KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

SCHOOL OF BUSINESS

MACROECONOMIC AND BANK-SPECIFIC FACTORS AS LEADING INDICATORS OF NON-PERFORMING LOANS IN THE BANKING SECTOR OF GHANA

BY

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DECLARATION

I hereby declare that this submission is my own work towards the award of a Master of Business Administration, Finance Option and that to the best of my knowledge, it contains no material previously published by another person or any material which has been accepted for the forward of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This thesis is dedicated to my

wife and family

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ABSTRACT

The concept of NPL is on ascendancy as a result of its strategic implication on the banking sector and the economy in general. A country like Ghana has been plagued by a key problem, that is, access to loanable funds as a result of rising non-performing loans. The main objective of this study was to analyze bank-specific and macro-economic determinants of NPLs in Ghana. To achieve this purpose of the study, a sample of 11 banks in Ghana with data spanning from 2015 to 2021 were utilized for the study. The secondary data were sourced from both the audited financial statement and the World Development Indicators (WDI). Macro-economic variables of the study include inflation rate, exchange rate, GDP, and interest rate for the study. To achieve the study objectives, the study conducts descriptive statistics and regression analysis in respect to each objective. The study also carries out the LM-test, F-test and Hausman tests to determine the appropriate model for this study and finds that the fixed-effect model was appropriate for this study. Based on the results, the study found that inflation rate has negative but insignificant impact on NPLs. It was also revealed that NIM has a positive and significant impact on NPLs. ROA on the other hand revealed a significant negative impact on NPLs. Bank size also indicated a significant positive impact on NPLs. The model also revealed that firm age has a positive but insignificant impact on NPLs. Based on the findings, this study recommends to management to devise stringent mechanisms and tight credit recovery mechanisms to reduce the incidence of NPLs in the country. Credit officers should also assess the credibility of borrowers before granting loans and other credit facilities to them. Based on this finding, the study also recommends to government and policy makers to control inflation rate and exchange rate volatility against the major currency to help stabilize the Ghanaian economy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The financial system of a country is established to channel funds from surplus unit to deficit unit through the efficient management of savings and investments to enhance development (Kumar et al., 2016). The stability of the banking sector has been threatened through increasing loans being tagged as non-performing (Angsoyiri, 2021). This menace hinders the flow of funds from surplus unit to deficit units, and may impede investment and growth in the long-run. The dire consequences rising from the incidence of high non-performing loans (NPLs) has piqued the interest of many scholars and academicians, raising the question of how well the development of the financial system and the economy in general can be accounted for (Staehr and Uuskula, 2020). This question is highly imperative from the policy-making perspective.

A high level of non-performing loans has a significant impact on a bank's overall financial performance (Berger and DeYoung, 1997). This is seen as the leading cause of economic crises in African countries (Fofack, 2005) and it is a prima causal agent of bank failures in Ghana (Amuakwa-Mensah et al., 2017). Literature is consistent on the causes and procedures that lead to non-performing loans (Hennie, 2003; Fofack, 2005; Radivojevic et al., 2019). Global financial shocks have been listed as a key source in literature (Boako and Alagidede 2017). For instance, a country like Ghana has experienced high rates of non-performing loans since the global financial crisis in 2007 (Adusei,2018). Several other studies have noted that stock market volatility can lead to high default rates due to wealth effects and a drop in collateral value (Baral 2019; Boako and Alagidede 2017).

National and international authorities in attempt to guard against the problem in the banking sector continue to monitor the development in the stock of NPLs. As revealed by Staehr and Unskula (2020), since the global financial crisis and the recession, financial instability and the distress in the banking sector have continually been the subject of discussion by analyst and policy makers. To monitor development and detect signs of banking distress in emerging economies like Ghana, authorities at the national and international level have develop systems that can function in that manner (Alessi and Detken, 2011). These regulatory authorities have come out with various measures that are aimed to strengthen the banking sector.

Literature has revealed that business cycle has the tendency to determine the condition of loan borrowers (Stijepovic, 2014; Ozili, 2019). Following Staehr and Uuskula (2020), comparing the good financial indicators to a period of economic turmoil, borrowers will be more solvent in the former. Many studies have revealed that macroeconomic variables affect the credit activities engaged by both the borrower and the lender (Kjosevski and Petkoyski, 2021; Karadima and Louri, 2021; Nasir et al., 2022; Foglia, 2022; Lee et al., 2022). Similarly, bank-specific factors such as return on asset, total capital, and return on equity, among others, impact on the lending activities of the financial sector (Foglia, 2022; Jin et al., 2022; Baituti and Ngaba, 2022). In line with the arguments above, both macro-economic and bank-specific factors can impact on the level of NPLs in a country.

In a number of developing countries, progressive changes in the economy have prompted a reduction in the quantity of loans offered to public and private sector for development. This has moreover, slowed down the development of many sectors of the economy (Asiamah and Amoah, 2018) which raises the questions: What is the trend of non-performing loans in the banking sector

of Ghana? What is the impact of macro-economic variables on NPLs of banks in Ghana? What is the impact of bank-specific factors on NPLs of banks in Ghana? A study of this nature is carried out to assess the leading indicators of NPLs in Ghana. Centrally, the purpose of this study is to analyze the macroeconomic and bank-specific factors as leading indicators of NPL.

1.2 Problem Statement

The concept of NPL is on ascendancy as a result of its strategic implication on the banking sector and the economy in general. A country like Ghana has been plagued by a key problem, that is, access to loanable funds (Adusei, 2018). Many institutions in the financial sector were founded to aid in the alleviation of this challenge by providing funds to sectors, both the private and the public (Amuakwa-Mensah et al., 2017; Asiamah and Amoah, 2018). However, as the rate of NPLs increased, quite a number of institutions within the financial sector became insolvent. The rise in NPLs during 2017 fiscal year has led to the takeover of UT Bank and Capital Bank by GCB (Ofori, 2023). For different causes, the apex Bank of Ghana (BoG) collapsed and merged five banking institutions into one bank called Consolidated Bank Ghana (CBG) in the second quarter of 2018 (Asiammah and Amoah, 2018). The rising rates of NPLs were a major cause of these infringements. Since 2008, the BoG has performed diverse operations by closing troubled microfinance and other financial institutions across the country (Belnye, 2012). Following the lack of deposit insurance within Ghana, the effect of such bankruptcies on investments, companies, and livelihoods cannot be overstated (Boateng et al., 2016).

In order to ensure that the sector is highly stable to sustain development through credit formation, the Bank of Ghana and the banking industry have taken steps to curb the incidence of rising NPLs. Because of the impact on bank survival, the emphasis on attempting to resolve the increasing

existence of NPLs has been renewed (Okyere and Mensah, 2022; Adusei and Bannerman, 2022). Although high lending rates and default rates are mentioned in the literature as contributing causes to NPLs in Ghana, less attention has been paid to macroeconomic and bank-specific factors that operate as leading indicators of NPL in the country's banking sector. In the context of Ghana, empirical research on the influences of macroeconomic and bank-specific variables on NPLs is still in its infancy. In literature, studies conducted outside of Ghana's context, such as those by Alnabulsi et al. (2023) and Di Febo and Angelini (2022), provide empirical data. This kind of research aims to close this gap.

Moreover, many studies done on the determinants of NPLs across the globe have linked it to firm profitability (Panta, 2018; Haneef et al., 2012; Balasubramaniam, 2012; Kirui, 2014; Adebisi and Matthew, 2015; Akter, and Roy, 2017; Nyarko-Baasi, 2018). However, there remains a huge gap on the effect of bank-specific variables on NPLs (Beck et al., 2013; Abid et al., 2014; Kuzucu and Kuzucu, 2019). Currently, knowledge on the impact of macro-economic variables on NPLs in Ghana remains minimal. There is a lacuna of studies that have analyzed the effect of both macroeconomic and bank-specific variables on NPLs in Ghana. To add to the existing literature and knowledge, this research seeks to explore the macroeconomic and bank-specific variables on NPLs of banks in Ghana using data that spans from 2001 to 2021. This study therefore addresses this gap by assessing the macroeconomic and bank-specific factors as leading indicators on NPLs.

1.3 Objectives of the Study

The general aim of this research is to examine the macroeconomic and bank-specific factors as leading indicators of non-performing loans (NPLs) in the banking sector of Ghana. The following specific objectives were outlined:

i. To analyze the trend of non-performing loans in the banking sector of Ghana.

ii. To assess the impact of macro-economic variables on NPLs of banks in Ghana.

iii. To examine the impact of bank-specific factors on NPLs of banks in Ghana.

1.4 Research Questions

In order to achieve the study objectives, the following research questions were asked:

i. What is the trend of non-performing loans in the banking sector of Ghana?

ii. What is the impact of macro-economic variables on NPLs of banks in Ghana?

iii. What is the impact of bank-specific factors on NPLs of banks in Ghana?

1.5 Significance of the Study

To the best of the researcher's knowledge, this study is among the limited studies conducted in Ghana that have employed macro-economic and bank-specific factors as leading indicators of NPLs in the banking sector. Therefore, key stakeholders, such as government and management stand to benefit from a study of this nature, and would provide measures that would guide them to reduce the menace of rising NPLs of banks in Ghana. Moreover, this study would be essential to regulators because it will assist them in formulating policies that will assist Ghanaian banks in better assessing whether a customer is capable of upholding his or her loan obligations and creditworthiness. The results of this research may be used to help establish regulatory guidelines

for central bank lending policies. Again, recommendations from this study would also assist management in identifying the basic variables that cause NPLs to deteriorate so that they can be handled properly to improve loan efficiency.

1.6 Scope of the Study

The study covers macro-economic and bank-specific factors as leading indicators of NPLs in the banking sector. Geographically, the scope of this work was limited to Ghana. This study analyzes selected banks in Ghana with regards to their capital, NPLs, NIM and ROA. Specifically, 11 universal banks operating fully in Ghana were used for the study. The macro-economic variables for this study include GDP, inflation rate, exchange rate, and interest rate. The selected banks were chosen for the study based on accessibility and availability of their yearly published financial report within the period between 2001 and 2021.

1.7 Summary of Methodology

The study is analyzed quantitatively with the help of SPSS and Eviews. Furthermore, in order to achieve the study's objectives, the study adopted the explanatory research method. This study takes a survey approach since it aims to measure the study's variables in numerical terms. The study chose 11 universal banks operating in Ghana and whose annual report was readily available for use. Secondary data from the universal banks' annual reports was used in this study. Besides, the macro-economic variables used in this study were drawn from the Bank of Ghana website as well as the World Development Indicators Database (WDID). This study followed the methodology used by Khan et al. (2020) and Koju et al. (2018), therefore utilized panel regression approach to assess the relationship among the variables under study.

1.8 Limitations of the Study

The study was limited by the inability of the researcher to cover more macro-economic and bank-specific variables that impact on NPLs. In addition, the study was limited to 11 universal banks in Ghana with data spanning from 2001 to 2021. The researcher admitted that the scope of the study could affect the study findings and its generalizability thereof.

1.9 Organisation of the Study

This study is organized into five chapters. The first chapter is the introduction chapter. The second chapter of the study is the literature review. The chapter three, which is the methodology, follows the literature review. The fourth chapter presents the data analysis and discussion of results. The final chapter is summary, conclusion and recommendation. The chapter further makes some suggestions for future studies.
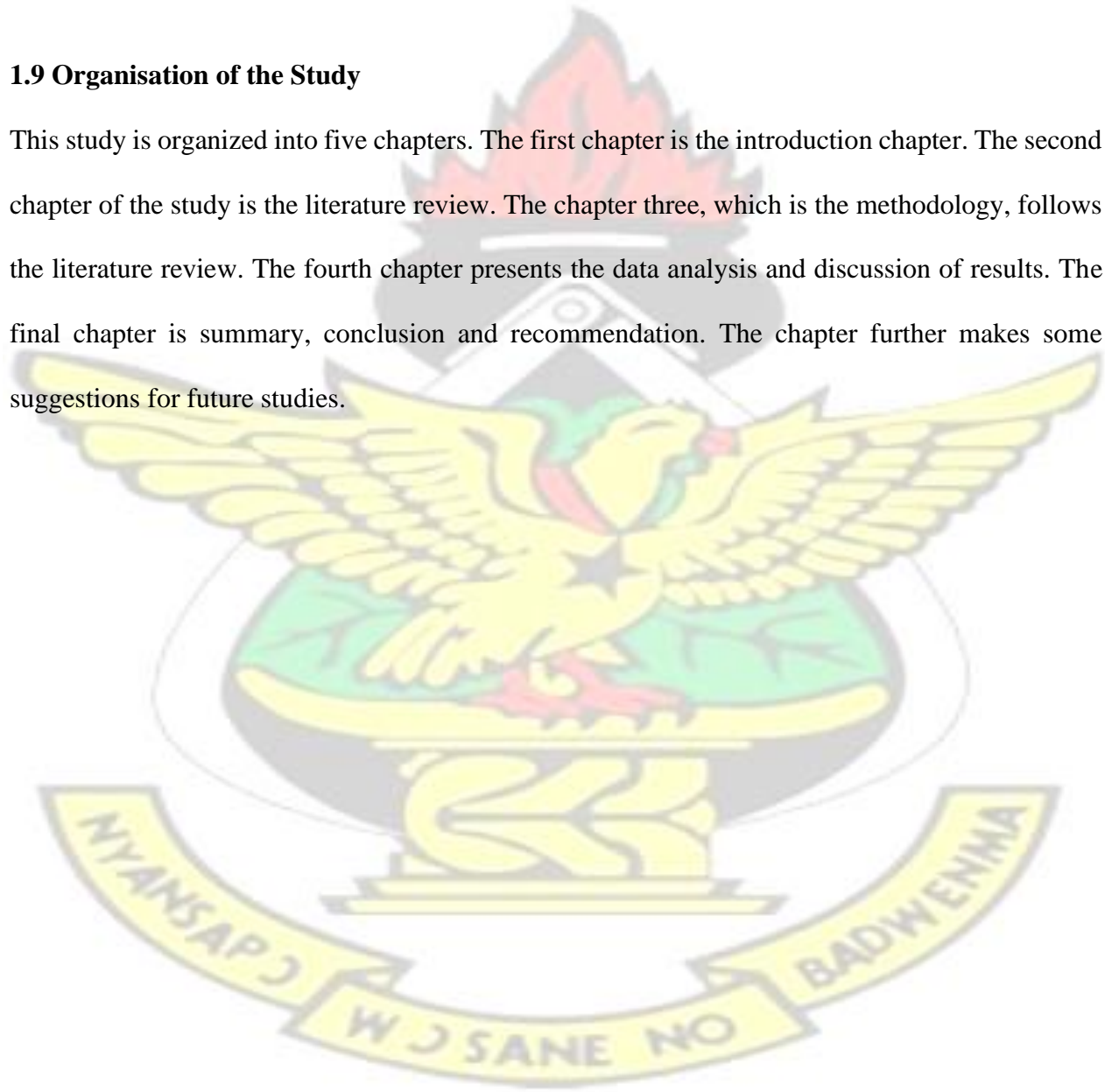
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter detailed the literature review guiding the study of macroeconomic and bank-specific variables. The chapter basically presents the literature review in four sections, namely, conceptual review, theoretical review, empirical review and conceptual framework model.

2.1 Conceptual Literature Review

In this section of the study, the researcher presents the major concepts guiding the study of macroeconomic and bank-specific determinants of NPL. These concepts have been presented and reviewed in details in the next sub-sections.

2.1.1 Non-Performing Loans (NPL)

Non-performing loans are loans that remain unpaid beyond 90 days (Alnabulsi et al., 2023), and therefore, no principal or interest accrued have been received by the financial institution (Anita et al., 2022). Similarly, loans are declared non-performing when it fails to generate interest and principal for 90 days and beyond (IMF, 2005). As revealed by Joseph et al. (2012), loans that are due more than 90 days, unable to receive interest and principal are termed as NPLs. From the perspective of Anita et al. (2022), there is no possibility of repayment when financial institutions fail to collect the principal plus the interest in a foreseeable future. Since the entire financial system of a country is impacted negatively by NPLs, it is considered as risk and threatens stability.

NPLs as explained by the BIS (2016) are credit obligations that are more than 90 days due. NPLs are credit obligations whose instalments are due but remained unpaid for a-90 day and beyond (Cavallo et al., 2002). Generally, when loans are declared as non-performing, it threatens economic

growth, signals financial weakness, jeopardizes the entire financial system of an economy, and adversely affect the stability of the financial system (Ivanovic, 2016). According to Anita et al. (2022), NPLs threatens revenue stability, impact negatively on investment opportunities, and increase financial institutions' liquidity risks, which ultimately result in financial system bankruptcy.

According to Anjom and Karim (2016), when a loan cease to generate income and failed to perform in line with the loan agreement, it is termed as NPL. The deterioration of the quality of loan portfolio on the balance sheet of a company indicates the existence of NPLs. Signaling the poor health and bad corporate governance practices, the proportion of NPL within the financial sector is on the rise. As revealed by Hakimi et al. (2023), most NPLs are in default or close to being default. Mostly, depending on the contract terms of the loan, it might not be declared non-performing after 90 days. Loans that are declared non-performing can be grouped into different types depending on the length of overdue.

One common indicator to measure credit risk that impact on the stability of the banking system and the general economy is NPLs. Dorji (2023) classified any loan that remains unpaid and failed to generate income as NPL. From the IFRS perspective, NPLs are representation of bad loans. In most studies, loan portfolio and credit quality have been proxied by NPLs (Ahmed et al., 2021; Khan et al., 2020). Empirical literature has grouped the determinants of NPLs into bank specific (Pirgaip and Uysal, 2023; Kigamwa and Mutwiri, 2023; Akhter, 2023) and macroeconomic variables (Alnabusi et al., 2023; Taswan et al., 2023). To sanitize the banking system and maintain a stable economy, NPLs should be managed to their barest minimum.

2.1.1.1 Determinants of Non-Performing Loans

Basically, empirical literature of this study has classified the determinants from the perspective of bank-specific factors and macroeconomic factors.

2.1.1.2 Bank-Specific Determinants of NPL

This section of the study details the literature review of bank-specific factors impacting on NPLs.

2.1.1.2.1 Bank Profitability

The core objective of banks is to maximize profit and sustain growth to satisfy the shareholders. Profitability of banks are key to stakeholders such as customers, shareholders, employees, management, the government, and the community, among others. This study proxied bank profitability with ROA. Banks with quality management who usually engage in high-risk activities are those with high profitability (Ahmed et al., 2013). As revealed by Gurbuz (2013), the relationship between NPLs and profitability is negative. This finding has been confirmed in literature (Ozili, 2019; Adusei, 2018; Messai and Jouini, 2013).

The pecking order theory argues that high-profit firms must retain a minimum leverage level as domestic profits can be generated to fund their company. A negative relation between firm leverage and profitability is anticipated from the perspective of the pecking order theory (Sheikh and Wang, 2011; Cassar and Holmes, 2003). Nevertheless, the trade of theory indicates that as result of the tax shield on interest paid by debt there is a beneficial link between profitability and leverage (Pike and Neale, 2006; Tong and Green, 2005). It may also be argued that profitable corporations are more likely than less efficient companies to take on the debt because lenders perceive them to be less risky. Fama and French (2002) concluded that, especially if investment

overweight profits, lucrative businesses with huge investment commitments are to be expected to be higher in leverage.

2.1.1.2.2 Bank Operating Efficiency

Operational efficiency measures the cost incurred during financial activities. Ahmed et al (2021) revealed that the cost efficiency impact on NPLs is massive, where higher costs equate with lesser efficiency. One cost-efficient measure of banks if for them to spend less funds to monitor lending risks, however, it results in possible rise of NPLs in future (Ozil, 2019). Financial institutions that spend high cost to reduce the risks in lending but put less control mechanisms in reducing NPL has a bad management practice. Empirical literature has revealed a negative link between NPLs and banks operating efficiency (Ahmed et al., 2021; Benthem, 2017).

2.1.1.2.3 Bank Capital

Capital is seen as the residual interest in assets of a firm after deducting all its liabilities. The capital structure and its size of a financial institution determines their financial position and has an impact on loan portfolio (Akhter, 2023). Banks with a high level of capital are more willing to make loans since they know they will not go bankrupt or fail because of these loans; as a result, banks are more involved in hazardous credit operations, implying a positive relationship between capital and NPLs (Rajan, 1994). Banks with high capital are able to withstand losses that may arise from NPLs. Hence, Makri et al. (2014) reported a negative link between high bank capital and NPLs of financial institutions. The capital adequacy ratio (CAR) demonstrates an organization's ability to withstand unexpected losses. According to Makri et al. (2014), there is a negative correlation between CAR and NPLs. NPLs and CAR have a favorable relationship with one another (Makri et al. (2014).

2.1.1.2.4 Credit Growth

Credit growth got to do with the expansion of credits to individuals, public and private sector. The grant of credit by the banks to these parties increase money supply in the system. These have an impact on the banking sector as well as the economy (Makri et al., 2014). Credit growth, as revealed by Jakubik and Moinescu (2015) is a good indicator of banking sector stability. However, Makri et al. (2014) are of the view that rapid increment in credit growth within an economy result in high loan losses. When supply of credit in an economy increases, there is a tendency of high NPLs which in turn decrease the stability and performance of the banking sector. In an economy, financial institution with high credit growth mostly exposes themselves to high loans being declared non-performing (Ahmed et al., 2021).

2.1.1.2.5 Loan Loss Provisions (LLP)

After the global financial crisis, many financial institutions across the world experienced the pilling up of bad loans, which decreased revenue and as well increase loan loss provision (Caporale et al., 2018). The main function of loan loss provision, as revealed by Caporale et al. (2018) is to cover expected losses. According to Kanagaretam et al. (2005), financial institutions can utilize LLP to signal their financial strength. Ahmed et al. (2021) revealed that loan loss provisions are utilized by financial institutions to provide for various loan losses. Looking at the loan portfolio, financial institutions with poor credit quality are risky, which eventually lead to high NPLs (Beck et al., 2015).

Ahmed et al. (1999) defined loan loss provisions as an instrument used to adjust loan loss reserves depending on loan portfolio performance. Numerous studies agree that loan-loss provisions provide a relevant source of information about the performance of a bank's loan portfolio. Loan loss provisions are recorded in the income statement as an expense while loan loss reserves are

treated as balance sheet items (Cohen et al., 2014). While loan-loss provisions signify the quality of bank loans, they are also used for other purposes (Erasmus, 2018). Laeven and Majnoni (2003) find that loan loss provisions are used effectively to level out bank earnings or mitigate capital management uncertainty. This result is close to that of Ahmed et al. (1999), who claimed capital management was one of the most critical aspects of loan loss clauses. Furthermore, loan loss provisions are misleading as a calculation of asset quality since loan loss provisions offer a skewed image of bank asset quality. As loan-loss provisions offer an interpreted perception on asset quality, bank managers have used loan-loss provisions to distort details on asset quality. Cohen et al. (2014) has reported that the tactical presentation of loan loss provisions has been used to influence the appearance of financial position of a bank.

2.1.1.2.1 Bank Size

Bank size, which represent the ownership of banks' assets, is considered as one key determinants of NPLs in a country (Ahmed et al., 2021). Banks usually expand their size for growth and profitability. In Literature, the size of bank matters to the direction of NPLs (Lu et al., 2005). Large banks with huge capital mostly have better management skills (Ozili, 2019) to recover loans from customers. The issue of bank supervision and regulation got to do with limiting the size of banks as a way of ensuring stability. When larger banks follow a thorough credit policy their chances of recording high NPLs are low as compared with smaller banks with liberal policy (Stern and Feldman, 2004). In a related study, Castanias (1983) explains that there is the presence of information asymmetry in smaller organizations, thus this hinders their ability to attract loans from lenders. As a result, smaller organizations mostly have lower equity to debt ratio. This is because lenders perceive that these firms have the capacity and are more likely to repay their debts. Thus,

larger organizations have large debt to equity ratio. Several studies have found that firm size have an influence on the ability of an organization to attract loans from debtors (Hall et al., 2004).

2.1.1.2.7 Net Interest Margin (NIM)

One bank-specific determinant of NPLs is net interest margin. Empirical literature has revealed a positive impact of NIM on NPLs of financial institutions (Bonin et al., 2005; Ahmed et al., 2021). Proponents of the positive impact of NIM on NPLs argued that when NIM rises, it increases their interest burden (Adusei, 2018; Ozili, 2019). To minimize default risk, Cavallo and Majnoni (2002) revealed that banks should raise their interest margin. This will eventually ensure a direct impact of interest margin on NPLs of banks.

NIM measures the health and efficiency of a financial institution in the activity of granting loans to customer from depositors' money (Angori et al., 2019). To create a healthy baking system, management should take care of their net interest income. NIM also measures the amount of funds that a financial institution is obtaining on interest on loans in comparison to the interest they are paying on depositors' funds. It is computed as a ration of financial income less the expenses to total asset of a company (Nguyen et al., 2020). To enhance the NIM, financial institutions should manage their earnings asset prudently and efficiently.

2.1.1.3 Macroeconomic Determinants of NPL

This section of the study details the literature review of macroeconomic factors impacting on NPLs. The next sub-section detailed the review of these macroeconomic determinants of NPLs. The section covers literature on GDP, inflation rate, interest rate, exchange rate, and political risk.

2.1.1.3.1 Gross Domestic Product

GDP growth rate, which measures how fast an economy is growing is another significant determinant of NPL. It has been identified in literature to have an inverse impact on NPLs (Us, 2017; Umar and Sun, 2018). When an economy's GDP rate increases, it usually reduces the level of NPLs (Ahmed et al., 2021). Mostly when an economy is experiencing recession, there is usually a fall in GDP growth rate, which in turn increases the rise in NPLs. When GDP in an economy increases, it's an indication of growth in most sectors in the country, which results in a reduction in the level of NPLs.

2.1.1.3.2 Inflation Rate

Over a period of time, when the prices of goods and services in an economy increases, it reduces the purchasing power of people. When inflation surges, the real value of money reduces, and it eventually impact on the livelihood of individuals as well as the operations of major businesses (Beck et al., 2015). Empirical literature has revealed a direct link between NPLs and inflation rates (Kigamwa and Mutwiri, 2023). Inflation in an economy slow down growth in many sectors, erode the real value of money, and mostly impact on the inability of individuals and organizations to service the loans they have contracted from many financial institutions.

2.1.1.3.3 Interest Rate

Interest rate, which is the price of money and the most perversive factor in an economy got to do with the amount charged on the principal by the lender. Mostly, when there is a hike in interest rate in a particular country, the volume of debts on the part of borrowers also rises, and eventually make debt servicing more expensive (Boss et al., 2009). On the other hand, Ahmed et al. (2021) revealed that low interest rate reduces the occurrence of NPLs in a country. Following Siddiqui et

al. (2012), the high volume of rising NPLs in most economies got to do with interest rate instability. In addition, high interest rate which causes NPLs reduces the earnings of financial institutions.

Interest rates have also been cited as a significant driver to NPLs at commercial banks. According to Berge and Boye (2007), real interest rates had a significant impact on loans in the Nordic banking system. The volume of bad loans will decrease as the real interest rate falls. Similarly, Jimenez and Saurina (2006) examine the macroeconomic factors that influence NPLs. The empirical evidence supports the hypothesis that as economic development slows, the percentage of NPLs rises, resulting in higher lending interest rates and risk aversion. Furthermore, a higher prime lending rate will increase the cost of loan charged to borrowers, forcing them to carry a higher financial default risk, which will lead to an increase in NPLs (Dao and Do, 2013).

2.1.1.3.4 Exchange Rate

The value of one currency, relative to the conversion to another currency has been identified in literature to impact on NPLs (Ahmed et al., 2021; Umar and Sun, 2018). Exchange rate as one macroeconomic variable has been revealed by Zia and Huma (2015) to affect NPLs of financial institutions significantly. According to Khemraj and Pasha (2009) on factor that is responsible for loan losses in a country got to do with fluctuations in interest rates. Specifically, when interest rates fluctuate, customers that have contracted loans and need to convert to another currency before they can trade mostly incur losses that impact negatively on their ability to pay back the credit secured from financial institutions (Gambera, 2000).

16

If loans are denominated in foreign currencies, the actual effective exchange rate is likely to have a negative impact on NPLs. As a result, a rise in the value of domestic currencies in relation to major trading currencies reduces NPLs (Zia and Huma, 2015). This means that a devaluation of the domestic currency exacerbates the hardship of consumers with these types of loans, culminating in loan default and interest payments. An appreciation of the domestic currency in relation to other main trading currencies, on the other hand, means that consumers with foreign-denominated loans can pay their debt, lowering the risk of default (Ahmed et al., 2021). In general, empirical studies have indicated that the actual effective exchange rate and NPLs have a mixed effect.

2.1.1.3.5 Political Risk

Political instability in a country is a major contributing factor to rising NPLs. When the political situation of a country is unstable, it threatens the stability of the banking system, and have a strong impact on NPLs (Ahmed et al., 2021). In most developing countries, Wheelock and Wilson (2000) revealed that most top management and directors of banks are influenced by political pressures. Most managers grant credit facilities to most politicians which is not based on merit. As revealed by Creane et al. (2006), factors such as judicial empowerment, bureaucracy, poor credit implementation policies by management are among political factors contributing to the rise of NPLs in a country.

2.2 Overview of the Banking Sector of Ghana

Ghana's banking sector comprises of the national system of accredited and statutory financial institutions engaged in banking under Ghana's banking law (Adams and Agbemade, 2012). The establishment of Banking Act 2004 (Act 673) helped create foreign financial services in Ghana; for example, a local subsidiary of Barclays Bank was allowed to start up as an offshore bank (Adams and Agbemade, 2012; Asamoah and Owusu-Agyei, 2020). This reform allowed banks, without the need of separate licenses, to engage in commercial, development, investment and merchant banking services. With this all-inclusive banking license, the banks are providing numerous services such as insurance plans, savings products, equity holdings, investment advice services and foreign exchange, not just taking deposits and offering loans. After a new minimal capital directive from the Bank of Ghana on 11 Sept 2017, the banking industry witnessed some reforms (PWC, 2019). In 2017 the Bank of Ghana laid out an ambitious policy plan to reinforce a more resilient banking regulatory and supervision System. Due to the changes, some banks left the market, while others had to combine to raise the proposed new minimum capital requirement of 400 million.

2.3 Theoretical Literature Review

This section of the study presents the review of literature on the theory guiding the study of bank-specific and macroeconomic determinants of NPLs. This study is anchored on the information asymmetry theory. This theory explains why information gap impact on NPLs. The next sub-section presents the review of this theory into details:

2.3.1 Information Asymmetry Theory

Information asymmetry theory, which suggests unequal or lopsided information between two or more parties mostly cause market failure. This theory, developed in respond to market failure in the 1970s posit that in a transaction, one party mostly has proper information than the other (Syed, 2021). Also referred to as information mismatch or failure, it usually exists in transactions where one party with better information is able to take advantage over the other party in the same transaction (Triyani, 2018). The theory of information asymmetry relates to an instance whereby there exists imperfect knowledge in a market. Hence, one party in a transaction is more knowledgeable in information than the other (Mishkin 2004).

Information Asymmetry theory was developed from many angels. The signaling theory is embedded in the theory of information asymmetry. For investors and business people, the information provided by management is crucial because it implicitly exposes, indicates, or explains past, present, and future circumstances pertaining to the company's viability and market impact (Besley, 2008). As first proposed by Spencer (1973), signaling theory defines how two parties behave when they have varying access to information. Many authors have adopted this theory to give an overview of how management conveys information about the company through various components of financial information disclosure. Triyani (2018) claims that the signaling theory explains how to convey to the owners the management's strengths and weaknesses through the use of signals. Because the market response is so dependent on the basics provided by the bank, the information asymmetry between the bank and outside parties creates the stimulus to send a signal. Banks must maintain their credit levels at all times to avoid placing at high levels of NPL in order to consistently send out favorable signals to debtors, investors, and the general public that they are healthy, efficient, and confident. Escalation of NPL is regarded as a severe danger to the

banking industry's structure and one of the indicators used to evaluate banking quality (Syed, 2021). It can also lead to a financial crisis.

One aspect that needs to be considered with respect to the theory of information asymmetry got to do with moral hazard. After a transaction, a moral hazard concept arises. When a borrower engages in risky behavior after receiving a loan, moral hazard occurs (Mishkin 2004). When interest rates are high, borrowers are encouraged to engage in riskier projects since project earnings rise as risk does. The likelihood of a loan default increases as project risk increases. Since borrower risk is classified information, banks are unable to assess the riskiness of borrowers (Hakimi et al., 2023).

The moral hazard is more of an ethical dilemma in which a party is persuaded to take risks during a transaction without taking accountability. Hakimi et al. (2023) imply that moral hazard issues in the banking sector leads to a greater loan growth rate and a higher number of non-performing loans (NPLs). The financial crisis of 2008 is a good example of this, when banks tried to improve their growth rate by extending subprime mortgage lending at cheap interest rates. They ignored the interaction of growth and risk, which resulted in financial bubbles, catastrophic losses, and worldwide economic bankruptcy (Ari et al., 2020). According to Islam and Nishiyama (2019), one of the causes of banks' considerable growth in bad debt is adverse selection. This idea is crucial to the study since it illuminates the underlying reason of NPLs. In this circumstance, either the lender or the borrower may assume the position of the side with more or fewer information.

After the transaction, a moral hazard concern arises. This is when a borrower participates in dangerous activity after receiving a loan (Mishkin 2004). Borrowers have an incentive to invest in riskier ventures when interest rates are high, because project profits increase as risk increases. The riskier the project, the greater the chance of loan default. Banks have no way of understanding the

riskiness of borrowers because borrower risk is private information (Dao and Phan, 2020). Jensen and Meckling (1976) as well as Cincinelli (2017) imply that moral hazard issues in the banking sector leads to a greater loan growth rate and a higher number of non-performing loans (NPLs). The financial crisis of 2008 is a good example of this, when banks tried to improve their growth rate by extending subprime mortgage lending at cheap interest rates. They ignored the interaction of growth and risk, which resulted in financial bubbles, catastrophic losses, and worldwide economic bankruptcy (Cincinelli, 2017).

2.4 Empirical Literature Review

The empirical review of literature had been presented on studies from Africa, developing and developed economies. The empirical review of this chapter had been categorized into macroeconomic factors as well as bank-specific factors impacting on NPLs.

2.4.1 Macroeconomic Variables on NPLs of Banks

The macroeconomic variables utilized in this study include GDP growth, inflation rate, interest rate, exchange rate, and political risk. Many studies have revealed the impact of these macroeconomic variables on NPLs. Among such studies, Beck et al. (2015) sampled 75 countries and utilized novel panel data set to analyze the key determinants of NPLs. One key variable employed in their study got to do with GDP. The findings of their study revealed that GDP growth has a significant impact on NPLs. Specifically, the results of their study proved that real GDP growth impact negatively on NPLs. Most studies have also confirmed the inverse relationship between GDP and NPLs (Us, 2017; Umar and Sun, 2018).

The study of the impact of inflation rate on NPLs have revealed 2 outcomes. Some studies have revealed positive relationship (Rinaldi and Sanchis, 2006); others have also revealed negative relationship (Shu, 2002). Empirical literature has revealed a direct link between NPLs and inflation rates (Kigamwa and Mutwiri, 2023). Skarica (2014) employed data spanning from 2007 to 2012 in 7 European countries to study the determinants of NPLs. One key variable employ in his study is inflation rate. The researcher revealed that the dynamics of inflation rate is an essential variable impacting on loan portfolio quality as well as the stability of the financial system. Their study revealed a direct link between NPLs and inflation rate increment.

Khemraj and Pasha (2009) analyzing the determinants of NPLs using panel dataset factored interest rate as another macroeconomic variable. The researcher revealed that financial institutions that charge high interest rates on their credits granted to borrowers usually incur high NPLs. Their study revealed a direct impact of interest rate on rising NPLs. Empirical studies on the impact of interest rate on NPLs has mostly revealed a positive outcome (Fofack, 2005; Ahmed et al., 2021). Mostly, when there is a hike in interest rate in a particular country, borrowers of funds usually default and this eventually contribute to rising NPLs.

In the study of NPLs, Beck et al. (2013) revealed that in a country where exchange rate depreciates, it results in rising NPLs. Akinlo and Emmanuel (2014) in their study found that exchange rate exerts a positive impact on NPLs. Gambera (2000) revealed that when interest rates fluctuate, customers that have contracted loans and need to convert to another currency before they can trade mostly incur losses that impact negatively on their ability to pay back the credit secured from financial institutions. Skarica (2012) also revealed that volatility in the exchange rate of a country has a significant impact on NPLs.

Political risk is another macroeconomic variable identified as impacting on NPLs. The political situation of a country has been revealed to have a significant impact on NPLs (Haneef et al., 2012). In most developing countries, Wheelock and Wilson (2000) revealed that most top management and directors of banks are influenced by political pressures. Most managers grant credit facilities to most politicians which is not based on merit. Ahmed et al. (2021) in their study revealed that political risk has a positive impact on rising NPLs in a country.

2.4.2 Bank-Specific Variables on NPLs of Banks

In this study, the bank specific variables utilized to study NPLs include bank profitability, bank operating efficiency, bank capital, credit growth, loan loss provision, NIM and bank size. Many studies have revealed the impact of these bank-specific variables on NPLs. Among such studies, bank capital has been identified as one key variable of NPLs. Empirical literature has revealed a significant impact of bank capital on NPLs (Makri et al.,2014; Nugroho et al., 2021; Swandewi and Pumawati, 2021). Banks with high capital are able to withstand losses that may arise from NPLs. Hence, Makri et al. (2014) reported a negative link between high bank capital and NPLs of financial institutions.

Haneef et al. (2012) investigated the impact of profitability on NPLs of banks in Pakistan. The researchers sampled 5 commercial banks in Pakistan with data spanning from 2007 to 2011. The study revealed that lack of risk management at the banking sector increase the level of NPLs which threatens their profitability and growth. Generally speaking, the rise in NPLs of banks threatens the profitability of financial institutions. Following Gollewski (2014), bank profitability, proxied

by ROA, impact negatively on the rising level of NPLs. Likewise, Garciya (2017) revealed that high credit risk which involves a rise in NPLs has a negative impact on NPLs of banks.

The rate of credit growth varies among banking industries. Because of its characteristics, it has both effects on banks. It is regarded as a reliable sign of the stability of the financial industry. Similar to this, research shows that faster credit expansion causes higher loan losses in the United States (Makri et al. 2014). Loan losses rise as bank loan supply rises as a result of lower interest rates and simpler loan application processes (Louzis et al. 2012). In both developed and developing nations, NPLs increase with the availability of loans, which has a negative impact on the functioning of the banking industry. Banks with higher credit growth are more likely to be exposed to NPLs, especially in developing countries where the prospects for profit are hazy.

Loan loss provision is another bank-specific variable identified in literature to have a significant impact on NPLs. Banks with poor credit quality are facing more risk in their loan portfolio that results higher NPLs (Beck et al. 2015). According to Kanagaretam et al. (2005), financial institutions can utilize LLP to signal their financial strength. Ahmed et al. (2023) revealed that loan loss provisions are utilized by financial institutions to provide for various loan losses. Empirical literature has revealed that loan loss provision has a significant impact on NPLs (Islam, 2018; Ahmed et al., 2021; Nugroho et al., 2021).

Also, net interest margin is another bank-specific variable impacting on NPLs. Empirical literature has revealed a positive impact of NIM on NPLs (Ahmed et al., 2021; Ozili, 2019; Adusei, 2018). A clear correlation between interest margin and NPLs is anticipated when banks boost their interest margin to reduce their default risk (Cavallo and Majnoni, 2002). In addition, Rifansa and Pulungan (2022) revealed a direct significant impact on NPLs. Likewise, Sukmadewi (2020) revealed a

direct effect of NIM on NPLs of commercial banks in selected European countries. In addition, bank size is another variable impacting on NPLs. Large banks with large assets have the potential to make more money if their operations are monitored for results. According to the findings of studies by Astrini et al. (2014) and Barus and Erick (2016), bank size has a favorable and only marginally significant impact on NPLs.

2.5.1 Studies on Determinants of Non-Performing Loans from Developed Countries

The determinants of NPLs have been examined in the developed context. Among such studies, Dimitrios et al. (2016) determine NPLs in Euro-area countries using quarterly data from the banking industry covering the period of 1990 to 2015. After employing the GMM estimation technique, their study found the role of income tax and output gap to be significant determinants of NPLs. Radivijevic et al. (2019) also analyze econometric model of NPLs determinants using GMM estimation technique. Their study however found no significant connection inflation rate and other macroeconomic variables on NPLs.

Zain et al. (2020) studied on NPLs determinants from conventional banks with data spanning from 2009 to 2018 and regressed all the determinants on NPL. Findings of the study revealed that bank capitalization impacted negatively on NPLs. Kuzucu et al. (2019) analyze the drivers of NPL from both advanced and emerging economies during the before and after the global financial crisis. After utilizing the dynamic panel estimation model, their results suggest GDP growth as the main determinant that impact on NPLs during the pre and post global financial crisis in both emerging and advanced economies.

Lee and Rosenkranz (2019) assess NPLs determinants and macro financial linkages using secondary data from developed countries. After employing the dynamic panel regression model, their findings reveal macroeconomic and bank-specific factors as impacting on NPLs. Dao and Phan (2020) empirically analyze the determinants of NPLs after the 2008 financial crisis and found the level of NPLs to be contributed by bank-specific variables. Their studies recommend to banks to improve on their lending policies as well as conducting a strict procedure in control, management and supervision to curb the menace of non-performing loans among the banking sector.

Staehr and Uuskula (2019) analyze macroeconomic and macro-financial variables as key determinants of NPL in EU countries using quarterly data over approximately 20 years. After regressing all the selected macroeconomic and bank-financial factors on NPL, findings from their study revealed that GDP, low inflation rate as well as lower debt ratio are major factors of a lower ratio of NPLs. In addition, Thornton and Tommaso (2020) assess the effect of NPLs on credit expansion using European banks. After considering capital and profitability in a panel of 521 selected banks across Europe, their study found a significant effect of NPLs and bank capital and bank's profitability.

2.5.2 Studies on Determinants of Non-Performing Loans from Developing Countries

Among the numerous studies done to assess the determinants of NPL in developing countries, Khan et al., (2020) analyze the determinants of NPLs in developing states. The researchers employed data spanning from 2005 to 2017 from the Pakistan Stock Exchange. After employing regression modeling technique to assess banking factors such as profitability, efficiency, as well as capital adequacy on NPLs, findings of their study revealed a negative connection between

efficiency and profitability on NPLs. In Ghana, Asiamah and Amoah (2018) analyze the determinants of NPL and the dynamics in monetary policy using quarterly data covering a 17-year period from 2000 to 2016. In estimating the impact of monetary policy on NPLs, the authors utilize the autoregressive distributed lag econometric approach and found no significant impact of monetary policy on NPLs growth. In order for the monetary policy to impact on the interest rates of banks, the researchers recommend to policy makers to pay extra attention on building a solid financial environment.

Fiji et al. (2015) examined the determinants of NPLs in the financial sector of developing states over the period of 2000 to 2013. The researchers estimate a base model to cover macroeconomic and bank-specific factors. After employing the pool OLS regression, the study results show a negative correlation between NPLs and ROE, capital adequacy, as well as, time and unemployment. Viswanadhan and Nahid (2015) analyze the determinants of NPL in Tanzania commercial banks using questionnaires distributed to 152 participants. The findings from their study revealed that the level of NPLs in Tanzania Commercial Banks are influenced by economic conditions as well as bank loan supervision. Similarly, Nyarko-Baasi (2018) assess the effect of NPLs on the profitability of banks listed on the Ghana Stock Exchange with data spanning from 2006 to 2015. Based on regression analysis model employed, their study found that NPLs of banks in Ghana impact negatively on their profitability and therefore recommend to managers strictly with the regulations governing the disbursement of loans.

Kingu (2018) analysis empirical concerned the impact of NPL on the profit level of selected banks in Tanzania. After utilizing data from 16 commercial banks spanning from 2007 to 2015, the analysis was conducted using the OLS regression technique. Their study revealed that NPLs are negatively related to the profitability of the banks under study. In Nigeria, Gambo et al. (2017)

27

investigates the determinants of NPLs with data covering a 5-year period from 2010 to 2014 of 10 commercial banks quoted on the Nigerian Stock Exchange. Their regression results reveal a positive connection between NPLs and bank size as well as loan to deposit ratio.

Amankwa-Mensah and Boakye-Adjei (2015) conducted a similar study in Ghana using data from the banking sector in Ghana. After utilizing the panel regression model technique, findings from their study brought to light that bank-specific as well as macroeconomic variables impact on the NPLs of banks in Ghana. Koju et al., (2018) analyze macroeconomic and bank-specific determinants of NPLs of 30 commercial banks of Nepalese with data covering the period of 2003 to 2015. Their study revealed low growth of the Nepalese economy as the primary cause of high NPLs in the country.

Amuakwa-Mensah et al. (2017) also re-examine the determinants of NPLs in the banking industry in Ghana basing their study on the role of the 2007 to 2009 financial crisis. After running their regression model, their findings reveal that macroeconomic, bank-specific, as well as industry specific factors impact on NPLs. Bolarinwa et al. (2021) studied the determinants of NPLs after the recapitalization of the banking sector in Nigeria between the period of 2011 to 2018. Their study employed the SGMM and stochastic frontier analysis. The study results confirm the role of macroeconomic determinants for addressing NPLs. Yilmaz (2019), on the other hand analyze both institutional and macroeconomic variables as well as bank-specific variables on NPLs in emerging market economies. After utilizing the dynamic panel regression technique, their study revealed that NPLs are impacted by economic growth, inflation, capital, ROA and ROE.

2.7 Conceptual Framework

This section presents the conceptual framework guiding the study. As revealed by Mugenda and Mugenda (2012), conceptual framework guiding a study is the diagrammatic representation of the variables employed. The study variables have been identified in literature to contribute to rising NPLs. It reveals the dependent and independent variables of the study. The dependent variable of the study is proxied by NPLs. The framework is been presented diagrammatically in Figure 2.1 after detail review of literature.
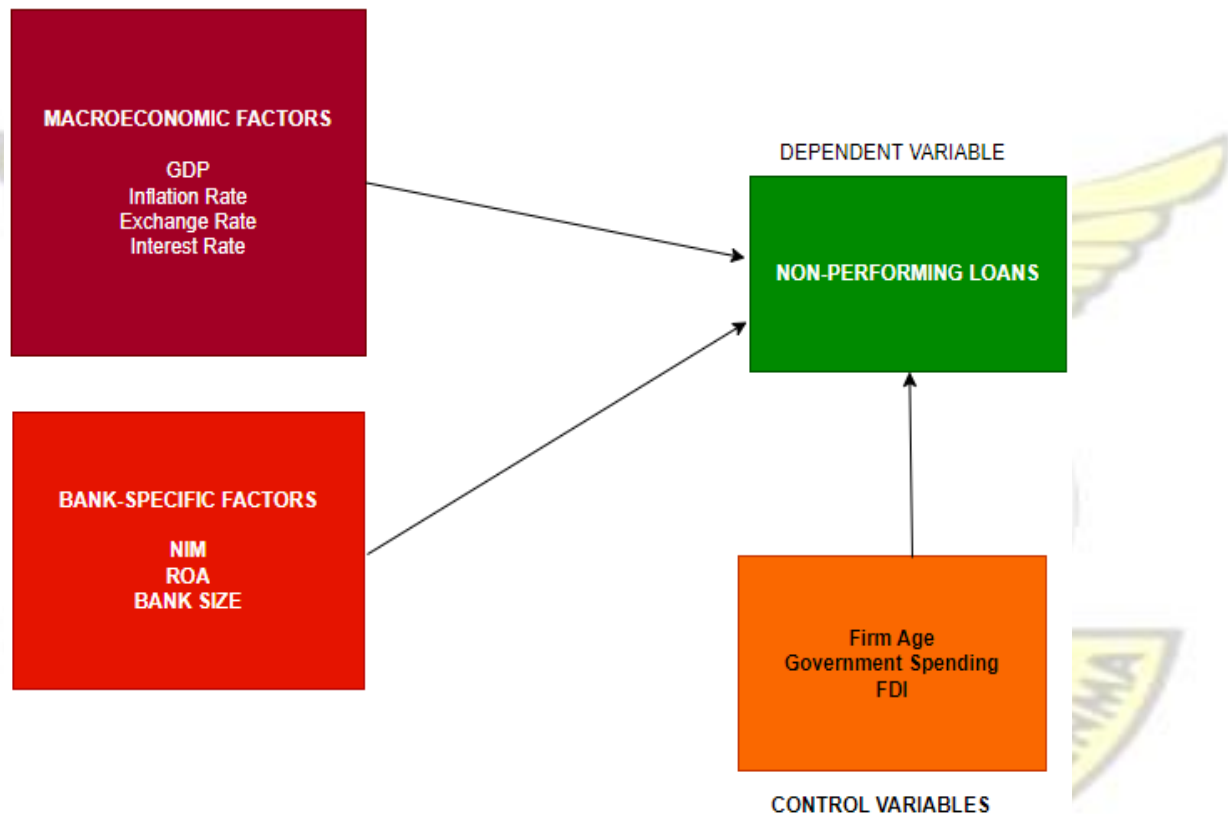
Figure 2.1: Conceptual Framework Model

3.0 Introduction

In this chapter of the study, the researcher presents the methodology followed to analyze the macroeconomic and bank-specific factors as leading indicators of non-performing loans in the banking sector of Ghana. Basically, the chapter presents the research design, population, data, methodology and model specification, diagnostics tests, variable description and measurement, among others.

3.1 Research Design

In Malhotra's (2004) view, research design is the blueprint that gives the direction and structure on how the researcher should carry on with the research work. According to Snyder (2019) a social science study can either employ quantitative, qualitative or the mixed method approach. Following Ong and Putch (2017), a study is said to be quantitative if it employs the use of numerical data to quantify the situation under review and in addition employ the correct technique that will aid the author analyze the data in an accurate and precise manner. Looking at the nature of this study, quantitative research approach was chosen to enable the researcher to measure, analyze, and use numeric data to provide understanding of the phenomenon under study.

The type of a study can either be descriptive, exploratory, explanatory or a combination of any of the approaches. According to Mark et al. (2009), explanatory research approach seeks to establish the relationship between the variables employed in a study. Looking at the research objectives, this study adopts the explanatory study approach. The explanatory study approach was chosen as

it will help the researcher to analyze the relationship between macroeconomic, bank-specific and non-performing loans variables.

3.2 Population and Sample Size and Sampling Technique

The population of a study is the entire set of chases of which the researcher can draw samples for a study from (Taherdoost, 2016). The population of this study consist of all universal banks operating in Ghana. The study has a total population of 23 universal banks operating in Ghana. Since the researcher cannot utilize all the 23 universal banks in the study, a sample needs to be drawn. This study made use of 11 universal banks in Ghana. The 11 banks for this study were chosen as a result of the availability of the audited financial statements from which the data for the study can be employed. The researcher selected the 11 universal banks whose annual financial data spanning from 2015 to 2021 are available for the study. These chosen banks include Ecobank, GCB, Stanchart, Prudential, ADB, Societe Generale, CAL bank, Access bank, Republic bank, Absa, and Fidelity bank.

3.3 Sources of Data

This study made use of secondary data. The study used a sample of 11 universal bans over a 7-year period (2015-2021), combined with macro-economic data from Ghana. The observations used in this study would provide higher degrees of freedom which could subsequently affect the accuracy of the estimated regression model. The dependent variable for this study is the non-performing loan which is measured using the NPL ratio. The independent variables for the study are made up of the bank specific variables and the macro-economic variables. In this study, the macroeconomic variables from Ghana utilized include GDP, inflation rate, exchange rate and interest rate. Likewise, profitability, bank size, loan loss provision, bank capital and net interest

margin are the bank-specific variables utilized in this study. The banks-specific variables were sourced from the audited published financial statements of the selected banks, while the macroeconomic variables were sourced from World Bank Development Indicators Database as well as the bank of Ghana.

3.4 Model Specification/Estimation Technique

Following the literature of Louzis et al. (2012) the researcher utilized the model used in their study. Specifically, this study used the panel regression approach since that has been used by most scholars who studies the determinants of NPLs across many countries. Considering the differences that may exist among the selected banks in Ghana, the Hausmann test would be employed to determine the appropriate estimator (fixed effect or random effect) for the data analysis. The model for the study is given as:

$$Y_{it} = \alpha + \beta_{It} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.1$$

Where;

NPL- non-performing loan

   a- is the intercept

    t – Represents the time from 2015 to 2021

   ε_t- error term.

The bank-specific model is given as:

$$NPL_{it} = \alpha + \beta 1ROA_{It} + \beta 2NIM_{It} + \beta 3BS_{It} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots.2$$

The macroeconomic specific model is given as:

$$NPL_{it} \quad = \quad \alpha \quad + \quad \beta 1INF_{It} + \quad \beta 2MW_{It} \quad + \quad \beta 3EXC_{It} + \beta 4GDP_{It} \quad +$$

$$\beta 5IR_{It} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.3$$

From the above, the model for the study is represented in equation form as.

$$NPLit = \alpha + \beta 1 ROA_{It} + \beta 2 BS_{It} + \beta 3 NIM_{It} + \beta 4 INF_{It} + \beta 5 EXC_{It} + \beta 6 GDP_{It} + \beta 7 INT_{It} + \beta 8 FDI_{It}$$

$$+ \beta 9 GS_{It} + \beta 10 FA_{It} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.4$$

Where;

NPL represents non-performing loans

ROA represents, return on assets

BS represents bank size

NIM represents net interest margin

INF represents inflation rate

EXC represents exchange rates

INT represents interest rate and

GDP represents gross domestic product.

FDI represents foreign direct investment

GS represents government spending

FA represents firm age

3.5 Variable Description and Measurement

In this section of the study, the researcher outlines all the variables and how it was measured in the study. These variables include non-performing loans, return on assets, bank capital, net interest margin, inflation rate, exchange rate, gross domestic products, among others. The variable description and measurement for the study is shown in table 3.1.

Table 3.1: Variable Description, Measurement and Studies

Variables	Proxies	Measurements	Studies
Bank-specific Variables	Net Interest Margin NPL Profitability (ROA)	credit to deposit ratio NPL to total loans net income to total assets	Ahmed et al., 2021 Foglia, 2022 Sinay et al., 2022
Macroeconomic Variables	Inflation rate Interest Rate Exchange rate GDP	consumer price index yield to maturity A cedi to dollar monetary value of goods and services of a country	Salman, 2021 Lee et al., 2022 Staehr, 2020 Adusei (2018)
Control Variable	Firm age Government spending FDI	Years the firm has operated The amount spent by government in a particular year Inflows from foreign countries	Kumar et al., 2016 Frimpong and Oteng-Abeyie (2006)

Source: Field Study (2023)

3.5.1 Dependent Variable

This section of the study describes NPL as the dependent variable of the study.

3.5.1.1 Non-performing Loans

Loans become non-performing if the principal and interest are not paid on the maturity date and are not expected to be paid in the future (Alton and Hazen, 2001). These loans are in default for 90 days period and beyond. This study measured NPL by the ratio of defaulted loans to the total ratio of the bank. This has been used in studies such as Alton and Hagen (2001) and Kumar and Kishore (2019).

3.5.2 Independent Variables

This section of the study describes the independent variables of the study.

3.5.2.1 Return on Assets (ROA)

This study proxied bank profitability with ROA. Following Rajan (1994), this study measured ROA by the ratio of net income to total assets of the banks under study. Studies such as Opoku-Appiah et al. (2017) also proxied bank profitability with ROA and as well measured it with net income to total assets.

3.5.2.2 Bank Capital

Capital of a bank is the equity put forward by the owners plus reserves and profits made by the bank but not shared. In this study, we measured the capital of banks by ratio of total equity to total assets. This measurement had been used in studies such Makri et al. (2014).

3.5.2.3 Net Interest Margin (NIM)

NIM is the ratio of lending to deposit rate. It is measured as the ratio of credit to deposit ratio. It has been identified as one bank-specific factors that impact on NPL. This has been used in studies such as Kumar et al. (2015).

3.5.2.4 Inflation Rate

The persistent increase in the prices of goods affects the real worth of individual's income, resulting in a rise in the number of NPLs (Fofack, 2005; Rinaldi et al., 2006). Inflation of a country is measured by consumer price index. This has been confirmed in studies such as Amankwah-Mensah et al. (2016).

3.5.2.5 Exchange Rate

Exchange rate is value of one's currency converted into other currency. In this study, we measured the exchange rate by the ratio of Ghana cedis to the dollar. This has been confirmed in the study of Boako and Alagidede (2017).

3.5.3 Control Variable

This section of the study describes how the control variable was measured in this study.

3.5.3.1 Firm Size

Firm size is important because it significantly affect the efficiency and the profitability of the firm. Firm size which serves as a control variable of the study is measured by taking the natural log of total assets of the banks under study. This was confirmed in the study of Kumar et al. (2015).

3.5.3.1 FDI

FDI, which stands for foreign direct investment had been defined by Frimpong and Oteng-Abayie (2006) as the total amount of inflows received by a country from foreign countries. It is measured by summing all the inflows investors brought into a country for investment purpose.

3.6 Diagnostics Tests

Before using the data for estimation, we first perform diagnostic tests on the data to validate the data before use in order to ensure that the regression model is not biased. This section presents the tests that were performed in this study.

3.6.1 Unit Root Test

A unit root test tests is undertaken to determine whether a variable of a time series data is non-stationary and possesses a unit root. The null hypothesis is generally defined as the presence of a unit root. To investigate the stationarity of the series used, this study applies the unit root tests on panel data. This study employed the Augmented Dickey-Fuller test to test for data stationarity.

3.6.2 Autocorrelation

Autocorrelation denotes the connection between past and future values in a series of time, making time series probable and can obscure the identification of significant relationships and covariates (Yaffee, 2003). The null and the alternative hypothesis respectively states that there is no serial correlation and there is serial correlation in the residual. It was tested using the Breusc-Godfrey test.

3.6.3 Heteroskedasticity

Ordinary least squares have the assumption that the error term's observations are extracted from a distribution that has a constant variance. We encounter heteroscedasticity in our studies whenever large differences exist among the sizes of our observation. It was tested using the Breusch-Pagan-Godfrey test.

3.7 Summary of Chapter

This chapter explored the methodology used to assess the determinants of non-performing loans in Ghana. The chapter had detailed the research design, data, methodology, and model specification among others. Data for the study were secondary and obtained from the World Bank Development Indicator database and the mother bank of Ghana. This study adopts and modifies

the econometric model used by Louzis et al. (2012). The chapter also presented the variable

description and measurement of the study. The next chapter presents the data and analysis.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents the results and discuss the findings of the study of bank-specific and macroeconomic determinants of NPLs in Ghana. Specifically, this chapter detail the preliminary data analysis which include trend analysis, descriptive statistics of the data as well as the correlation analysis. It also presents the Hausman test to determine the best estimator for the study. In addition, this chapter detail the test for autocorrelation as well as heteroscedasticity test. Lastly, it also presents the analysis of the data as well as the discussion of the findings of the study.

4.1 Preliminary Analysis

To achieve the research objectives, this section presents the preliminary analysis of the data and include the trend analysis, correlation, descriptive statistics as well as the unit root test.

4.1.1 Trend Analysis

In this section of the study, the researcher presents the trend analysis of the bank-specific factors and the macro-economic factors that impact on NPLs in Ghana.

4.1.1.1 Trend Analysis on Average Non-Performing Loans

Figure 4.1 indicates that the highest average of non-performing loans among the banks under study happened in 2016, while the lowest average of NPL occurred in 2018. This might be as a result of the interest rates during those particular years. The interest rate of 2016 in Ghana was 28.14, while 2018 was 24.47. It can be witnessed that the average of NPL among the banks under study is not static and changes year after year.
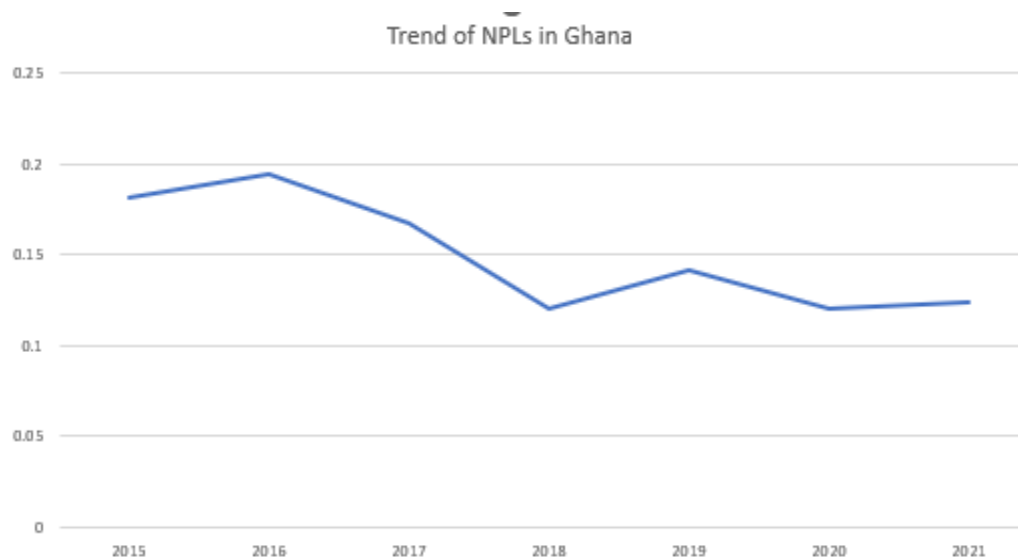
Figure 4.1: Trend of Average Non-Performing Loans

4.1.2 Descriptive Statistics

The study employed the various statistical tools to describe the variables used in the study. Descriptive statistical tools such as the mean, standard deviation (SD), minimum and maximum were utilized. The researcher presents the descriptive statistics based on the bank-specific variables, the macro-economic variables as well as the control variables of the study. As revealed in Table 4.1, NPL recorded a mean of 0.1603, SD of 0.1609, with a minimum and a maximum of 0.0140 and 0.9340 respectively. This is an indication that about 16.02% of loans contracted in banks in Ghana are mostly declared non-performing. The NIM obtained a mean of 0.2940, SD of 0.6700, a minimum of 0.0380, and a maximum of 0.6700. This is an indication that universal banks in Ghana earn around 29.40% in interest on loans. ROA recorded a mean, SD, minimum and a maximum of 0.0202, 0.0187, 0.0000 and 0.1160 respectively. By indication, universal banks in Ghana generate about 2.02% profit from its total assets. Pertaining to firm size, the banks under

study has an average of 3.5800, SD of 0.2200, with a minimum and maximum of 3.0200 and 4.1900 respectively. Firm age obtained a mean of 40.0909, SD of 24.0942, minimum of 9.0000 and a maximum of 104.0000. This is an indication that the universal banks under study have operated for a period of 40 years.

Relative to the macroeconomic variables, FDI obtained a minimum, maximum, mean and SD of 0.9600, 9.5200, 4.8968 and 2.6319 respectively. This is an indication that Ghana received yearly inflows from outside to the tune of 4.89% to our GDP. A mean of 36.5395, a SD of 23.4676. a minimum and a maximum of 4.9900 and 72.3500 relates to GDP. This mean, on average, Ghana records a yearly gross domestic product of around 36.5300 billion. Inflation rate on the other hand obtained a mean of 14.6659, SD of 6.5960, with a minimum (maximum) of 7.1200 (32.9000). By implication, prices of goods and services in Ghana increase persistently on average of 14.66%. With respect to exchange rate, a mean of 2.3732 and SD of 1.83325 were obtained. This means on average, 2.3700 Ghana cedis is required to exchange the US dollar. Pertaining to government's spending, a minimum, maximum, mean and SD of 7.1800, 15.0300, 10.3609 and 2.03866 were recorded respectively. Lastly, it can be indicated in Table 4.1 that interest rate obtained a mean of 28.9100, SD of 6.34199, with a maximum (minimum) of 20.6100 (46.7200).

Table 4.1 Descriptive Statistics of the Variables Employed to Study NPLs

	N	Minimum	Maximum	Mean	Std. Deviation
NPL	77	0.0140	0.9340	0.16025	0.15061
NIM	77	0.0380	0.6700	0.29400	0.13882
ROA	77	0.0000	0.1160	0.0202	0.0187
FIRM SIZE	77	3.0200	4.1900	3.5800	0.2200
FIRM AGE	77	9.0000	104.0000	40.0909	24.0942
FDI	22	0.9600	9.5200	4.8968	2.6319
GDP	22	4.9900	72.3500	36.5295	23.4676
INFLATION	22	7.1200	32.9000	14.6659	6.5960
EXCHANGE RATE	22	0.5400	6.2100	2.3732	1.8332
GOV'T SPENDING	22	7.1800	15.0300	10.3609	2.0386
INTEREST RATE	22	20.6100	46.7200	28.9114	6.3419

Source: Field Study (2023)

4.1.3 Correlation Analysis

Table 4.3 showcase that no perfect correlation exists among the variables. From the Pearson correlation matrix, the highest and the lowest correlation among the variables occurred between interest rate and GDP which is 0.5170 as well as between interest rate and total asset which is 0.0020 respectively. With reference to Table 4.2, the researcher concludes that multicollinearity is not an issue in this study.

Table 4. 2: Pearson Correlation Analysis

	1	2	3	4	5	6	7	8	9	10	11
1. NPL	1										
2. NIM	0.091	1									
3. ROA	-0.045	0.030	1								
4. FS	0.047	0.172	-0.069	1							
5. FA	0.135	0.224	0.022	0.595	1						
6. FDI	0.038	-0.007	0.439	-0.109	0.125	1					
7. GDP	0.307	0.005	0.193	0.125	0.098	0.355	1				
8. INF	-0.557	-0.162	-0.264	-0.050	-0.201	-0.285	-0.583	1			
9. EXC	0.221	-0.044	0.161	0.230	0.093	0.082	0.087	-0.409	1		
10. GS	0.047	-0.256	-0.233	0.147	-0.296	-0.404	0.008	-0.489	0.090	1	
11. IR	-0.462	-0.262	-0.255	-0.002	0.256	0.360	-0.517	0.338	0.321	0.421	0.334	1

Source: Field Study (2023)

4.1.4 Panel Unit Root Test

In this section of the study, the researcher utilized the Augmented Dickey-Fuller technique to test for data stationarity. As depicted in Table 4.4, all the variables employed to study NPLs in Ghana are stationary at level, first and second difference. With this, the researcher can therefore draw a conclusion that the variables used in this study contain no unit root since the p-values obtained are less than 0.05.

Table 4.4 Augmented Dickey-Fuller Test

	ADF					
	AT LEVEL		**AT 1ˢᵗ DIFFERENCE**		**AT 2ᴺᴰ DIFFERENCE**	
	t-stats	prob	t-stats	prob	prob	t-stats
NPL	-4.2238	0.0000	-14.3298	0.0000	-7.6226	0.0000
NIM	-6.7991	0.0000	-12.2298	0.0000	-6.5436	0.0002
ROA	- 7.1232	0.0000	-13.4534	0.0000	-6.5423	0.0000
TA	-7.4323	0.0003	-14.5434	0.0000	-7.6534	0.0000
FA	-9.5413	0.0020	-17.6534	0.0000	-5.5643	0.0000
FDI	-7.5637	0.0001	-16.5434	0.0000	-6.3234	0.0000
GDP	-4.5421	0.0002	-8.9876	0.0000	-5.6376	0.0000
INF	-4.5421	0.0000	-13.6574	0.0000	-7.8775	0.0001
EXC	-2.2346	0.0001	-8.9860	0.0000	-6.5476	0.0000
GS	-7.6422	0.0000	-17.5643	0.0000	-7.9866	0.0020
MW	-5.4322	0.0000	-14.4322	0.0000	8.3432	0.0000
IR	-3.5453	0.0001	-9.4345	0.0000	-5.6754	0.0032

Source: Field Study (2023)

4.1.5 Autocorrelation

The null and the alternative hypothesis respectively states that there is no serial correlation and there is serial correlation in the residual. From Table 4.5, using the Breusch-Godfrey test, it can be seen that the p-values under the two models are more than 5%, and hence, we can conclude that there is no autocorrelation.

Table 4.5: Breusch-Godfrey Test of Autocorrelation

	Test	F-Statistics	P-value	Conclusion
Model 1	Breusch-Godfrey	0.67447	0.3212	no first order autocorrelation
Model 2	Breusch-Godfrey	0.54345	0.4322	no first order autocorrelation

Source: Field Study (2023)

4.1.6 Heteroscedasticity

Heteroscedasticity is encountered whenever large differences exist among the sizes of our observation. Breusch-Pagan-Godfrey test results, as shown in Table 4.6 indicates that there is no heteroscedasticity as a result of accepting the null hypothesis since the p-values in the two models are more that 5%.

Table 4.6: Breusch-Pagan-Godfrey Test Results

	Test	F-Statistics	P-value	Conclusion
Model 1	Breusch-Pagan	5.2190	0.4532	no heteroscedasticity
Model 2:	Breusch-Pagan	4.2231	0.6333	no heteroscedasticity

Source: Field Study (2023)

4.2 Model Determination

LM test and the F-test were employed to validate the model under pooled OLS, random-effect or the fixed effect model. From Table 4.7, it can be observed that LM test reject the random-effect while the F-test support the fixed-effect model. This conclusion cut across the two models of the study. The decision here is to use the fixed effect model since the F-test supports it.

Table 4.7: LM and F-Test Statistics

	Test	Stats	P-value	Conclusion
Model 1	LM Test	0.82	0.2112	Random-Effect Rejected
	F-test	1.47	0.0032	Fixed-Effect Supported
Model 2	LM Test	1.23	0.3232	Random-Effect Rejected

F-Test	1.32	0.0012	Fixed-Effect Supported

Source: Field Study (2023)

4.2.1 Hausman Test

The Hausman test is utilized to determine the best model to apply. The outcome of the Hausman test confirms whether the fixed effect or the random effect is effective to apply for the study. The null hypothesis is that the preferred model is random effects; the alternate hypothesis is that the model is fixed effects. All the two models indicated in Table 4.8 are efficient under the fixed-effect model. Hence, the fixed-effect model is the best estimator to apply for this study.

Table 4.8: Hausman Test Results

	Test	P-value	Conclusion
Model 1	Hausman	0.0031	Fixed-Effect Supported
Model 2	Hausman	0.0024	Fixed-Effect Supported

Source: Field Study (2023)

4.3 Results of Regression Analysis

The results of the Hausman test revealed the fixed-effect model as the best estimator to be used. The regression was run under two models. Specifically, the first and second models focused on the effects of bank-specific factors on NPL and the impact of macro-economic factors on NPLs. Table 4.9 presents the summary of the fixed-effect regression under the two models of the study.

Table 4.9: Summary of Fixed-Effect Regression Analysis

	Model 1	Model 2

	Coefficient	T-stats	Prob	Coefficient	T-stats	Prob
Constant	0.0190	2.0530	0.0480	0.1320	23.2960	0.0020
NIM	0.0190	0.0910	0.0270			
ROA	-0.1240	-2.2890	0.0180			
FS	0.0010	0.1080	0.0000			
FA	0.0050	0.4530	0.8210			
FDI				0.0030	19.4330	0.0000
GDP				-0.0040	-23.2260	0.0000
INF				-0.0020	-0.4170	0.6790
ER				-0.1920	-27.4380	0.0000
GS				-0.0050	-26.5340	0.0030
IR				-0.0040	-12.0730	0.0000
R-squared		0.1321			0.1453	

Source: Field Study (2023)

As indicated from the first model, in the absence of variables such as total assets, net interest margin, return on asset (ROA) and firm size, NPLs of the banks under study are expected to increase by 0.0190 (p= 0.0480). In relation to the bank-specific variables under study, NIM recorded a parameter estimate of 0.0190 (p=0.0270). ROA as another bank-specific variable obtained a coefficient of -0.1240 (p=0.0180). Relative to firm size, a coefficient of 0.0010 was obtained which is statistically significant at 0.05 level (p=0.0000). Firm age on the other hand has a parameter estimate of 0.0050 which is statistically insignificant at 0.05 level (p=0.8210). The first model obtained an R-squared of 0.1321. This is an indication that the model could explain up to 13.21% of the changes in NPLs.

As indicated from model 2, in the absence of variables such as GDP, inflation rate, interest rate, exchange rate, government spending, FDI, NPLs are expected to increase by 0.0132 (p= 0.0020).

Relative to FDI as a macro-economic variable, a coefficient of 0.0030 (p=0.0000) was achieved. GDP as the next macroeconomic variable recorded a parameter estimate of -0.0040 (p=0.0000). On the other hand, inflation rate achieved a coefficient of -0.0020 (p=0.6790). The study found that exchange rate also recorded a parameter estimate of -0.1920 which is statistically significant at 0.5 level (p=0.0000). Likewise, government spending had a parameter estimate of -0.0050 which is statistically significant at 0.05 (p=0.0030). Lastly, interest rate also has a coefficient of -0.0030 (p=0.0000). The second model obtained an R-squared of 0.1453. This is an indication that the model could explain up to 14.53% of the changes in NPLs.

4.4 Discussion of Findings

In this section of the chapter, the researcher discusses the findings of the study in line with exiting literature. The discussion of the findings follows the analysis of the results and have been presented in line with the study objectives.

4.4.1 Trend of NPLs in Ghana

The first objective of the study was to assess the trend of NPLs in Ghana. The trend of NPLs change with respect to time. Trend analysis enables the comparison of data over a period of time and also help to make predictions (Gocić and Trajković, 2013). Relative to the trend of NPLs with respect to the banks under study, a 7-year period was covered. In the year 2015, average of 0.182 was recorded for NPLs. In 2016 and 2017, NPLs of the banks obtained an average of 0.195 and 0.168 respectively. Similarly, the year 2018 and 2019 recorded an average NPLs of 0.121 and 0.142 respectively. In addition, an average of 0.101 related to the year 2020, whiles an average of 0.134 relates to the year 2021. As revealed from Figure 4.1, the highest average of NPLs is said to occur in the year 2016, while the lowest occurred in the year 2018. This might be due to the interest

rate differences in 2016 and 2018. It can be observed from the trend that the NPLs of banks in Ghana is unstable and subject to change with respect to time.

4.4.2 Impact of Macro-Economic Variables on NPLs

The second objective of the study was to evaluate the effect of macro-economic variables on NPL. These macro-economic variables employed include exchange rate, GDP, inflation rate, interest rate, exchange rate, and GDP. The results of the model revealed the coefficient of FDI to be 0.00343 which is statistically significant at 0.05 level. Meaning, FDI impact positively on NPLs in Ghana. If FDI increases by a unit, NPL is expected to increase by a percent. The model also revealed that GDP has a significant negative impact on NPLs in Ghana. If GDP increases by a unit, NPL is expected to reduce by a percent. This has been confirmed in literature (Us, 2017; Umar and Sun, 2018). Based on the results, the study found that inflation rate has negative but insignificant impact on NPLs. If inflation rate increase by a unit, NPL is expected to reduce by a percent. The study of the impact of inflation rate on NPLs have revealed 2 outcomes. Some studies have revealed positive relationship (Rinaldi and Sanchis, 2006); others have also revealed negative relationship (Shu, 2002). Empirical literature has revealed a direct link between NPLs and inflation rates (Kigamwa and Mutwiri, 2023). In addition, the study results shown a significant negative impact of exchange rate on NPLs. Meaning, if exchange rate increase by a unit, NPL is expected to reduce by a percent. Akinlo and Emmanuel (2014) in their study found that exchange rate exerts a positive impact on NPLs. Likewise, government spending revealed a significant negative impact on NPLs. Meaning, if government spendings increase by a unit, it could cause NPL to reduce by a percent. Lastly, the model revealed a significant negative relationship between interest rate and

NPLs. Empirical studies on the impact of interest rate on NPLs has mostly revealed a positive outcome (Fofack, 2005; Ahmed et al., 2021).

4.4.3 Impact of Bank-Specific Variables on NPLs

The third objective of the study was to evaluate the effect of bank-specific variables on NPL. These banks specific variables employed include ROA, NIM, firm age, and firm size. The study uses the fixed-effect regression to analyze this objective. Based on the model, it was revealed that NIM has a positive and significant impact on NPLs. Empirical literature has revealed a positive impact of NIM on NPLs (Ahmed et al., 2021; Ozili, 2019; Adusei, 2018). ROA on the other hand revealed a significant negative impact on NPLs. Following Gollewski (2014), bank profitability, proxied by ROA, impact negatively on the rising level of NPLs. Firm size, proxied by the logarithm of total assets also indicated a significant positive impact on NPLs. According to the findings of studies by Astrini et al. (2014) and Barus and Erick (2016), bank size has a favorable and only marginally significant impact on NPLs. Lastly, firm age also revealed an insignificant positive impact on NPLs.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents the summary of key findings, conclusion and make recommendations to stakeholders. The summary of findings was drawn from the results and discussion from the previous chapter. Finally, the researcher made some recommendation that would guide future researchers in the field of NPLs.

5.1 Summary of Findings

In this section of the study, the researcher presents the summary of findings of the study. The first objective of the study was to assess the trend of NPLs in Ghana. Specifically in the year 2015, average of 0.182 was recorded for NPLs. In 2016 and 2017, NPLs of the banks obtained an average of 0.195 and 0.168 respectively. Similarly, the year 2018 and 2019 recorded an average NPLs of 0.121 and 0.142 respectively. In addition, an average of 0.101 related to the year 2020, whiles an average of 0.134 relates to the year 2021. The highest average of NPLs is said to occur in the year 2016, while the lowest occurred in the year 2018.

The second objective of the study was to evaluate the effect of macro-economic variables on NPL. Based on the analysis, the study found that FDI impact positively on NPLs in Ghana. The model also revealed that GDP has a significant negative impact on NPLs in Ghana. Based on the results, the study found that inflation rate has negative but insignificant impact on NPLs. In addition, the study results shown a significant negative impact of exchange rate on NPLs. Lastly, the model revealed a significant negative relationship between interest rate and NPLs.

The third objective of the study was to evaluate the effect of bank-specific variables on NPL. Based on the model, it was revealed that NIM has a positive and significant impact on NPLs. ROA on the other hand revealed a significant negative impact on NPLs. Bank size also indicated a significant positive impact on NPLs. The model also revealed that firm age has a positive but insignificant impact on NPLs.

5.2 Conclusion

The main objective of this study was to analyze bank-specific and macro-economic determinants of NPLs in Ghana. To achieve this purpose of the study, a sample of 11 banks in Ghana with data spanning from 2015 to 2021 were utilized for the study. The secondary data were sourced from both the audited financial statement and the WDI. Macro-economic variables of the study include inflation rate, exchange rate, GDP and interest rate for the study. To achieve the study objectives, the study conducts descriptive statistics and regression analysis in respect to each objective. The study also carries out the LM-test, F-test and Hausman tests to determine the appropriate model for this study and finds that the fixed-effect model was appropriate for this study. Based on the findings, the study concludes that both bank-specific variables as well as macro-economic variables are determinants of NPLs in Ghana.

5.3 Recommendation

Based on the findings, the study recommends the following;

The study revealed that NPLs in Ghana is on the rise. This study recommends to management to devise stringent mechanisms and tight credit recovery mechanisms to reduce the incidence of

NPLs in the country. Credit officers should also assess the credibility of borrowers before granting loans and other credit facilities to them.

The study found that exchange rate and inflation rate have a negative and significant impact on NPL. Based on this finding, the study recommends to government and policy makers to control inflation rate and exchange rate volatility against the major currency to help stabilize the Ghanaian economy.

The study also found that bank-specific variable plays a role in rising NPLs in the country. For instance, firm operating years have a positive impact on rising NPLs in the country. Based on this, the study recommends to new firms to consider their assets available and make prudent decisions on granting loans to borrowers.

5.4 Recommendation for Future Studies

This study analyzed bank-specific and macroeconomic determinants of NPLs in Ghana. The study recommends that future studies should extend the scope by covering all the 23 universal banks in Ghana for the purpose of comparison and generalizing the findings of the study. In addition, more bank-specific such as capital adequacy ratio, liquidity ratios and return on equity and macro-economic variables such as policy rate, unemployment rate and minimum wage impacting on NPLs should be employed in future studies. Also, future studies can be conducted using savings and loans companies or rural banks for the purpose of comparing findings for policy formulation. Finally, future studies can be conducted in different economies to ascertain the main determinants of NPLs.

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