UNIVERSITY OF CAPE COAST

# DETERMINANTS OF NON-PERFORMING LOANS OF COMMERCIAL BANKS IN GHANA

BY

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# DECLARATION

## Candidate's Declaration

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

Candidate's Signature …… Date…….

Name: Godfred Anim

## Supervisors' Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of the dissertation laid down by the University of Cape Coast.

Supervisor's Signature …… Date…….....

Name: Dr. Seyram Kawor

## ABSTRACT

Banks in Ghana have recorded that non-performing loans from customers contribute greatly to the industry's poor financial performance. Arguably, the influence of the cost of borrowing, and the return on savings are what contribute to increasing non-performing loans. Irrespective, subsequent to the financial sectoral clean-up there is a paucity of literature on the determinants of non-performing loans which was a main cause of the sector instability. Thus, using a descriptive research design and a quantitative approach, this study adopts a census sampling of all 23 commercial banks to identify the determinants of non-performing loans in Ghana. Using annual secondary data from 2017 to 2021, the Statistical Package for Social Sciences (SPSS) for regression analysis, the study reports a significant, negative relationship between non-performing loans and lending rates. Also, the results showed a significant correlation between interest rates and commercial banks' financial performance. Lastly, a significant and positive relationship between banks' non-performing loans and cost-efficiency ratio was adduced. Inherently, interest rate, lending rate, and cost-efficiency affect the magnitude of non-performing loans in Ghana. As such, the study recommends that banks should implement proficient and successful credit risk management practices. This can be achieved by establishing suitable interest rates and lending terms through the implementation of macroeconomic policies. This would ensure that loans are aligned with the borrowers' capacity to repay them, accurate projections are made for potential loan defaults, and appropriate steps are taken to reduce the likelihood of default by setting the right interest rates and lending rates on loans through the policies.

**KEYWORDS**

Commercial Banks

Cost-efficiency Ratio

Ghana

Interest Rates

Lending Rates

Non-Performing Loans

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## DEDICATION

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# CHAPTER ONE

# INTRODUCTION

Banks are very dominant, wield significant influence and hold a pivotal position in driving economic expansion. They approve credits and these loans are a large source of revenue for the industry. Nevertheless, there are individuals who do not meet their intermittent obligations and end up defaulting on loan repayments. Non-performing loans (NPLs) affect the stability of economies as most of these monies end up unpaid and uncollected. In some cases, these monies do not circulate in the two-sector economic system causing the economy to lose money. Loans play a critical part in an economy's development and their non-repayment results in significant losses for the banks and respective countries, thus, they must not be disregarded. Thus, this study identifies factors that determine the levels of NPLs in Ghana, a developing economy so that the respective banks can strategise to manipulate stability and the Governor, Bank of Ghana can also formulate effective policies that can improve the level of NPLs in Ghana.

## Background to the Study

The financial sector is a dynamic and very challenging sector that needs careful concern and regulation. As such, there are policies set in an attempt to stabilize macroeconomic policies that affect household and firm consumption. Particularly, in the event of increasingly challenging issues revealing the vulnerability of the financial sector, there are regulations and policies that economies put in place. The stability of every economy is important and as such, economies develop macroeconomic policies to regulate and stay in a sustainably stable economy (Vogiazas & Nikolaidou, 2011). The banking system maintains

dominancy in the financial sector and an economy's growth is heavily dependent on the industry's role in guaranteeing a financial system that promotes stability and socio-economic development (Swamy, 2014; Duho, Owodo & Onumah 2020).

Commercial banks dominantly are financial institutions that contribute to the acceleration in the growth of an economy (Richard, 2010). The Bank of Ghana (BoG) is the regulatory bank for all banks in Ghana and also undertakes supervisory roles as well. Consequent to the 2016 financial sector clean-up, is the new Act set by the BoG – Banks and Specialized Deposit-Taking Institutions Act, Act 930 in 2016 that regulates the licensing, operations, and formulation of policies for financial institutions. In addition, the BoG has ensured to promote a stable financial system and as such, set a new minimum capital requirement of GHS 400 million for financial institutions to stay in operation which led to a reduction in commercial banks to 23 (BoG, 2018).

In their operations, loans are a part of the assets that are meant to generate some income for the banks through interest payments (Waweru & Kalani, 2009). However, because some loans may go unpaid over the intermittent expected periods, they lead to accrual in non-performing loans (NPLs). Non-performing loans refer to substantial financial obligations that have surpassed a 90-day delinquency period or where there exists evidence indicating that complete repayment of both interest and principal, without resorting to collateral, is improbable, irrespective of the specific number of days overdue (BoG, 2016).

Banks' primary operation in Ghana is lending as a result, there are large loans captured under assets on banks' financial statements. Loans are considered the most important assets of banks because of their enormous contribution to the

financial sector and the economy at large. Unfortunately, some people to whom credits are given do not meet their obligations and continually end up in bad debts, reducing the bank's profit margins. This imperatively reduces the banks' asset levels, causes loss to the banks and may result in crisis (Caprio & Klingebiel, 2002).

Non-performing loans greatly influence a nation's banking system and are a crucial credit risk indicator. Due to the limited loan availability caused by high NPL levels, financial crises might result. High NPL ratios signify weaker financial positions, while low NPL ratios typically show better financial systems (Ciukaj & Kil, 2020). Commercial banks may suffer from the rising prevalence of NPLs, which could eventually harm the economy and trigger banking crises (Saba, Kouser & Azeem, 2012). NPLs threaten the banking industry's stability and may even result in bankruptcy by interfering with how well it operates overall (Khairi, Bahri & Artha, 2021; Messai & Jouini, 2013). High NPL levels have been cited as a major contributor to economic crises in specific locations, such as African nations, where they directly impact the financial performance of banks (Ahmad, Guohui, Hasan Ali, Rafiq & Rehman, 2016; Naili & Lahrichi, 2022).

Finding the causes of NPLs and taking action to lower their levels is essential for ensuring financial stability and achieving economic goals. High NPL levels can lead to blocked interest income, fewer investment prospects, liquidity problems, and even insolvency, weakening the economy as a whole (Olarewaju, 2020). Through appropriate regulatory measures and risk management in the banking industry, efforts ought to be taken to lower NPL

levels. Empirically, there is a consistently noteworthy influence of interest rates on the levels of NPLs in the banking sector.

A study by Beck, Demirgüç-Kunt and Merrouche (2014) conducted in various countries demonstrated an affirmative correlation between higher interest rates and an increase in NPL ratios. Their study reaffirmed earlier literature that showed how borrowers are sensitive to repaying their loans based on fluctuations in interest rates (Demirgüç-Kunt & Detragiache, 1998). Claessens and Laeven (2004) also reported that when interest rates rise, borrowers face increased debt service burdens which potentially lead to a higher incidence of loan defaults. Furthermore, prolonged periods of elevated interest rates and lending rates can impede economic growth affecting borrowers' income streams and thereby exacerbating NPL levels across banks (Borio & Lowe, 2002).

The relationship between interest rates and NPLs is a dynamic concern within the economies as interest rates is a fundamental tool of monetary policy intended to influence the behavior of borrowers and lenders. Generally, when interest rates rise the cost of borrowing escalates potentially leading to reduced demand for credit among businesses and consumers, this in turn can affect the repayment capacity of borrowers especially those with existing loans potentially elevating the likelihood of loan default (Tölö & Virén, 2021). Conversely, when interest rates decline borrowing becomes more affordable stimulating credit demand and potentially enhancing the repayment capacity of borrowers. However, this policy may also incentivise riskier lending practices potentially heightening the probability of default of loans in the long run. Though there is a dominance in literature that interest rates can determine the level of NPLs, there

are other indicators that could determine the levels of NPLs in Ghana. Hence, understanding the elaborate relationship between the determinants of NPLs and their relationship with NPLs is essential for formulating effective monetary policies and for a stable financial sector particularly, in Ghana.

**Statement of the Problem**

The banking system plays an important role in the modern economic world. The banking industry is undergoing a radical shift, one driven by new competition from changing business models, mounting regulation and compliance pressures, and disruptive technologies. Banks still have to generate profit for their shareholders and perform their baking role in the market. One way of generating profit is through loans. Yet, some customers may default on repaying the loans. These non-performing loans are the legacy of financial crisis (Kartikasary, Marsintauli, Serlawati & Laurens, 2020). Non-performing loans undoubtedly affect the efficiency and operating capacity of financial institutions which subsequently affects an economy's financial performance – either domestic or international economy (Kartikasary et al., 2020; Korankye, Bright & Dunyoh, 2022). Basically, non-performing loans reflect the performance standard of the banks and the financial stability of the sector (Singh, Basuki & Setiawan, 2021). Aside from these implications, lower rates of loan repayment could affect the growth and productivity of the economy as there would be less production, affecting savings and investments (Kartikasary et al., 2020; Korankye et al., 2022).

To add to this, current literature that have sort to explore the recovery of a financial sector from distress have noted that, this can be better understood from the loan books (Abdullah, Hasan & Dusa, 2021; Enos, Tölö & Virén 2021;

Serrano, 2021; Pastory, 2021; Ntarmah, Kong, Cobbinah, Gyan & Manu, 2020). These studies have also noted that subsequent to large numbers of non-performing loans, is the likelihood of sectoral crisis. In practical terms, banking crises in sub-Saharan African nations can be attributed to elevated levels of NPLs (Abdullah et al., 2021; Mugwe, 2013; Ntarmah et al., 2020) and particularly, in Ghana (Aboage, 2020; Affum, 2020).

Largely, this is the economic explanation of why the BoG formulates policies that can regulate the NPLs levels through the regulation of money in the country. The financial sector in Ghana underwent a clean-up in 2016 and it was evident that the banking industry was facing crisis due to large NPLs and the banks' inability to strategise and reduce the level of loan defaults (Aboagye, 2020; Affum 2020; Carsamer, Abbam & Queku, 2021). The Governor of BoG, through the sectoral clean-up revealed compelling evidence that the huge NPLs are due to banks' poor internal drivers, improper credit assessment and insufficient internal governance (BoG, 2017).

The dominant cause of the financial crises that led to the clean-up exercise in Ghana was largely attributed to non-performing loans (Aboagye 2020: Affum, 2020). Precedent to the financial crisis however, there are several literature that have explored the relationship between specific macroeconomic variables that determine NPLs in various economies including Ghana (Berger & DeYoung, 1997; Ngugi, 2001; Adela & Iulia, 2010; Kanyuru, 2011; Haneef & Karim, 2012; Siddiqui, Malik & Shah, 2012; Messai & Jouini, 2013; Beck et al., 2015; Masavu, 2015; Amuakwa-Mensah & Boakye-Adjei, 2015; Amuakwa-Mensah, Marbuah & Marbuah, 2017; Kapopoulos, Argyropoulos & Zekente, 2017; Adusei, 2018; Bredl, 2018; Appiah, 2019; Asiama & Amoah, 2019;

Olarewalu, 2020; Khairi et al., 2021; Msomi, 2022; Amoah, Asiama & Korle, 2023). The findings from these studies have dominantly showed that gross domestic product, interest rate, inflation, fluctuations in exchange rate, capital adequacy ratio, lending rates, macroeconomic conditions, and credit factors among others lead to non-performing loans across economies – developed or developing.

Subsequent to the sectoral clean-up in Ghana, there is a paucity of literature on the determinants of non-performing loans. Since the financial sector has been clean-up and there is a strong financial base (new capital requirement for banks – GHS 400 million), there is barely any study that has explored the determinants of non-performing loans in the commercial banks in Ghana. Most of the literature that has been conducted after the sectoral clean-up have mainly focused on the effect of non-performing loans on the profitability of banks (Korankye et al., 2022); the effect of the aftermath (e.g., mergers and collapse of banks etc.) on the economy (Kwame, 2023) and customers (Yomboi, Nangpiire, Aloriwor Kutochigaga & Majeed, 2021); what the clean-up exercise revealed about the financial sector (Affum, 2020; Aboagye, 2020); the regulatory and supervisory framework (Amenu-Tekaa, 2020; Korankye et al., 2022) and corporate governance functions (Torku, 2020) to avoid high non-performing loans among others. No literature has explicitly explored the determinants of non-performing loans in Ghana after the sectoral clean-up.

Yet, the results from this study using data from 2017-2021 (after the sectoral clean-up) using a System GMM model that is flexible and can accommodate an efficient use of the panel data and to analyse the complex relationship between the variables is important for policy impact. This study is

important because it will reveal the role of banks in the stability of the financial sector and also contribute to improving the regulatory system and policies of the central bank in improving the quality of banks' loan portfolios in Ghana. Loans play a critical part in an economy's development, and their non-payment results in significant losses for banks and countries, thus they must not be disregarded (Sharon 2007). Loans are the primary source of income generation for banks (Kipyego & Wandera, 2013), and so their supervision is central to bank operations. That is why this study seeks to investigate the determinants of non-performing loans in commercial banks in Ghana subsequent to the sectoral clean-up in 2016.

**Purpose of the Study**

This study aimed to investigate the determinants of non-performing loans in commercial banks in Ghana.

**Research Objectives**

The study sought to achieve the following research objectives:

1. To examine the effect of lending rate on non-performing loans among commercial banks in Ghana;
2. To assess the effect of interest rate on non-performing loans in commercial banks in Ghana; and
3. To determine the effect of cost efficiency ratio on non-performing loans in commercial banks in Ghana.

**Research Hypotheses**

The following hypotheses were out forth to be tested in the study:

1. There is a significant effect of lending rates on non-performing loans in commercial banks in Ghana;

2. Interest rate is a significance determinant on the level of non-performing loans in commercial banks in Ghana; and
3. There is a statistically significant effect of cost efficiency ratio on the level of non-performing loans in commercial banks in Ghana.

**Significance of the Study**

Because literature has shown the role of non-performing loans to financial crisis, it is important that as an economy, there is an understanding of the determinants of non-performing loans to aid in recovery and stabilization of the financial sector. That is why this study has sought to determine the factors that affect non-performing loans following the sector's restructuring and policies to strengthen the banking industry because there is barely any literature that has explicitly done this after 2017 in Ghana. To do this, this study would use System GMM model to identify the effect of interest rate, lending rate and cost-efficiency ratio on non-performing loans in commercial banks in Ghana.

The results from this study is significant to identifying macroeconomic indicators that can fluctuate the level of NPLs in Ghana. This will help the Regulator, Central Bank and the Monetary Policy Committee (MPC) to identify policies that can regulate the NPLs to a suitable stabilized level. Also, the study would contribute to existing literature and to developing and developed countries alike on the need to re-identify determinants of NPLs post-distress to identify the systemic weaknesses and vulnerabilities. This will enable the Regulator to implement preventive measures and regulatory reforms that would improve loan acquisitions and repayment structures.

Also, the theoretical background of this study can inform commercial banks on how to reform their loan structure and improve loan repayments

through screening and interest rates and lending rates given to customers. This will make it more permissible to identify investors who are likely to default on loans based on their risk level and the transactional costs that feed into the rates. The study would also contribute to strengthening investor's confidence levels in the financial system as investors can personally seek investment avenues based on the rates in the markets and also inform them on the functionality of the banking sector to the economy.

**Delimitation of the Study**

The study used secondary data collected from the Central Bank of Ghana (BoG) supervision reports on the macroeconomic indicators and Ghana Statistical Services (GSS) reports on the Ghanaian commercial banks. The study sought to use data on the 23 commercial banks because these banks which are still in operation after the sectoral clean-up are believed to have good operations and are in compliance with the capital requirements, licensing, and other regulatory permits. Thus, an analysis of their data would reveal the true nature of the determinants of non-performing loans in Ghana as they are licensed to operate.

**Limitations of the Study**

The study's scope was limited to 23 Ghanaian commercial banks to achieve its goal. Because their operations differ from those of commercial banks, microfinance institutions were excluded. As a result, the impact on these companies could not be included in the study.

The study's scope was restricted to identifying the determinants of NPLs in Ghana's commercial banks. The study is also limited to the five-year study

period, from 2017 to 2021. A longer study period would have included times of different economic significance.

**Organisation of the Study**

The paper's first Chapter discusses the background study using existing empirical evidence on determinants of NPLs; and identifies the gap that helps to deduce the objectives; the significance and delimitations and the limitations that were encountered when the study was carried out. Focusing on recent results, Chapter Two reviews the fast-growing academic literature on the topic and also the theoretical underpinning for the specific objectives. Chapter Three covers the methodology to be used the achieve the purpose of the study. The analysis and the specific discussions according to the objectives were done in Chapter Four. The concluding Chapter Five summarizes the findings and recommendations of the study and suggests directions for future work.

# CHAPTER TWO

# LITERATURE REVIEW

## Introduction

The study sought to identify the determinants of NPLs in Ghana. This chapter consequently presents a review of theories that can underpin what the study seeks to achieve; on the concepts as used in this study; and a review on the literature that have been conducted to identify determinants of NPLs.

## Theoretical Review

This section assesses the theoretical foundations upon which the study is built. This was done to provide current and applicable theories to support the research objectives. The theories reviewed explain the link between determinants of NPLs the Asymmetry Theory and the Transaction Cost Theory.

## Theory of Asymmetry

Information asymmetry occurs in situations where one party in a transaction (usually the moneylender) has less information about the true creditworthiness and risk profile of the borrower as compared to the borrower's own knowledge (Stiglitz & Weiss, 1981). The theory of asymmetry in information tells us that it may be problematic to differentiate borrowers who may not default on loans from those who would (Auronen, 2003; Richard, 2010), because the imbalance of information can lead to adverse selection, where riskier borrowers are more likely to seek loans, while safer borrowers might be deterred from borrowing. The theory posits that when it comes to borrowing or lending, the party with more knowledge about the particular project for which the loan is needed holds an advantageous position in negotiating the most

favorable terms and rates as compared to the other party (Boot, 2000; Auronen, 2003).

Interest rates charged on loans factor into it the default risk. The interest rate is used by lenders to regulate the behaviour of borrowers (incentive effect) or to attract a class of investors depending on the risk aversion levels (adverse selection effect). Stiglitz and Weiss (1981) argued that due to the unproportional information that exists between lenders and borrowers, there is adverse selection. This suggests that riskier borrowers are more likely to accept loans at relatively high-interest rates, as they may have limited access to cheaper credit due to their perceived higher risk. This can create a self-reinforcing cycle, where lenders charge higher interest rates to reimburse for the potential risk of lending to riskier borrowers (Stiglitz & Weiss, 1981; Bester, 1994). As adverse selection leads to a higher proportion of risky borrowers in the lending pool as a result of information asymmetry, the likelihood of NPLs increases. Riskier borrowers may struggle to meet obligations on loans, leading to a surge in the number of NPLs in the banking system (Hodgman, 1960; Hoff & Stiglitz, 1990).

The presence of adverse selection poses a dilemma for lenders. Charging higher interest rates might offset the higher risk but can also contribute to an adverse selection spiral, where only the riskiest borrowers are willing to take loans. Consequently, this elevates the overall risk within the lending pool, resulting in an upswing in NPLs and potential financial losses for the lender. Thus, the level of information asymmetry in the banking sector in relation to the borrower-lending relationship affects the level of NPLs in the financial system as lenders would want to hedge against risky borrowers (Stiglitz & Weiss, 1981).

**Transaction Cost Theory**

Transaction costs are incurred when making economic transactions and include elements of uncertainty (Coase, 1937). In banking, transaction cost theory suggests that borrowers and lenders evaluate the costs and benefits associated with taking on a loan transaction. As such, the lenders (the banks) undertake screening, loan purpose verification, collateral verification and monitoring exercises to ensure that the borrowers can meet their credit obligations when due. These are captured by the transactions costs of granting the loan and reflected in the interest rates on these loans (Muriithi, 2013). The interest rate influences overall economic conditions as drawn by monetary policies – low interest rates are typically associated with periods of economic growth and increased credit activity (Shih, 2004; Asiama & Amoah, 2019). Conversely, during periods of higher interest rates (due to contractionary monetary policy), economic activity may slow down, leading to potential financial distress for borrowers and an uptick in non-performing loans.

Subject to this, banks try to avoid any losses by covering greater part of the loans through high interest rates to avoid non-performing loans over the period of governmental uncertainties. This leads to high lending interest rates as part of transaction costs which may contradict with government monetary policy over the period of the loan term causing an increase in volume in non-performing loans (Korankye et al., 2022; Yomboi et al., 2021).

**Conceptual Review**

The concepts identified in the study, thus the determinants of NPLs (lending rate, interest rate and cost-efficiency ratio) and NPLs are reviewed and defined in terms of how it is used in this study.

**Determinants of NPLs**

***Interest Rate***

Interest rate in this study is the compensation a lender or financial institution receives for granting a loan or credit and paid intermittently; and expressed as a percentage on the loan granted (Asare, 2019).

Recently, on March 21st, 2022, the Monetary Policy Committee of the BoG made a significant decision to increase its key prime interest rate by 250 basis points to 17% on loans. This move, according to the Governor of BoG, marks the most substantial rise in borrowing costs in over two decades (BoG, 2022). The increase in the rate was informed based on increasing prices and the impact it has on the economy in terms of its value in relation to other currencies. Evidently, the annual inflation rate reached 15.7% in February 2022, marking the highest rate since October 2016 (BoG, 2022). Thus, if banks were going to earn any income on loans, the rise in the interest rate was necessary.

Interest rates reflect the premium for inflation and has a component for the likelihood of borrowers defaulting on loans (Gorton & Metrick, 2012). Thus, when the Central banks are setting the interest rates, they consider the expectations of inflation, risk perceptions of borrowers' default and the changing economic conditions (Cecchetti & Schoenholtz, 2019). The randomised behavior of interest rates also emerged as a weighty factor shaping how banks deliver their services as it feeds into transaction costs. While shifts in interest rates have a modest effect on bank profits, alterations in economic conditions prove to be far more influential as it could potentially impact borrowers' capacity to fulfill their responsibilities (Asare, 2019). Below are some literature and how they have defined interest rates in their research:

- Fisher (1930) defines interest rate as "the nominal interest rate adjusted for inflation, reflecting the true purchasing power gained from saving or investing money";
- Interest rate is "the cost of borrowing or the return earned on an investment, typically expressed as a percentage of the principal amount" (Abel & Lehmann, 2018)
- "Interest rate is the price of money paid for deposits", Ringim and Sayedi (2019)

***Lending Rate***

Lending rates in this research are the charges (in terms of money) imposed by banks on borrowers, when granting loans or credit to borrowers. They represent the cost of borrowing for individuals, businesses, or governments (Mishkin, 2018). These typically include the base interest rate, which reflects the cost of funds for the lender, and additional factors like risk premiums, which account for the perceived risk associated with the borrower and the type of loan (Fabozzi, Klingler, Mølgaard & Nielsen, 2021). Thus, the level of risk associated with a borrower is a crucial determinant of the lending rate on the loan granted. Higher-risk borrowers are generally imposed higher rates to make up for the lender for the increased probability of defaulting (Stiglitz & Weiss, 1981; Brealey, Myers & Allen, 2017).

Central banks play a crucial role in influencing lending rates through their monetary policy tools. By adjusting policy rates, central banks can directly influence lending rates, hence manipulating the borrowing costs for businesses and consumers (Cecchetti & Schoenholtz, 2019). Market conditions, including the level of competition among lenders, the demand for loans, and the overall

state of the economy, can also affect lending rates. In a competitive market, lenders may adjust rates to attract borrowers, while economic conditions can influence the availability of funds for lending (Fama, 1985). Regulatory policies and legal frameworks established by governments can have a significant impact on lending rates. These may include usury laws that set maximum allowable interest rates and regulations governing the lending industry (Schwarcz, 2018).

Lending rates play a crucial role in stimulating or constraining economic activity through the repayment of loans. Lower lending rates can encourage borrowing for investment and consumption, potentially spurring economic growth. Conversely, higher lending rates can have a dampening effect on borrowing and spending reducing the productivity of an economy (Bernanke & Gertler, 1995). Some of the definitions of lending rates as used by other researchers are:

- "Lending rate is a price paid for the use of borrowed assets which reflects the market information regarding expected change in the purchasing power of money or future inflation", Mukolu and Adeleke (2020).
- "The price of money paid for loan is known as lending rate" (Ringim & Sayedi, 2019).
- "Lending rate is the interest given to the lender or the price that should be paid by the borrowers to the bank" (Darmawan, 2018)

***Cost-Efficiency Ratio***

The cost-efficiency ratio, in this study is a measure of how efficiently commercial banks manage their expenses in relation to the revenue generated from lending activities. The cost-efficiency ratio into the importance of commercial banks operational effectiveness in the costs involved in granting

loans (Ross, Westerfield, Jordan & Roberts, 2019). In essence, a lower cost-efficiency ratio indicates that commercial banks are cost-effective in granting loans theoretically suggesting that for each loan granted, a large income is gained against the transactional costs of granting the loan (Wheelock & Wilson, 2012; Tuškan & Stojanović, 2016). Conversely, a higher cost-efficiency ratio means that the transactional costs involved in granting a loan is high and would feed into the rates charged on the loan resulting in low interest income obtained from granting loans (Wheelock & Wilson, 2012; Tuškan & Stojanović, 2016).

**Non-Performing Loans (NPLs)**

In this study, a non-performing loan (NPL) is a loan that has either defaulted or is on the brink of defaulting because borrowers are either unwilling or unable to meet their repayment obligations intermittently. The concept of NPL characteristically happens when a loan has not been repaid for around 90 days or beyond from when it was due for payment as per the contract of the loan (Boudriga, Boulila & Jellouli, 2009). Also, as money is lent out, but it is not generating any income, and there is little expectation of full repayment for both the principal and interest, then there is a likelihood of NPL.

In Ghana, a detailed analysis of the banking sector during efforts to clean up the sector, reported high levels of NPLs as stated in the financial statements. According to the Banking Sector Report of June 2017, just before the sector clean-up, NPLs in the banking industry had risen to GH¢7.96 billion from GH¢6.09 billion in June 2016. This translates to a NPL of 21.2% in June 2017, compared to 18.8% in June 2016. After the clean-up, in November 2017, the BoG reported that the industry's NPL had increased to 21.6%, largely due to the financial chaos – the seizure of license, the mergers and acquisitions and the

takeovers. Nonetheless, after the clean-up in December 2019, the BoG reported a sharp decline in the NPL to 13.9% due to recoveries, write-offs, and an uptick in credit growth. This was right before Ghana started recording cases of COVID-19 in March 2020, which had its own economic impacts (Real Estate Times Africa, 2021).

Commercial banks, due to the nature of their business, expose themselves to the risk of borrowers defaulting. Practical credit risk assessment and setting aside enough money for bad debts can protect the bank from these risks. However, if the level of NPLs is very high, these provisions might not be enough buffer (Waweru & Kalani, 2009). Often, banking crises are linked to a massive build-up of NPLs, which can make up a significant portion of insolvent banks' total assets. This emphasizes the need to understand the factors behind loan defaults to decrease the number of NPLs.

In early 2020, the Monetary Policy Committee report noted that the industry's NPL ratio had increased slightly, reflecting the initial impact of the pandemic on low credit growth and higher loan provisioning. In response, the Bank of Ghana introduced policy measures to support the economy by reducing lending rates, promoting credit growth, and offering moratoriums on loan repayments to help customers. Despite these efforts, the non-performing loan ratio has continued to rise, particularly in the private sector. This is partly because the private sector tends to have a higher risk profile (Real Estate Times Africa, 2021). The services sector, which receives the largest share of credit, consistently holds a smaller share of total non-performing loans. Indigenous and foreign enterprises, as well as commerce and finance sectors, contribute moderately to NPLs. The Bank of Ghana notes that weaknesses in banks' credit

classification practices are contributing to the increasing non-performing loan ratio (Real Estate Times Africa, 2021).

## Empirical Review

Literature that has explored the determinants on NPLs are reviewed chronologically according to the study's objectives. Also, literature that collectively explores determinants of NPLs would be captured under other empirical review section.

### *Lending Rate and NPLs*

The relationship between NPLs and lending rates is critical. NPLs pose risks to financial institutions and the stability of the economy. Lending rates, on the other hand, influence the cost of borrowing for service users who request loans. Understanding the interplay between these two factors is crucial for maintaining financial stability. Theoretically, financial institutions are expected to assess the creditworthiness of borrowers to determine appropriate lending rates (Stiglitz & Weiss, 1981). This may influence the level of NPLs. When lending rates are set low, it may attract borrowers with higher credit risk, potentially leading to an increase in NPLs. Conversely, setting lending rates too high may deter creditworthy borrowers, impacting economic growth. Numerous empirical studies have explored the relationship between NPLs and loan lending rates across different economies and financial systems.

Jimenez and Saurina (2006) conducted a study on Spanish banks and found that higher lending rates were associated with lower NPL ratios. This indicates that charging higher interest rates may serve as a risk-mitigating measures for banks initiative toward reducing the level of NPLs. Asiama and Amoah (2019) also sought to explore NPLs and the dynamics of monetary

policy in Ghana using an autoregressive distributed lag approach using quarterly data from 2000 to 2016. Their findings characterised in the short- and long-term showed that monetary policy (lending rate) does not affect NPL in the short-term but in the long term, there is a significant influence.

Matu (2001) on the other hand resorted to the fact that high levels of NPLs makes banks reluctant to charge lower lending rates on loans in their quest to reduce the level of NPLs. Brownbridge (1998) theorised that a large part of commercial banks NPLs stems from insider lending among the banks and the workers. This Brownbridge explains arises as a result of relaxed contractual terms, political pressure and undercapitalisation among the workers and the banks. Collins and Wanjau (2011) also found a positive relationship between lending rates and NPLs.

In Bangladesh, a report from the Bangladesh Bank (2010) also found a linear movement between lending rates (12.29% (in 2008) to 11.23% (in 2010)) and NPLs because relatively, as lending rates reduced, there was a proportional decrease in NPLs (from 10.8% (in 2008) to 8.7% (in 2010)). In another developing country just as Ghana where this study was carried, Zhen, Mawoko, and Benjamin (2020) reported that there a very important link between NPLs and lending rates as they used data from 1998:2015 in a regression model.

Along the same line of literature that had found that lending rates cause an increase in the level of NPLs, Messai and Jouini (2013) concluded that the level of lending in banks does not affect the level of NPLs in Italy, Greece and Spain. Using a multiple regression model and data from 2004 to 2008, the macro- and country-specific variables showed that there is an opposite connection between lending rates and NPLs. Siddiqui, Malik and Shah (2012)

using data from fourth quarter 1996 to third quarter 2011 in an attempt to examine the volatility of lending rates on NPLs found that there is no significant effect from the fluctuation in NPLs on lending rates on NPLs using GARCH and regression models.

Msomi (2022) showed that lending rates have an unconstructive and insignificant impact on NPLs according to the correlation analysis of 47 commercial banks from 6 selected West African countries over 11-year-period (2008:2019). The theoretical implication of their study showed that interest rates induced customers to default on loans causing the banks to put high lending rates on loans which also imperatively attract high-risk-borrowers. Earlier studies that also found a negative connectedness between lending rates and NPLs is from Om'mbongo (2020) and Olarewaju (2020).

***Interest Rate and NPLs***

The relationship between interest rates and NPLs has been a subject of extensive investigation in both developed and developing economies. This empirical review synthesizes key findings from various studies to shed light on the intricate dynamics between interest rates and NPLs. The relationship between interest rates and NPLs is multifaceted and influenced by several theoretical constructs. According to Stiglitz and Weiss (1981), the presence of moral hazard and adverse selection in credit markets may lead to loan failures. This highlights the importance of effective customer screening to mitigate risks associated with high-risk borrowers.

Beck and Feyen (2013) conducted a comprehensive analysis encompassing both developed and developing countries. They found a positive association between interest rate spreads, which can be indicative of lending rates, and NPLs. This suggests that wider interest rate spreads may lead to higher levels of NPLs. Ongweso (2005) investigated the relationship between interest rates and NPLs in commercial banks in Kenya. The study revealed a positive correlation, indicating that an increase in interest rates may necessitate the implementation of mechanisms to address NPLs and mitigate adverse effects on bank performance.

Olarewaju (2020) employed dynamic panel regression analysis on a sample of 110 commercial banks from nine countries. The study identified lagged NPLs, real interest rates, and lending rates as significant factors influencing non-performing loans, particularly in lower middle-income countries. Additionally, studies such as those by Espinoza and Prasad (2010) and Nkusu (2011) underscore the broader macroeconomic factors influencing

NPLs. Lower monetary growth and higher interest rates were identified as triggers for an increase in NPLs. These findings emphasise the interplay between economic conditions and the prevalence of NPLs.

Khemraj and Pasha (2009) noted that banks charging higher real interest rates and displaying a penchant for risk-taking tend to experience greater loan delinquencies in sub-Saharan African countries, underlining the importance of prudent lending practices.

***Cost-Efficiency Ratio and NPLs***

The theoretical framework for understanding the relationship between cost-efficiency and NPLs lies in the financial institutions' quest to reduce transactional costs and risks associated with credits granted. Cost-efficiency directly impacts a bank's profitability and financial stability as it may influence the level of NPLs. High levels of cost-efficiency may indicate effective management and lower operational expenses, which can help absorb losses from NPLs. Conversely, low cost-efficiency may constrain a bank's ability to absorb losses from NPLs, potentially exacerbating financial instability.

Kumbirai and Webb (2010) conducted a study on South African banks and found a significant adverse relationship between cost-efficiency and NPLs using data from 2005 to 2009. Banks with higher cost-efficiency ratios were associated with lower levels of non-performing loans, indicating that efficient resource utilization can contribute to better risk management. Bashir and Hassan (2005) also assessed data from Islamic banks and conventional banks in the Gulf Cooperation Council (GCC) countries. The study found that cost-efficiency was a significant determinant of NPLs in both types of banks. Higher cost-efficiency

was associated with lower NPL ratios, indicating the importance of efficient resource allocation in managing credit risk.

Tabak, Fazio and Cajueiro (2012) conducted a study on Brazilian banks and found that cost efficiency had a significant negative relationship with NPLs. Banks with higher cost efficiency were better equipped to handle credit risk, leading to lower levels of NPLs. Berger, DeYoung, Genay, and Udell (2000) conducted a study in the U.S. banking industry and found evidence that higher cost-efficiency was associated with lower levels of NPLs. This suggests that banks with efficient operations are better equipped to manage credit risk. Baele, Farooq, Ongena, and Vander Vennet (2015) used data from European banks and concluded that more cost-efficient banks had lower levels of NPLs. They also found that cost-efficient banks were more resilient during economic downturns.

Zhang, Cai, Dickinson and Kutan (2016) examined Chinese banks and found that cost-efficient banks were associated with lower NPL ratios. This indicates that effective resource allocation and management contribute to lower levels of non-performing loans. Berger and DeYoung (1997) conducted a study on U.S. banks and found a significant negative relationship between the cost-efficiency ratio and NPLs. Banks with lower cost-efficiency ratios were associated with lower levels of non-performing loans, indicating the importance of efficient resource utilization in managing credit risk. Godlewski and Weill (2008) analyzed data from European banks and found that cost efficiency had a significant negative relationship with NPLs. European banks with higher cost efficiency were better equipped to handle credit risk, leading to lower levels of non-performing loans.

In a similar vein, Karim, Chan and Hassan (2010) assessed the link between NPLs and cost efficiency in Malaysia and Singapore. Their results showed that though Singapore may have lower cost efficiency, there is no significant difference on transactional cost efficiency in both countries. Their results further revealed that when banks in Singapore and Malaysia have low cost efficiency, the level of NPLs in both countries reduce. Likewise, Ahmad et al. (2016) averred that in Pakistan, the cost of borrowings technically reduces the efficiency in collecting back intermittent payments from service users. Transactional costs such as borrowers' monitoring cost, loan operations divisional cost appear to cause a rise in NPLs (Shahidul & Shin-Ichi, 2016; Pradhan & Parajuli, 2017).

Empirical evidence suggests that higher levels of cost-efficiency are associated with lower levels of non-performing loans, indicating the importance of efficient resource allocation in managing credit risk. Striking a balance between cost-efficiency and risk management practices is essential for maintaining a stable and resilient financial system.

***Other Literature on Determinants of Non-Performing Loans***

Ninson, Sidza, and Ampah (2021) investigated the nexus among NPLs, lending rates, and financial performance of banks in Ghana. Their findings revealed that the interest rate of commercial banks, inflation, and inter-bank interest rate significantly influence NPLs in the Ghana. The study concluded that there are interconnected associations in NPLs, commercial banks' lending rates, and their financial performance. This implies that any of these factors can be a leading variable in maintaining a stable financial system in Ghana.

Mensah (2019) similarly conducted to explore the determinants of NPLs among the listed banks in Ghana as they may have strict regulatory policies that could protect their operation. Using regression analysis, the bank-specific variables showed a positive relationship for bank size and NPLs while return-on-assets (ROA) had a negative association with NPLs, though it was not statistically significant. Other macro-variables inflation and gross domestic product – were also identified significant to the level of NPLs. Appiah (2019) also discovered that inadequate credit monitoring, subpar credit assessment, lenient credit terms, and staff incompetence were major contributors to NPLs at FBN Bank Ghana Limited. High-interest rates were also identified as a factor amplifying NPLs at the bank.

Hawtrey and Liang (2008) scrutinised various factors that could affect NPLs in OECD countries from 1987:2001 using panel regression. Their analysis revealed significant coefficients for transaction size and managerial efficiency yet they are inversely related to margins, indicating the importance of efficient management in obtaining low-cost deposits and extending loans at higher interest rates. They determined that factors such as"market dominance, operational expenses, aversion to risk, fluctuating interest rates, credit risk, foregone opportunities, and implied interest expenses"would collectively contribute to higher interest rate spreads that affect service users' ability to repay loans.

Kwambai and Wandera (2013) sought to trace the origins of NPLs in Kenya looking at the external environment within which commercial banks Spain. Using a multiple regression model and data from 2004 to 2008, the macro- and country-specific variables showed that there is an opposite

connection between lending rates and NPLs. Siddiqui et al. (2012) using data from fourth quarter 1996 to third quarter 2011 in an attempt to examine the volatility of lending rates on NPLs found that there is no significant effect from the fluctuation in NPLs on lending rates on NPLs using GMM regression models.

Msomi (2022) showed that lending rates have an unconstructive and insignificant impact on NPLs according to the correlation analysis of 47 commercial banks from 6 selected West African countries over 11-year-period (2008:2019). The theoretical implication of their study showed that interest rates induced customers to default on loans causing the banks to put high lending rates on loans which also imperatively attract high-risk-borrowers. Earlier studies that also found a negative connectedness between lending rates and NPLs is from Om'mbongo (2020) and Olarewaju (2020).

Amuakwa-Mesah and Boakye-Adjei (2014) found in their study that both bank-specific variables ("past years accumulated NPLs, bank size, net interest margin, and current year's loan growth") and macroeconomic variables ("past inflation, real gross domestic product per capita growth, and real effective exchange rate") significantly influence NPLs in the Ghanaian banking industry. The study also revealed differences in the factors affecting NPLs for large and small banks. This is an indication that a bank's size affects its level of NPLs.

Understanding the interplay between these two factors is crucial for maintaining financial stability. Theoretically, financial institutions are expected to assess the creditworthiness of borrowers to determine appropriate lending rates (Stiglitz & Weiss, 1981). This may influence the level of NPLs. When lending rates are set low, it may attract borrowers with higher credit risk,

potentially leading to an increase in NPLs. Conversely, setting lending rates too high may deter creditworthy borrowers, impacting economic growth. Numerous empirical studies have explored the relationship between NPLs and loan lending rates across different economies and financial systems.

Afonso and Alves (2019) conducted a study in European Union countries and found a significant inverse relationship between lending rates and NPLs. Lower lending rates were associated with reduced levels in NPLs, indicating the potential impact of monetary policy on credit risk. Jimenez and Saurina (2006) conducted a study on Spanish banks and found that higher lending rates were associated with lower NPL ratios. This indicates that charging higher interest rates may serve as a risk-mitigating measures for banks initiative toward reducing the level of NPLs. Their findings indicated that NPLs are influenced by bank-specific, industry, and macroeconomic variables. The study also observed variations in the determinants of NPLs for different sub-samples of data. The impact of the financial crisis on NPLs was found to be contingent on the level of credit risk.

A study from Beck, Demirgüç-Kunt and Merrouche (2014) conducted in various countries demonstrated an affirmative correlation between higher interest rates and an increase in NPL ratios. Their study reaffirmed an earlier literature that showed how borrowers are sensitive to repaying their loans based on the fluctuations in interest rates (Demirgüç-Kunt & Detragiache, 1998). Claessens and Laeven (2004) also reported that when interest rates rise, borrowers face increased debt service burdens which potentially lead to a higher incidence of loan defaults. Furthermore, prolonged periods of elevated interest rates and lending rates can impede economic growth affecting borrowers'

income streams and thereby exacerbating NPL levels across banks (Borio & Lowe, 2002).

The relationship between interest rates and NPLs is a dynamic concern within the economies as interest rates is a fundamental tool of monetary policy intended to influence the behavior of borrowers and lenders. Generally, when interest rates rise the cost of borrowing escalates potentially leading to reduced demand for credit among businesses and consumers this in turn can affect the repayment capacity of borrowers especially those with existing loans potentially elevating the likelihood of loan default. Conversely, when interest rates decline borrowing becomes more affordable stimulating credit demand and potentially enhancing the repayment capacity of borrowers. However, this policy may also incentivise riskier lending practices potentially heightening the probability of default of loans in the long run.

**Gaps Identified**

Prior research on the determinants of non-performing loans were conducted prior to financial crisis aside the global financial crisis. But in Ghana, after the sectorial cleanup, it was evident that the financial industry was almost in a financial crisis and one of the causes was high levels of non-performing loans on the banks' loan books. Therefore, there is a research gap in understanding how the determinants of non-performing loans may have changed subsequent to the clean-up which the sector had benefited from (through mergers and acquisitions, new capital requirement levels and policies). How the relationships between interest rates, lending rates, and cost-efficiency ratios differ across affect the exposure to non-performing loans after a sectoral clean-

up in Ghana is what is missing in literature. That is what is study seeks to bridge using System GMM models and annual data from 2017-2021.

**Conceptual Framework**

A pictorial representation of the theoretical and empirical review that has informed the objectives are presented in terms of the concepts as in Figure 1 below:

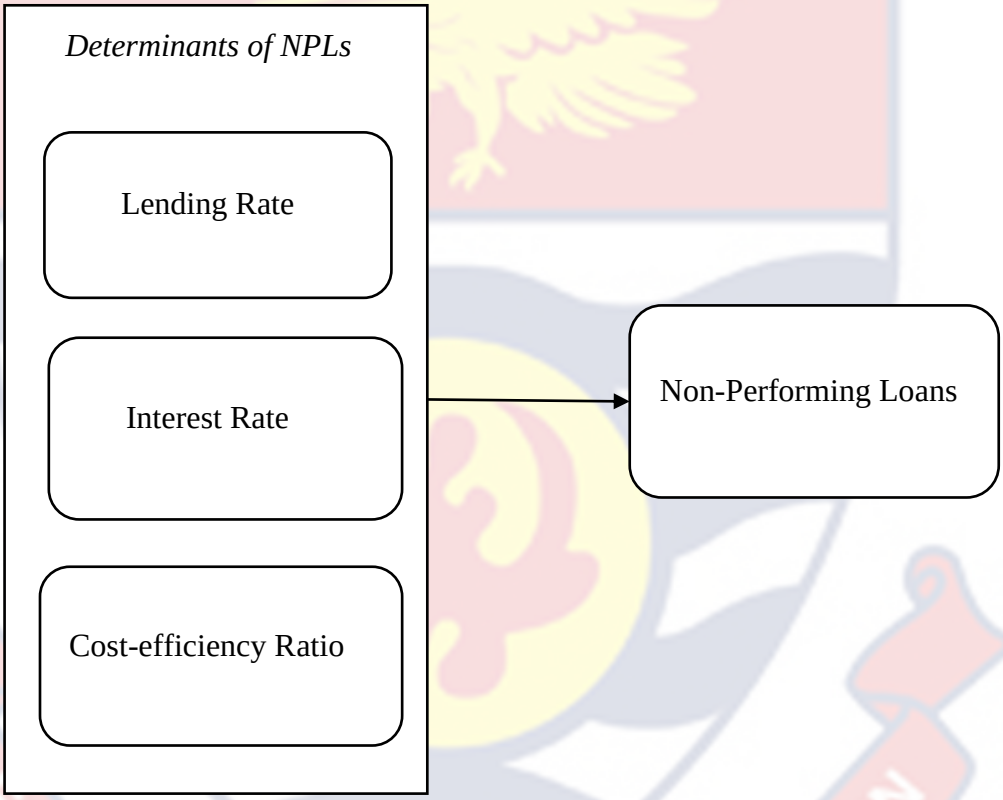


***Figure 1: Conceptual Framework***

Source: Author's Construct (2024)

Figure 1 is the pictorial depiction of the purpose and objectives of the study. The changes in lending rate, interest rate, and cost-efficiency ratio charged on loan services have a direct influential to the level of non-performing loans on banks' loan books. Theoretically, higher interest rates typically lead to higher lending rates, as banks adjust their rates to reflect the cost of funds and

to maintain profitability. Additionally, changes in interest rates can influence the demand for loans and the ability of borrowers to repay their debts. The cost-efficiency ratio reflects the efficiency with which financial institutions manage their operating expenses relative to their revenue generation through loans thus, a higher cost-efficiency ratio may indicate inefficiencies in cost management which may be passed on to customers. Non-performing loans are influenced by a combination of factors such as interest rates, lending rates, and cost-efficiency ratios.

The relationship between the independent variables (interest rate, lending rate, and cost-efficiency ratio) and non-performing loans is complex and multidimensional. Changes in these variables can have direct and indirect effects on the likelihood of loan defaults and the overall credit risk faced by commercial banks. Overall, the conceptual framework provides a theoretical basis for understanding how changes in interest rates, lending rates, and cost-efficiency ratios may impact non-performing loans, highlighting the interconnectedness of financial markets, institutional dynamics, and economic conditions. This framework guides empirical research aimed at examining these relationships and informing policies to understand their contribution to non-performing loan levels in commercial banks in Ghana.

**Chapter Summary**

In this chapter, the existing research on the determinants of NPL are reviewed. A visual outline to illustrate the objectives of the study is also presented in line with the concepts. We delve into key concepts pertinent to this area of research, and thoroughly analyse the theories (the Information

Asymmetry Theory and Transaction Cost Theory) that form the foundation of this study, along with additional empirical discoveries.

# CHAPTER THREE

# RESEARCH METHODS

## Introduction

The chapter outlines the research paradigm, the approach to the research, the design of the research, the population and the sampled data and period for which the study was taken. Further, in this chapter, the data collection process and tools for the analysis as well as the model specification is presented. Last, there is a chapter summary for all the principles that this study was built on.

## Research Paradigm

Every researcher is guided by certain beliefs, values, and a view of the world (Adjei, 2015). These guiding principles are often referred to as paradigms or philosophical assumptions that inform the researcher's perspective before undertaking a study. Research philosophy, is defined by Saunders, Lewis, and Thornhill (2016), as a system of beliefs and assumptions about knowledge development. Depending on these beliefs, researchers may gravitate toward a qualitative, quantitative, or mixed-methods approach (Creswell & Creswell, 2018). Social science research draws from five major philosophical perspectives: positivism, critical realism, interpretivism, post-positivism, and pragmatism (Saunders et al., 2016).

In this study, the chosen approach is post-positivism. As defined by Saunders et al. (2016), post-positivism is a philosophical approach that aims to scientifically investigate issues while acknowledging the role of subjectivity and value judgments in the construction of knowledge. Post-positivists emphasize the generation of facts influenced by human interpretation. It utilizes existing theories to formulate hypothesis, which is then rigorously tested, either

confirming or refuting it. Post-positivism allows for the coexistence of objective reality and subjectivity, aiming for universal truth in social sciences study (Saunders et al., 2016; Sekaran & Bougie, 2016). Post-positivist approach is suitable for this study because it involves testing hypotheses and establishing relationships.

**Research Design**

Research design entails a set of arrangements made to collect and analyze data in a manner that aligns with the research purpose (Potwarka et al., 2019). It serves as a systematic framework that integrates various components, such as structure, strategies, and methods, to ensure effective inquiry and control over diversity (Zikmund, 2000). According to Young and Javalgi (2007), research design can be seen as a master plan that outlines the process and methods for obtaining and analyzing the necessary information. Zikmund et al. (2012), underscores that it involves aspects of data collection, measurement, and analysis. A well-defined research design entails promptly identifying the research problem, selecting and organizing research objectives, defining concepts and issues, and thoroughly documenting research ideas (Zikmund, 2000). Akhtar (2016) highlights that research design entails a systematic approach to economically collect, analyze, and interpret the appropriate information using a well-defined procedure.

This study employed explanatory research design due to its alignment with scientific research, which aims to establish cause and effect relationships among constructs such as banking sector stability and digital financial inclusion (independent variables), and sustainable development (dependent variable). Explanatory studies elucidate the nature and direction of relationships between

variables, (Zikmund, Carr, Babin, and Griffin, 2013). Potwarka et al. (2019) further assert that explanatory research design is based on the premises of the positivist research paradigm, seeking to establish cause-and-effect relationships. Explanatory research design primarily aims to explain why events occur and predict future occurrences (Potgieter et al., 2019; Malhotra, 2015). The decision to employ an explanatory research design is driven by the desire to understand the logic behind the cause-and-effect relationships among the variables of interest.

**Research Approach**

Based on the descriptive design, a quantitative approach was used in this study. Based on the objectives to use secondary data due to the relatively cheap cost and little time duration of collecting data, the quantitative approach was more suitable as opposed to the qualitative approach (Zikmund et al., 2000; Bryman & Bell, 2003). The approach used was also motivated from the design of the study which informed the type of data and the mode for analysis. On the contrary, quantitative research fails to capture very important human aspects which could influence the data and could be useful to understanding why individuals default on their loans outside of the macroeconomic variables sampled (Rahman, 2020). Nevertheless, a quantitative research approach helps to quantify the magnitude to which a change in either of the lending rate, interest rate or cost-efficiency rate may have on NPLs (Rahman, 2020).

**Population and Sample**

The current study's target population is all commercial banks licensed by the Bank of Ghana; thus, all the twenty-three commercial banks in Ghana (Bank of Ghana, 2020b). Because the sector crisis had showed that dominantly,

it was because of the levels of NPLs present in all the banks, this study sought to using a consensus sampling to include all the variables that are important to identifying the determinants of NPLs (BoG Monetary Policy Report, 2021). Because all twenty-three commercial banks were sampled for this study, the census sampling technique was adopted based on readily available data for all commercial banks.

**Data Collection**

The data used from this study were gleaned from the respective financial statements of the commercial banks that are published as part of their obligations towards the society and the Regulator. The data were collected for all banks over a five-year period (2017:2021) consequent to the sectoral clean-up. The data was carefully entered into excel document for further analysis by SPSS and STATA.

**Model Specification**

*Baseline model*

$$Y_{it} = a_i + Y_{it-1} + \beta X_{it} + \varepsilon_{it} \quad (1)$$

$$e_{it} = a_i + \varepsilon_{it}$$

Where;

i refers to the country (i = 1, 2, 3,..., 23);

t refers to time period from (2017 to 2021) (t = 1, 2, 3, ..., 5)

$Y_{it}$ is the dependent variable

$Y_{it-1}$ is the lag of the dependent variable

$a_i$ is the intercept

$X_{it}$ is the vector of independent variables (regressors, control variables

and intervening variables)

$\varepsilon_{it}$ is the error term assumed to be serially uncorrelated.

The equation for the error term eit specifies that the error term is a function of the time-invariant individual effect ai and the idiosyncratic error term $\varepsilon_{it}$.

Thus,

$$NPL_{it} = \beta_{o+}\beta_1 NPL_{it-1} + \beta_2 LR_{it} + \beta_3 IR_{it} + \beta_4 CER_{it} + \sum_{h=i}^{n}\beta_h Z_{it+}\mu_{it} + \varepsilon_{it} \quad (2)$$

Where;

$NPL_{it}$ is Non-Performing Loans (explained variable) for each country $i$ at time $t$.

$NPL_{it-1}$ denotes the lag of the explained variable.

$LR_{it}$ represents Lending Rate for each country $i$ at time $t$.

$IR_{it}$ denotes Interest Rate for each country $i$ at time $t$.

$CER_{it}$ represents Cost-Efficiency Ratio for each country $i$ at time $t$.

$\sum_{h=i}^{n}\beta_h Z_{it}$ represents the summation of the control variables

$\beta_o, \beta_1, \beta_2, \beta_3, \beta_4, \beta_h$ are the regression coefficient

$\mu$ denotes the unobserved country-specific effect

$\varepsilon_{it}$ also denotes the error term

Model 1

$$NPL_{it} = \beta_{o+}\beta_1 NPL_{it-1} + \beta_2 LR_{it} + \beta_3 IR_{it} + \beta_4 CER_{it} + \sum_{h=i}^{n}\beta_h Z_{it+}\mu_{it} + \varepsilon_{it} \quad (3)$$

Where;

$NPL_{it}$ is Non-Performing Loans (explained variable) for each country $i$ at time $t$.

$NPL_{it-1}$ denotes the lag of the explained variable.

$LR_{it}$ represents Lending Rate for each country $i$ at time $t$.

$IR_{it}$ denotes Interest Rate for each country $i$ at time $t$.

$CER_{it}$ represents Cost-Efficiency Ratio for each country $i$ at time $t$.

$\sum_{h=i}^{n} \beta_h Z_{it}$ represents the summation of the control variables

$\beta_o, \beta_1, \beta_2, \beta_3, \beta_4, \beta_h$ are the regression coefficient

$\varepsilon_{it}$ also denotes the error term.

*To eliminate country-specific effects, we take the first differences of eqn. (3)*

$$NPL_{it} - NPL_{it-1} = \beta_o + \beta_1 (NPL_{it-1} - NPL_{it-2}) + \beta_2 l_n(LR_{it} - LR_{it-1}) + \beta_3 l_n(IR_{it} - IR_{it-1}) + \beta_4 l_n (CER_{it} - CER_{it-1}) + (\sum_{h=i}^{n} \beta_h Z_{it} - \sum_{h=i}^{n} \beta_h Z_{it-1} + \varepsilon_{it} - \varepsilon_{it-1} \quad (4)$$

Where;

$NPL_{it} - NPL_{it-1} = \Delta NPL_{it}$ and this definition applies to all explanatory variables as well. Similarly, $\varepsilon_{it} - \varepsilon_{it-1} = \Delta \varepsilon_{it}$.

**Estimation Technique**

The two-step System Generalised Method of Moments by Roodman (2009) was employed to investigate the relationship among the variables. The two-step System GMM extends the approach used by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The approach by Arellano and Bond (1991) makes use of the lagged levels of the explanatory variables and the first difference of the variables to deal with issues of unobservable simultaneity bias and country-specific effects. Arellano and Bover (1995) later observed that Arellano and Bond's (1991) technique would result in erroneous conclusions when the series have time-persistent problems. Additionally, Blundell and Bond (1998) contend that if the instruments utilized

in the traditional first-difference GMM are not strong enough, then there is the possibility of the results of the within groups being biased. The System GM, therefore, originated as a remedy to the problems posed by the approaches of the earlier scholars.

The System GMM combines both the level of the residuals and the difference of the disturbance term as well as additional instruments in the levels equations (Odhiambo, 2020). It consists of one-step and two-step System GMM. The latter has been confirmed to be more efficient and robust to heteroscedasticity and autocorrelation (Obuobi et al., 2021). The choice of the two-step System GMM is motivated by the following justifications which have received massive support from earlier works (Fosu & Abass, 2019; Agyei, Marfo-Yiadom, Ansong, & Idun, 2020; Abeka, Andoh, Gatsi, & Kawor, 2021, Acher & Idun, 2023). The estimator is suitable to use when the cross-sectional data (the number of countries) is significantly more than the time series data (the number of periods). The banks of interest for this current paper are 23 while the period is 5 years.

Moreover, the technique deals with the proliferation of instrumental variables as well as controlling for the persistence of the dependent variables. The argument for persistence in the dependent variables is that the previous year's sustainable development tends to influence that of the current year. Adding to this, Agyei et al. (2020) contend that if the correlation between the regressand and its lag exceeds 0.80, then the former is persistent. In this study, the correlation between sustainable development (SD) and its lag (L.SD) is 0.821.

Additionally, the technique tends to account for the possible endogeneity problem or bias resulting from the potential reverse causality between the explained and explanatory variables and time-invariant omitted variables and account for it using instrumental variables (Tchamyou, 2020; Agyei et al., 2021). Lastly, it controls for the problem of unobserved heterogeneity and reduces the overidentification of instruments and cross-sectional dependence (Agyei et al., 2020).

Aside GMM, the researcher could have equally employed other panel estimation techniques such as pooled ordinary least square (POLS), pooled mean group (PMG), two-stage least square (2SLS), and fixed and random effect. However, GMM has been disclosed to have some advantages over these estimators. The POLS is not the best method because it does not account for heterogeneity among panels (Hill, Griffiths & Lim, 2012) and violates one of the assumptions of no the traditional linear regression model. The PMG as a cointegration model estimates the long-run relationship among variables. Though it uses lags of the variables because of its autoregressive nature (Pesaran, Shin & Smith, 1999), it requires panel models with more time series observations than cross-sectional which may not be appropriate for this study. Concerning fixed and random effects, the assumption of the current value of the dependent variable being completely independent of its past values is unrealistic which leads to leads to endogeneity arising from unobservable heterogeneity (Gujarati & Porter, 2009; Bell & Jones, 2015). The GMM technique is superior over 2SLS in the sense that the instrumental variable estimates are retrieved from lagged values which eliminate the need for an external instrument as required in 2SLS (Roodman, 2009).

**Model Diagnostic Tests**

To assess the potential over-identification problem, the Sargan test of over identifying restrictions is employed in the technique. The null hypothesis for this test is that "overidentifying restrictions are valid." The purpose of this test is to determine whether all instruments used in the analysis are valid. It is expected that the null hypothesis should not be rejected, indicating that the instruments are indeed valid for the model. In addition to the Sargan test, the system GMM approach requires conducting the Arellano-Bond test for serial correlation. The null hypothesis for this test is "no serial correlation." Specifically, the AR (1) test examines first-order serial correlation in first differences, while the AR (2) test examines higher-order serial correlation in first differences. It is anticipated that the null hypothesis of no first-order serial correlation (AR (1)) will be rejected, suggesting the presence of serial correlation. However, the null hypothesis of no higher-order serial correlation (AR (2)) is expected to be non-rejected.

Furthermore, the Difference in Hansen Test (DHT) is employed to assess the exclusion restriction of the exogenous variable in the model. The purpose of this test is to determine whether the exogenous variable is truly exogenous and does not suffer from endogeneity issues. By examining the statistical significance of the test, it helps to evaluate the validity of the exclusion restriction. The utilization of these model diagnostic tests is crucial for ensuring the validity and reliability of the empirical analysis. These tests provide insights into the robustness of the model, the validity of instruments, the presence of serial correlation, and the appropriateness of the exclusion restriction. By conducting these tests, the quality of their model can be assessed and make

informed decisions regarding the validity of the results.

**Chapter Summary**

This chapter explained in detail the methodology followed in carrying out the research. The research paradigm of the study, research approach, research design, data sources and analysis procedure, empirical model specification and estimation, were thoroughly discussed. The positivist research paradigm was used as the theoretical foundation of the study. The quantitative research approach was employed for the study. Explanatory research design was adopted to ensure objectivity in the research process.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## Introduction

This chapter presents the analysis and discussions of the determinants of non-performing loans in Ghana. Using secondary data from 23 commercial banks, the preliminary statistics and the regression analysis are duly discussed to assess if lending rates, interest rates and cost efficiency ratio determine the level of NPLs chronologically according to objectives.

## Preliminary Statistics

In Table 1, the descriptive statistics are averagely presented for 23 commercial banks for the respective variables that were sampled for the study. The statistics showed that NPLs was an average of 16.93% for all commercial banks at a traditional risk measure of 12.8. This implies that the standard deviation is relatively close to the mean indicating that NPLs are a sign of financial crisis. Also, the mean ratio of the NPL reflect the likelihood of loss in amount of GHS16.93 that each bank may suffer for granting credit for GHS100 to each loan applicant.

Averagely, commercial banks charge a lending rate 23.53% on loans granted. This is greater than the percentage of loans that banks are unable to recoup after granting loans. Arguably, if customers go to banks for loans and their loans attract a rate of 23.53%, this is a first indication that some customers may default on their loans looking at the magnitude of the loans they may have to pay back intermittently. Intuitively, if banks are charging an interest rate of 16.03% on their investments, investors may find it unprofitable to get loans and invest in their projects. This is because the extent of the average differences

between the interest rate and the lending rate may be unprofitable for investors who may go for loans to invest into other ventures causing a decrease in the level of national productivity.

***Table 1: Descriptive Statistics***

| | N | Min | Max | Mean | SD |
|---|---|---|---|---|---|
| NPL | 23 | 0.058 | 48.87 | 16.93 | 12.8 |
| Cost Income Ratio | 23 | 11.37 | 88.47 | 36.5 | 19 |
| Total Asset | 23 | 1103355 | 24415356 | 6018613 | 5216100 |
| Capital Adequacy Ratio | 23 | 14.34 | 51.89 | 24.64 | 8.56 |
| Average Savings Deposits Rate (%) | 60 | 6.05 | 7.75 | 7.5 | 0.34 |
| Interest Rate % | 60 | 12.41 | 21.67 | 16.03 | 2.49 |
| Average Commercial Banks Lending Rate (%) | 60 | 20.04 | 27.72 | 23.53 | 2.32 |
| Valid N (listwise) | 23 | | | | |

Source: Author's Construct (2024)
*Note*: N is observations of data sampled for the study

The cost efficiency ratio for the commercial banks is averagely 36.5 showing the transactional costs for banks is more than the lending rate for granting credit. Thus, if banks are incurring a cost for GHS 36.5 for each GHS 100 loan granted, then there is a tendency that this cost would feed into the lending rate. From the lending rate and the cost efficiency ratio, there is a clear indication that investors are likely to default on their loans per each GHS 100.00 that is granted.

**Inferential Statistics**

The inferential statistics in this study, a correlation analysis was presented to identify the multicollinearity and the suitability among the variables

included in the study and a regression analysis which was analysed and discussed according to the objectives of the study.

**Correlation Analysis**

The Pearson's unconditional correlations of the data series gives an introductory insight into the data set. The correlation matrix in Table 2 shows that there is no multicollinearity between the variables sampled for the study. Relatively, the relationship between the variables and NPL depict a negative relationship between both variables at a degree less than 0.8 (Shrestha, 2020). Also, there is a low pairwise correlation between all variables negatively ranging from (0.1 to 0.6). This is an indication that there is no collinearity between the variables and thus, all the variables can be used for the analysis. This is an indication that the magnitude of a variable does not depend on the happening of another variable.

Taking the pairwise correlation into account, the matrix shows that as the size of a bank grows, the level of NPL in commercial banks reduce. This is probably because banks have enough capital to accommodate their level of defaulting loans. Just as the size of banks and their capital power base, interest rate has a negative pairwise relationship with NPLs ($R = 0.206$, $p = .354$). This shows that, as interest rates are low, customers would be unwilling to take out loans. Yet, the cost income ratio showed that as banks transactional costs on their loans increase ($R = 0.016$, $p = .944$), the level of NPLs would increase because it would feed into lending rates on the bank.

*Table 2: Results of Correlation Analysis*

| | NPLs | Cost Income Ratio | Capital Adequacy Ratio | Total Asset | Average Savings Deposits Rate (%) | Interest Rate (%) | Average Commercial Banks Lending Rate (%) |
|---|---|---|---|---|---|---|---|
| NPLs | 1 | | | | | | |
| Cost Income Ratio | 0.016 | 1 | | | | | |
| Capital Adequacy Ratio | -0.211 | -0.214 | 1 | | | | |
| Total Asset | -0.303 | 0.137 | -0.32 | 1 | | | |
| Average Savings Deposits Rate (%) | 0.005 | 0.311 | 0.013 | -0.109 | 1 | | |
| Interest Rate % | -0.181 | -0.216 | 0.12 | 0.225 | -0.57 | 1 | |
| Average Commercial Banks Lending Rate (%) | -0.206 | -0.156 | 0.156 | 0.226 | -0.467 | 0.993 | 1 |

Source: Author's Construct (2024)

*Table 3: Separate effects of Lending Rate, Interest Rate and Cost-efficiency on Non-performing loans of Commercial Banks in Ghana*

| | | |
|---|---|---|
| L.lnNPL | 0.319*** | (0.0778) |
| LnLR | -0.725** | (0.317) |
| lnIR | 0.354** | (0.164) |
| LnCER | 0.0859** | (0.0426) |
| **Control** | | |
| LnCIR | 0.564*** | (0.105) |
| LnCA | 0.313*** | (0.0897) |
| LnASDR | 0.891* | (0.841) |
| LnSB | 0.177* | (0.125) |
| Constant | 5.645* | (3.443) |
| **Diagnostics** | | |
| Observations | 284 | |
| No. of instruments | 40 | |
| AR1 (p-value) | 0.000945 | |
| AR2 (p-value) | 0.539 | |
| Hansen-J (p-value) | 0.928 | |

Source: Author's Construct (2023)

* p<0.10, ** p<0.05, *** p<0.0 significant levels respectively, standard errors in parentheses

Note: lnNPL denotes non-performance loans, lnLR represents lending rate, lnIR denotes interest rate, lnCER denotes cost-efficiency ratio, lnICIR denotes cost income ratio, lnCA denotes capital adequacy, lnASDR denotes average savings deposits ratio and lnSB denotes size of commercial banks.

## Analysis and Discussion of Findings

### Objective 1: To examine the effect of lending rate on non-performing loans among commercial banks in Ghana

From Table 3, an increase in the lending rate is associated with a decrease in non-performing loans. Specifically, a 1% increase in the lending rate corresponds to a 0.725% decrease in non-performing loans. This result is significant at the 5% level, implying that, banks use the lending rate to generate some income for their operations. Generally, a high lending rate would mean that the commercial banks are making heed for a high likelihood of loan default – credit risk (Adebola & Dahalan, 2011; Bredl, 2018). In Ghana, the lending rate is averagely higher than the interest rates on loans. This inherently contribute to the negative relationship as this study has established. Conventionally, banks set high lending rates in an attempt to lower the level of NPLs (Matu, 2001; Darmawan, 2018; Chiesa & Mansilla-Fernandez, 2020).

Consequently, this study shows that high lending rates would not increase the level of NPLs. This result is contrary to findings from Messai and Jouini (2013) who undertook a similar study in developed economies of Greek, Italy and Spain. In developed countries, Messai and Jouini (2013) found significantly positive relationship between NPL and lending rate just as the study from (Wood & Skinner, 2018; Mukolu & Adeleke, 2020). In the same vein, a study by Adebola and Dahalan (2011) found a significant positive relationship between lending rates and NPLs in Malaysia. Another study from Beck et al. (2015) in the UK found a statistically more significant effect from lending rates on non-performing loans. Bredl (2018) further theorized that as

interest rates rise, the lending rates chronologically increase reducing a borrower's ability to pay off loans when due because of their unwillingness to pay more than the benefits of obtaining the loans.

In a long run analysis, this study is in agreement to the findings from Badar and Javid (2013), Ringim and Sayedi (2019) and Ninson et al. (2020). Kapopoulos et al. (2017) on the contrary found an insignificant relationship between NPLs and lending rates in the long run yet, a strong impact on the level of NPLs. Unarguably, the relevance on lending rates on the level of non-performing loans should not be overlooked. Along another line, Farhan, Sattar, Chaudhry and Khalil (2012) and Saba, Kouser and Azeem (2012) found that indeed lending rates are significant to the level of NPLs. Yet, this significance can either be positive or negative with no dominance on the effect from lending rate to non-performing loans.

In Ghana, a close study from Asiama and Amoah (2019) and Zhen et al. (2020) established that high lending rates are a dominant factor that determines the level of NPLs. Attentively, lending rates depend on a number of factors that determine the maturity of loans issued out (Beck et al., 2015; Serrano, 2021). This explains the role lending rates play on a customer's capacity to repay the loans when due. Vehemently, the negative significant relationship that has been established in the study shows that commercial banks can use lending rates to deter borrowers or control the excessiveness of customers getting loans so that the level on NPL can reduce. Thus, the higher the lending rate, the lower the NPL profile of the commercial banks in Ghana just as in Nigeria (Olarewaju, 2020).

This is contrary to the situation in developed economies experiencing positive relationships between lending rates and NPLs. Theoretically, the commercial banks in Ghana and other developing countries can capitalize on the finding from this study and ride on the negative relationship between non-performing loans and lending rates to reduce the level of NPLs in the economy of respective commercial banks (Agung, Kusmiarso, Pramono, Hutapea, Prasmuko & Prastowo, 2001; Asiama & Amoah, 2019; Olarewaju, 2020). In conclusion, this study reports a negative relationship between lending rates and NPLs which can be strategized into reding the level of credit risk in the economy in line with findings from (Agung et al., 2001; Monokroussos & Gortsos, 2017; Kapopoulos et al., 2017; Asiama & Amoah, 2019; Olarewaju, 2020; Ninson et al., 2021).

**Objective 2: To assess the effect of interest rate on non-performing loans in commercial banks in Ghana**

Again, the results from Table 3 indicate that cost-income ratio is strongly associated with non-performing loans. A 1% increase in the cost-income ratio leads to a 0.564% increase in non-performing loans. Thus, from the analysis, this study reports a significant positive relationship between banks' NPLs and interest rates. There are a plethora and extensive research on interest rates and NPLs. A number of research present that a high real interest rate is certainly associated to NPL. High-interest rates by a commercial bank (the case of FBN Bank) are repeatedly acknowledged as an imperative determinant of NPLs in Ghana (Appiah, 2019). Similar to preceding literature, there is a significant positive relationship between the interest rate variable and NPLs

(Curak, Pepur & Poposki, 2013; Saba et al., 2013; Ahmad et al., 2016; Abel & Lehman, 2019).

The theoretical explanation of the consequence of interest rates to NPLs is by Stiglitz and Weiss (1981) on how banks use credit rationing to approve loans. Their theory was on the basis that higher interest rates would increase the likelihood of default on loans or credit risk. Thus, the justification for the significant positive relationship between interest rates and NPLs in this study is from Stiglitz and Weiss (1981). The empirical justification therefore lies in their opinion that an increase in interest rates promote borrowing for relatively riskier projects with higher interest costs. Pending the level of information asymmetry, the loans would be issued to more risky customers as opposed to risk averse customers who may in their opinion, be willing to take up riskier projects for higher returns to meet the loan obligations. Hence, increase in dangerous lending results in increased probability of defaults and consequently, large NPLs.

This suggests that when a commercial bank raises interest rates, this may an increase in the portfolio of NPLs in Ghana. This is in line with earlier literature from Khemraj and Pasha (2009) and Asare (2019) who found that banks that allocate a relatively higher interest rate on loan orders are at a high risk of experiencing defaults on loans – non-performing loans. The same is reported by Adela and Iulia (2010) who confirmed a positive relationship between interest rates and NPLs in Kenya, Jefferis, Kasekende, Rubatsimbira and Nicole Ntungire (2020); Siddiqui et al. (2012) in Pakistan; in Spain (Jiménez & Saurina, 2005) and by Afonso and Alves (2019). This implies that, the economic position of a country does not affect the relationship between

interest rates and NPLs as there is a dominant positive and significant relationship between both variables (Stiglitz & Weiss. 1981; Fofack, 2005; Kapopoulos et al., 2017; Jefferis et al., 2020). Inherently, the type of interest rates charged – either fixed or floating would affect borrowers' ability to repay loans (Hu et al, 2006; Khairi et al., 2021).

Credit risk management, consequently, unswervingly is influenced by the level of interest rates on loans in commercial banks in Ghana. Ahmad et al. (2016) found that low interest rates has the capability of reducing the level of loan insolvency and credit risk in financial institutions. Along this line, the findings from this study is in line with earlier studies from Curak et al. (2013); Messai and Jouini (2013); Saba et al. (2013); Beck et al. (2015); Ahmad et al. (2016); Kapopoulos et al. (2017); Adusei et al., (2018); Asiamah and Amoah (2019). Contrary to previous studies, Adusei (2018) found a significant negative link between the interest rate variable and NPLs. The findings from this study however does not confirm to the findings from Adusei (2018) because theoretically the level of interest rate on a loan determine the capacity of the customer to pay back and the level of risk of the customer (Stiglitz & Weiss, 1981).

Thus, this study concludes that there is a significant positive relationship between interest rates and non-performing loans of commercial banks in Ghana.

**Objective 3: To determine the effect of cost efficiency ratio on non-performing loans in commercial banks in Ghana**

From Table 3, a 1% increase in the size of a commercial bank results in a 0.177% increase in non-performing loans. Thus, from the analysis, this study reports a significantly positive linear connection between banks' NPLs and cost

efficiency ratios. Cost efficiency in banking is a bank's competence to manage its operating expenses and yet provide quality services to customers at affordable costs. A more cost-efficient bank is generally what financial institutions expect to use to achieve respective financial goals and meet customer needs at lower costs. Yet, it is believed that the cost efficiency of approving loans may have an effect on the level of NPLs among commercial banks in Ghana (Berger & DeYoung, 1997). The analysis of this study showed a significant positive linear relationship between NPLs and cost-efficiency ratio.

This is in line with findings from Amuakwa-Mensah and Boakye-Adjei (2015) who found that in Ghana, a bank's ability to provide financial services and products are low transactional costs drives a long way to lessening the level of NPLs. Along the line, the theoretical implication shows that the transactional costs (origination fees, late payment fees, servicing fees, servicing costs, regulatory compliance costs, credit risk quota) that feeds into the lending rates and interest rates are at a low cost so that customers may find it easy to meet loan repayment dates (Monokroussos et al., 2017).

The positive relationship between cost-efficiency and NPLs show that the transactional and operational costs influence the ability of loan repayments (Berger & DeYoung, 1997; Amuakwa-Mensah & Boakye-Adjei, 2015; Oduro, 2020). As a result, when there is a decrease in the level of cost-efficiency, it would motivate loan holders to use the high provisions from the loan effectiveness to lessen the level of NPLs (Nikolopoulos & Tsalas, 2017). Naturally, costs on the servicing of loans would reduce the likelihood to meet loan obligations as per the loan contracts making it more costly for the bank to make provisions for the NPLs (Nikolopoulos & Tsalas, 2017; Oduro, 2020). An

earlier study from Ngugi (2001) noted that expenses like cost-efficiency on loans significantly determines the level of NPLs.

Technically, there's positive relationship between cost-efficiency and NPLs indicates a striking balance between reduced credit risk and interest income for loan holders (Amuakwa-Mensah & Boakye-Adjei, 2015; Oduro, 2020). Such a balanced approach is prudent to lending practices which commercial banks must adopt and strategise policies to make it useful. For all the commercial banks that want to lessen their level of NPLs, can capitalize on the positive relationship between NPLs and cost-efficiency and create a competitive advantage over other financial institutions that are unwilling to reduce their cost-efficiency (Berger & DeYoung, 1997; Bismark, 2021; Zamore, Beisland & Mersland, 2023).

This is in line with the findings from Ngugi (2001); Amuakwa-Mensah & Boakye-Adjei (2015); Nikolopoulos and Tsalas (2017); Monokroussos et al. (2017); Abel (2018); and Zamore et al. (2023) who established a positive relationship between cost-efficiency and NPLs – implying that when costs involved in processing a loan are high, the level of NPLs would also be high. On the contrary, Olarewaju, 2020 reports an inverse relationship between cost-efficiency and NPLs. The findings from Trung (2019), Pradhan and Parajuli (2017) and Oduro (2020) further affirmed that the relationship between cost-efficiency and NPLs is negative in the events where the bank management is unable to monitor increase in loan-related costs as it may increase the level of NPLs.

Thus, this study settles that, there is a positive association between cost-efficiency and NPLs in commercial banks in Ghana. Along the lines of literature

that had reported a negative relationship between NPLs and cost-efficiency, cost-efficiency is more effective and stable in a resilient economy. This reaffirms the finding that an increase in cost-efficiency is a positive significant determinant on the level of NPLs in commercial banks in Ghana.

**Diagnostics tests on the models assessing the determinants of non-performing loans of commercial banks in Ghana**

The two-step system GMM necessitate some diagnostic tests to be conducted. This study conducted the Difference in Hansen Test (DHT), Sargan test of overidentification and Arellano–Bond test for serial correlation. It is expected that the null hypotheses of these test should not be rejected with the exception of first-order serial correlation in first differences (AR (1). From Table 3, the first diagnostic test is the AR1 test, which tests for autocorrelation of order 1. The p-value for the AR1 test is 0.000945, which is less than 0.05. This means that there is significant autocorrelation of order 1 in the residuals of the model. Autocorrelation is a problem because it can lead to biased estimates of the regression coefficients. The second diagnostic test is the AR2 test, which tests for autocorrelation of order 2. The p-value for the AR2 test is 0.539, which is greater than 0.05. This means that there is no significant autocorrelation of order 2 in the residuals of the model. The third diagnostic test is the Hansen-J test, which tests for overidentification. The p-value for the Hansen-J test is 0.928, which is greater than 0.05. This means that the number of instruments is not greater than the number of parameters, so the problem of instrument proliferation is not a concern.

## Chapter Summary

The chapter is presented in preliminary analysis followed by a chronological order of the objectives. The preliminary statistics and the inferential analysis of the System GMM model were subsequently presented. The analysis revealed a significant but negative relationship between lending rate and NPLs. Further, the results exposed a significant-positive relationship between interest rate and NPLs; and between cost-to-efficiency ratio and NPLs.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Introduction

This chapter includes a summary to the study and the findings, the conclusions that can be implied from the findings and the recommendations for practical and theoretical implications to the stakeholders in the commercial banks in Ghana.

## Summary

Loan defaults among commercial banks continue to be significant, causing financial distress and perhaps eventual bank failure. With a prior impact on loan defaults on the Ghanaian economy, this study sought to determine the factors of non-performing loans in the commercial banks in Ghana. Thus, as per the theory of asymmetric information which makes it difficult to distinguish between good and bad borrowers based on the average rates on the loan, this study used lending rates and interest rates as the first two determinants of NPLs in Ghana. Subsequently, the transaction cost theory suggests that borrowers and lenders evaluate the costs associated with taking on a loan transaction – hence, the cost-efficiency ratio was sampled for the last objective of the study. Thus, to connexion the gap in literature pending the paucity in literature after the 2016 sectoral financial crisis in Ghana, the following objectives were set:

1. To examine the effect of lending rate on non-performing loans among commercial banks in Ghana;
2. To assess the effect of interest rate spread on non-performing loans in commercial banks in Ghana; and

3. To determine the effect of cost efficiency ratio on non-performing loans in commercial banks in Ghana.

A descriptive research design, sampling all 23 commercial banks in Ghana, a quantitative approach to research was adopted for this study. The data used was on the interest rate charged by the banks, cost-efficiency ratio, and lending rate for five years (2017 – 2021) to determine their effect on non-performing loans as per the objectives.

The study found a significant and negative relationship between lending rates and commercial banks in Ghana. Intuitively, if banks upsurge the level of the lending rates, the level of non-performing loans would reduce as customers may be unwilling to process loans. Though this action would help to lessen the level of non-performing loans and promote some soundness in the system, there could be negative implications on the entire economy as customers may be unwilling to up for loans. this will vehemently reduce the level productivity, savings or investment.

Secondly, the study established a significant positive relationship between banks' NPLs and interest rate. This further explains that the higher the interest rate, the higher the level of NPLs. Theoretically, the Stiglitz-Weiss credit rationing theory, the higher the risk level of a customer, the higher their desire to opt for higher interest rate as opposed to investors that are risk averse. Mostly, loans would be issued out to such customers on the theory of information asymmetry where it is only known to the customer that he would default on the loan because of the high quoted interest rate.

Lastly, the study reports a significant positive relationship between commercial banks' NPLs and cost-efficiency ratio. This is true and along the

line of the transaction cost theory, high cost-efficiency ratio would lead to non-performing loans. As customers bear a high cost for processing a loan, their level of default on loans and hence, NPLs – due to the increase in the cost of efficiency or transaction costs on the loans. Thus, the impact of cost-efficiency on NPLs in Ghana is quite glaring because the transaction costs for approving a loan is competitively high among banks.

**Conclusion**

Based on the findings of the study, the following conclusions are made:

The conclusion from objective one show that the level of lending rate can be mechanised to demotivate the level of NPLs in Ghana and other developing economies. The inverse relationship between lending rates and NPLs could deter customers from getting loans and generally reduce the level of higher credit risk. Thus, the Governor can capitalize on this finding and tighten the monetary and credit conditions of loan contracts so that there can be a lower incidence of defaults and NPLs.

Secondly, the study concludes that interest rates positively determine the level of NPLs in commercial banks in Ghana. As interest rates increase(decrease), the level of NPLs also increase(decrease). This could cause financial strain and crisis in the financial system because the banks cannot solely set the interest rates on loans – it is a macroeconomic variable that the banks have little control on. Yet, banks have to screen the borrowers well to be able to identify customers that could default on the loans pending their risk levels (Stiglitz & Weiss, 1981).

The last objective concludes that there is a positive relationship between cost-efficiency and NPLs. A higher level of cost-efficiency that is characterised

by prudent resource allocation and effective loan-related transactional cost management practices, corresponds to a lower incidence of NPLs. Thus, commercial banks should be motivated to reduce the level of transactional costs on loans. This can affect the level of NPLs as high cost-efficiency would mean higher transactional costs that may feed into the interest rate or lending rate making it quite difficult to meet obligations.

**Recommendations**

The following recommendations are made based on the conclusions from the findings of the study:

This study recommends that banks commercial banks should strategies appropriate levels of lending rates relative to the risk profile of loan plans available to customers. Some classes of loans attract risk-loving customers who may have a higher likelihood of default that risk-averse customers. This can be done by employing the service of Credit Reference Bureaus (CRBs) and similarly, by knowing and understanding all the necessary documents and capacity of the borrower to repay before giving out loans, and any properties that may serve as collateral. Thus, the Governor and other commercial bank managers should carefully strike a balance between the risk level of customers and use set lending rates that can gauge the creditworthiness of borrowers. This would ensure that loans are approved for individuals and businesses who have the capacity to repay their loans thereby reducing the risk of default.

Secondly, banks should continually evaluate and appraise policies on interest rates on loans since loan non-payments are higher for banks that increase their real interest rates on loans. Also, while banks would find it difficult to remain competitive in the industry, they should ensure that they have

effective screening phase for customers so that they do not offer loans to customers that have a high chance of default. Financial institutions should also use efficient and effective credit risk management to ensure that loans are matched with a customer's capability to repay. This can help project accurately, the level of non-performing loans so that it can be minimized or provisions can be made against it. Lastly, because of the changing economic conditions, if banks should adopt a flexible repayment schedule so that customers can navigate through periods of economic stress.

Lastly, the study proposes that commercial banks should focus on optimising operational costs on loans by upholding a balanced approach to profitability and risk. Thus, banks should keep an concentrated eye on the economic trends and conditions to reduce the operational costs on loans and yet render enviable loan services.

**Suggestion for Further Studies**

The level of NPLs greatly affects the financial stability of an economy. As such, it is prudent for every economy to try and reduce the level of NPLs as the individual financial systems are interconnected. Thus, for further studies, other researchers can undertake a comparative study to assess if the level of NPLs has improved subsequent to the sectoral clean-up or not.

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