to affect other commodities and services in the economy. In Ghana and in most places in the world inflation id primary driven by surge in crude oil prices though inflation can be determined or be affected by other factors in an economy (Khan et al., 2023). It is considered as a systematic risk since it is inherent in economy. Due to the distortion or soar in inflation can cause to business activities it is expected to increase or worsen credit risk of banks. However, introduction of pragmatic measures by banks to strengthen their risk management system can curtail or minimize the profile of credit risk among banks (Chaibi & Fitti, 2015).

2.3.3 Exchange Rate

Exchange rates play a crucial role in determining credit risk for banks. They refer to the rate at which one currency can be exchanged for another (Jegadeeshwaran & Basuvaraj,

2019). Fluctuations in exchange rates can impact the creditworthiness of borrowers, especially those engaged in international transactions (Khan et al., 2023). A depreciating local currency can increase the credit risk for borrowers who have foreign currency-denominated loans (Jegadeeshwaran & Basuvaraj, 2019). When the local currency weakens, borrowers may struggle to repay their loans, leading to higher default rates. Businesses involved in international trade are particularly vulnerable to exchange rate fluctuations. Sudden changes in exchange rates can affect their ability to service their debt, thus elevating credit risk for banks. Per the account of previous studies soar in exchange rate would lead to increase in credit risk of banks since it would increase cost of doing business and limit borrower's ability of repaying their loans (Tanasković & Jandric, 2015).

2.3.4 Efficiency of Banks

Efficiency measures how well a bank manages its resources to generate profits while minimizing costs (Jegadeeshwaran & Basuvaraj, 2019). Inefficient banks may be less capable of assessing and managing credit risk effectively. Efficient banks tend to have better risk assessment processes. They can accurately evaluate the creditworthiness of borrowers, reducing the likelihood of granting loans to high-risk clients (Kablan 2018; Othman et al., 2020). Efficient banks are more likely to diversify their loan portfolios, spreading risk across different sectors and industries. This diversification can mitigate credit risk by reducing overexposure to a single industry or market segment. According to existing studies assert that efficiency has positive impact on the credit risk of banks (Jegadeeshwaran & Basuvaraj, 2019) meanwhile another strand of study concludes that efficiency has negative impact on credit risk of banks (Othman et al., 2020; Kablan, 2018).

2.3.5 Policy Rate

The policy rate, often set by a country's central bank, influences credit risk through its impact on interest rates and overall economic conditions (Othman et al., 2020). Changes in the policy rate can affect the cost of borrowing for businesses and individuals. An increase in the policy rate may lead to higher interest rates on loans, making it more challenging for borrowers to repay, thus increasing credit risk. The policy rate reflects the central bank's efforts to maintain economic stability (Raiter, 2021). A stable economic environment can lead to lower credit risk, while periods of economic volatility can heighten risk.

2.4 Empirical Review

A number of studies have taken keen interest in exploring the influence of micro and macroeconomic variables as well as the influence of firm specific variables in determining its credit risk, this section of the study explores these studies. This section of the study enables the researcher to know the extent and depth of work that has been done on the topic under discussion and how it has been explored.

2.4.1 The impact of policy rate on the credit risk of Ghana's banking sector

Comparatively, Othman et al. (2020) aimed to investigate the factors, both external (macroeconomic) and internal institutional variables, that impact credit risk in Islamic banks across Association of South East Asian Nations (ASEAN) countries. The analysis draws from the data of 29 Islamic banks operating in ASEAN from 2011 to 2018, employing a panel data model as the research method. The outcomes of the long-term regression analysis, particularly FLOMS, DLOS, and PMG, highlight several key findings. The research recorded that a significant positive relationship between policy rate and credit

risk. Just as found by Raiter (2021) who documented a positive relationship between interest rare and credit risk. The study underscores the need for further research to gain a deeper understanding of the mechanisms through which credit risk is generated within Islamic banking. The insights derived from such research can equip Islamic banks with the knowledge and strategies required to effectively manage and mitigate credit risk.

Several recommendations were made by the study which include Islamic banks in ASEAN should focus on strengthening their internal risk management practices, particularly in terms of management efficiency and capital adequacy. This can involve more effective utilization of resources and ensuring sufficient capital reserves to cushion against credit risk. Given the significance of external economic factors, Islamic banks should closely monitor and adapt to changes in economic growth, inflation rates, and interest rate environments. A number of notable limitations may undermine the findings of the study such as the ASEAN region is predominantly dominated by Islamic banks therefore, the study's reliance on data from 29 Islamic banks may not fully capture the diversity within the ASEAN Islamic banking sector. A larger and more diverse sample could provide more comprehensive insights. The study covers the years 2011 to 2018. Economic and financial dynamics may have evolved since then, potentially affecting the relevance of the findings to the present context. While the study identifies relationships between variables, it may not establish causality. Further research could delve into the causal mechanisms through which these factors influence credit risk. Additionally, since the study focused on a specific geographic region (ASEAN). Its findings may not be directly transferable to other regions or global contexts.

Misman and Bhatti (2020) analysed the critical aspects related to credit risk within a selection of Islamic banks operating across nine countries spanning the Association of Southeast Asian Nations (ASEAN) and Gulf Cooperation Council (GCC) regions. The study employs generalized least squares panel data regression to assess the ratio of non-performing financing to total financing, using bank-specific variables (BSV) to gauge credit risk. Drawing on an unbalanced panel dataset spanning 12 years and encompassing 40 diverse Islamic banks, the research made diverse discoveries. Precisely, the study uncovers a significant positive relationship between interest rate and credit risk of the studied banks. The positive results corroborate with the Othman et al. (2020) whose study a positive relationship. Again, there was a positive association between financing quality and credit risk. Notably, larger Islamic banks (IBs), characterized by more substantial assets, tend to exhibit lower levels of credit risk compared to their smaller counterparts. Additionally, the age of the bank emerges as a pivotal factor influencing credit risk.

Raiter (2021) investigated the factors contributing to credit risk. The dataset utilized was derived from the WDI and Bankscope databases, comprising balanced panel data for six years. It encompasses 106 commercial banks, both private and state-owned. The study applied both Fixed Effect (FE) and Random Effect (RE) models in its analysis. The study's outcomes indicate several significant relationships. Notably, an increase in inflation, interest rates, and unemployment is associated with heightened credit risk in commercial banks. The positive effect of interest rate on credit risk is in alignment of Othman et al. (2021). Conversely, an increase in GDP growth, efficiency, and bank size is linked to a reduction in credit risk. The reduction of effect of GDP on credit risk confirms the account of Tanasković and Jandrić (2015), Mpofu and Nikolaidou (2018) who documented an

inverse relationship between GDP and credit risk. Meanwhile the same result debunks the account of Havidz and Obeng-Amponsah (2020) and Jegadeeshwaran and Basuvaraj (2019) who alluded that there is positive statistically significant relationship between GDP and credit risk. Additionally, private banks tend to exhibit lower credit risk compared to state-owned banks. However, the findings do not provide support for the hypotheses that exchange rates and regulatory capital have an influence on credit risk. One potential limitation of this study is that it relies on existing datasets, which may not encompass all relevant variables or account for all contextual nuances. Additionally, the study's findings may be subject to the limitations inherent in the FE and RE models used, such as assumptions about the nature of the data.

Waemustafa and Sukri (2015) investigated the determinants of credit risk in Islamic and conventional banks, focusing on macroeconomic and bank-specific factors. Utilizing multivariate regression analysis, the research centered on a sample comprising 15 conventional banks and 13 Islamic banks in Malaysia. The study spans the years 2000 to 2010 and aims to discern how various determinants shape credit risk in these two banking categories. There was positive relationship between policy rate and credit risk. This reuslt directly agrees with the findings of Othman et al. (2020) who found that a positive association between policy rate and credit risk. The study revealed that credit risk in both Islamic and conventional banks is notably influenced by bank-specific factors, albeit in distinct ways. For Islamic banks, credit risk is significantly impacted by variables like risky sector financing, regulatory capital (REGCAP), Islamic contract. Conversely, in conventional banks, credit risk is influenced by factors such as loan loss provision, debt-to-total asset ratio, REGCAP, size, earning management, and liquidity. Additionally,

certain macroeconomic factors, specifically inflation and M3, are identified as significant drivers of credit risk in both Islamic and Conventional banks.

Chaibi and Ftiti (2015) applies a dynamic panel data approach to investigate the factors influencing non-performing loans (NPLs) in commercial banks within two distinct economic frameworks in a market-based economy (represented by France) and a bank-based economy (represented by Germany). The study covers the period from 2005 to 2011, aiming to discern how macroeconomic and bank-specific variables impact loan quality within these differing banking systems. The research reveals policy rate significantly affect NPLs in negative direction in both France and Germany. This negative finding deviates from the reuslt of Othman et al. (2020), Misman and Bahatti (2020) who concluded that policy rate set by countries inversely affect credit risk. One limitation of the study is its focus on a specific time period (2005–2011), which may not capture more recent developments and shifts in credit risk factors. It was recommended that future research in this domain should consider extending the study period to include more recent data, providing a more up-to-date understanding of the dynamics influencing credit risk in both market-based and bank-based economies.

2.4.2 The impact of inflation rate on the credit risk of Ghana's banking sector.

Mpofu and Nikolaidou (2018) delved into the macroeconomic factors influencing credit risk within the banking systems of 22 Sub-Saharan African countries. The study measured credit risk based on the ratio of non-performing loans (NPLs) to the total gross loans, and it employs dynamic panel data analysis spanning the years 2000 to 2016. Across various model specifications, the findings consistently reveal that an increase in the real GDP growth rate has a substantial and statistically significant impact in reducing the NPL-to-

total-gross-loans ratio. This inverse association between GDP and non-performing loans is consistent with the findings espoused by (Tanasković & Jandrić, 2015) who also documented that GDP has adverse impact on non-performing implying a dampening effect. There was a noteworthy positive association between the inflation rate and NPLs. Higher inflation rates are linked to an increase in credit risk within the banking systems. This positive reuslt deviated from the findings espoused by (Tanasković & Jandrić, 2015) that there is no significance relationship between inflation and non-performing loan in CEE SEE countries. Similarly, the research adduced that when domestic credit extended to the private sector by banks as a percentage of GDP rises, it leads to a significant uptick in credit risk. The degree of trade openness within these Sub-Saharan African economies is positively correlated with credit risk. Greater trade openness is associated with higher NPL ratios. The study employed the VIX index as a proxy for global volatility.

It finds that increased global volatility has a positive and significant impact on NPLs, suggesting that global economic fluctuations affect credit risk. The aftermath of the 2008/2009 global financial crisis has a lasting impact on credit risk within these economies, with a positive and significant association. Though the research makes insightful strides, it is necessary to acknowledge the following limitations that characterize the study. The study employs the NPL-to-total-gross-loans ratio as the primary measure of credit risk, while this is a commonly used indicator, it simplifies the multifaceted nature of credit risk, which can encompass various dimensions and types of loans. Again, the study establishes associations between macroeconomic variables and credit risk but does not delve into causality. Understanding the causal relationships between these factors could provide deeper insights into the dynamics of credit risk. Also, the study focuses on few macroeconomic variables

and may not capture the full spectrum of factors influencing credit risk within individual banking systems, such as bank-specific strategies and regulatory frameworks.

On the other hand, Jegadeeshwaran and Basuvaraj (2019) primarily aimed to examine the factors influencing credit risk in specific private sector banks during the post-financial crisis period. The study spans a decade, covering the years 2008-2009 to 2017-2018 accounting years. To conduct this analysis, the researchers chose the top ten private sector banks based on their significant share in Non-Performing Assets (NPAs). These banks include ICICI Bank, Axis Bank, HDFC Bank, Jammu and Kashmir Bank, Kotak Mahindra Bank, Karur Vysya Bank, Federal Bank, Yes Bank, Lakshmi Vilas Bank, and South Indian Banks. The analysis employed various tools, such as ratio analysis and statistical techniques like mean, standard deviation, coefficient of variation, compound annual growth rate, Hausman test, and panel data regression. The study's findings underscore that several factors significantly contribute to credit risk in these selected private sector banks. These influential factors encompass the GDP growth rate, inflation rate, operational inefficiency, return on assets, bank branch growth, and bank size.

Again, inflation rate has significant negative relationship with credit risk implying rising price of goods and services lead to significant reduction in credit risk among Indian private banks. The inverse relationship between inflation and credit object the insignificant finding adduced by Tanasković and Jandrić (2015) and the positive significance finding unveiled by Mpofu and Nikolaidou (2018). Also exchange rate of the Indian rupees to the united state dollar demonstrated a negative significant relationship with credit risk among the selected the private banks. This result is unsupported by the account of Tanasković and Jandrić (2015) who discovered negative significant relationship between exchange rate and

credit risk. Interest rate showed an insignificant positive relationship with credit risk within the analysed dataset. The limitations associated with the research are; the study focused on a specific set of private sector banks and may not capture the broader banking landscape. The findings may not be directly applicable to other banks or financial institutions. Again, the study relies on historical data, and credit risk can be influenced by dynamic and evolving factors. Using only past data may not account for changing economic conditions and banking practices. More so, the analysis makes certain assumptions about the relationships between variables and credit risk. These assumptions may not hold in all scenarios. The study does not extensively explore external factors beyond the economic indicators mentioned. Credit risk can also be impacted by global events, regulatory changes, and market dynamics, which are not fully addressed. While the findings offer insights into these specific banks, generalizing the results to the entire banking industry should be done cautiously, considering the variations in bank operations and risk profiles. Also, the inquiry sampled banks from only India making the findings lack generalizability to neighbouring countries.

Additionally, Raiter (2021) investigated the factors contributing to credit risk. The dataset utilized was derived from the WDI and Bankscope databases, comprising balanced panel data for six years. It encompasses 106 commercial banks, both private and state-owned. The study applied both Fixed Effect (FE) and Random Effect (RE) models in its analysis. The study's outcomes indicate several significant relationships. Notably, an increase in inflation, interest rates, and unemployment is associated with heightened credit risk in commercial banks. The positive relationship between inflation and credit risk is consistent with the result of Mpofu and Nikolaidou (2018) whose study unveiled a positive effect of

inflation on credit risk. Notwithstanding, the positive effect of inflation on credit opposes the result of Tanasković and Jandrić (2015), Chaibi and Ftiti (2015).

Furthermore, Waemustafa and Sukri (2015) investigated the determinants of credit risk in Islamic and conventional banks, focusing on macroeconomic and bank-specific factors. Utilizing multivariate regression analysis, the research centered on a sample comprising 15 conventional banks and 13 Islamic banks in Malaysia. The study spans the years 2000 to 2010 and aims to discern how various determinants shape credit risk in these two banking categories. Specifically, inflation and M3, are identified as significant drivers of credit risk in both Islamic and Conventional banks. The discovery that inflation is a significant positive determinant of credit risk among banks corroborate with literature see the account of Mpofu and Nikolaidou (2018) who documented a positive relationship of inflation with credit risk nonetheless, the result refutes the argument as put forward by Chaibi and Ftiti (2015), Tanasković and Jandrić (2015) who whose studies showed an insignificance relationship between inflation and credit risk. A potential limitation of the study may be the relatively limited timeframe (2000 to 2010), which may not capture more recent developments and trends in credit risk determinants.

Future research in this area could benefit from extending the study period to include more recent data, thereby offering insights into how credit risk determinants have evolved over time in both Islamic and Conventional banks. Regulatory capital is identified as a crucial element in mitigating credit risk exposure, particularly when adhering to minimum regulatory capital requirements. Intriguingly, the study indicates that Islamic banks were less susceptible to the impact of the global financial crisis, primarily due to their lower credit risk levels compared to conventional banks. A potential limitation of this research

may be its focus on a specific set of countries, which might restrict the generalizability of its findings to a broader global context. It was recommended that additional research could involve expanding the scope to encompass a more diverse range of countries and regions, thereby enhancing the applicability and generalizability of the study's findings concerning credit risk in Islamic banks.

Othman et al. (2020) aimed to investigate the factors, both external (macroeconomic) and internal institutional variables, that impact credit risk in Islamic banks across Association of South East Asian Nations (ASEAN) countries. The analysis draws from the data of 29 Islamic banks operating in ASEAN from 2011 to 2018, employing a panel data model as the research method. The outcomes of the long-term regression analysis, particularly FLOMS, DLOS, and PMG, highlight several key findings. External economic variables, including economic growth, inflation, and interest rates, are also identified as influential factors affecting the credit risk of Islamic banks. This finding supports the account of Nikolaidou and Vogiazas (2017) who discovered that economic growth is significantly inversely related to credit risk among commercial banks. Again, the finding confirms the result of Mpofu and Nikolaidou (2018) who unveiled that economic growth negative and significantly affect credit risk. Specifically, inflation on the other hand significantly and positively affect credit risk among commercial banks.

Contrastingly, the significant relationship between inflation and credit risk unveiled by the study debunks the argument put forward by Nikolaidou and Vogiazas (2017) who adduced that there is insignificant relationship between inflation and credit risk among commercial banks. The study underscores the need for further research to gain a deeper understanding of the mechanisms through which credit risk is generated within Islamic banking. The

insights derived from such research can equip Islamic banks with the knowledge and strategies required to effectively manage and mitigate credit risk. Several recommendations were made by the study which include Islamic banks in ASEAN should focus on strengthening their internal risk management practices, particularly in terms of management efficiency and capital adequacy. This can involve more effective utilization of resources and ensuring sufficient capital reserves to cushion against credit risk. Given the significance of external economic factors, Islamic banks should closely monitor and adapt to changes in economic growth, inflation rates, and interest rate environments. A number of notable limitations may undermine the findings of the study such as the ASEAN region is predominantly dominated by Islamic banks therefore, the study's reliance on data from 29 Islamic banks may not fully capture the diversity within the ASEAN Islamic banking sector. A larger and more diverse sample could provide more comprehensive insights. The study covers the years 2011 to 2018. Economic and financial dynamics may have evolved since then, potentially affecting the relevance of the findings to the present context. While the study identifies relationships between variables, it may not establish causality. Further research could delve into the causal mechanisms through which these factors influence credit risk. Additionally, since the study focused on a specific geographic region (ASEAN). Its findings may not be directly transferable to other regions or global contexts.

Chaibi and Ftiti (2015) applies a dynamic panel data approach to investigate the factors influencing non-performing loans (NPLs) in commercial banks within two distinct economic frameworks in a market-based economy (represented by France) and a bank-based economy (represented by Germany). The study covers the period from 2005 to 2011,

aiming to discern how macroeconomic and bank-specific variables impact loan quality within these differing banking systems. The research reveals that inflation rate has significant effect NPLs in both France and Germany. The insignificant nature of inflation rate of coincides with the account of Tanasković and Jandrić (2015) nevertheless, it contradicts the findings of Mpofu and Nikolaidou (2018) who uncovered that there is insignificant relationship between inflation rate and credit risk. This outcome is attributed to both countries' membership in the same euro area. Furthermore, the research highlights that, compared to Germany, the French economy is more influenced by bank-specific factors. This underscores the influence of the type of economy, whether bank-based or market-based, on credit risk and corroborate with the account of Nikolaidou and Vogiazas (2017) who pronounced that bank inherent factors do predict credit risk. One limitation of the study is its focus on a specific time period (2005–2011), which may not capture more recent developments and shifts in credit risk factors. It was recommended that future research in this domain should consider extending the study period to include more recent data, providing a more up-to-date understanding of the dynamics influencing credit risk in both market-based and bank-based economies.

Havidz and Obeng-Amponsah (2020) examined the factors influencing credit risk in banks within the Indonesian context. The analysis takes a comprehensive approach, considering both macroeconomic factors and bank-specific characteristics. Panel data analysis techniques, including fixed effect, different GMM, and system GMM, were employed to account for lagged determinant variables, which are used to assess the delayed response of bank credit risk due to its persistence. Specifically, the investigation unveiled that inflation rate has significant positive relationship with credit risk implying rising price of goods and

services lead to significant increase in credit risk among banks. The positive significant relationship between inflation and credit refutes the insignificant finding adduced by Tanasković and Jandrić (2015) and significant negative relationship adduced by Jegadeeshwaran and Basuvaraj (2019) yet supports the positive significance finding unveiled by Mpofu and Nikolaidou (2018).

2.4.3 The impact of exchange rate on the credit risk of Ghana's banking sector.

Tanasković and Jandrić (2015) undertook an examination of the empirical determinants of non-performing loans (NPL) ratio growth, focusing on selected Central and Eastern European Countries (CEEC) and Southeast European (SEE) countries during the period from 2006 to 2013. The analysis employs a static panel model approach, with the logarithm of the NPL-to-total-loans ratio serving as the dependent variable. The study incorporates a set of independent variables encompassing macroeconomic and financial indicators typically referenced in the literature, along with pertinent institutional variables. The study discovered that there exists a negative association between increases in Gross Domestic Product (GDP) and the rise in the NPL ratio. This suggests that higher economic growth tends to be correlated with a lower NPL ratio. Again, the research unveiled that the ratio of foreign currency loans and the level of exchange rates exhibit a positive correlation with the NPL ratio. This underscores the notion that countries where domestic currency is not the primary medium for credit placements tend to experience greater challenges with NPLs, particularly during periods of domestic currency depreciation. Also, the inflation rate, as an independent variable, was pronounced statistically insignificant in relation to the NPL ratio for the sample countries.

On the other hand, among the institutional variables, the level of financial market development emerges as statistically negative significant in its relationship with the NPL level. Notably, a more advanced financial market is associated with a lower NPL ratio. The study recommended that countries where foreign currency loans play a substantial role should consider implementing measures to mitigate currency risk. This may include offering hedging options to borrowers or enforcing prudent foreign exchange risk management practices by financial institutions. Again, efforts to foster the development of financial markets should be prioritized. A well-developed financial market can contribute to a more stable lending environment and potentially reduce NPL levels. The study implores that despite the negative relationship between GDP growth and NPL ratio observed in this study, it is crucial for authorities and financial institutions to exercise vigilance during economic expansions. Prudent lending and risk management practices should not be overlooked. The study has a number of weaknesses which include limited data period from 2006 to 2013. Economic and financial dynamics may have evolved since that time, potentially impacting the relevance of the findings to the present day. Again, the quality and availability of data may influence the accuracy and comprehensiveness of the study's results. Data limitations can inadvertently affect the robustness of the conclusions. Also, the study focused on CEEC and SEE countries, the applicability of the findings to other regions, similar economic blocs or global contexts may be limited due to variations in economic, regulatory, and institutional factors. Moreover, the study identifies impacts between variables and the NPL ratio but did not establish causal relationships. Additional research may be needed to explore causal mechanisms.

Raiter (2021) investigated the factors contributing to credit risk. The dataset utilized was derived from the WDI and Bankscope databases, comprising balanced panel data for six years. It encompasses 106 commercial banks, both private and state-owned. The study applied both Fixed Effect (FE) and Random Effect (RE) models in its analysis. The study's outcomes indicate several significant relationships. Notably, an increase in inflation, interest rates, and unemployment is associated with heightened credit risk in commercial banks. However, the findings do not provide support for the hypotheses that exchange rates and regulatory capital have an influence on credit risk. credit risk. Additionally, private banks tend to exhibit lower credit risk compared to state-owned banks. One potential limitation of this study is that it relies on existing datasets, which may not encompass all relevant variables or account for all contextual nuances. Additionally, the study's findings may be subject to the limitations inherent in the FE and RE models used, such as assumptions about the nature of the data.

Moreover, Chaibi and Ftiti (2015) applies a dynamic panel data approach to investigate the factors influencing non-performing loans (NPLs) in commercial banks within two distinct economic frameworks in a market-based economy (represented by France) and a bank-based economy (represented by Germany). The study covers the period from 2005 to 2011, aiming to discern how macroeconomic and bank-specific variables impact loan quality within these differing banking systems. Finding was that exchange rate exert negative influence credit risk of banks in both countries. The outcome of the study aligns with the (Jegadeeshwaran & Basuvaraj, 2019) however, it deviates from the account of Tanasković & Jandrić, 2015). One limitation of the study is its focus on a specific time period (2005–2011), which may not capture more recent developments and shifts in credit risk factors. It

was recommended that future research in this domain should consider extending the study period to include more recent data, providing a more up-to-date understanding of the dynamics influencing credit risk in both market-based and bank-based economies.

Havidz and Obeng-Amponsah (2020) examined the factors influencing credit risk in banks within the Indonesian context. The analysis takes a comprehensive approach, considering both macroeconomic factors and bank-specific characteristics. Panel data analysis techniques, including fixed effect, different GMM, and system GMM, were employed to account for lagged determinant variables, which are used to assess the delayed response of bank credit risk due to its persistence. The study's findings indicate that bank-specific variables exert a more significant influence on credit risk compared to macroeconomic variables. This suggests that the management practices and characteristics specific to individual banks play a pivotal role in determining credit risk levels. This evidence supports the account of Nikolaidou and Vogiazas (2017) which documented that banks inherent factors do significantly affect credit risk of banks. Specifically, the investigation unveiled that inflation rate has significant positive relationship with credit risk implying rising price of goods and services lead to significant increase in credit risk among banks.

Again, Havidz and Obeng-Amponsah (2020) examined the factors influencing credit risk in banks within the Indonesian context. The analysis takes a comprehensive approach, considering both macroeconomic factors and bank-specific characteristics. Panel data analysis techniques, including fixed effect, different GMM, and system GMM, were employed to account for lagged determinant variables, which are used to assess the delayed response of bank credit risk due to its persistence. The study's findings indicate that bank-specific variables exert a more significant influence on credit risk compared to

macroeconomic variables. This suggests that the management practices and characteristics specific to individual banks play a pivotal role in determining credit risk levels. This evidence supports the account of Nikolaidou and Vogiazas (2017) which documented that bank inherent factors do significantly affect credit risk of banks. Again, exchange rate showed a significant positive relationship with credit risk which agrees with the findings of Tanasković and Jandrić (2015) who found positive relationship between the two variables conversely it contradicts the inverse finding Jegadeeshwaran and Basuvaraj (2019). GDP revealed a positive significant relationship with credit risk implying increasing gross domestic product leads to higher credit risk among banks.

This evidence supports the pronouncement made by Jegadeeshwaran and Basuvaraj (2019) who announced based on empirical evidence that GDP has strong positive relationship with credit risk. Notwithstanding, the positive result disagree with the argument put forward by Tanasković and Jandrić (2015) and Mpofu and Nikolaidou (2018) that a statistically significant positive relationship exists between GDP and credit risk. Also, exchange rate registered a statically significant positive relationship with credit risk. The significant positive finding agrees with positive elucidation provided by Tanasković and Jandrić (2015). Nevertheless, the inverse result ascertained by Jegadeeshwaran and Basuvaraj (2019) is strongly opposed by the positive finding. Moreover, the research reveals that the banks under examination maintain prudent credit risk management, which further explains the heightened significance of bank-specific variables. This prudence enables these banks to resist the impact of macroeconomic fluctuations to a greater extent. Recommendations made based on the findings are that one, banks should continue to focus on strengthening their internal risk management practices. This includes robust credit risk assessment,

portfolio diversification, and measures to mitigate specific credit risk factors. Two, while bank-specific factors are crucial, it remains important for banks to stay vigilant regarding changes in the broader macroeconomic environment. Continuous monitoring of macroeconomic indicators can help banks proactively adapt their risk management strategies. Three, banks should emphasize the use of data-driven decision-making processes.

By analyzing historical data and lagged variables, banks can gain insights into how their credit risk profiles may evolve over time. Though the study shed light on the growing discussion on the determinant of credit the following limitation are wealthy of note. In the first place the findings of this study may be specific to the Indonesian banking sector and may not be directly applicable to other countries or banking environments. Any limitations or inaccuracies in the data may affect the study's outcomes. Again, the study focused on specific determinants of credit risk, and other potential factors influencing credit risk may not have been considered. A broader analysis could provide a more comprehensive understanding.

2.4.4 The impact of efficiency on the credit risk of Ghana's banking sector.

Othman et al. (2020) aimed to investigate the factors, both external (macroeconomic) and internal institutional variables, that impact credit risk in Islamic banks across Association of South East Asian Nations (ASEAN) countries. The analysis draws from the data of 29 Islamic banks operating in ASEAN from 2011 to 2018, employing a panel data model as the research method. The outcomes of the long-term regression analysis, particularly FLOMS, DLOS, and PMG, highlight several key findings. Specifically, efficiency (MGT) and capital ratio (CR) emerge as internal factors significantly influencing the credit risk of

Islamic banks in ASEAN. This result in line with the account of Nikolaidou and Vogiazas (2017) who posited that bank internal variables can impact its credit risk though Nikolaidou and Vogiazas (2017) failed to point out the actual intuitional variables that can cause higher credit risk among banks. This study builds on the weakness that characterized the study of (Nikolaidou and Vogiazas, 2017) by unveiling efficiency and capital ratio as the intriguing firm specific factors that causes credit risk.

Jegadeeshwaran and Basuvaraj (2019) primarily aimed to examine the factors influencing credit risk in specific private sector banks during the post-financial crisis period. The study spans a decade, covering the years 2008-2009 to 2017-2018 accounting years. To conduct this analysis, the researchers chose the top ten private sector banks based on their significant share in Non-Performing Assets (NPAs). These banks include ICICI Bank, Axis Bank, HDFC Bank, Jammu and Kashmir Bank, Kotak Mahindra Bank, Karur Vysya Bank, Federal Bank, Yes Bank, Lakshmi Vilas Bank, and South Indian Banks. The analysis employed various tools, such as ratio analysis and statistical techniques like mean, standard deviation, coefficient of variation, compound annual growth rate, Hausman test, and panel data regression. The study's findings underscore that several factors significantly contribute to credit risk in these selected private sector banks.

These influential factors encompass the GDP growth rate, inflation rate, operational inefficiency, return on assets, bank branch growth, and bank size. Efficiency of banks has statistically significant positive relationship with credit risk. This finding contradicts the significant inverse relationship found between efficiency and credit risk (Othman et al., 2020). Moreover, return on asset recorded a negative significant relationship with credit risk among the studied banks in India. In relation to existing literature, the significant

relationship between return on asset and credit risk vindicate the posit of Nikolaidou and Vogiazas (2017) who alluded that bank inherent factors do impact credit risk. The registered significant effect of return on asset, efficiency on credit risk confirms the assertion that bank internal variables do affect credit risk Othman et al. (2020). This factor poses a substantial threat to the financial health of these banks, elevating their credit risk. Consequently, the study concludes that these banks should take proactive measures to mitigate credit risk, including adhering to regulatory guidelines like the Prompt Corrective Action (PCA) framework and maintaining sufficient capital reserves to absorb potential risks. The analysis made some sound recommendations which include one, the identified influential factors should prompt banks to develop robust risk mitigation strategies. This may involve diversifying their loan portfolios, enhancing risk assessment processes, and closely monitoring economic indicators. Two, Banks must strictly adhere to regulatory guidelines, such as the PCA framework, to ensure timely corrective actions in response to deteriorating financial health. Compliance is crucial in maintaining the stability of the banking sector. Three, to withstand credit risk, banks should ensure they maintain adequate capital buffers.

This can serve as a safeguard against unexpected losses and economic downturns. Four, addressing operational inefficiencies can reduce the overall risk exposure of banks. Streamlining processes, improving cost management, and optimizing resource allocation can enhance operational efficiency. The limitations associated with the research are; the study focused on a specific set of private sector banks and may not capture the broader banking landscape. The findings may not be directly applicable to other banks or financial institutions. Again, the study relies on historical data, and credit risk can be influenced by

dynamic and evolving factors. Using only past data may not account for changing economic conditions and banking practices. More so, the analysis makes certain assumptions about the relationships between variables and credit risk. These assumptions may not hold in all scenarios. The study does not extensively explore external factors beyond the economic indicators mentioned. Credit risk can also be impacted by global events, regulatory changes, and market dynamics, which are not fully addressed. While the findings offer insights into these specific banks, generalizing the results to the entire banking industry should be done cautiously, considering the variations in bank operations and risk profiles. Also, the inquiry sampled banks from only India making the findings lack generalizability to neighbouring countries.

In a similar vein, Asamoah and Adjare (2015) delved into the factors influencing the credit risk of commercial banks in Ghana over the period from 2007 to 2014. It employs Robust Least Squares regression analysis as its analytical method. The study uncovers several noteworthy findings. Firstly, the research uncovered a negative association between efficiency and credit risk and there is a significantly positive relationship between bank credit risk and leverage. Lastly, in terms of the relationship between bank credit risk and profitability, a significant negative correlation is identified. The research implores that it is advisable for commercial banks to continue diversifying their lending activities, particularly into productive sectors. This diversification strategy can serve as a risk mitigation measure against credit risk, a weakness associated with the study is it use of short span of data as well as micro scope.

Relatedly, Zhou and Tewari (2018) analyzed the influence of political institutions and macroeconomic factors on credit risk within South Africa. The study encompassed

quarterly data spanning from 1998 to 2016. To conduct this analysis, the ARDL approach to cointegration is employed, offering insights into both long-term and short-term dynamics affecting credit risk. In the long-term perspective, the study identified that political institutions and gold prices exert a positive impact on credit risk, while Gross Domestic Product (GDP) exerts a negative influence. The finding that gross domestic product exerts adverse influence on credit risk concord with the finding of Tanasković and Jandrić (2015) and Mpofu and Nikolaidou (2018) who documented an inverse relationship between GDP and credit risk. Meanwhile the same result debunks the account of Havidz and Obeng-Amponsah (2020) and Jegadeeshwaran and Basuvaraj (2019) who alluded that there is positive statistically significant relationship between GDP and credit risk. However, in the short-term, political institutions are found to negatively affect credit risk. Additionally, the study corroborates recent country risk downgrades issued by prominent rating agencies such as S&P, Moody's, and Fitch. To bolster investor and lender confidence, the study suggests adopting policies that align with the government's long-term strategy and promote economic growth. To enhance investor and lender confidence, the study recommends the pursuit of policies that align with the government's long-term strategy and foster economic growth. The use of outdated data weakens the findings of the study, therefore, to strengthen the study's robustness, future research should consider incorporating more recent data to provide a more up-to-date perspective on credit risk factors in South Africa. The study focused on data spanning from 1998 to 2016, which may not capture more recent developments and events that could influence credit risk.

Also, Yağli and Topcu (2023) seeks to identify and examine the factors influencing credit risk within the Turkish banking sector during the period from 2003 to 2018. In contrast to

prior studies, the analysis employs the Augmented Mean Group estimator, considering factors both internal and external to banks. Moreover, it accounts for heterogeneity and cross-sectional dependence, providing a dynamic assessment of the influence of external factors. The study's outcomes reveal that both internal and external factors play a significant role in shaping credit risk. Importantly, these factors do not have a uniform impact across different ownership structures within the Turkish banking sector. The account that firm specific factors impact credit risk of banks vindicate the assertion of Nikolaidou and Vogiazas (2017) who alluded that factors attributed to banks have significant effect on credit risk The results underscore the notion that a standardized regulatory approach may not be suitable for addressing credit risk management across the entire spectrum of banks in Turkey.

Khan et al. (2023) assessed the factors that contribute to credit risk within the banking sector in Pakistan. The study relied on secondary data, primarily financial information, obtained from three banks listed on the Karachi Stock Exchange (KSE). The data spans a substantial duration, covering 17 years from 2000 to 2016. To investigate the cause-and-effect relationships related to credit risk, the researchers employed a Panel Regression Model. The study's results revealed several significant insights. Firstly, there was negative effect of efficiency on credit risk in the banking sector. The positive result concord with the positive findings recorded by Othman et al. (2020) who recorded a negative relationship between efficiency and credit risk. Contrastingly, the negative result opposes the argument put forth by (Jegadeeshwaran & Basuvaraj, 2019). Secondly, credit risk and operational risk exhibit a notable and positive correlation with Non-Performing Loans (NPLs).

Thirdly, there is a positive but statistically insignificant relationship between credit risk and operational risk with Liquid Assets (LA). Lastly, credit risk and operational risk are positively associated with variables such as the Gearing Ratio. The research recommended that regulatory authorities should consider strengthening the regulations governing the banking sector, particularly in relation to credit risk. This can involve stricter credit analysis and the establishment of provisions for potential credit loan scenarios. Again, banks should focus on bolstering their risk management strategies, with specific attention to credit risk and operational risk. This includes improving risk assessment processes and implementing measures to mitigate these risks effectively. Moreover, continuous monitoring and management of NPLs are crucial. Banks should develop strategies to identify and address NPLs promptly to minimize their impact on overall financial stability. Several notable limitations are wealthy to be acknowledged which include the study relies on data from only three banks listed on the Karachi Stock Exchange. This limited sample size may not fully represent the diversity of the banking sector in Pakistan. Again, the study uses historical data from 2000 to 2016. Credit risk factors can change over time, and more recent data may provide a more accurate reflection of current banking conditions. The study establishes relationships between variables, but the real-world dynamics of credit risk can be much more complex. Other unaccounted factors may influence credit risk in practice. Findings from this study may not be directly applicable to other banking sectors or countries, as banking practices and regulatory environments can differ significantly.

Jegadeeshwaran and Basuvaraj (2019) primarily aimed to examine the factors influencing credit risk in specific private sector banks during the post-financial crisis period. The study spans a decade, covering the years 2008-2009 to 2017-2018 accounting years. To conduct

this analysis, the researchers chose the top ten private sector banks based on their significant share in Non-Performing Assets (NPAs). These banks include ICICI Bank, Axis Bank, HDFC Bank, Jammu and Kashmir Bank, Kotak Mahindra Bank, Karur Vysya Bank, Federal Bank, Yes Bank, Lakshmi Vilas Bank, and South Indian Banks. The analysis employed various tools, such as ratio analysis and statistical techniques like mean, standard deviation, coefficient of variation, compound annual growth rate, Hausman test, and panel data regression.

The study's findings underscore that several factors significantly contribute to credit risk in these selected private sector banks. These influential factors encompass the GDP growth rate, inflation rate, operational inefficiency, return on assets, bank branch growth, and bank size. Specifically, GDP has significant positive relationship with credit risk of Indian private banks. This finding opposes conventional findings in literature since Tanasković and Jandrić (2015) and Mpofu and Nikolaidou (2018) provided evidence that gross domestic product significantly and negatively impacts credit risk among banks.

Contrastingly, Bussmann et al. (2020) conducted an empirical investigation that introduces an interpretable Artificial Intelligence (AI) model designed for credit risk management, specifically tailored to assess risks associated with borrowing through peer-to-peer lending platforms. The model utilizes correlation networks in conjunction with Shapley values, allowing AI predictions to be categorized based on shared underlying explanations. Through an empirical analysis involving 15,000 small and medium-sized enterprises seeking credit, the study uncovers those borrowers, both those deemed risky and those considered safe, can be grouped together based on a common set of financial

characteristics. These shared characteristics serve as a means to elucidate their credit scores and, consequently, facilitate predictions regarding their future credit behaviour.

The findings of this study are contingent on the dataset of 15,000 small and medium-sized companies used for analysis. These results may not be directly applicable to other contexts or borrower profiles. The study's effectiveness in predicting future credit behavior is subject to the assumption that future financial conditions will resemble those in the dataset period. Economic conditions and borrower behaviours can evolve over time, potentially impacting the model's predictive accuracy. This is deemed a limitation because variation in economic condition can alter the observed narrative making the findings period restrictive. Though the model emphasizes interpretability, there may be instances where it sacrifices predictive accuracy. Striking a balance between interpretability and predictive power remains a challenge in AI-based credit risk assessment. The research is focused on peer-to-peer lending platforms and small to medium-sized enterprises. Generalizing the model's applicability to other types of lending or borrower categories would require further investigation. Credit risk is influenced by various external factors such as economic shocks, industry-specific dynamics, and regulatory changes. These external factors may not be fully captured by the model's current framework making the study’s findings limited. Another noteworthy weakness of the investigation is that it does not extensively discuss potential ethical considerations related to AI in credit risk assessment, such as fairness, bias, and privacy concerns. These issues warrant attention in real-world applications. Moreso, for the result to be robust the study should include rigorous validation processes to assess the model's accuracy and reliability in practical lending scenarios, ensuring its real-world effectiveness.

Abara et al. (2017) focused on assessing the factors influencing default risks in microfinance institutions within the Assosa zone. To address these issues, the researchers collected primary data using structured questionnaires and supplemented it with secondary data sources. The data analysis encompassed both descriptive and inferential techniques. Specifically, the logistic probit model was employed to estimate the determinants of credit default risk and repayment performance. The estimation revealed that credit diversion is positively associated with the number of dependents supported by the borrower, the use of financial records, credit/loan size, and the number of times borrowed from the same source. These relationships were statistically significant at a 10% significance level. Again, income from sources other than credit/loan, loan supervision conducted on the borrower, and the suitability of the credit repayment period were all found to have a negative relationship with loan diversion. The significance level for these relationships varied, with suitability of the repayment period being significant at a 1% level. Also, the study indicates that credit diversion, as measured by the fitted value of credit/loan diversion rate (FITCDR), has a significant and negative impact on credit repayment performance. This negative sign suggests that diverted funds are possibly being used for non-income generating purposes. The significance level for this relationship is 5%. Moreover, factors such as gender, credit/loan size, and the number of dependents were all found to have a negative relationship with the probability of credit repayment. Only the suitability of the repayment period was significant at a 1% level. Based on the findings from the test the analysis made the following recommendation. Microfinance institutions (MFIs) should review and potentially revise their credit rationing mechanisms to address the issues identified in this study. MFIs should implement processes to accurately assess borrower capacity and

identify any existing obligations that could interfere with repayment. The inquiry noted that to minimize default rates, MFIs should intensify efforts to recover outstanding balances from defaulters by enhancing borrower follow-up and collections processes. The weakness of the study is that its findings are specific to the Assosa zone, and their applicability to other regions or contexts may be limited. Also, since structured questionnaires were used for primary data collection, potential limitations such as response bias or data quality issues should be acknowledged.

Contrastingly, Zolkifli et al. (2020) aimed to identify efficiency, capital structure, lending structure factors and bank size that influence credit risk and operational risk in Islamic and conventional banks whilst examining the effect of these factors on performance of the respective banks. The investigation used panel data collected from 2009 to 2018 for all traditional and islamic banks in Malayasia and Bahrain that totals 72 banks. Data for these banks were collected from the website of the central banks of Malayia and Bahrain and institutional website of these banks. Through the application of panel estimation technique, the finding revealed that the determinant of credit risk in these two countries differ. Precisely the determinant of credit risk is efficiency which is consistent with the findings of Raiter (2020), Jegadeeshwaran and Basuvaraj (2019) who documented that efficiency is a negative determinant of credit risk implying that efficiency reduces credit risk. The remaining factors that determine capital structure, lending structure and bank size. Again, all the countries variables showed significant relationship between credit risk and performance of banks. These findings vary from the previous discoveries made by Tanasković and Jandrić (2015) who unveiled that credit risk are caused by exchange rate

volatility, and Mpofu and Nikolaidou (2018) who found credit risk among bank are caused by inflation.

Conversely, Chikalipah (2018) delved into the assertions surrounding the relationship between loan sizes and credit risk within the microfinance sector. The study harnesses a substantial dataset comprising over 2000 annual observations and involving 632 microfinance institutions spanning across 37 countries within the sub-Saharan African (SSA) region. The researchers scrutinized data spanning from 1995 to 2013. By applying the GMM (Generalized Method of Moments) technique, the analytical outcomes reveal a positive correlation between credit risk and loan sizes among microfinance institutions operating in SSA. This discovery carries notable implications, particularly for the portfolio managers overseeing microfinance institutions in the SSA region. It gains particular relevance in the context of the burgeoning wave of mobile money services unfolding in numerous countries.

While the study encompasses a substantial number of microfinance institutions and countries within SSA, the applicability of the results to other regions or settings may be subject to variation due to differing economic, regulatory, and cultural factors. Also, the study sampled only microfinance institutions whose narrative may differ from that of commercial since these institutions may have different risk management strategies. The study's analysis covers a specific time frame, from 1995 to 2013. Credit risk dynamics and microfinance landscapes are subject to evolution over time, and our findings may not fully capture more recent developments. While the research employs the GMM technique, alternative methodologies or robustness checks could provide additional insights or perspectives on the relationship between loan sizes and credit risk. Credit risk can be

influenced by various external factors, including economic conditions, regulatory changes, and market dynamics. Since the study primarily focused on the relationship between loan sizes and credit risk, it overlooked the influence of other crucial external factors making it as another weakness of the study.

Also, Nikolaidou and Vogiazas (2017) sets out to uncover the factors influencing bank credit risk within the context of five Sub-Saharan African (SSA) nations: Kenya, Namibia, South Africa, Zambia, and Uganda. Employing the Autoregressive Distributed Lag (ARDL) to cointegration estimation approach to analyze country level data for these countries collected from 2000 to 2016, the study yields several notable findings which are; across all the examined countries, an increase in efficiency and money supply conditions demonstrates a consistent and noteworthy decrease in non-performing loans (NPLs). This suggests that the availability of money supply plays a significant role in reducing credit risk. For South Africa and Uganda, industry-specific variables within the banking sector exert a significant influence on NPLs.

This indicates that factors unique to the banking industry itself are vital contributors to credit risk dynamics in these countries. In the cases of Kenya, South Africa, and Zambia, NPLs are primarily driven by variables specific to each country. This implies that factors inherent to the economic and financial landscapes of these nations have a pronounced impact on credit risk. Although not directly explored, the study indirectly reveals the influence of the global financial crisis on credit risk within these SSA countries. Drawing insights from Central, Eastern, and Southeastern European (CESEE) countries with extensive experience in managing banking crises, reforms, and financial deepening, the paper recommended that policy makers in these SSA countries should pursue sector

specific policies that would help to strengthen bank's sheet to enhance financial stability. In as much the research makes valuable contribution to literature there are several limitations that need to be acknowledged. While the paper identifies associations between variables and credit risk, it does not delve into the causal mechanisms underlying these relationships. Understanding the causal pathways would provide deeper insights. The study focused on only five specific SSA countries, and while it offers valuable insights, the generalizability of its findings to other SSA nations may vary based on differences in economic conditions, regulatory frameworks, and financial sector structures. Credit risk is influenced by dynamic factors that evolve over time. The study's focus on a specific period may not capture the full spectrum of these dynamics.

2.5 Gap Identification

A thorough review of existing literature has unveiled that a plethora of studies have been conducted on the concept credit risk and its determinants. However, majority of the existing studies used old and outdated data that precede the novel covid-19 era. The outbreak of the coronavirus led to significant changes in most industries inflicting a demeaning effect on their operation which altered the dynamic and characteristics of variables that affect bank credit risk justifying for current and contemporary studies on the concept that covers data from the covid period. Again, several studies concentrated on only macroeconomic variables whilst other also focus on only bank specific variables meanwhile those considered both macroeconomic and bank specific variables used different variables in each case without any sufficient evidence to confirm this result. Also, most of the existing studies concentrated outside Africa especially in Asia with those that focused on Africa also focusing outside Ghana. On top of it, none of the existing studies has considered policy

rate, exchange rate, efficiency and inflation in a single study leaving a lacuna in literature and justifies further studies.

2.6 Conceptual Framework

A conceptual framework is a visual or written representation that outlines the key concepts, variables, relationships, and theories relevant to a research study. It provides a structured foundation for understanding and analysing complex phenomena, which helps researchers conceptualize their research questions, hypotheses, and the displays the interconnections between different factors concerning the concepts under review. The conceptual framework for this research utilizes a model that constructs and links the interrelationship between independents and dependent variables in the study.

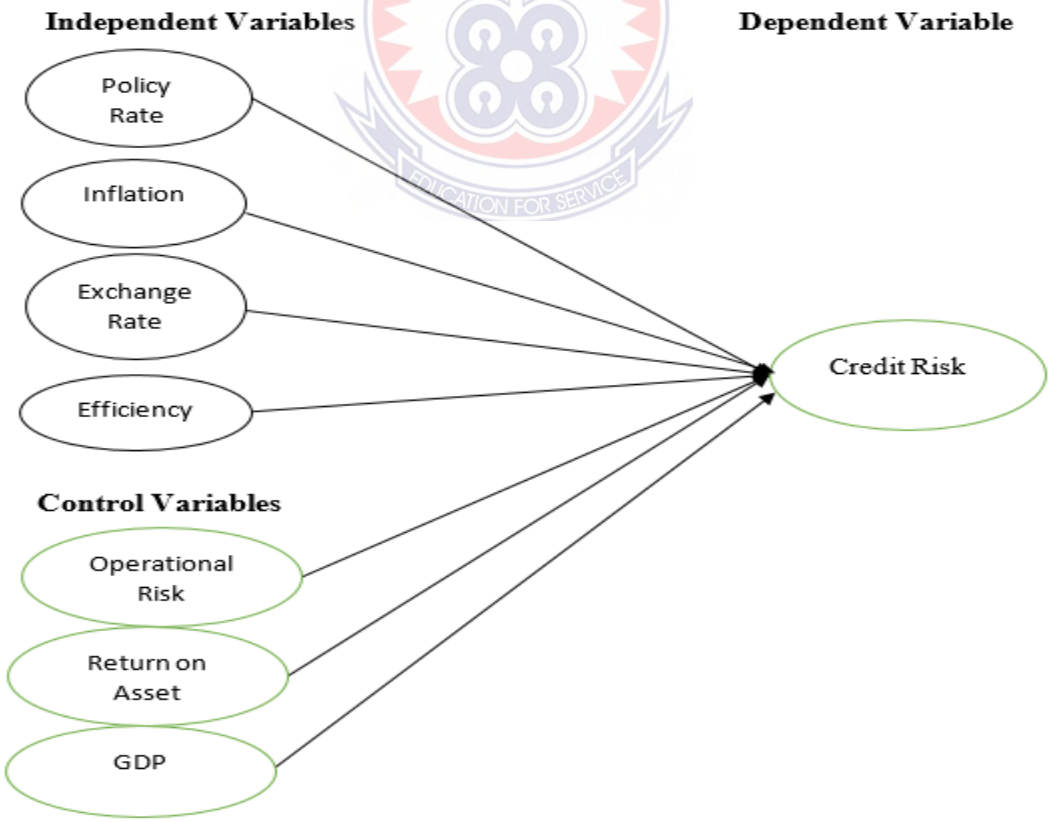

Figure 2. 1:Conceptual framework
Source: Author's construct (2023)

The above conceptual model draws its motivation from the financial intermediation theory by demonstrating that an increase in the loan portfolio on a particular sector of the economy may expose the bank to high credit risk if such industry or sector experiences economic shocks. For instance, a bank concentrating on export financing may encounter high credit risk due deprecation in the Ghanaian cedi to other major trading currencies most especially the United State dollar, the Great Britain pounds, the euro among others. Again, the postulate as espoused by the prudential regulation framework that prudent measures put in place to control banks would lead to lower credit risk is demonstrated in the above model such that when there is reduction in the policy rate banks would be limited from increasing their lending rate thereby limiting the rate leading to charging moderate interest rate and consequently limiting the rate of default. The same concept is applied to efficiency in the banks that can be motivated if the banks ensure prudent internal management leading to lower credit risk. In the nutshell, the independent variables and the control variables are expected to cause a reduction effect on the credit risk of bank just as the interested independent variable as inspired by the expectations of the financial intermediation theory, prudential regulation theory and the information asymmetry theoretical framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section of the research work provides a comprehensive account of the research design, approach, and the underlying research philosophy. It further outlines the study's target population, the sampling methodology employed, and details regarding data collection and its sources. Additionally, the chapter delves into the data analysis process, including model specifications and estimation techniques, while also addressing ethical considerations. This chapter holds paramount significance in the realm of scientific research as it delineates the procedural framework of the study, enabling fellow researchers to comprehend the methods and potentially replicate them if required.

3.2 Research Philosophy

Research philosophy refers to the set of beliefs, values, and principles that underpin a researcher's approach to conducting research. It serves as the foundation for the entire research process, shaping how researchers perceive and interact with the world, select research methods, and interpret findings. The research will be grounded in the philosophical framework of positivism. As noted by Park et al. (2020), positivism is firmly rooted in the realm of quantifiable observations, which subsequently lead to rigorous statistical analyses (Seran & Bougie, 2016). It is widely accepted that the positivist research philosophy aligns with the empirical perspective, asserting that knowledge is derived from systematic human exploration. This knowledge forms the fundamental basis upon which scientific explanations, provided by researchers, seek to elucidate real-world phenomena. In accordance with Park et al.'s perspective (2020), adopting a positivist approach within

the study serves the purpose of minimizing and tightly controlling any external human influences throughout the research process. This approach establishes the researcher as an autonomous and impartial entity within the study, emphasizing the commitment to objective and empirical inquiry. This implies that in order to establish the researcher's complete independence from the studied population, a research study grounded in positivist philosophy can be structured to analyze data collected from a sample with which the researcher has had no prior interactions, whether in a professional or personal capacity. In this scenario, the primary focus of the author is solely on utilizing the available information to arrive at precise judgments and well-founded conclusions (Smith & Johnson, 2018). Consistent with the explanation above, it is acknowledged that adhering to a deductive approach for data analysis and drawing conclusions aligns perfectly with the fundamental principles of positivist philosophy (Crowther & Lancaster, 2015).

Research philosophy significantly influences the choice of research methods and data collection techniques. The underlying philosophy will guide whether a study leans toward quantitative or qualitative research, mixed methods, or other methodological approaches. This study is firmly rooted in the positivist philosophy, as the researcher will objectively employ data gathered from different sources to derive meaningful conclusions and inferences without allowing any external or internal human influences to affect the research process. Furthermore, the adoption of the positivist philosophy by this study is driven by the study's objectives and its reliance on a quantitative research approach.

3.3 Research Approach

Research approach encompasses the fundamental perspective or worldview that underpins a researcher's beliefs and assumptions regarding the acquisition of knowledge. It serves as the guiding framework that informs how a researcher conducts the research, including the methods employed for data collection and analysis, as well as the interpretation and comprehension of findings (Nachimias & Nachimias, 2014). The selection of a research approach hinges on factors such as the research questions, and the researcher's philosophical stance. In some cases, researchers may opt for a mixed method, blending elements from both qualitative and quantitative methodologies to best align with the specific research context. For the current study, a quantitative approach will be employed to facilitate its exploration.

Quantitative research entails a systematic and empirical method of scientific inquiry that revolves around the collection and analysis of numerical data. The measurement of variables, testing of hypotheses, and the generalization of findings to broader populations are some of the factors that leads to the adoption of quantitative method. This research approach relies on statistical tools for data analysis and aims to derive objective and evidence-based conclusions. As articulated by Saunders et al. (2018), quantitative research is characterized by its methodical and structured nature, emphasizing the collection and analysis of numerical data. It typically employs well-defined research instruments such as surveys or questionnaires to gather data from either a sample or an entire population. The collected data is subsequently subjected to statistical techniques, enabling the identification of patterns, relationships, and trends, ultimately leading to the formulation of impartial conclusions (Sekaran & Bougie, 2016). The adoption of the quantitative research method

in this study is influenced by the research's objectives, which are focused on investigating the impact of risk factors on credit risk. Furthermore, the choice of a quantitative approach is well-suited to the data analysis techniques to be employed in the study. Additionally, the decision to employ a quantitative approach is consistent with the nature of the secondary data to be used in the study. Moreover, prior research studies, exemplified by works such as those conducted by Smith and Johnson (2018) and Forson et al. (2021), have contributed to the motivation behind opting for the quantitative approach.

3.4 Research Design

Research design serves as the comprehensive plan that guides research, outlining the methods and procedures to be employed in data collection, analysis, and interpretation. It plays a pivotal role in upholding the study's validity, reliability, and the ability to derive meaningful insights from the data collected (Yin, 2018). Selecting the appropriate research design is a critical decision, as it significantly influences the study's success and the robustness of its findings. Researchers take into consideration various factors, including research questions, available resources, ethical considerations, and the feasibility of implementation when adopting a particular design.

In this particular study, the explanatory research design was adopted. The explanatory research design is employed to explore a concept or topic into details (Sreejesh et al., 2024; Swedberg, 2020). It is especially useful when the study aims to investigate the relationships between the variables of interest (Stebbins, 2001). The choice of the explanatory design by this study was driven by the study's objective to assess the influence of policy rate, efficiency and other macroeconomic indicators on credit risk. Additionally, the utilization

of explanatory design in previous research studies contributed to its selection for the current investigation (Gadzo et al., 2019; Raiters, 2021).

3.5 Population of the Study

A target population refers to the complete set of individuals, cases or objects who exhibit some common noticeable characteristics in a defined jurisdiction for research where a study chooses to make generalizations (Sekaran & Bougie, 2016). The target population for this study refers to the total number of commercial banks in Ghana both indigenous or foreign owned with complete set financials. Per data available from the central bank, these banks are 21 in number BoG (2022), notwithstanding, the total number of banks with complete set of data for the period considered for data collection are 18 banks. Therefore, for the purpose of this study the population refers to all the 14 banks with complete set of financials.

3.6 Sampling and Sampling Technique

A sample is essentially a subset of a population that is selected for the purpose of gathering data (Flick, 2014). Determining the appropriate sample size can be a complex process, influenced by a variety of factors such as the sampling method employed, population characteristics, and time constraints. In this research, data will be collected from a sample size consisting of fourteen (14) banks. The method used for sampling is known as "census sampling," which involves selecting all participants within the population under study as part of the chosen sample for data collection. In line with this approach, the study's sample will include all the 18 banks with complete sets of financial data. These banks are listed in the appendix I.

3.7 Data and Sources of Data

Data, as defined by Sakaran and Bougie (2016), represents raw information that is both observable and measurable, gathered with the intention of drawing conclusions and forming generalizations about a more extensive population. Research data is typically classified into two main types: primary and secondary data. Primary data is collected directly from its original source and is predominantly utilized in exploratory research. In contrast, secondary data is acquired from pre-existing sources such as industrial catalogs or government agency websites (Kothari, 2000). The study would use annual panel secondary data of the chosen banks from 2012 to 2022. The 10 years duration of data is considered appropriate based on the assertion by Rashid (2020) who postulated that using a data period of 10 years and above for statistical analysis is sufficient for ascertaining a reliable result as empirically confirmed by the works of (Adam & Quansah, 2019). The variables for which data would be collected includes Policy Rate (PR), Efficiency (EFF), Consumer Price Index for Inflation (IF), and Exchange Rate (EXR) as the main independent variables, Return on Asset (ROA), Gross Domestic Product (GDP), and Operational Risk (OPR) would be deployed as control variables whilst Credit Risk (CR) is the dependent variable. The data for policy rate would be ascertained from the Bank of Ghana's annual report (BoG, 2022), the data for bank variables thus, EFF, CRR, OPR and ROA would be calculated from annual financial statement as published whilst data for GDP, INF, EXR variables would be sourced from World Development Indicators (WDI) section of the world bank data repository (WDI, 2022).

3.8 Data Analysis

The study would utilize a variety of methods to estimate and analyze its data. These methods would encompass the study's model, estimation technique, and diagnostic tests.

3.8.1 Estimation Technique

The study would utilize the Robust Least Square (RLS) technique to investigate the impact of the selected variables on credit risk, which serves as the dependent variable. While previous studies have relied on the Ordinary Least Squares (OLS) technique to explore this subject, the current research opts for the robust least square method due to certain limitations associated with OLS. One notable weakness is OLS's susceptibility to outliers, which can reduce the accuracy of estimations (Sorokina, 2013). In contrast, the robust least square approach offers several advantages, including its ability to address inherent data issues such as serial and autocorrelation and autocorrelation, partial correlation as well as the ability to control heteroskedasticity. Furthermore, the decision to employ the robust least square method is substantiated by its documented use in prior literature see (Asamoah & Adjare, 2015).

3.8.2 Model Specification

To explore the connection between the independent variables and the dependent variable, especially given the study's diverse objectives, a multivariate linear model was employed. Linear models are appropriate when the research's goal is to investigate the relationship between dependent and independent variables that do not adhere to an exponential or quadratic pattern (Asamoah & Adjare, 2015). The study borrows and adapts the linear model approach from prior research by Asamoah and Adjare (2015). In this study, which employs multidimensional variables to assess the dependent variables, two distinct linear

equations were formulated to analyse the effects of the study's variables. Equation one serves as the functional form, while equation two expresses the objectives of the study. The underlying concept behind the model in this study is that changes in the monetary policy indicators by the Bank of Ghana (Chinedu, 2021), macroeconomic and bank-specific indicators, as used in this study, have an impact on credit risk.

$$CRR = f(PR, EFF, IF, EXR, GDP, ROA, OPR) \quad \ldots\ldots(1)$$

$$CRR_{i,t} = \delta + \beta_1 PR_{i,t} + \beta_2 EFF_{i,t} + \beta_3 IF_{i,t} + \beta_4 EXR_{i,t} + \beta_5 ROA_{i,t} + \beta_6 GDP_{i,t} + \beta_6 OPR_{i,t} + \varepsilon_t \quad \ldots\ldots(2)$$

Where:

CR=Credit Risk

PR= Policy Rate

EFF= Efficiency

IF= Inflation

EXR= Exchange Rate

ROA= Return on Asset

GDP= Gross Domestic Product

OPR= Operational risk

δ = constant

β_1- β_4 = coefficient

ε = Error term

t= time series factor

i= cross section factor

3.9 Description and Measurement of Variables

3.9.1 Credit Risk

Credit risk, sometimes referred to as default risk, is the potential loss that financial institutions, including banks, could face if a borrower or debtor fails to meet their financial obligations by failing to repay borrowed funds or fulfil contractual commitments. Essentially, it represents the risk that a borrower may not repay their loan, resulting in financial setbacks for the lending institution (Kithinji, 2010). Banks and financial institutions provide loans to a diverse range of borrowers, including individuals, businesses, and governments. Credit risk exists because not all borrowers can repay their loans fully or on time, often due to factors such as economic downturns, business difficulties, personal financial challenges, or unexpected events (Mengle, 2007). It is typically assessed by considering factors like the borrower's credit history, financial stability, income, and other relevant details.

In this study, credit risk is quantified as the exposure to default, which represents the potential loss a bank might incur when a borrower defaults, commonly known ask Non-Performing Loans (NPL), as utilized in prior studies by (Beerbaum & Ahmad, 2015; Eita, 2012; Ghasemi & Rostami, 2015; Samahiya & Kaakunga; 2018). It specifically refers to the outstanding loan or credit balance at the time of default. Loss given default, another key aspect, indicates the portion of exposure that a bank anticipates losing if a borrower defaults. It considers factors such as collateral and recovery rates on loans that have

defaulted (Beerbaum & Ahmad, 2015). Banks employ various strategies to manage and mitigate credit risk, including a thorough evaluation of the creditworthiness of borrowers before granting loans or credit. This process entails an in-depth analysis of the borrower's financial details and the establishment of loan terms and conditions.

3.9.2 Policy Rate

A policy rate, often referred to as a key interest rate or benchmark interest rate, is the rate at which a country's central bank lends to or borrows from commercial banks. It is a critical tool used by central banks to influence and control a nation's monetary policy, particularly in terms of managing inflation, economic growth, and stability. Changes in the policy rate can affect interest rates throughout the economy, including those offered to consumers and businesses for borrowing and saving. To account for inflation, researchers might use the real policy rate, which is the nominal policy rate minus the expected inflation rate. This provides a measure that reflects the real economic impact of the central bank's interest rate decisions. For the purpose of this study, the rate set by monetary policy committee of the central bank of Ghana is deployed as the policy rate measure.

3.9.3 Inflation

Inflation is the persistent increase in the general prices of goods and services within an economy over an extended period. It occurs when prices for various products and services rise due to various influencing factors (Crowley, 2007). Banks, like other entities, may need to adjust their service charges in response to increased costs arising from such price hikes. Hence, the study incorporates inflation as an independent variable. In this research, inflation is quantified using the consumer price index, a widely accepted measurement in the literature (as seen in works by Crowley, 2007; Chirwa & Mlachila, 2004; WDI, 2022).

3.9.4 Efficiency

Efficiency within the realm of banking pertains to a bank's capacity to keep expenses in check and use its resources optimally to generate revenue. Banks that operate efficiently can enhance profitability by controlling costs while upholding or enhancing the quality of their services. Evaluating efficiency can involve various metrics and models. In this research, efficiency is gauged through a common method, which is to calculate a bank's cost efficiency by contrasting their real operating expenses with post-tax net income. This approach is in line with prior studies such as Rusuhuzwa (2016) and Fumey and Doku (2016), where efficiency measures were utilized to appraise banking performance.

3.9.5 Exchange Rate

Exchange rate denotes the relative value of one currency when compared to another currency. It signifies the rate at which one currency can be exchanged for another Brock and Suarez (2000). In the context of this research, the exchange rate is quantified as the value of the Ghanaian cedi concerning the United States dollar, following widely employed practices found in sources like the World Development Indicators (2022), Eita (2012), and Crowley (2007). When the dollar's value climbs concerning the Ghanaian cedi, it implies that the cedi is depreciating. Consequently, a depreciating cedi can pose a risk to banks operating in Ghana, prompting them to formulate strategies for mitigating this risk. These strategies often involve levying higher interest rates on transactions and engaging in derivative transactions, as observed in studies like those by Brock and Suarez (2000) and Crowley (2007).

3.9.6 Return on Asset

Return on Assets (ROA) is a financial ratio that measures a company's profitability in relation to its total assets. It provides insight into how efficiently a company can generate

earnings from its assets. ROA is expressed as a percentage, and it indicates the percentage of net income a company earns concerning its total assets (Okaro, 2014). A higher ROA signifies that a company is more efficient in using its assets to generate profit, while a lower ROA suggests less efficiency. It's an essential financial metric for assessing a company's overall financial performance and profitability.

3.9.7 Operational Risk

Operational risk pertains to the possibility of financial loss arising from insufficient or malfunctioning internal processes, systems, human factors, or external factors. It stands as one of the primary risk categories confronting businesses and financial institutions, alongside market risk, credit risk, and liquidity risk (Havranek et al., 2016). Operational risk can manifest due to internal inefficiencies, errors, or breakdowns within operational processes, systems, or controls, potentially resulting in financial losses (Ng'etich, 2011). Examples include data breaches stemming from weak cybersecurity measures or transaction processing errors. Operational risk may also stem from employee mistakes, misconduct, or negligence, ranging from data entry errors to fraudulent activities. External factors beyond an organization's control, such as natural disasters, political instability, or regulatory alterations, can disrupt operations and lead to financial losses. Failure to adhere to laws, regulations, or industry standards can result in legal and regulatory penalties, ultimately causing financial losses.

3.10 Ethical Consideration

In both applied and non-applied research, researchers have a responsibility to address various ethical considerations, which depend on the study's focus and the involvement of participants. Studies involving primary data collection from human subjects must adhere

to ethical principles such as respect and confidentiality. On the other hand, ethical principles guiding secondary data research would differ from studies involving human participants. In line with the guidelines and principles set forth by the University of Education, Winneba (UEW, 2019), the current study will diligently observe all ethical requirements, including proper acknowledgment of all sources from which information is obtained. This research will ensure that all sources from which information was retrieved are appropriately cited.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The purpose of this study is to investigate the antecedents of credit risk among commercial banks operating in Ghana. The study is guided by the following research objectives: (i) to investigate the impact of policy rate on the credit risk among commercial banks operating in Ghana, (ii) to assess the effect of inflation rate on the credit risk Ghana's banking industry, (iii) to ascertain the impact of exchange rate on the credit risk in Ghana's banking industry and (iv) to investigate the impact of cost efficiency on the credit risk in Ghana's banking industry. To address these objectives, the study employed a robust least squares estimation with its related auxiliary diagnostics tests such as stationarity, normality and autocorrelation. The results begin with the descriptive statistics seeking to assess the profile of the obtained data such as the averages, deviations and shape.

4.2 Descriptive Analysis

This section presents the summary statistics of the eight variables, namely credit risk (CRR), policy rate(PR), inflation rate(IF), exchange rate(EXR), cost efficiency(EFF), gross domestic product(GDP), operational risk(OPR), and return on total asset(ROTA). The table provides information on the central tendency, dispersion, and shape of the distribution of each variable. The section also presents Jarque-Bera statistics which seeks to test the normality of the dataset understudy.

Table 4. 1:Descriptive Statistics

	CRR	PR	IF	EXR	EFF	GDP	OPR	ROTA
Mean	0.036	18.550	12.013	76.931	0.271	250.019	0.105	0.042
Median	0.021	16.500	11.430	75.627	0.166	241.197	0.064	0.038
Maximum	0.541	26.000	17.450	88.479	1.528	391.941	0.796	0.485
Minimum	0.001	14.500	7.140	68.184	0.028	102.099	-0.289	-0.171
Std. Dev.	0.056	4.171	3.463	6.506	0.364	103.596	0.155	0.061
Skewness	5.849	0.770	0.316	0.670	2.937	0.075	2.331	2.514
Kurtosis	48.651	2.092	1.856	2.452	10.346	1.558	9.227	24.110
Jarq-Bera	2.796	4.133	0.547	4.767	2.872	0.674	1.056	3.081
Probability	0.247	0.127	0.761	0.092	0.238	0.714	0.590	0.214
Obs	140	140	140	140	140	140	140	140

Source: Author's own construct (2023)

As reported in Table 4.1, CRR recorded a mean score of 0.036 with a median score of 0.021. The result further reported that CR recorded a minimum value of 0.001 with a maximum value of 0.541. Considering the low standard deviation score, it can be inferred that most commercial banks in Ghana record about 3.6 percent of the loan advances as bad within the context of the years under review (2012-2021). However, it is important to note that a group of commercial banks in Ghana recorded about 54.1 percent of their loan advances as bad as indicated by the maximum score. The result further indicated that the data on CR is moderately positively skewed since its mean score weighed more than its median score. This assertion is validated by the positive skewness score of 5.849. Furthermore, the results revealed that over the ten-year period (2012-2021), the rate at which Ghana's central bank lends to commercial banks averaged 18.55 percent with a maximum of 26 percent. The result also supports the fact that policy rate data is moderately positively skewed as confirmed by the skewness score of 0.770. The result does not support a thickened-tailed distribution, hence a low chance of existence of upper outliers in the PR dataset. This is because PR recorded a kurtosis score of 2.092 which is less than the threshold of 3.

The result also evinces that inflation rate reported an average score of 12.012 with a standard deviation of 3.463, reaching a peak of 17.45 within the study period, indicating that the average increase in the general price of goods and services within the study's period hovers around 12.012 percent with some minor deviations. Exchange rate also recorded an average score of 76.931 with a maximum score of 88.479, indicating that the country's currency has weakened in value in relation to the foreign currencies, which could have a debilitating impact on international trade and investment. The result further indicates that the distribution is moderately skewed to the right(skewness=0.670) and that there is less evidence of the existence of extreme values in the dataset of the exchange rate. Cost efficiency of the banks recorded an average value of 0.271, indicating that Ghana's banking sector spends an average of 27 pesewas to generate a cedi revenue.

The results further evince that the distribution of the data across all the variables follows a normal curve since the p-value of the Jarq-Bera statistics for all the variables weighed above the threshold of 0.05.

4.3 Correlation Analysis and Multicollinearity

Table 4.2 presents the correlation matrix of the eight variables, namely CRR, PR, IF, EXR, EFF, GDP, OPR, and ROTA. The correlation matrix shows the strength and direction of the linear relationship between each pair of variables. The correlation coefficient ranges from -1 to +1, where -1 indicates a perfect negative correlation, 0 indicates no correlation, and +1 indicates a perfect positive correlation. One important consideration when interpreting the correlation coefficients is the presence of multicollinearity (Dormann et al., 2013; Elith et al., 2006). Multicollinearity occurs when two or more independent variables in a regression model are highly correlated with each other, making it difficult to

determine the individual effect of each variable on the dependent variable (Elith et al., 2006). In the presence of multicollinearity, the coefficients of the correlated variables may be unstable and have large standard errors, making it difficult to interpret their significance. According to Elith et al. (2006), a correlation coefficient between two explanatory variables of more than 0.85 indicates the presence of multicollinearity. The presence or otherwise of multicollinearity problem was assessed using the centered variance inflation factor.

Table 4. 2:Correlation Matrix

Variable	CRR	PR	IF	EXR	EFF	OPR	ROTA	GDP	Centered VIF
CRR	1.000**								
PR	-0.056	1.000*							5.235
IF	0.043*	0.870	1.000**						5.551
EXR	0.089**	0.421*	0.216*	1.000*					6.663
EFF	-0.042**	-0.020	0.024	0.022	1.000**				4.353
OPR	0.013	0.190	0.088	-0.097	-0.527*	1.000			5.332
ROTA	0.013	-0.080	-0.081	-0.165	0.007	-0.432*	1.000		4.411
GDP	0.080	-0.368	-0.565	-0.445	0.041	0.055	0.187	1.000*	6.113

Source: Author's own construct (2023). Note: Sig at 1%, 5% and 10% are denoted as ***, ** and *

As reported in Table 4.2, CR recorded an insignificant and weak correlation coefficient of -0.056 with policy rate, an indication that an increase policy rate could cause a decrease in credit risk. The result also records a significant and positive relationship between credit risk and inflation(r=0.043), exchange rate(r=0.089), operational risk(r=0.013), return on total asset(r=0.013) and GDP(r=0.080), as well as a negative relationship with cost efficiency(r=-0.042). Additionally, policy rate was found to have a strong positive but insignificant relationship with inflation rate(r=0.870), weak positive and significant relationship with exchange rate(r=0.421), weak negative but insignificant relationship with

cost efficiency(r=-0.02), return on total asset(r=-0.08), GDP(r=-0.368) and a positive but insignificant relationship with operational risk(r=0.190). Inflation also reported a weak positive and significant relationship with exchange rate(r=0.216), weak positive but insignificant relationship with cost efficiency(r=0.024) and operational risk(r=0.088), as well as a weak negative but insignificant correlation with return on total asset(r=-0.081) and GDP(r=-0.565). Exchange rate, however, reports a weak positive but insignificant relationship with cost efficiency(r=0.022), weak negative but insignificant correlation with operational 1

risk(r=-0.097), return on total asset(r=-0.165) and GDP(r=-0.445). Consistent with intuition, cost efficiency records a moderately strong negative and significant relationship with operational risk(r=-0.527), indicating that if banks can effectively manage their internal processes, they are likely to be much cost efficient than those grappling with internal process deficiencies. Cost efficiency of the banks also records weak positive but insignificant correlation coefficients of 0.007 and 0.041 with return on total asset and GDP respectively. The results also indicate that operational risk documents a weak negative and significant relationship with return on total asset(r=-0.432) but a weak positive correlation with GDP(r=0.055). Finally, return on total asset also reports a weak and insignificant correlation with GDP (r=0.187), implying that a booming economy could be favourable for Ghana's banking sector.

Generally, Table 4.2 reveals weak correlation between the different pairs of the variables under study suggesting an absence of serious multicollinearity problems among the explanatory variables. This position is further validated by the centred variance inflation

factor (VIF) scores which are below the threshold of 10 (Aboagye-Otchere & Boateng, 2023).

4.4 Regression results

This section presents the multivariate linear regression result of the eight variables, namely CRR, PR, IF, EXR, EFF, GDP, OPR, and ROTA using the robust least squares estimation technique. The choice of this estimation technique over the ordinary least squares is informed by the limitations inherent in the OLS. One notable weakness is OLS's susceptibility to outliers, which can reduce the accuracy of estimations (Sorokina, 2013). In contrast, the robust least square approach offers several advantages, including its ability to address inherent data issues such as serial and autocorrelation and heteroskedasticity. These results are presented in Table 4.3.

Table 4. 3:Regression result

Variable	Coefficient	Std. Error	z-Statistic	Prob.
PR	-0.001098	0.000903	-1.215781	0.2241
IF	0.002311	0.001103	2.095854	0.0361
EXR	0.002118	0.001028	2.060311	0.0449
EFF	-0.018442	0.005286	3.488824	0.0005
OPR	0.018430	0.014028	-1.313837	0.1889
ROTA	-0.017793	0.030461	-0.584129	0.5591
GDP	2.07E-05	2.59E-05	0.798123	0.4248
C	-0.000829	0.042348	-0.019565	0.0844

Robust Statistics

R-squared	0.082568	Adjusted R-squared	0.033917
Rw-squared	0.188656	Adjust Rw-squared	0.188656
Akaike info criterion	187.4256	Schwarz criterion	215.8258
Deviance	0.054972	Scale	0.017658
Rn-squared statistic	21.87247	Prob (Rn-squared stat.)	0.002672

Source: Author's own construct (2023)

As contained in Table 4.3, the Bank of Ghana's policy rate was found to have a negative but insignificant effect on the credit risk of Ghana's banking sector (β=-0.001, p-value=0.224), indicating that an increase in policy rate could cause a decrease in the rate of non-performing loans in Ghana. This result departs from the conventional position of increased policy rate worsening credit risk. Having observed credit risk record a negative beta coefficient and a p-value greater than the threshold of 5%, research hypothesis one (H_1) is, thus, rejected. Contrastingly, inflation reported a beta coefficient of 0.002 with a p-value of 0.036, offering substantial evidence to fail to reject the research hypothesis two(H_2) to conclude that inflation has a positive and statistically significant effect on credit risk of Ghana's banking sector. This result suggests that if the prices of goods and services witness a sustained hike in Ghana, it is highly probable that credit risk may witness a surge, perhaps, due to the additional burden posed on borrowers.

In line with the dynamics of inflation, the exchange rate was also found to have a positive and statistically significant effect on the credit risk of commercial banks operating in Ghana (β=-0.002, p-value=0.045), implying that a continued weakening of the country's domestic currency may lead to increased exchange losses and reduced purchasing power, ultimately resulting in defaults on loans. In effect, research hypothesis three(H_3) is accepted. However, cost efficiency recorded a beta coefficient of -0.018 with a p-value of 0.000, indicating that more cost-efficient banks record lower rates of non-performing loans, perhaps, by charging relatively lower lending rates or being effective in credit management by way of minimizing costs. This revelation is supported by the positive but statistically insignificant effect of operational risk on credit risk (β=0.018, p-value=0.189), implying that banks with internal processes deficiencies may be prone to higher risk of loan defaults.

This may be due to their ineffective credit management characterized by poor credit worthiness assessment of borrowers. Finally, return on total asset and GDP were found to have insignificant negative and positive effect respectively on the credit risk among commercial banks in Ghana.

4.5 Post Estimation Diagnostics

Table 4.4 presents the results of the correlogram test, which is used to test for autocorrelation in a time series. Autocorrelation occurs when the values of a time series at different points in time are correlated with each other. The table shows the autocorrelation coefficient (AC), partial autocorrelation coefficient (PAC), Q-statistic, and probability value for each lag. The AC measures the correlation between a variable and its lagged values, while the PAC measures the correlation between a variable and its lagged values, controlling for the effects of intermediate lags. The Q-statistic tests the null hypothesis that the residuals are uncorrelated against the alternative hypothesis that the residuals are correlated up to a certain lag. The probability value represents the probability of obtaining a Q-statistic as extreme as the one observed, assuming the null hypothesis.

Table 4. 4:Correlogram test

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
.|* |	.|* |	1	0.158	0.158	3.5664	0.059
.|. |	.|. |	2	-0.014	-0.040	3.5939	0.166
.|. |	.|. |	3	-0.002	0.007	3.5944	0.309
.|. |	*|. |	4	-0.065	-0.068	4.2071	0.379
.|. |	.|. |	5	-0.041	-0.020	4.4577	0.486
.|. |	.|. |	6	0.003	0.009	4.4588	0.615
.|. |	.|. |	7	0.011	0.008	4.4761	0.724
.|. |	.|. |	8	-0.005	-0.011	4.4796	0.811
.|. |	.|. |	9	0.007	0.006	4.4872	0.877

Source: Author's own construct (2023)

The results as contained in Table 4.5 provide p-values greater than the threshold of 5% level of significance, offering inadequate evidence to reject the null hypothesis. As a result, the researcher fails to reject the null hypothesis and concludes that the residuals are uncorrelated, implying that there are no issues of autocorrelation in the dataset across all the lags.

4.6 Discussion of Results

This section is devoted to discussing in great depth the results in line with the research objectives which are to (i) investigate the impact of policy rate on the credit risk among commercial banks operating in Ghana, (ii) assess the effect of inflation on the credit risk of Ghana's banking sector, (iii) ascertain the effect of exchange rate on the credit of commercial banks operating in Ghana and (iv) assess the effect of cost efficiency of banks on the credit risk of commercial banks in Ghana. These discussions are presented under subsections 4.6.1, 4.6.2, 4.6.3 and 4.6.4.

4.6.1 Effect of Policy Rate on credit risk among commercial banks operating in Ghana

As indicated earlier, the central bank's lending rate was found to have a negative but statistically insignificant impact on the credit risk of commercial banks in Ghana. It is worth noting that when the central bank raises the policy rate, it becomes more expensive for commercial banks to borrow money from the central bank. This increase in borrowing costs is typically passed on to borrowers in the form of higher interest rates on loans. Higher loan interest rates could deter borrowers from taking on more debt or can make it more difficult for them to service existing debt. As a result, borrowers may become more cautious in their borrowing decisions, leading to a decrease in the demand for loans. A

decrease in loan demand can reduce credit risk for banks, as there are fewer borrowers who may potentially default on their obligations.

Additionally, higher policy rates may lead to more stringent lending practices by commercial banks. This could include improved documentation, better monitoring of borrowers, and enhanced loan structuring. Responsible lending practices are essential for reducing credit risk, as they minimize the probability of loans turning into non-performing assets. When the cost of borrowing is higher, banks tend to become more selective in approving loan applications. They are more likely to scrutinize the creditworthiness of borrowers more rigorously, resulting in higher-quality borrowers in their loan portfolios. Higher-quality borrowers are less likely to default, and consequently reducing the overall credit risk for the bank (Emekter et al., 2015; Chen et al., 2019). In line with the earlier postulations, an increase in the policy rate can also lead to a strengthening of the loan portfolio of commercial banks in Ghana. Higher interest rates can make lending more profitable for banks (Ekpu & Paloni, 2016), motivating them to lend responsibly and prudently. The pursuit of higher returns on loans may lead to a more selective approach in choosing borrowers, which can lead to a higher quality loan book. A stronger loan portfolio reduces the overall credit risk for commercial banks.

This finding is a sharp departure from the empirical literature (Othman et al., 2020; Raiter, 2021; Misman & Bhatti, 2020; Waemustafa & Sukri, 2015). For instance, Othman et al., 2020 investigated the factors, both external (macroeconomic) and internal institutional variables, that impact credit risk in Islamic banks across Association of South East Asian Nations (ASEAN) countries and found that an increase in policy rate could worsen credit risk situation. Additionally, Raiter (2021) who sought to explore factors contributing to

changes in credit risk used both fixed and random effect panel regression models and found that heightened credit risk is associated in increased lending rates. Consistent with Raiter (2021), Waemustafa and Sukri (2015) also reports a significant positive association between lending rate and credit risk among Islamic and conventional banks in Malaysia. These results suggest that when policy rates are high, it poses more burden on the existing borrowers, making it difficult to service the debt, ultimately resulting in many cases of defaults. The current result, however, lends support to Chaibi and Ftiti (2015) who found that an increased policy rate could cause a reduction in the potential of loan defaults.

4.6.2 Effect of Inflation on credit risk among commercial banks operating in Ghana

Unlike the policy rate, the results evince that inflation has a positive and statistically significant effect on the credit risk of commercial banks in Ghana. This result could be justified based on purchasing power erosion, interest rate dynamics, unforeseen inflation shocks, asset value fluctuations and reduced economic stability. For instance, elevated inflation diminishes the purchasing power of currency over time. As the real value of money erodes, borrowers may find it progressively burdensome to repay loans with currency that is worth less than when the debt was incurred (Priyadi et all, 2021). This depreciation in purchasing power effectively increases the real burden of debt, resulting in potential default on existing credit obligations.

More so, in response to heightened inflationary pressures, central banks may resort to raising policy rates to curb inflation (Okwori & Abu, 2017). Higher interest rates, in turn, render borrowing more costly, particularly for variable-rate loans (Othman et al., 2020). Borrowers with such loans may experience an increased strain on their debt servicing capacity, leading to a higher probability of credit defaults (Mahrous et al., 2020),

particularly among economically vulnerable segments of the population. Furthermore, rapid or unexpected increases in inflation can disrupt the stability and predictability of economic environments. Such unexpected inflationary shocks can impact borrowers' ability to meet their debt obligations, as they may not have adequately accounted for inflation risks in their financial planning. This lack of foresight can exacerbate credit risk, especially in industries or regions where such shocks are more pronounced.

It must also be considered that rising inflation can lead to considerable fluctuations in asset prices (Bordo & Landon-Lane, 2013). This is particularly pertinent to collateralized loans, where the value of the collateral may decline in real terms. Consequently, lenders may find themselves exposed to greater credit risk, as the collateral backing their loans may no longer provide the anticipated level of protection against borrower defaults.

Finally, persistent inflationary pressures can contribute to economic instability, affecting the overall financial well-being of borrowers (Ekinci et al., 2020). This instability may lead to job losses, income reductions, and economic uncertainty, all of which can significantly enhance the likelihood of credit defaults. In times of inflation, businesses may also encounter challenges, which can result in corporate defaults on loans, further heightening credit risk(Khan & Hanif, 2020).

The finding from this study is in tandem with previous literature (Tanasković & Jandrić, 2015; Jegadeeshwaran & Basuvaraj, 2019; Nikolaidou, 2018), advancing that banks faced worsening cases of non-performing loans amid high inflation regimes. However, other studies refute this position (Supriani & Sudarsono, 2018; Haniifah, 2015; Firmansyah, 2014; Soekapdjo et al., 2018) holding that high inflation rates could significantly result in declining non-performing financing.

4.6.3 Effect of exchange rate on credit risk among commercial banks operating in Ghana

The results also revealed that exchange rate has a positive and significant effect on the credit risk on commercial banks in Ghana, indicating a high probability of Ghanaian-resident banks witnessing high rates of non-performing loans amid weakening domestic currency. In an environment of exchange rate increases, borrowers who have taken loans denominated in foreign currencies face greater difficulties in repaying their obligations (Atanasijević & Božović, 2016). The local currency, in this case, is typically depreciating against foreign currencies. As the local currency loses value, the cost of servicing foreign currency-denominated loans rises, making it more onerous for borrowers (Badar et al., 2013). This can lead to a higher likelihood of defaults, particularly by businesses that rely heavily on foreign currency loans. Commercial banks that have extended such loans may witness an increase in non-performing loans (NPLs), thereby heightening credit risk.

An increase in exchange rates often accompanies currency depreciation, which can impact import-dependent industries (Mensah et al., 2021). As the local currency depreciates, the cost of importing goods and services rises, affecting businesses that rely on imported inputs. These businesses may face financial challenges, including decreased profitability and increased operational costs. Consequently, commercial banks with exposures to such industries may experience a surge in loan defaults, increasing credit risk.

Furthermore, exchange rate fluctuations can introduce economic uncertainty, which, in turn, influences borrower confidence. When exchange rates are highly volatile, borrowers may become apprehensive about their ability to repay loans. Economic uncertainty can lead to delayed investment decisions by businesses, which, in turn, can impact their creditworthiness and repayment capacity. As borrowers struggle in an uncertain economic

environment, commercial banks may see an increase in loan defaults, amplifying credit risk. This finding is consistent with previous studies (Raiter, 2021; Tanasković & Jandrić, 2015; Havidz & Obeng-Amponsah, 2020; Jegadeeshwaran & Basuvaraj, 2019), strongly amplifying that banks grapple with heightened credit risk during worsening exchange rate regimes.

4.6.4 Effect of cost efficiency on credit risk among commercial banks operating in Ghana

The cost efficiency recorded a negative and statistically significant effect on the credit risk of Ghanaian-resident banks, indicating that more cost-efficiency-conscious banks are highly likely to witness reduced rates of non-performing loans. Cost-efficient banks are often better equipped to allocate resources to effective risk management processes, including loan underwriting and risk assessment (Zolkifli et al., 2020). When banks can allocate resources efficiently, they are more likely to conduct comprehensive borrower assessments, making informed lending decisions. By enhancing their ability to identify and manage credit risk effectively, cost-efficient banks can reduce the likelihood of lending to high-risk borrowers, which ultimately decreases the incidence of loan defaults.

Again, cost-efficient banks can afford to establish robust loan monitoring and collection procedures. Timely and effective loan monitoring allows banks to identify early signs of borrower distress, enabling them to take proactive measures to prevent loan defaults or mitigate losses. This proactive approach to credit risk management is facilitated by a well-structured and efficient operation. More so, cost-efficient banks tend to have higher levels of capital adequacy, as they are less likely to experience financial strain and unexpected losses. Adequate capital provides a buffer that can absorb credit losses without threatening the stability of the bank. An increased capital buffer can reduce the overall credit risk

exposure of the bank. It is also imperative to note that cost-efficient banks can invest in advanced risk management tools and technologies that aid in identifying and managing credit risk. This includes credit scoring models, portfolio risk assessment, and early warning systems. Such tools improve the precision of risk assessment, leading to better credit decisions. It is not far-fetched that efficient banks can diversify their loan portfolios, spreading credit risk across various sectors and industries. Diversification, therefore, helps reduce the concentration of credit risk in a specific sector, making the banks less vulnerable to economic downturns that may affect a particular industry. A diversified loan portfolio is a strategic approach for minimizing credit risk (Boot & Thakor, 2010).

The negative effect of cost efficiency of banks on their credit risk can again be justified on the premise that cost-efficient banks are better positioned to secure funding at lower costs. Lower borrowing costs enable banks to offer more competitive interest rates to borrowers. Affordable borrowing costs can stimulate economic activity and make it easier for borrowers to service their loans, thereby reducing the likelihood of loan defaults. Also, efficiency often correlates with sound governance and regulatory compliance. Well-governed banks are more likely to adhere to regulatory requirements, including capital adequacy and risk management guidelines. Regulatory compliance contributes to the reduction of credit risk, as it ensures that banks maintain prudent lending practices.

This finding is in sync with the extant literature (Nikolaidou & Vogiazas, 2017; Othman et al., 2020; Jegadeeshwaran & Basuvaraj, 2019; Asamoah & Adjare, 2015; Chaibi & Ftiti, 2015; Kagoyire & Shukla, 2016; Khan et al., 2023; Zolkifli et al., 2020; Raiter, 2021). According to Kagoyire and Shukla (2016), non-performing Loans (NPLs) is a pointer of poor efficiency and has the possibility of threatening the commercial bank's overall credit

system and lessen its value. Furthermore, Chaibi and Ftiti(2015) also discovered that bank inefficiencies translate into higher incidence of bad loans in the context of market-based economies, represented by the French. Raiter (2021), in his study to investigate macroeconomic and bank-specific determinants of credit risk, also provides evidence in favour of how significantly cost-efficient banks reduce loan defaults. The study also provides evidence in favour of Berger and DeYoung's (1997) "bad management" leg of their efficiency-risk hypothesis. It reveals a negative causal relationship between cost efficiency and increased risk in banks that ultimately fail. This suggests that banks with cost inefficiencies might encounter issues with loan performance due to several factors. Notably, these banks not only struggle with monitoring their internal expenses but also face difficulties in evaluating the quality of loans. Consequently, poor cost management is linked to a rise in future non-performing loans (NPLs).

The study's findings also provide support for the information asymmetry theory. Information asymmetry can give rise to adverse selection challenges, where borrowers who are more likely to default on their loans may seek financing, taking advantage of the fact that lenders may not possess comprehensive information regarding their creditworthiness. This adverse selection can result in heightened credit risk for banks, as they may unwittingly extend loans to riskier borrowers without the ability to accurately evaluate their creditworthiness, stemming from internal inefficiencies (Akerlof, 1970; Berg et al., 2019). Information asymmetry can also foster moral hazard problems among borrowers. When borrowers believe that lenders lack complete information about their financial conduct, they may be tempted to engage in precarious financial activities, assuming that lenders won't be able to effectively monitor their behaviour (Martínez-Ferrero et al., 2016). This

moral hazard behaviour can contribute to an increase in non-performing loans as borrowers take on excessive risks (Trinugroho et al., 2021).

The findings, however, dispel that of Salim et al. (2017) whose empirical findings elucidate that even though Iranian banks have witnessed efficiency improvements over time, the problem of non-performing loans deteriorated after the regulatory changes introduced in 2005. In line with Salim et al. (2017), Naili and Lahrichi (2022) also found a negative and significant relationship between bank inefficiency and bank non-performing loans, lending support to the Berger and DeYoung's (1997) skimming hypothesis and therefore linking the costs devoted to credit assessment and evaluation processes to the quality of banks' loan portfolios. They advanced that banks devoting insufficient resources to conduct adequate loan analysis and underwriting are cost-efficient in the short run, yet they will incur higher loan losses in the long run.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, the summary of the results and the findings ascertained from the various statistical tests conducted to assess the objectives of the study. The chapter also makes conclusions based on the findings recorded by the study. Finally, the chapter also makes recommendations based on the objectives of the study and implores academia on the areas for further exploration.

5.2 Summary of the Study

The effective operations of a bank can be marred when a bank is entangled with some challenges that affect the profitability of the bank which include credit risk. Internally, a number of firm-specific variables may affect the credit risk profile of a financial institution. Aside the internal variables that affect the financial well-being of banks, other macroeconomic factors can also affect the rate at which borrowers are able to repay their loans triggering an overall impact on the credit risk of banks. Existing studies have delved into the impact of either internal or external factors on the credit risk of banks. However, none of the existing studies has examined the impact of efficiency and selected macroeconomic variables together in a single study. This leaves a gap in the literature and incites further research. On this backdrop, this study explores this gap by specifically examining; one, the impact of policy rate on credit risk of Ghana's banking sector.

Two, to examine the effect of inflation rate on credit risk of Ghana's banking sector. Three, to investigate the impact of exchange rate on credit risk of Ghana's banking sector and finally to examine the effect of efficiency on the credit risk of Ghana's banking sector. To

assess the intended objectives, the study reviewed existing studies on the topic to form the background of the research and reviewed the information asymmetry theory, prudential regulation theory and the financial intermediation theory. The methodology used a causal research design, and quantitative approach and employed panel secondary data collected from 14 commercial banks operating in Ghana for a period of 10 years from 2012 to 2022. The research deployed the robust least square estimation technique, and the results from the statistical tests are summarized below.

5.2.1 The impact of policy rate on credit risk of Ghana's banking sector.

On the first objective which was to examine the impact of policy rate on credit risk of Ghana's banking sector, the research found statistically insignificant inverse relationship between policy rate and credit risk at a coefficient of -0.001 and a probability of 0.22. This result shows that an increase in the policy rate set by the central bank leads to a reduction in the credit risk of Ghana's banking sector. This result though counter intuitional means that when the bank of Ghana raises the benchmark rate commercial banks turns to limit the quantum of loans given to borrowers which limit their credit profile and consequently reduce the level of credit risk notwithstanding, the effect is unlikely to occur due to insignificant probability and support the expectation of the prudential regulation theory which assert that prudent regulation of the banking sector would lessen credit risk pressures on the banking sector.

5.2.2 The effect of inflation rate on credit risk of Ghana's banking sector.

In assessing the second objective of the study, it was discovered that inflation has a statistically significant positive effect on credit risk of the Ghanaian banking sector. This demonstrate that a unit increase in inflation causes the credit risk of the Ghanaian banking

sector to increase at a rate of 0.002 and associated probability of 0.03**. This result is intuitional and support the information asymmetry theory because granting loans to borrowers who may be heavily exposed to inflation at the blind side of the bank would increase default rate thereby increasing credit risk of the banking sector.

5.2.3 The impact of exchange rate on credit risk of Ghana's banking sector.

The research revealed a weak statistically significant positive effect of exchange rate on credit risk on the banking sector of Ghana. This finding shows that depreciation of the local currency increases the credit risk of the banking sector because lending money to businessmen who engage in international trade may be faced with challenges in repaying their loans due to the fall in the value of the cedi making their goods more expensive which reduces sales, this in turn would reduce repayment rate and increases default rate and consequently higher credit risk.

5.2.4 The effect of efficiency on the credit risk of Ghana's banking sector.

On objective four which was to examine the impact of efficiency on credit risk of the banking sector, the study recorded a coefficient of -0.018 associated with a probability of 0.000***. This shows that efficiency has negative statistically significant effect on credit risk of the Ghanaian banking sector. A rise in efficiency leads to a reduction in the credit risk of the banking sector, this result is intuitional and aligns with the prudential regulation theory because ensuring agile banking practices required by the regulator of the banking sector would increase efficiency and consequently reduces the level of default rate because loans would be advanced with upmost care and due diligence which would minimize the credit risk profile of the banking industry.

5.3 Conclusion

The recorded result and their related interpretation give rise to the following conclusions.

5.3.1 The impact of policy rate on credit risk of Ghana's banking sector.

It is concluded based on the inverse relationship that when the Bank of Ghana raises the benchmark rate, it prompts commercial banks to exercise greater caution in extending loans to borrowers. This cautious approach results in a limitation of the quantum of loans offered, subsequently reducing the overall credit risk within the banking sector.

5.3.2 The effect of inflation rate credit risk of Ghana's banking sector.

The study concludes based on the positive effect of inflation on credit risk that rising inflation increases the cost of doing business, reduces sales level and increases default rate thereby raising credit risk level of the banking sector of Ghana which aligns with financial intermediation theory.

5.3.3 The impact of exchange rate on credit risk of Ghana's banking sector.

When the Ghanaian cedi depreciates, it can elevate the credit risk faced by local banks. This relationship can be attributed to the challenges encountered by businesses engaged in international trade. As the local currency loses value, the goods they export become more expensive for foreign buyers. This, in turn, can reduce sales and profits, making it more difficult for these businesses to repay their loans in full and on time. Consequently, this leads to an increase in loan defaults and, ultimately, a rise in credit risk within the banking sector.

5.3.4 The effect of efficiency on the credit risk of Ghana's banking sector.

Per the inverse relationship discovered between efficiency and credit risk, the research concludes that efficient banks are better able to manage their affairs, able to conduct better

credit assessment and lend credit to borrowers with better credit profile which in turn limit chances of default and consequently lower credit risk within the banking sector.

5.4 Recommendations of the study

The various conclusions drawn above necessitate the following recommendations to practice and policy.

5.4.1 The impact of policy rate on credit risk of Ghana's banking sector.

Regulatory authorities, including the bank of Ghana, should continue to focus on and strengthen prudential regulations within the banking sector. This includes providing clear guidelines and regulations that encourage responsible lending practices among commercial banks. The central bank should regularly assess and adjust the policy rate to maintain a balance between stimulating economic growth and ensuring the stability of the banking sector.

Commercial banks should also develop and implement robust risk management practices, including rigorous loan assessment procedures. They should continue to exercise caution in extending loans, considering factors such as the policy rate and its potential impact on credit risk. Banks should proactively monitor and adjust their lending strategies in response to changes in economic conditions, including policy rates. Additionally, they should diversify their lending portfolios to spread risk effectively and maintain a healthy balance between loan origination and credit risk management.

5.4.2 The effect of inflation rate credit risk of Ghana's banking sector.

Banks operating in Ghana should incorporate inflation risk into their overall risk assessment and management strategies. They should conduct thorough evaluations of borrowers' businesses to identify those most vulnerable to rising inflation. This will enable

banks to tailor loan terms and covenants accordingly, reducing the potential impact of inflation on credit risk. Banks should also enhance their internal risk modeling and management systems to factor in inflation as a key variable when assessing credit risk.

Regulatory authorities and the Bank of Ghana should closely monitor inflation trends and develop appropriate policies to manage and mitigate its adverse effects. This may include implementing policies aimed at controlling inflation within acceptable ranges and providing guidance to banks on risk management strategies in periods of rising inflation. Regulatory agencies should work in collaboration with the banking industry to develop standardized approaches to handle inflation-induced credit risks, thus promoting financial stability in the country.

5.4.3 The impact of exchange rate on credit risk of Ghana's banking sector.

Banks operating in Ghana should enhance their risk assessment and credit monitoring practices, particularly for businesses engaged in international trade. They should develop more robust risk models that factor in the potential impact of currency depreciation on borrowers' ability to repay loans. Additionally, they should work closely with their clients engaged in international trade to provide tailored financial solutions, such as hedging strategies, to mitigate the adverse effects of currency depreciation on their businesses. This proactive approach can help banks manage and minimize credit risk effectively.

Regulatory authorities and the Bank of Ghana should consider developing guidelines or recommendations for banks to manage currency risk effectively. These guidelines can include stress-testing scenarios related to currency depreciation and providing banks with best practices for managing currency risk. By implementing these measures, regulators can

help ensure that banks are better prepared to handle the challenges posed by currency depreciation, ultimately contributing to the stability of the financial sector.

5.3.4 The effect of efficiency on the credit risk of Ghana's banking sector.

Banks operating in Ghana should focus on enhancing their operational efficiency. This includes streamlining processes, reducing operational costs, and improving overall management. They should invest in advanced technology and training for their employees to boost efficiency. Moreover, banks can incentivize efficient lending practices and credit risk management by their employees. This will enable them to maintain a healthy credit portfolio with fewer defaults.

The Bank of Ghana could establish efficiency benchmarks and best practices for banks. These benchmarks can encourage banks to maintain a certain level of operational efficiency, which can help reduce credit risk in the sector. Additionally, regulators could provide incentives for banks that consistently demonstrate high levels of efficiency and effective credit risk management, contributing to the overall stability of the banking sector.

5.5 Recommendation for further studies

The study implores future studies to develop keen interest in exploring the determinant of credit risk among expatriate banks operating in Ghana and as well examine the factors that causes high credit risk among Ghanaian owned banks.

REFERENCES

Abara, G., Mengesha, B., & Reddy, P. A. K. (2017). Determinants of credit default risk of microfinance institutions in Assosa zone. *International Journal of Research in Management, Economics and Commerce*, *7*(10), 45-52. Retrieved from http://indusedu.org/

Acharya, V., Engle, R., & Richardson, M. (2012). Capital shortfall: A new approach to ranking and regulating systemic risks. *American Economic Review*, *102*(3), 59-64. https://doi.org/ 10.1257/aer.102.3.59

Adam, A. M., & Quansah, E. (2019). Effects of working capital management policies on shareholders' value: Evidence from listed manufacturing firms in Ghana. *Panoeconomicus*, *66*(5), 659-686. https://doi.org/10.2298/PAN161206027A

Ahinsah-Wobil, I. (2023). Analyzing the Impact of Domestic Debt Restructuring on Banks in Ghana: Challenges Faced and Strategies for Resilience. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4433029

Ahmad, I., Salam, S., Ahmad, A., & Abbas, S. (2019). The nexus between credit risk and liquidity risk and their impact on banks financial performance: Evidence from Pakistan. *Sarhad Journal of Management Sciences*, *5*(1), 67-86. https://doi.org/10. 31529/sjms.2018.5.1.5

Al Zaidanin, J. S., & Al Zaidanin, O. J. (2021). The impact of credit risk management on the financial performance of United Arab Emirates commercial banks. *International Journal of Research in Business and Social Science (2147-4478)*, *10*(3), 303-319. https://doi.org/10.20525/ijrbs.v10i3.1102

Aliani, K., Souilah, G., & Mhamid, I. (2021). Banking governance and credit risk: evidence from Tunisian banks. *International Journal of Governance and Financial Intermediation*, *1*(2), 139-154. https://doi.org/10.1504/IJGFI. 2021.116834

Allen, F., & Gale, D. (2000). Comparative Financial Systems: A Theoretical Framework. MIT Press. Retrieved from https://scholar.google.com/citations?user

Allen, F., & Santomero, A. M. (1997). The theory of financial intermediation. *Journal of banking & finance*, *21*(11-12), 1461-1485. https://doi.org/10.1016/S0378-4266(97) 00032-0

Altunbas, Y., Gambacorta, L., & Marques-Ibanez, D. (2009). Securitisation and the bank lending channel. *European Economic Review*, *53*(8), 996-1009. https://doi.org/ 10.1016/j.euroecorev. 2009.03.004

Amenu-Tekaa, K. S. (2022). Financial Sector Regulatory and Supervisory Framework in Ghana- The Pre and Post 2017 Banking Crisis. *International Journal of Economics, Commerce and Management*, 10(1), 1-29. Retrieved from http://ijecm.co.uk/

Anginer, D., Demirguc-Kunt, A., Huizinga, H., & Ma, K. (2018). Corporate governance of banks and financial stability. *Journal of Financial Economics*, *130*(2), 327-346. https://doi.org/10.1016/j.jfineco.2018.06.011

Asamoah, L., & Adjare, D. (2015). Determinants of credit risk of commercial banks in Ghana. https://dx.doi.org/10.2139/ssrn.2679100

Atanasijević, J., & Božović, M. (2016). Exchange rate as a determinant of corporate loan defaults in a euroized economy: Evidence from micro-level data. *Eastern European Economics*, *54*(3), 228-250. https://doi.org/10.1080/00128775. 2015.1137198

Badar, M., Javid, A. Y., & Zulfiquar, S. (2013). Impact of macroeconomic forces on nonperforming loans: An empirical study of commercial banks in Pakistan. *wseas Transactions on Business and Economics*, *10*(1), 40-48. Retrieved from: https://wseas. com/journals/bae/2013/56-259.pdf

Bank of Ghana (2022). Annual Report. www.bog.gov.gh Retrieved on 22/07/2023.

Bank of Ghana, (2019). Monetary Committee Release. www.bog.gov.gh Retrieved on 22/07/2020

Bank of Ghana, (2020). Monetary Committee Release. www.bog.gov.gh Retrieved on 22/07/2021

Bank of Ghana, (2022). Monetary Committee Release. www.bog.gov.gh Retrieved on 22/07/2023

Berger, A. N., & Bouwman, C. H. (2013). How does capital affect bank performance during financial crises?*Journal of financial economics*, *109*(1), 146-176. https://doi.org/ 10.1016/j.jfineco. 2013.02.008

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of banking & finance*, *21*(6), 849-870. https://doi.org/10.1016/ S0378-4266(97)00003-4

Bergh, D. D., Ketchen Jr, D. J., Orlandi, I., Heugens, P. P., & Boyd, B. K. (2019). Information asymmetry in management research: Past accomplishments and future opportunities. *Journal of management*, *45*(1), 122-158. https://doi.org/ 10.1177/0149206318798026

Birindelli, G., Bonanno, G., Dell'Atti, S., & Iannuzzi, A. P. (2022). Climate change commitment, credit risk and the country's environmental performance: Empirical evidence from a sample of international banks. *Business Strategy and the Environment*, *31*(4), 1641-1655. https://doi.org/ 10.1002/bse.2974

Boot, A. W., & Thakor, A. V. (2018). Commercial banking and shadow banking: The accelerating integration of banks and markets and its implications for regulation. *The Oxford University Press-Handbook – 3rd Edition (Chapter 3). https://dx.doi.org/ 10.2139/ssrn.3099114*

Bordo, M. D., & Landon-Lane, J. (2013). *Does expansionary monetary policy cause asset price booms; some historical and empirical evidence* (No. w19585). National Bureau of Economic Research. https://doi.org/ 10.3386/w19585

Botha, E., & Makina, D. (2011). Financial Regulation and Supervision: Theory and Practice in South Africa. *International Business & Economics Research Journal (IBER)*, *10*(11), 27–36. https://doi.org/10.19030/iber.v10i11.6402

Boussemart, J. P., Leleu, H., Shen, Z., Vardanyan, M., & Zhu, N. (2019). Decomposing banking performance into economic and credit risk efficiencies. *European Journal of Operational Research*, *277*(2), 719-726. https://doi.org/10.1016/j .ejor.2019.03.006

Capasso, G., Gianfrate, G., & Spinelli, M. (2020). Climate change and credit risk. *Journal of Cleaner Production*, *266*, 121634 https://doi.org/10.1016/ j.jclepro.2020.121634

Cappucci, M. T. (2014). Prudential Regulation and the Knowledge Problem. Virginia Law & Business. Revision, 9, 1. Available at https://home.heinonline.org/

Castro, V. (2013). Macroeconomic determinants of the credit risk in the banking system: The case of the GIPSI. *Economic modelling*, *31*, 672-683. https://doi.org/ 10.1016/ j.econmod.2013.01.027

Cecchetti, S. G., & Schoenholtz, K. L. (2021). Central banking with many voices: the communications arms race. corporate financial intermediation. *Journal of Financial Intermediation*, 36, 44-58. https://hdl.handle.net/20.500.12580/6135

Chaibi, H., & Ftiti, Z. (2015). Credit risk determinants: Evidence from a cross-country study. *Research in International Business and Finance*, *33*, 1-16. https://doi.org/10.1016/ j.ribaf.2014.06.001

Chaibi, H., & Ftiti, Z. (2015). Credit risk determinants: Evidence from a cross-country study. *Research in international business and finance*, *33*, 1-16. https://doi.org/ 10.1016/j.ribaf.2014.06.001

Chikalipah, S. (2018). Credit risk in microfinance industry: Evidence from sub-Saharan Africa. *Review of Development Finance*, *8*(1), 38-48. https://hdl.handle.net/10520/EJC-fa4257d28

Chinedu, U. A. (2021). Impact Of Monetary Policy on Commercial Banks' Supply of Agriculture Credit in Nigeria. *International Journal of Research*, 7(21), 67-88.

Crowther, D. & Lancaster, G. (2015). *Research methods: A concise introduction to research in management and business consultancy*. Butterworth-Heinemann.

Dragomir, L. (2010). European prudential banking regulation and supervision: the legal dimension. Routledge. Available at https://books.google.com.gh/url?id=FaKMAgAAQBAJ&pg=

Ekinci, R., & Poyraz, G. (2019). The effect of credit risk on financial performance of deposit banks in Turkey. *Procedia Computer Science*, *158*, 979-987. https://doi.org/10.1016/ j.procs.2019. 09.139

Ekinci, R., Tüzün, O., & Ceylan, F. (2020). The relationship between inflation and economic growth: Experiences of some inflation targeting countries. *Financial Studies*, *24*(87), 6-20. http://hdl.handle.net/10419/231692

Ekpu, V., & Paloni, A. (2016). Business lending and bank profitability in the UK. *Studies in Economics and Finance*, *33*(2), 302-319. https://doi.org/10.1108/SEF-04-2015-0097

Flick, U. (2014). An Introduction to Qualitative Research, 5th edition. *London: Sage*. Retrieved from https://scholar.google.com/citations?user=

Forson, J.A., Buracom, P., Chen, G., Baah-Ennumh, T.Y. & Carsamer, E. (2015). Corruption, EU aid inflows and economic growth in Ghana: cointegration and causality analysis. Contemporary Economics, 9(3), 299-318, available at: http://www.ce.vizja. pl/en/issues/volume/9/issue/3 #art400.

Fosu, S., Danso, A., Ahmad, W., & Coffie, W. (2016). Information asymmetry, leverage and firm value: Do crisis and growth matter? *International Review of Financial Analysis*, *46*, 140-150. https://doi.org/10.1016/j.irfa.2016.05.002

Gadzo, S. G., Kportorgbi, H. K., & 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 & Finance*, *7*(1), 1-16. https://doi.org/10.1080/ 23322039.2019.1589406

Giordano, C. (2009, April). Prudential regulation and supervision instruments and aims: A general framework. In *Financial Market Regulation in the Wake of Financial Crises: The Historical Experience Conference* (p. 243). https://ssrn.com/ abstract=2101732

Gorton, G. (2010). Slapped by the Invisible Hand: The Panic of 2007. Oxford University Press. Retrieved from https://scholar.google.com/citations?

Haniifah, N. (2015). *Economic Determinants of Nonperforming Loans in Ugandan Commercial Banks* (Doctoral dissertation, Asia Pacific University). Retrieved from https://scholar. google.com/scholar?hl=en&as_sdt=0%2C5&q=Haniifah%

Havidz, H. B. H., & Obeng-Amponsah, W. (2020). Banking Industry Specific and Macroeconomic Determinant of Credit Risk. *International Journal of Advanced Engineering Research and Science*, *7*(1). http://journal-repository.theshillonga. com/ index.php/ijaers/article/view/1526

Hull, J. (2012). *Risk management and financial institutions, + Web Site*, 733. John Wiley & Sons. Available at https://books.google.com.gh/url?

Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*, 40(6), 1104-1125. https://doi.org/ 10.1016/j.jpolmod.2018.08.001

Jegadeeshwaran, M., & Basuvaraj, M. (2019). Impact of economic and banks specific determinants of credit risk of select indian private sector banks in the post financial crisis period. *International Journal of Scientific and Technology Research*, *8*(9), 1162-1166. Available at ISSN 2277-8616

Jiménez, G., Ongena, S., Peydró, J. L., & Saurina, J. (2014). Hazardous times for monetary policy: What do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking? *Econometrica*, *82*(2), 463-505. https://doi.org/10. 3982/ECTA10104

Kablan, S. (2009). Banking efficiency and financial development in sub-Saharan Africa (SSA). *African Finance Journal*, *11*(2), 28-50. https://hdl.handle.net/ 10520/EJC33745

Khalid, K., Abdullah, H. H., & Kumar M, D. (2012). Get along with quantitative research process. *International Journal of Research in Management,* 2(2), 15-29. Available at ISSN 2249-5908

Khan, I. A., Akhter, S., Faiz, J., Khan, S., Amir, M., Shah, N. A., & Khan, M. S. (2023). Determinants of Credit Risk and Operational Risk in Banking Sector Evidence

from Pakistani Banking Sector. *Journal of Financial Risk Management*, *12*(1), 15-27. https://doi.org/10.4236/jfrm .2023.121002.

Khan, M., & Hanif, W. (2020). Institutional quality and the relationship between inflation and economic growth. *Empirical Economics*, *58*, 627-649. https://doi.org/10. 1007/s00181-018-1479-7

Kothari, C. R. (2004). Research Methodology Methods and Techniques. New Delhi: New Age International Limited. Retrieved from https://books.google.com/books

Kuzucu, N., & Kuzucu, S. (2019). What drives non-performing loans? Evidence from emerging and advanced economies during pre-and post-global financial crisis. *Emerging Markets Finance and Trade*, *55*(8), 1694-1708. https://doi.org/10.1080/1540496X. 2018.1547877

Kwashie, A. A., Baidoo, S. T., & Ayesu, E. K. (2022). Investigating the impact of credit risk on financial performance of commercial banks in Ghana. *Cogent Economics & Finance*, *10*(1), 1-15. https://doi.org/10.1080/23322039.2022.2109281

Laeven, M. L., & Valencia, M. F. (2018). *Systemic banking crises revisited*. International Monetary Fund. https://scholar.google.com/citations?

Lawrence, B., Doorasamy, M., & Sarpong, P. (2020). The Impact of Credit Risk on Performance: A Case of South African Commercial Banks. *Global Business Review*, 1-14. https://doi.org/10.1177/0972150920969927

Louzis, D. P., Vouldis, A. T., & Metaxas, V. L. (2012). Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance*, *36*(4), 1012-1027. https://doi.org/10.1016/ j.jbankfin.2011.10.012

Mahrous, S. N., Samak, N., & Abdelsalam, M. A. M. (2020). The effect of monetary policy on credit risk: evidence from the MENA region countries. *Review of Economics and Political Science*, *5*(4), 289-304. https://doi.org/10.1108/REPS-07-2019-0099

Martínez-Ferrero, J., Ruiz-Cano, D., & García-Sánchez, I. M. (2016). The causal link between sustainable disclosure and information asymmetry: The moderating role of the stakeholder protection context. *Corporate Social Responsibility and Environmental Management*, *23*(5), 319-332. https://doi.org/10.1002/csr.1379

Matthew, N. a. L. A., 2012. A Financial Performance Comparison of Foreign vs. Local Banks in Ghana.. *International Journal of Business and Social Science,* 3(21), 82-87. Available at http://www.ijbssnet.com/

Mensah, E. K., Asamoah, L. A., & Ahiadorme, J. W. (2021). On the impact of exchange rate uncertainty on private investment in Ghana. *International Journal of Finance & Economics*, *26*(1), 208-217. https://doi.org/10.1002/ijfe.1785

Mensi, W., Hammoudeh, S., Tiwari, A. K., & Al-Yahyaee, K. H. (2020). Impact of Islamic banking development and major macroeconomic variables on economic growth for Islamic countries: Evidence from panel smooth transition models. *Economic Systems*, *44*(1), 1-40. https://doi.org/10.1016/j.ecosys. 2019.100739

Mishkin, F. S. (2018). Improving the use of discretion in monetary policy. *International Finance*, *21*(3), 224-238. https://doi.org/10.1111/infi.12337

Misman, F. N., & Bhatti, M. I. (2020). The Determinants of Credit Risk: An Evidence from ASEAN and GCC Islamic Banks. *Journal of Risk and Financial Management*, *13*(5), 89. https://doi.org/10.3390/jrfm13050089.

Mohd, N.H. (2016). Financial development and economic growth: a survey of the literature. Available at https://ideas.repec.org/

Mpofu, T. R., & Nikolaidou, E. (2018). Determinants of credit risk in the banking system in Sub-Saharan Africa. *Review of development finance*, *8*(2), 141-153. https://hdl.handle. net/10520/EJC-139fd36d52

Nachmias, C. & Nachmias, D. (2014). Research methods in social sciences. (8th ed). *New York: St. Martin's.*

Naili, M., & Lahrichi, Y. (2022). Banks' credit risk, systematic determinants and specific factors: recent evidence from emerging markets. *Heliyon*, *8*(2). Available at http://www.cell.com/heliyon

Nikolaidou, E., & Vogiazas, S. (2017). Credit risk determinants in Sub-Saharan banking systems: Evidence from five countries and lessons learnt from Central East and South East European countries. *Review of Development Finance*, *7*(1), 52-63. https://hdl.handle.net/10520/EJC-83184c91d

Nkusu, M. M. (2011). *Nonperforming loans and macrofinancial vulnerabilities in advanced economies*. International Monetary Fund. Retrieved from https://scholar.google. com/citations?

Obuobi, B., Nketiah, E., Awuah, F., Agyeman, F. O., Ofosu, D., Adu-Gyamfi, G., ... & Amadi, A. G. (2020). Impact of currency redenomination on an economy: Evidence of Ghana. *International Business Research*, *13*(2), 62-73. https://doi.org/10.5539/ ibr.v13n2p62

Okwori, J., & Abu, J. (2017). Monetary policy and inflation targeting in Nigeria. *International Journal of Economics and financial management*, *2*(3), 1-12. Available at http://www.iiardpub.org/

Othman, K., Laidin, J. B., & Ismail, N. A. (2020). Determinants of Islamic Bank Credit Risk in ASEAN Countries. *Journal of Emerging Economies and Islamic Research*, *8*(3), 1-16. https://doi.org/ 10.24191/jeeir.v8i3.8851

Park, Y. S., Konge, L. Artino, A. R. (2020). The Positivism Paradigm of Research. Himmelfarb Health Sciences Library, The George Washington University. https://doi.org/10. 1097/ACM. 0000000000003093

Philippon, T. (2015). Has the US finance industry become less efficient? On the theory and measurement of financial intermediation. *American Economic Review*, *105*(4), 1408-1438. https://doi.org/10.1257/aer.20120578

Priyadi, U., Utami, K. D. S., Muhammad, R., & Nugraheni, P. (2021). Determinants of credit risk of Indonesian Sharīʿah rural banks. *ISRA International Journal of Islamic Finance*, *13*(3), 284-301. https://doi.org/10.1108/IJIF-09-2019-0134

PwC (2023). Post-DDEP: how do banks intend to build back? Ghana Banking Survey Report. Available at https://www.pwc.com/gh/en/assets/pdf/ghana-banking-survey-report-2023.pdf

Rachman, R. A., Kadarusman, Y. B., Anggriono, K., & Setiadi, R. (2018). Bank-specific factors affecting non-performing loans in developing countries: Case study of Indonesia. *The Journal of Asian Finance, Economics and Business (JAFEB)*, *5*(2), 35-42. https://doi.org/10.13106/jafeb.2018.vol5.no2.35

Radivojević, N., Cvijanović, D., Sekulic, D., Pavlovic, D., Jovic, S., & Maksimović, G. (2019). Econometric model of non-performing loans determinants. *Physica A: Statistical Mechanics and its Applications*, *520*, 481-488. https://doi.org/ 10.1016/j.physa.2019.01.015

Raiter, O. (2021). Macro-Economic and Bank-Specific Determinants of Credit Risk in Commercial Banks. *Empirical Quests for Management Essences*, *1*(1), 36-50. Retrieved from https://researchberg.com/index.php/eqme/article/view/28

Rossi, M. M. (1999). *Financial fragility and economic performance in developing economies: do capital controls, prudential regulation and supervision matter?* International Monetary Fund. Available at https://books.google.com/books?

Salim, R., Arjomandi, A., & Dakpo, K. H. (2017). Banks' efficiency and credit risk analysis using by-production approach: the case of Iranian banks. *Applied Economics*, *49*(30), 2974-2988. https://doi.org/10.1080/00036846.2016.1251567

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2018). Research methods for business students. Pearson. Retrieved from https://scholar.google.com/citations

Scholtens, B., & Van Wensveen, D. (2003). *The theory of financial intermediation: an essay on what it does (not) explain* (No. 2003/1). SUERF Studies. Retrieved from https://scholar. google.com/citations?

Sekaran, U. & Bougie, R. (2016). Research Methods for Business: A Skill Building Approach (7th ed). Chichester, West Suex, United Kingdom: John Wiley & Sons. Retrieved from https://books.google.com/books.

Sharma, R. (2021). *Credit risk management and its impact on profitability of Nepalese commercial banks* (Doctoral dissertation, Department of Management). https://elibrary.tucl.edu.np/ bitstream/123456789/9575/1/Full%20Thesis.pdf

Shim, J. (2019). Loan portfolio diversification, market structure and bank stability. *Journal of Banking & Finance*, *104*, 103-115. https://doi.org/10. 1016/j.jbankfin.2019.04.006

Smith, A., & Johnson, B. (2018). The relationship between sleep duration and academic performance among college students: A quantitative study. *Journal of Educational Research*, 42(3), 123-136.

Sorokina, N., Booth, D. E., & Thornton Jr, J. H. (2013). Robust methods in event studies: Empirical evidence and theoretical implications. *Journal of Data Science*, *11*. 575-606. Retrieved from https://www.researchgate.net/

Sreejesh, S., Mohapatra, S., Anusree, M. R., Sreejesh, S., Mohapatra, S. & Anusree, M.R. (2014). Business research design: Explanatory, descriptive and causal designs. Business research methods: An applied orientation, 25-103. https:// doi.org/10.1007/978-3-319-00539-3_3

Stebbins, Robert A. (2001). Explanatory research in the social sciences, 48. Sage. Retrieved from https://scholar.google.com/citations?

Supriani, I., & Sudarsono, H. (2018). Analisis Pengaruh Variabel Mikro Dan Makro Terhadap NPF Perbankan Syariah di Indonesia. *Equilibrium: Jurnal Ekonomi Syariah*, *6*(1), 1-18. Retrieved from https://www.academia.edu/download /69039799/pdf.pdf

Swedberg, Richard. Explanatory research (2020). The production of knowledge: Enhancing progress in social science 17-41. Retrieved from https:// books.google.com.gh/url?

Tanasković, S., & Jandrić, M. (2015). Macroeconomic and institutional determinants of non-performing loans. *Journal of Central Banking Theory and Practice*, *4*(1), 47-62. http://hdl.handle.net/10419/217570

Trinugroho, I., Santoso, W., Irawanto, R., & Pamungkas, P. (2021). Is spin-off policy an effective way to improve performance of Islamic banks? Evidence from Indonesia. *Research in International Business and Finance*, *56*, 1-35. https://doi.org/ 10.1016/j.ribaf.2020.101352

University of Education, Winneba (2019). Dissertation/Thesis writing guidelines. University printing press. Available at https://www.uew.edu.gh/downloads/sgs-thesisdissertation project-handbook-guide-preparation-submission-and-completion-degree

Vouldis, A. T., & Louzis, D. P. (2018). Leading indicators of non-performing loans in Greece: the information content of macro-, micro-and bank-specific variables. *Empirical Economics*, *54*, 1187-1214. https://doi.org/10.1007/s00181-017-1247-0

Waemustafa, W. & Sukri, S. (2015). Bank Specific and Macroeconomics Dynamic Determinants of Credit Risk in Islamic Banks and Conventional Banks. International Journal of Economics and Financial Issues, 5 (2), 476-481. Retrieved from https://dergipark.org.tr/en/pub/ijefi/issue/31969/352147?publisher=http-www-cag-edu-tr-ilhan-ozturk

Word Development Indicators (2020). Consumer Price Index. Retrieved from www.databank. worldbank.org.

Wubin, S., Arthur, J., & Agyapong, E. K. (2022). Financing SMEs in Ghana: evidence of the optimal credit guarantee ratio. *International Journal of Trade and Global Markets*, *15*(1), 88-95. https://doi.org/10.1504/IJTGM.2022.120886

Yağli, İ., & Topcu, M. (2023). Determinants of Credit Risk in the Turkish Banking Sector: Does Ownership Matter? *Sosyoekonomi*, *31*(55), 49-67. https://doi.org/10.17233/sosyoekonomi.2023.01.03

Yin, R., K. (2018). Case study research and application: Design and methods (6th ed). *Thousand Oaks, CA: Sage.* Retrieved from https://scholar.google.com/scholar

Zhou, M., & Xiong, C. (2017, October). Impact of commercial bank internal governance mechanism on credit risk: an empirical study based on China's listed banks. In *Second International Conference On Economic and Business Management (FEBM 2017)* (pp. 1006-1011). Atlantis Press. https://doi.org/10.2991/febm-17.2017.135

Zhou, S., & Tewari, D. D. (2018). Political Institutions and Macroeconomic Factors as Determinants of Credit Risk in South Africa. *Journal of Economics and Behavioral Studies*, *10*(6 (J)), 211-221. https://doi.org/10.22610/jebs.v10i6(J). 2611

Zolkifli, N., Ismail, Z. & Mokhtar, N. S. (2021). Credit Riak and Operational Risk Determinants of Conventional and Islamic Banking in Malaysi and Bahrain. Asia Proceedings of Social Sciences, 7(1), 30-33. https://doi.org/10.31580/apss. v7i1.1742