

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF DISTANCE LEARNING

EFFECT OF NON-PERFORMING LOANS ON PROFITABILITY: A CASE
STUDY OF SELECTED RURAL BANKS IN ASHANTI REGION OF GHANA

BY

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DECLARATION

I hereby declare that this submission is my work towards the award of a Master of
Science degree and that, to the best of my knowledge and belief, it contains no material
previously published by another person nor material to a substantial extent that has been

accepted for the award of any degree in the University or any other educational institutions except where due acknowledgment has been made in the thesis.

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DEDICATION

I dedicate this piece of work to my dearest wife Janet Kumah and my children Keren Elinam Amenyo, Jeremy Elorm Amenyo and Marvellous Adablah Amenyo

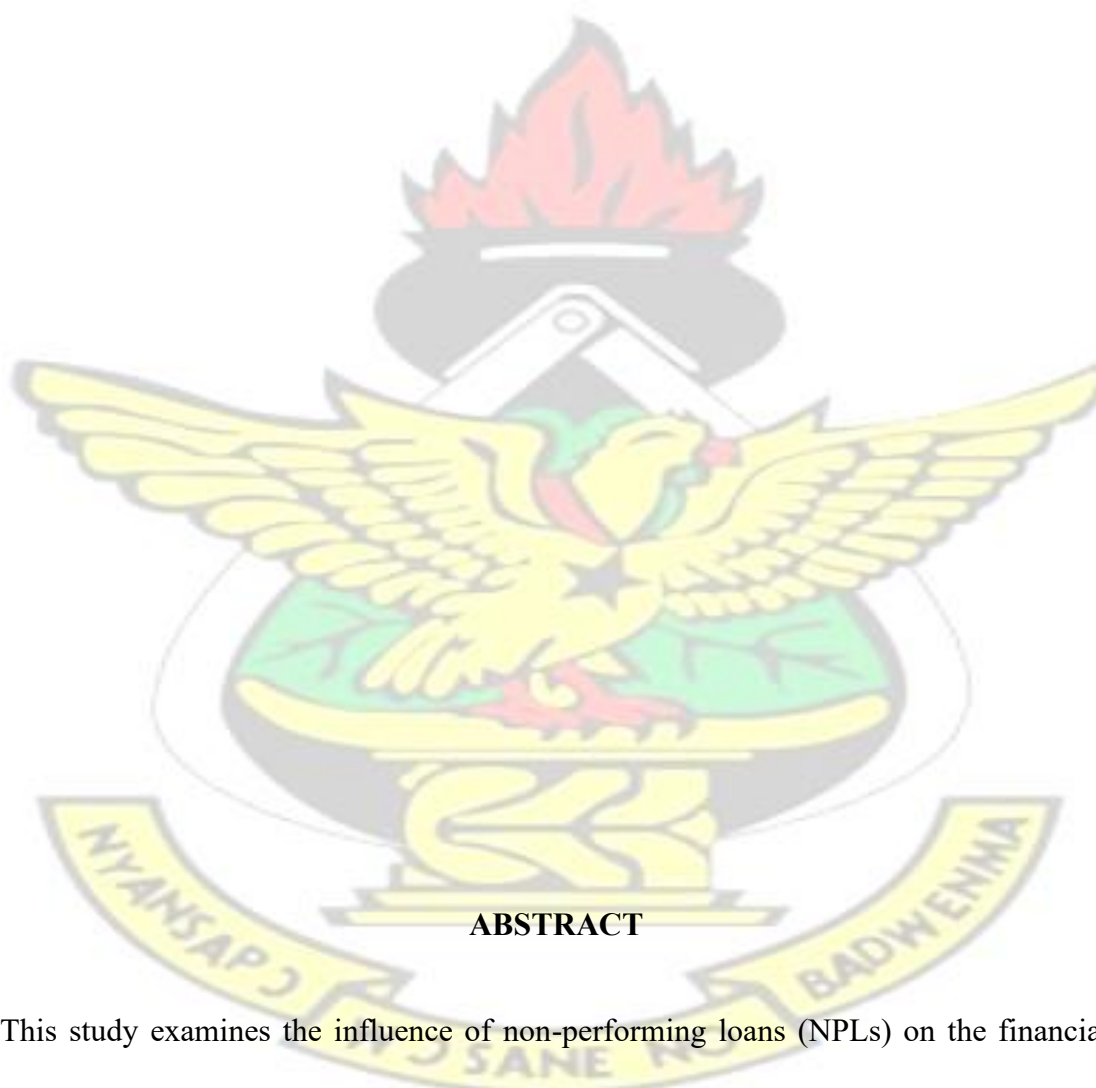
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ABSTRACT

This study examines the influence of non-performing loans (NPLs) on the financial performance of rural banks, with a specific emphasis on the Ashanti Region in Ghana. The study takes into account the recent economic development in the country. The population of the study consisted of all 29 rural banks that were in existence as of December 30, 2022. The data are from audited annual reports spanning over nine years

period, 2013 - 2021. The study employs the Panel Least Squares (PLS) technique as an analytical method to evaluate the impact of non-performing loans on the profitability of rural banks. The research found that internal factors such as the financing-to-deposit ratio are statistically significant in determining non-performing loans. However, the capital adequacy ratio, bank size, operating expenses ratio, and bank profitability are not significant determinants of rural banks non-performing loans in Ghana. The research also finds that the nonperforming loan ratio has an adverse effect on rural banks return on assets, but it is statistically insignificant. The results further reveal that the moderating role of economic growth on NPLs is established to have a positive effect on banks' return on assets. Based on these results, it is recommended that rural banks in Ghana should focus on strengthening their risk management practices, particularly concerning the financing to deposit ratio. Also, rural banks should focus on diversifying their loan portfolios to mitigate the potential negative impacts of NPLs on profitability. A diverse portfolio can help distribute risks and ensure that the adverse effects of NPLs are offset by other income-generating assets. Rural banks should also recognize the importance of economic growth as a moderating factor in their profitability. In periods of economic expansion, they should be cautious not to become overly aggressive in lending, leading to a surge in NPLs when the economic cycle turns.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LISTS OF ABBREVIATION	xi

CHAPTER ONE.....	1
INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem	4
1.3 Objectives of the Study	6
1.4 Research Questions	6
1.5 Significance of the Study	7
1.6 Scope of the Study	8
1.7 Summary of Methodology	8
1.8 Limitations of the Study	8
1.9 Organization of the Study	9
CHAPTER TWO	11
LITERATURE REVIEW	11
2.0 Introduction	11
2.1 Conceptual Literature Review	11
2.1.1 Ghana's Financial System	11
2.1.2 History of Rural Banking in Ghana	12
2.1.3 Non-Performing Loans (NPL)	14
2.1.4 Profitability of Banks	17
2.2 Theoretical Literature Review	18
2.2.1 Asymmetric Information Theory	19
2.2.2 Agency Theory	20
2.2.3 Modern Portfolio Theory (MPT)	21
2.3 Empirical Literature Review	22
2.3.1 Effect of Internal Factors on Non-Performing Loans	22
2.3.2 Effect of NPLs on Bank Profitability.....	23
2.3.3 Effect of Economic Growth on the relationship between NPLs and Banks Profitability	27
2.4 Conceptual Framework	29
2.5 Summary of the Chapter	30
CHAPTER THREE	31
METHODOLOGY	31
3.0 Introduction	31
3.1 Research Philosophy	31
3.2 Research Design	31

3.3 Population of the Study	32
3.4 Sample and Sampling Technique	32
3.5 Source of Data	33
3.6 Research Methods	33
3.7 Model Specification	35
3.8.1 Diagnostic Testing	37
3.8.1.1 Heteroscedasticity test	37
3.8.1.2 Multicollinearity	38
3.8.1.3 Stationarity test	38
3.9 Variables Description and Measurement	39
3.9.1 Dependent variable – bank profitability	39
3.9.2 Independent variables	39
3.10 Data Analysis Techniques	42
3.11 Chapter Summary	43
CHAPTER FOUR	44
RESULTS AND DISCUSSIONS	44
4.0 Introduction	44
4.1 Preliminary Analysis of Data	44
4.1.1 Trend Analysis of Banks’ Non-Performing Loans and Profitability	45
4.1.2 Descriptive Statistics of the Study Variables	46
4.1.3 Correlation Analysis	49
4.1.4 Unit Root Test	49
4.2 Internal Factors that affect Non-Performing Loans	51
4.3 Impact of Non-Performing Loans on Rural Banks’ Profitability	52
4.4 Effect of Economic Growth on NPLs and Rural Banks’ Profitability	56
4.5 Diagnostics Tests	57
4.5.1 Test for multicollinearity	57
4.5.2 Heteroscedasticity Test	58
4.5.3 Test for Data Normality	58
4.6 Chapter Summary	59
CHAPTER FIVE	60
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS	60
5.0 Introduction	60
5.1 Summary of Findings	60
5.2 Conclusion	61

5.3 Policy Implications and Recommendations	61
5.4 Suggestions for Future Research	63
REFERENCES	64
APPENDIX I: Lists of Rural Banks: Ashanti Region	71
APPENDIX II: Dataset for the Research	72

LIST OF TABLES

Table 2.1: Tiers of Ghana's Financial System	12
Table 3.1: Summary of Variable Descriptions and Measurements	42
Table 4.1: Descriptive Statistics of the Study Variables	47
Table 4.2: Correlations Matrix	49
Table 4.3: Results of unit root test	50
Table 4.4: PLS Results on the Internal Factors that affect NPLs	51
Table 4.5: PLS Results on the Effect of NPLs on Rural Banks' Profitability	53
Table 4.6: PLS Results on the Effect of Economic Growth on NPLs and Rural Banks' Profitability	56
Table 4.7: Test for multicollinearity	58

LIST OF FIGURES

Figure 2.1: Conceptual Framework of the Study	29
Figure 4.1: Trend analysis of banks' non-performing loans and profitability	45
Figure 4.2: Test for Data Normality	59

LISTS OF ABBREVIATION

ARBs	Association of Rural Banks
PLS	Panel Least Squares
CAPBuss	Coronavirus Alleviation Programme Business Support Scheme
BoG	Bank of Ghana
GDP	Gross Domestic Product
GEA	Ghana Enterprise Agency
NPLs	Non-Performing Loans
RCB	Rural and Community Bank

KNUST



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The banking industry plays a crucial role in the financial sector of every economy worldwide. They are institutions mandated across the financial space on major basis to provided financial services which have the ability and purpose of influencing society wellbeing and economic prospective. Kargi (2011) explains further that in developing countries, the role of banks becomes even more crucial as banks are known be the primary source of external financial system where loans are offered to individuals and businesses. Bollard (2011) discusses the important role played by banks in modern economic world, they explain that banks provide critical role in the entire capital development which is the core ingredient for a nation's economic development; they do this by mobilizing the small savings and investments from people scattered throughout their catchment areas while making those funds available for production. Laryea et al (2016), agreed with the views of Bollard (2011), on the importance of the financial sector stressing that, the financial sector helps with the easy flow of credit facilities in the economic space which then leads to investment opportunities in the production sectors of the economy. A peaceful and a sound banking space over time is considered as an essential stability in the financial system and thus ensures the monetary strength of any country (John, 2018).

Banks like any other business is mostly considered as successful based on its profits, quality of assets and the rate of progress. Njanike (2009) on his part views profits as a driving force that maintains running a business and can thus be a reflection of the progress of the firm while also serving as a test of its efficiency of progress. As

explained by Ali (2015), profit might be a whole lot depending on who is on the lookout for it, according to them, to the economist, profit is that magic eye that mirrors the entire picture of the business; they stress that whereas the manager of a business views profits as an efficiency test and a control measurement, creditors view profits as a wellbeing limit while the proprietors view it as the assessment of their value. Employees also view profits as a source of marginal benefit while customers would see it as a call to action for better quality products amidst price reduction, above all, the country's view on profits stands from the fact that, profits reflect the whole economic progress.

Banking profitability has long been linked to lending which has over the years become the foundation of the banking sector thereby generating the greatest sum of all banking operating income. According to Boahene, Dasah, and Agyei (2012), banks are anticipated to enhance their profitability in circumstances characterised by a higher loan to assets ratio and the liberalisation of interest rates, despite the expenses incurred from maintaining extensive portfolios. In such scenarios, banks have the opportunity to apply mark-up prices to their services.

Nsobilla (2015) explains that, with all these profits expected by banks mostly through credit, banks are exposed to several levels of risks mostly because of excessive loans, he explains that although there are some contingencies made to reduce these risks, however, where the non-performing loan ratio is high, the risk provision becomes weak. Laryea et al. (2016) argue that banks face a range of risks, with credit risks having a pronounced effect on a bank's profitability. This is attributed to the fact that loans serve as the primary revenue stream for banks.

According to Boahene et al (2012), the banking sector in Ghana plays a crucial role in the financial and economic landscape. However, it is unable to separate itself from the

potential risks associated with non-performing loans. The author elucidates that while the majority of industries in Ghana heavily rely on credit obtained from banks, thereby playing a crucial role in the socio-financial advancement of the country, a significant number of industries and individuals tend to default on their loan obligations. This phenomenon results in the classification of loans as either non-performing or bad, consequently impacting the profitability of banks.

John (2018) defined bad loans as loans where there are difficulties with its repayment. Ahmad and Ariff (2007) however on his part viewed non-performing loans not as a multiclass concept because of the different classifications of credits facilities in difficulty based on its duration of overdue. Atemnkeng and Nzongang (2006) sees nonperforming credits as a result of a monetary emergencies and has the capability of massively extending the seriousness and span f he monetary emergencies which in turn have the ability of complicating the macro-economic management. As said by Kosmidou (2008), the rising prevalence of non-performing loans can be attributed to the absence of a robust risk management framework. Therefore, the increase in nonperforming loans within the banking sector can be interpreted as a reflection of deficiencies in administrative practises.

Drehman, Sorensen, and Stringa (2008) outlines some of the major causes of nonperforming loans; these include inapt management skills on the part of bank managers, lack of an effective and an efficient loan policy, insufficient analysis on loans as much as attitude and political decisions which results in economic challenges thereby resulting in depression and instability which leads to most people and businesses defaulting on their loans.

Bikker and Hu (2002) identified inadequate, weak monitoring systems and controls of banks in monitoring its loans, poor recovery strategies as well as a weak legal infrastructure as the main cause of rising non-performing loans in the banking space.

Mwangi (2012) found a negative link between bank profitability and non-performing loans. He explains that bank profitability decreases when non-performing loans increase. Funso, Kolade, and Ojo (2012) further observed that, the viability of banks is dependent on the size of its non-performing advances and thus serves as one of major determinants of profits in the banking space.

Amoako (2015) on his part discusses two significant impacts of non-performing advances on the financial space, these includes limiting the banks performance as well as the lending potentials of the bank which in the long run affects the growth and performance of the economy. Given the significance of the banking sector in fostering economic growth, it is essential to investigate the effect of non-performing loans on the profitability of banks in Ghana. Additionally, it is essential to propose viable solutions that can enable banks to effectively contribute to the overall growth of Ghana's economy.

1.2 Statement of the Problem

Several researchers across the globe have cited non-performing loans as one of the primary causes of failure in the financial sector, this is because of poor and ineffective loaning policy (Anuradha, 2020). However, lending happens to be the major operating income of banks globally and hence the decision of banks not to give out credit would in the long run extinguish the bank and shuts all its operations. Kingu Macha and Gwahula (2018) observed that an efficient and effective credit management plan put forward by banks could alleviate this plight experienced by banks. Supriani and

Sударsono (2018) on their part identified several risks faced by financial institutions but singled out credit risk as the single most visible threat to banking sector operations sterling from the fact that banks are dependants on the loans they give out. Mpofu and Nikolaidou (2018) also ranked credit risk as the most serious of risks to the banking sector because of the possibility of borrowers defaulting on credit facilities advanced to them by banks. Sukmana (2015) observed that banks must consciously selects applicants who have a higher probability of paying their loans while rejecting those who have a higher probability of defaulting, but further raises that questions of how to genuinely know that one client would be in the position of paying all his indebtedness over the other.

Despite the banking sector's importance to Ghana's economic development, the percentage of non-performing loans continues to rise. According to a survey conducted by CEIC on Ghana's non-performing loans spanning from 2008 to 2022, it was established that Ghana's non-performing loans rates have increase from \$365,078 in 2008 to \$1.233 billion as at June 2022. The upward trend is even worrying with the ravaging effects of the COVID-19, the Russian-Ukrainian war as well as with the current IMF conditionality's which requires a debt exchange program with government set to default of many of its liabilities of which the banking sector plays an enormous role in it. The banking crises that occurred in 2017 brought to light the vulnerability of the banking sector, with non-performing loans emerging as the primary cause of illiquidity within this industry.

Although several works (such as Antwi-Wiafe, Asante, and Takyi, 2023; Sarpong et al., 2023; Wongnaa et al. 2023) have recently touched on the operations of the financial sector in relations to other business sectors, little have been done on the factors that

affect non-performing loans in rural banking and its effect on profitability. This calls for a much broader discussions as the predicament of rural banks are expected to be on the increase. This research intends to investigate the internal factors that influence NPLs in rural banking, assess the impact of NPLs on rural banks profitability and also examine whether the relationship between NPLs and profitability is contingent on the economic growth of Ghana. Specifically, the research focuses on selected rural banks in Ghana's Ashanti Region.

1.3 Objectives of the Study

The primary objective of this research is to examine the influence of NPLs on the financial performance of rural banks. The analysis is performed utilising data that has been gathered from selected rural banks situated in the Ashanti Region of Ghana. The following are a list of the specific objectives that the research aims to accomplish:

- i. To analyse the internal factors that have an impact on non-performing loans.
- ii. To evaluate the impact of NPLs on the profitability of rural banks.
- iii. To assess the effect of economic growth on the relationship between NPLs and rural banks profitability.

1.4 Research Questions

The following research questions have been made to help the researcher reach the goals of the study.

- i. To what extent does internal factors affect non-performing loans?
- ii. To what extent does NPLs affect rural banks profitability?
- iii. To what extent does economic growth affect the relationship between NPLs and rural banks profitability?

1.5 Significance of the Study

Banks play a crucial role in facilitating the economic development of each nation. According to Nsobilla (2015), every bank principal asset is their loan portfolio, and it holds majority of its interest income as well as its major operating income. Nevertheless, it appears that the impact of NPLs on the aforementioned banks is diminishing the profits of banks in Ghana.

This study will be of benefit to managers and managements of rural banks to emerge with doable and practicable answers for the issue of non-performing credits in their books.

The findings of the research will also provide a significant scholarly contribution by examining the impact of NPLs on the financial performance of rural banks in Ghana. Additionally, this study will function as a valuable resource of empirical data for policymakers and the board of directors, aiding them in the development of effective credit policies aimed at mitigating the prevalence of non-performing loans within the financial sector.

The general public will through this study have more insights into the impact of NPLs banking and the entire economic and financial space. People wanting to defraud banks by planning to default would know the consequences of their actions which might affect the general populace and the general economic performance of the country.

Finally, the results of this study will provide valuable insights for rural bank managements and boards, enabling them to implement appropriate risk management strategies that effectively address the impact of NPLs on the banks' portfolios and overall profitability.

1.6 Scope of the Study

The study's focus is restricted to a particular group of rural banks situated within the Ashanti Region of Ghana. The selection of rural banks is predicated upon the distinctiveness of this domain, which has been relatively underexplored despite its significant economic significance. In pursuit of this objective, the study encompassed an analysis of the financial data pertaining to banks spanning the timeframe from 2013 to 2021.

1.7 Summary of Methodology

A quantitative approach involving a panel research methodology is used in this study. The population consists of selected rural banks in Ghana from 2013 to 2021. Data is gathered from the sample banks' annual reports. The results obtained are coded and analysed using a regression technique. The researcher employed the use of the Eviews statistical software in generating the results.

1.8 Limitations of the Study

The primary aim of this research is to investigate the influence NPLs on the financial performance of a select group of rural banks situated in the Ashanti Region of Ghana. However, it is crucial to recognize the constraints that may have influenced the results and analyses of the research.

The study was conducted utilizing a sample of ten rural banks that were selected in the Ashanti Region of Ghana. Although efforts were made to ensure representativeness, the sample size may not capture the full diversity of rural banks in the region. As a result, the findings may not be generalizable to all rural banks in Ghana or other regions of the country.

Furthermore, the study utilized secondary data sourced from the financial statements of the chosen rural banks. The accuracy and completeness of the data may vary across different banks, and there may be variations in reporting practices and data quality among the banks. These factors could potentially introduce biases or limitations in the analysis and interpretation of the findings.

Third, the study was conducted within a specific period (2013-2021). Potential alterations in the banking sector, economic circumstances, or regulatory structures subsequent to the designated study period may exert an influence on the correlation between NPLs and profitability. The obtained results may not provide an accurate representation of the current or future dynamics of the rural banking industry in Ghana.

1.9 Organization of the Study

The entirety of the work is segmented into five primary chapters. The introductory chapter encompasses various components, such as the contextual backdrop of the study, the articulation of the problem, the establishment of objectives, the formulation of research inquiries, the elucidation of the investigation's significance, the delineation of the study's boundaries, the identification of its constraints, and a brief overview of the employed methodology.

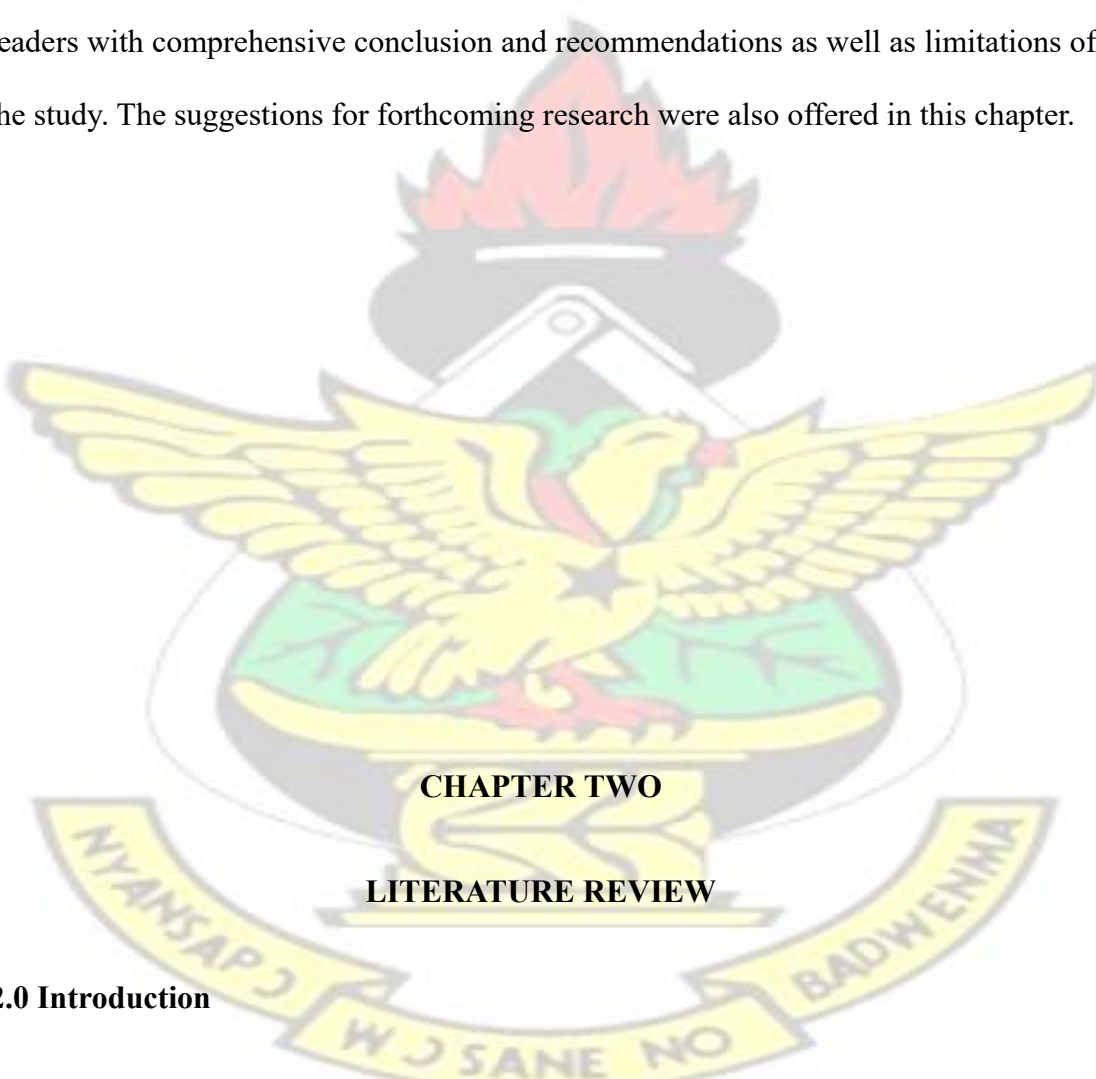
Chapter two reviews related literature already carried out on the research area by researchers and academia. The study seeks to review articles, journals, books, and publications to enrich the study with the required inputs.

Chapter three concentrated on the research strategies that are utilized in the study to accomplish the expressed intents of the research; it incorporated the study plan, the number of entities in research, the study sample and sampling technique, the sources of

information, the techniques for information analysis, empirical model determination, and the definition of study variables.

Chapter four is centred on data presentation and discussions of results coherent with the objectives of the study. In this chapter, empirical findings and analysis offered justification for the research objectives of the current study.

Finally, chapter five of the research covers the summary of results in the study and offers readers with comprehensive conclusion and recommendations as well as limitations of the study. The suggestions for forthcoming research were also offered in this chapter.

The logo of Kenya National University of Science and Technology (KNUST) is centered in the background. It features a yellow eagle with spread wings perched on a green shield. Above the eagle is a black mortar and pestle with a red flame. Below the eagle is a yellow banner with the Swahili motto 'NYANSAPU WJ SANE NO BADWENMA'.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides a comprehensive review of the relevant literature pertaining to the impact of non-performing loans on the profitability of banks. It examines a range of studies conducted by researchers and authors in this field. In the bid of examining related literature, the researcher reviewed related journals, articles, publications, books,

magazines, and other relevant materials relevant to the research. The chapter is organized in the following thematic sections: conceptual review, theoretical review, and empirical review on the relationship between NPLs and profitability. Finally, the conceptual framework of the study is also discussed.

2.1 Conceptual Literature Review

This section reviews all extant knowledge hovering on the research area. It identifies important gaps as well as throw more light on the research topic. This section provides a comprehensive review of the existing literature pertaining to the financial system in Ghana, encompassing an overview of its structure and functioning. Additionally, it examines the profitability of banks operating within the Ghanaian financial system, as well as the prevalence of NPLs within these institutions.

2.1.1 Ghana's Financial System

Financial institutions in Ghana are classified as official, semi-formal or informal (Adusei, 2015; BoG, 2013; Mann et al, 2010; Steel, 2006). Table 2.1 depicts these classes, their services, clients, and reach. Table 2.1 shows that rural and community banks (RCBs), credit unions, savings, and loans (S&Ls) organizations, Susu enterprises, and monetary non-legislative associations function in Ghana's rural and remote areas, while business and development banks work in the country's urban areas.

Table 2.1: Tiers of Ghana's Financial System

Tier	Definition	Institutions	Services	Clients	Outreach
		Commercial banks, development banks exchange,	deposits, loans, foreign government	Large businesses, cash	Urban
Formal	Licensed by BoG	Rural and community Banks	Deposits, loans, money transfer, payments, social investments	SMEs, large enterprises	Rural
	transfer, insurance	Credit unions	Deposits, loans for	Low income,	

Semiformal	Provisionally licensed as of January 2013	Savings and loans companies (Microfinance institutions), financial NGOs	members only Deposits, loans,	self-employed Microenterprises, Rural entrepreneurial poor
Informal	Not legally registered at the national level	Susu informal Moneylenders	institutions, Deposits, loans	Self-employed, Rural poor

Source: Bank of Ghana (2013) and Adusei (2015)

2.1.2 History of Rural Banking in Ghana

According to "The Rural Banker" gave by the ARB Apex Bank, Agona Nyakrom is the first Rural and Community Bank (RCB) to be laid out in 1976, presently there are 144 Rural and Community Bank (RCB) across Ghana within excess of 800 branches spread across the 16 districts of the country. Disregarding every one of these, the Rural and Community (RCB) industry controls under 10% of the complete resource in financial industry, with more than six (6) million clients, without a doubt, RCBs control a bigger extent of the clients in the monetary market. More than 15,000 individuals of the Ghanaian populace are utilized by the RCBs. This has decreased the joblessness rate in the country. Ashanti district right now can flaunt 29 RCBs, Eastern region can likewise flaunt 24 RCBs and Focal area has 20 RCBs. Ashanti district, Western region and Eastern region have the vast majority of the rural and community banks in Ghana.

Amoako (2015) state that a rural bank is any rural financial institution—corporate, community, or bank—that accepts deposits and offers specialized financial services to rural populations. According to Tsamenyi and Shazzad (2008), the Agona Nyarkrom Rural Bank, which was founded in the central area of Ghana in 1976 to offer financing to small-scale farmers and enterprises and support development projects, was the country's first rural bank. Locally owned and operated rural banks exist.

In regard of the difficulties that monetary foundations have confronted, RCBs have witnessed a huge development in their stores, which expanded from GHC2.37 billion in 2016 to GHC5.32 billion toward the finish of 2020. Total Asset multiplied in a similar period from GHC3.0 billion of every 2016 to GHC6.1 billion toward the finish of 2020. Deposits of Rural and Community (RCB's) Banks expanded from GHC232million in 2016 to GHC648million in 2020, i.e., 179% while all Total Assets developed from GHC274 millions of 2016 to GHC751million toward the end of 2020.

According to the “Rural Banker” gave by ARB Apex Bank ltd, following the Coronavirus pandemic, government sent off the CAPBuss conspire as a help to Small Medium Enterprises (SMEs). The fundamental reason for this mediation is for Government to offer help to SMEs who were adversely impacted by the Coronavirus pandemic. With the assistance of Ghana Enterprise Agency (GEA), The ARB Bank shaped collusion with Government to help in the conveyance and the executives of the assets raised through CAPBuss finances through the organization of RCBs. The ARB Pinnacle Bank had in obtaining a measure of GH¢ 30 million and helped with dispensing CAPBuss advances to the north of 9,000 clients who are in different organizations across Ghana.

Per the “Rural Banker’ given by ARB Pinnacle Bank Ltd RCBs gave produced benefits of GH¢1.842 billion from GH¢1.091 billion over a similar five-year time frame. The store likewise developed from GH¢2.378 billion to GH¢5.323 billion which brought about 124% development, this additionally come about 102% development in resources from GH¢3.040 billion to a noteworthy GH¢6.139 billion over the period being talked about.

2.1.3 Non-Performing Loans (NPL)

The non-performing loan ratio is a prominent key performance indicator (KPI) in the banking sector that has consistently presented a substantial challenge to the industry. According to Bhattarai (2017), it has been acknowledged that a decrease in nonperforming loans has consistently had a positive effect on return on equity (ROE). The researcher conducted an empirical investigation and found that NPLs, capital adequacy ratio, liquidity, and bank size exert a substantial influence on the profitability of banks. It was observed that the NPL has over the years been observed to significantly impact strongly on profitability hence the need for banks to critically examine its reduction.

Banks are exposed to credit risk as a result of non-performing loans because they exist not only to receive deposits but also to provide credit to individuals (DeYoung, and Rice, 2004). The absence of a universally applicable definition for NPLs across different countries is attributed to the recognition that appropriateness can vary between nations. Nonetheless, there is some rudimentary analysis on this subject. According to the Compilation Guide on Financial Soundness Indicators by the International Monetary Fund (IMF), non-performing loans (NPLs) are defined in the following manner.

“When interest and/or principal payments are 90 days or more past due, or interest payments equal to 90 days or more have been capitalized, refinanced, or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full, such as a debtor filing for bankruptcy” (IMF Report, 2017).

Furthermore, the Banking Sector Report of the Bank of Ghana likewise characterizes NPL as follows:

“Nonperforming loans are those whose credit quality has deteriorated, making it difficult to collect the full principal and/or interest due under the loan's contractual repayment terms, as well as advances”. (Banking Sector Report of BoG, 2020).

According to Arko (2012), non-performing credits refer to loans in which both the principal amount and the interest have remained unpaid for a period of at least 90 days, rendering them classified as non-performing advances. NPLs are credits that have been in default for a long time, both in principal and interest, in violation of the advance agreement's terms and conditions. NPLs are any credit facility that is past due in terms of principal and interest payments, in violation of the loan agreement's terms. As a result, a nonperforming loan portfolio denotes the performance of a bank's total loan portfolio (Ugoani, 2016).

Chen and Pan (2012) defined credit risk as the degree of value fluctuation in debt instruments because of changes in the derivatives originally agreed forth by the parties.

Loans in default are mostly classified under ‘standard’, ‘doubtful’, and ‘loss’ all depending on the number of days in default, however, a loan categorized as loss can move in between the categories into a standard loan depending on the recoveries of the firm. Kolapo et al. (2012) argue that banks are thus obliged to use NPLs in allocating credit losses that are collective and impersonal into the various categories they fall. Arko (2012) observed that allowances made for loan losses serve as a safeguard for banks by helping them to amortize the shocks that would otherwise have been paid and can thus boost the profitability of banks. They also acknowledged that high levels of

NPLs do affect bad debt provisions and loans to be written off which have a direct implication on profitability and capital levels.

Elekdag et al (2019) after studying several papers on the factors that lead to increases in NPLs concluded two main categories which include the size of the bank (size, capital, liquidity, and efficiency) and secondly cause of socioeconomic factors (unemployment rates, investments rates, gross domestic products, and rate of inflation). Kithinji (2010) observed that sources of credit risks include inappropriate laws and policies governing loan disbursements, direct lending, liquidity levels as well as poor loan underwritings. Others include poor lending practices, inadequate supervision by the central bank, and government interjections.

Bofondi and Gobbi (2003) indicate that the NPLs are bad debts due to the minimal chances of recovering the loan when in default for a long period; this in turn have a way of minimizing the liquidity by reducing the cash flow the system. Banks must thus enforce the recovery of its loans to prevent such occurrences. Ratnovski (2020) observed that its devoid investors from investing in equities of banks which have high NPLs because of the risks its poises to their investments. It also implies that the future profitability of the firm might suffer as a result of the growing NPLs in the books of the company.

In the context of this study, NPLs in rural banking are loans that were extended to borrowers in rural areas, typically for agricultural or rural development purposes, but are not being repaid according to the agreed-upon terms and conditions. That is, when borrowers fail to make scheduled loan payments or exhibit significant delays in repayment, their loans are classified as non-performing.

2.1.4 Profitability of Banks

Profitability is a subject that has gotten a ton of consideration since time and memorial. The degree of firm performance is noteworthy for investors of a bank since it shows how viable management has used their investments (Devinaga, 2010). In deciding the monetary quality of a commercial bank, the degree of gainfulness is paramount. According to Codjia (2010), productivity performance centres around the income statement which shows what sum is created (income), what sum is spent (costs). This may be set up by the bank on a month to month, quarterly or yearly premise.

Arthur et al (2013) believe that profit is a definitive objective and basic measure of all business ventures performance. In this way, without profit, the company will not stay alive in the future, thus determining the present and previous profitability and yet to come productivity is significant for each business venture. Every one of the techniques planned and exercises performed thereof are expected to understand this major objective.

There are a number of literatures that has looked at the determinants of banks performance. As indicated by Rushdi and Tennant (2003), the profitability of banks can be estimated in various ways and include return on assets (ROA), net interest margin (NIM) and return on equity (ROE). There are anyway different perspectives concerning the incomparability of one indicator over others as a proper measure of profit. In any case, throughout the year, most researchers lean toward utilizing return on assets (ROA). Godlewski (2004) utilized ROA in estimating profit. It was uncovered that the performance of a bank was adversely influenced by the degree of nonperforming proportion. The concept of Return on Assets (ROA) pertains to the demonstration of

how bank management effectively utilised the resources at their disposal to generate a profit (Athanasoglou, Brissimis, and Delis, 2005).

In addition, the performance of a business is ordinarily assessed utilizing its profitability standings. These researchers utilized return on resources as a measure of gainfulness. With all due respect, these researchers chose ROA over ROE since it is free of financial leverage and the dangers related to it (Flamini, McDonald, and Schumacher, 2009). Furthermore, it is conceivable to think about organizations in a similar industry or different industries when ROA is utilized as an intermediary for profitability. This makes ROA a solid measure of benefit (Devinaga, 2010).

The operational meaning of profitability in this research is the ability of rural banks to generate earnings and financial returns from their operations in rural areas. It measures the extent to which a rural bank is able to generate profits relative to its costs, investments, and risks.

2.2 Theoretical Literature Review

This section provides an analysis of theoretical frameworks pertaining to the subject of study. Asymmetric information theory, agent theory, and modern portfolio theory are all examined in the research.

2.2.1 Asymmetric Information Theory

The theory of asymmetric information elucidates the dynamics and transmission of information, positing that it is probable for multiple parties to possess disparate information relative to one another. An example can be equated to a borrower lending money from a financial institution where the borrower has better information in terms of his creditworthiness and information provided than the lender. Pagano and Jappelli

(1993) opined that information sharing is vital to the lender in the cause of taking vital decisions as to whether to art with a facility or not. The theory is thus premised on the idea that the lack of information thus makes it difficult in differentiating between a good and a bad borrower.

Auronen (2003) explained that information plays a paramount position in market determination. That a party that holds better information can negotiate for a better deal in the market than those without information. He further explained that the party with more information is thus likely to make mistakes than the one who has access to less information. Bofondi and Gobbi (2003) observed that this system can result in a moral hazard that can lead to an increase in the total NPLs of the lender. They however observed that in situations where managers of the banks do have enough information on the borrower, then the bank may be reluctant to give out a facility to bad creditworthy persons thus reducing the NPLs in the banks.

The application of the asymmetric information theory is appropriate for this research because it provide a comprehensive understanding on the relationship between NPLs and profitability in rural banks, accounting for the information challenges and dynamics specific to the context of the Ashanti Region of Ghana. This allows for the study of unique characteristics of the rural banking sector, such as the nature of borrowers, the availability of collateral, and the effectiveness of credit assessment and monitoring practices.

2.2.2 Agency Theory

The agency hypothesis was presented by Jensen and Meckling (1976), who characterized the connection between principals and managers in completing work. A

principal offers power to an agent to run the organization. The principal additionally regulates the agent to zero in on accomplishing the principal's ideal objective.

The agency hypothesis has been utilized in financial exploration for two primary reasons (Demsetz, Saidenberg, and Strahan, 1997). To start with, the protection of the client by a bank's administration decreases the chance for a bank to participate in dangerous financing and in this manner lessens the inspiration of the investor to control and limit hazard taking. Second, isolation between the principal and agent may help the principal in arriving at his own objectives by forfeiting the investors' interest.

Credit hazard is a kind of operational danger that can influence bank performance (Donnellan and Rutledge, 2016). Brilliant and sound financial accomplishment is without a doubt the essential assumption among stakeholders in the banking industry. In this manner, the administration of a rural bank should be equipped for accomplishing an ideal degree of monetary performance.

The agency theory is appropriate in this research as it allows for an examination of the agency problems and governance mechanisms in the context of NPLs and profitability in rural banks. It offers a relevant framework for understanding the dynamics of the principal-agent relationship and its impact on NPL management and profitability in the Ashanti Region of Ghana. This theory provides insights into the specific agency challenges in rural banking, the effectiveness of existing governance mechanisms, and suggest strategies to improve NPL management and profitability.

2.2.3 Modern Portfolio Theory (MPT)

The modern portfolio theory, formulated by Markowitz in 1952, is widely regarded as a highly influential economic theory pertaining to investments and finance. Popularly

defined by the phrase “not putting all your eggs in one basket”, it shows the benefits of diversity. The modern portfolio theory considers how investors could minimize their risks while maximizing their gains. The theory has an explanation of the important role played by the banking sector and its performance. It explains the indication of bank management graced to maintain and invests into portfolios and composition of the bank.

Atemnkeng and Nzongang (2006) observed that the ability to maximize profit depends largely on the assets and liabilities as well as the unit costs incurred by the bank in producing each component of assets. They further advised banks from minimizing the default risks in loans thereby reducing the NPLs in order to boost profitability; they also called for an improvement in revenue diversification. With enough information available to both lenders and borrowers, individuals will have the right urge to also diversify their own investments as a means of decreasing firm-specific risk.

In the context of this research, the application of MPT is appropriate because it helps to understand how the presence of NPLs affects the risk and return profile of rural banks' loan portfolios. It further examines how the composition of loan portfolios, including the proportion of NPLs, impacts the profitability and risk exposure of rural banks in the Ashanti Region of Ghana.

2.3 Empirical Literature Review

This part gives the premise for the comparison of the results of the present study to existing writing. It does along these lines concentrating on the determinants of NPLs and the relationship between NPLs and the profitability of banks.

2.3.1 Effect of Internal Factors on Non-Performing Loans

The growth of non-performing advances is heavily influenced by individual bank activities and financial industry events. As per Kuzucu N. and Kuzucu S. (2019), the bank-level components tended to by analysts in the writing are to a great extent bank capital, bank size, credit quality, and cost-effectiveness or productivity, which are all utilized alternatives for ineffective management.

The data for the impact of bank size on nonperforming loans appears to be equivocal. NPLs and bank size have been proven to have a negative association in several research (Rajan and Dhal, 2003; Salas and Saurin^{878a}, 2002). According to this research, the adverse link is due to major banks' better risk management strategies, which result in better portfolios when compared to smaller banks. On the other side, Rajan and Dhal (2003) identified an optimistic link between NPLs and bank size.

Louzis, Vouldis, and Metaxas (2012) examined loan quality, cost proficiency, and bank capital using data from the Greek financial framework from 2003 to 2009. They investigated what factors influence different types of credit and discovered that macroeconomic conditions and board quality are responsible for NPLs. Their findings point to a link between management deficiency and all NPL classes. Ghosh (2015) focused on the causes of NPLs for business banks and reserve funds organizations in the United States between 1984 and 2013. According to his findings, NPLs are linked to low credit quality, liquidity risk, increased capitalization, and larger financial industry.

As per Havidz and Setiawan (2015), a bank with fewer resources will in general be not able to oversee credit risk appropriately, which implies its NPF is probably going to be high. Supriani and Sudarsono (2018) also stated that a higher capital adequacy ratio

(CAR) indicates a larger monetary asset that can be used to retain losses and reduce the amount of bad debt. Sukmana (2015) expressed that CAR negatively affects NPF at Islamic banks in Indonesia. A huge CAR empowers banks to utilize data innovation to completely evaluate the capacity of forthcoming financing clients or to utilize its funding to improve the capacity of risks assessors (Sukmana, 2015).

Salas and Saurina (2002) posit that certain banking variables, namely rapid credit expansion, bank size, capital ratio, and market strength, play a significant role in elucidating the fluctuations observed in nonperforming loans within Spanish business and investment funds banks. Alhassan, Kyereboah-Coleman, and Andoh (2014) as well as Amuakwa-Mensah and Boakye-Adjei (2015) have identified credit development, bank size, previous year's non-performing loans, and credit risk as fundamental indicators of non-performing loans in Ghana.

2.3.2 Effect of NPLs on Bank Profitability

Non-performing loans pose a serious threat to bank profitability (Funso et al, 2012). There are different investigations that have been embraced internationally on the connection between NPLs and banks profitability and their discoveries have been mixed (Poudel, 2012; Epure and Lafuente, 2012; Gaur and Mohapatra, 2020). In a study conducted by Ugoani (2016), an examination was conducted to assess the impact of NPLs on bank productivity in Nigeria. The study employed descriptive and regression techniques to analyse the data. It has been set up that has a huge arrangement of nonperforming advances adversely affects a bank's benefit.

Based on information asymmetry theory, Kingu et al (2018) examined how nonperforming loans affect bank profitability. This study employed panel data from 16

Tanzanian commercial banks and a causality research methodology from 2007 to 2015. According to the study, non-performing loans have an undesirable link with profitability in Tanzanian commercial banks.

Gaur and Mohapatra (2020) examine the relationship between NPAs and profitability in the Indian banking sector. Other banks, industry, and macroeconomic factors affecting banking earnings were also considered. The study used a 14-year (2005–2018) balanced panel data set of 37 commercial banks in India. The analysis identified NPA as the key detractor of banking industry earnings because of its huge negative regression coefficient. In other words, poor credit quality hurts bank performance, ultimately leading to failure.

Kjosevski et al. (2019) examine how bank-specific and macroeconomic determinants affect all NPLs to Macedonian banks and households. According to the data, bank profitability increased lending to businesses and families, and GDP growth all have an undesirable effect on the rise of NPLs in both models, while bank solvency and unemployment have an optimistic influence. Besides, the review found that the exchange rate essentially affects banks NPLs, while inflation fundamentally affects the increment in non-performing credits to individual banks in Macedonia. Jreisat (2020) assessed the relationship between Credit risk, economic growth and profitability of banks in UAE. The study found that credit risk is one of the most important factors negatively affecting the banks' financial performance. This research proposed that UAE banks should focus on increasing non-interest income and avoiding risk when lending to customers in addition to being cautious about it.

Nsobilla (2015) investigated the influence of NPLs on the financial performance. The data was gathered from a sample of six rural banks situated in the Ashanti and Western

Regions of Ghana. The research utilised ordinary least squares (OLS) regression analysis to investigate the impact of non-performing loans on the financial performance. The variables pertaining to NPLs, cost-income ratio, loan recovery, and total revenue demonstrated statistical significance at a significance level of 1%. The statistical analysis indicated that the level of risk attributed to liquidity was found to lack statistical significance.

Nyarko-Baasi (2018) used panel regression to analyse credit risk and profitability in Ghanaian banks. EVIEWS was used to analyse a fixed effects model with Correlated Random Fixed Effects. Profitability was measured by return on equity (ROE). NPLR and CAR were key factors. According to the study, NPLs hurts bank profitability. However, the capital adequacy ratio (CAR) and bank size boosts bank profitability.

The study conducted by Laryea et al. (2016) examines the various factors that contribute to the occurrence of NPLs and the subsequent effect they have on the profitability of banks. Based on the research outcomes, it is observed that banks with higher levels of capitalization exhibit a greater propensity to assume credit risk through NPLs, thereby exerting an adverse influence on both return on equity and return on assets. According to the study, although there is a positive correlation between inflation and industry concentration with NPLs, these factors are not deemed significant in determining NPLs.

Asare (2015) analysed balanced panel data from seven chosen banks from 2005 to 2013 using fixed and random effects methods. The study employed ROA and ROE. The study's credit risk metrics were NPL-to-total-loan ratio, loan loss provisions ratio, and loans-to-advances ratio. The model comprised internal and external profitability drivers. NPLs hurt bank profitability, although the loan loss provision ratio and loan-to-

advance ratio did not. The study found that bank size negatively affects profitability, although capital adequacy and age positively affect it. External factors were always insignificant.

Do et al. (2020) conducted a study to investigate the influence of non-performing loans on the financial performance of commercial banks in Vietnam. The research utilised a combination of fixed and random effects models, in conjunction with the feasible general least square method, to establish the panel data test. The empirical evidence suggests that an increase in the rate of nonperforming loans is linked to a decrease in a bank's return on assets (ROA), leading to a decline in the bank's profitability. Furthermore, the study's findings have revealed that within the Vietnamese context, the loan-to-deposit ratio and the GDP growth rate have a substantial impact on bank performance, while the size of the bank does not demonstrate any significant influence.

Ihemeje, Ugwuanyi, and Efanga (2022) conducted research to assess the impact of NPLs on the financial performance of banks within the Nigerian context. A multiple regression model was constructed to investigate the correlation between variables pertaining to NPLs and the profitability of banks. The results of this study suggest that there is no significant correlation between NPLs and return on capital employed (ROCE), indicating a negative relationship. On the other hand, performing advances show a statistically significant positive correlation with return on capital employed.

2.3.3 Effect of Economic Growth on the relationship between NPLs and Banks Profitability

The relationship between non-performing loans (NPLs) and bank profitability has been a topic of significant interest in the field of banking and finance. As economic growth

plays a crucial role in shaping the banking sector, understanding the effect of economic growth on the relationship between NPLs and bank profitability becomes essential. This empirical literature review provides insights into the complex dynamics between economic growth, NPLs, and bank profitability.

Abdelmoneim and Yasser (2023) conducted a study to examine the impact of bank performance and economic growth on bank profitability in eight middle-income countries from the Middle East and North Africa (MENA) region and MINT countries. They employed the Generalized Method of Moments (GMM) model for their analysis. The findings indicate that the MINT countries exhibited superior bank performance compared to the MENA region. The MINT countries demonstrated robust capital, increased assets, credits, and deposits, leading to enhanced bank profitability, which in turn contributed to economic growth. The profitability (measured by ROA and ROE) of both MENA and MINT regions was influenced by GDP, indicating successful economic restructuring and the potential for rapid growth in their banking industries.

Iqbal and Nosheen (2023) conducted an analysis using panel data and regression along with the GMM technique. Their study also independently examined economic, social, and environmental indicators. The findings of the research indicated that sustainable development goals (SDGs) play a significant role in moderating the relationship between non-performing loans (NPLs) and financial performance. The study recommended that banks should prioritize their focus on the customers to whom they provide loans.

Obiora et al. (2022) conducted a study that examined 23 Sub-Saharan Africa (SSA) countries and 14 developed countries from 1981 to 2018, employing the general least squares method. The findings revealed that SSA countries faced challenges such as

declining deposit rates and increasing real interest rates compared to developed countries. Additionally, the study demonstrated that economic development had a positive influence on commercial bank lending, lending rates, domestic credit amounts to the private sector (DCPS), and a decrease in non-performing loans (NPLs).

In a separate study, Jreisat (2020) investigated the determinants of banking profitability specifically focusing on the UAE banking sector. Using a dataset of 14 banks spanning the period from 2008 to 2016, the research identified economic growth as the most significant factor impacting loan delinquency and bank profitability in the UAE, with a positive relationship observed.

Bernini and Brighi (2018) examined the effects of branch network expansion and geographical strategies on the cost efficiency of Italian cooperative banks between 2006 and 2013. The results indicated that, except for banks with a more diversified product offering, expansion had a negative impact on efficiency. This negative effect was further exacerbated by increased distance between the headquarters and branches. While a larger bank size had the potential to generate positive effects, these benefits were neutralized by branch expansion. Efficient local banks and increased credit availability were found to positively contribute to the local economy. However, structural changes through branch expansion had a detrimental effect on local economic development.

2.4 Conceptual Framework

Kumar (2011) defines a conceptual framework as a compilation of concepts or variables utilised by a researcher to achieve specific objectives. Figure 2.1 illustrates the diagrammatical depiction of the conceptual framework explaining the interaction effect of economic growth on the relation between NPLs and rural banks profitability.

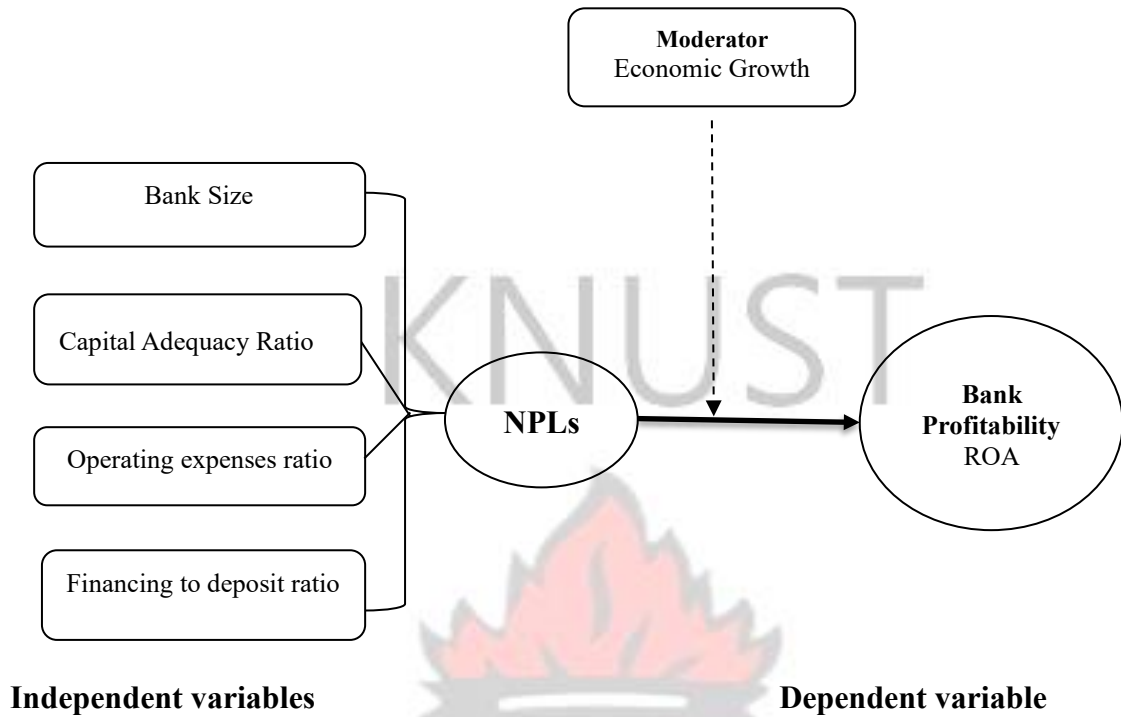


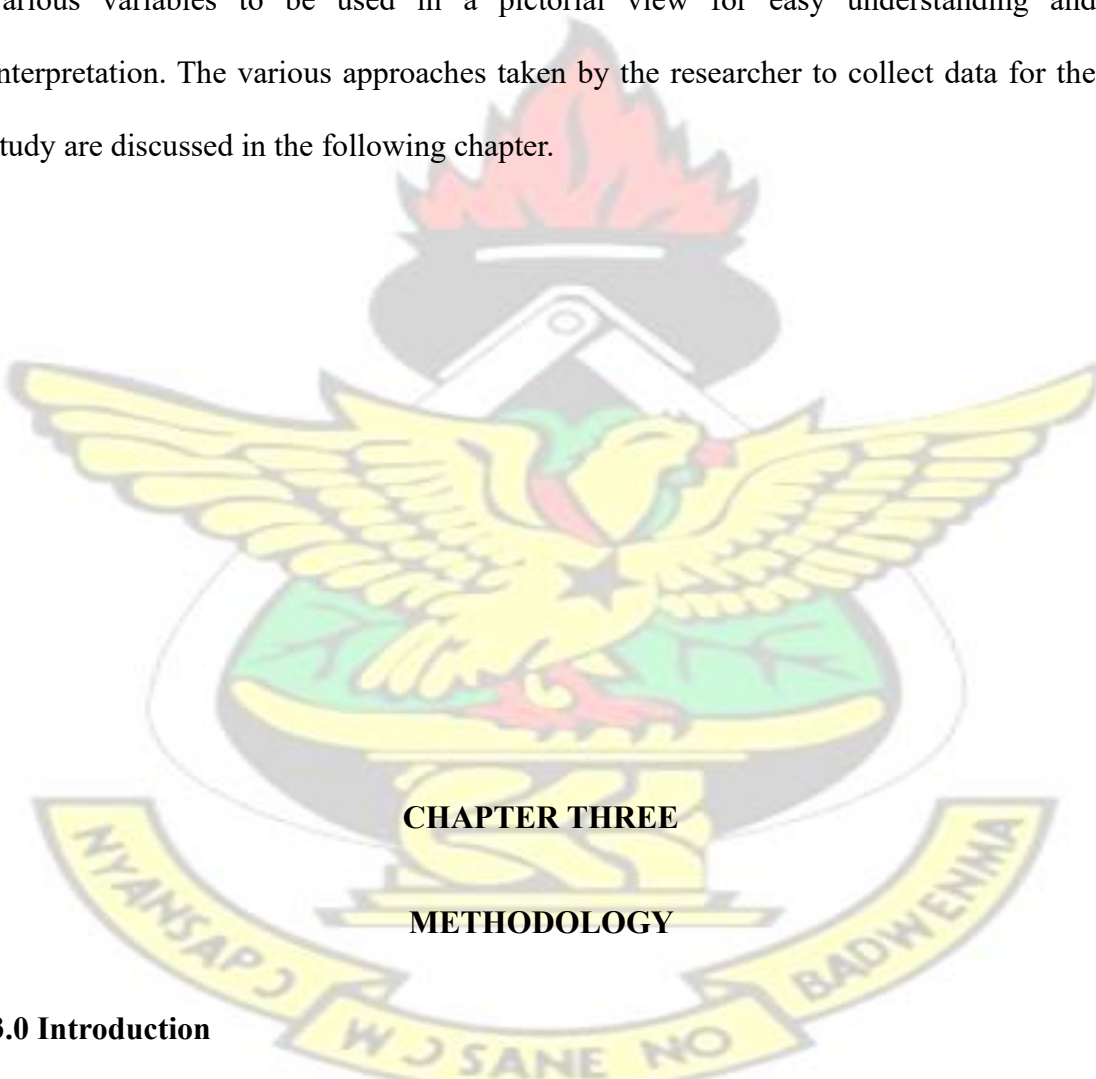
Figure 2.1: Conceptual Framework of the Study

Source: Author's Construct (2023)

The conceptual framework of the research is presented in Figure 2.1. It illustrates the investigation's focus on internal specific factors (capital adequacy ratio, bank size, return on assets, operating expenses ratio, and financing to deposit ratio) as potential determinants of non-performing loans (NPLs) in the rural banking industry in Ghana. The framework also highlights the impact of NPLs on the profitability of rural banks. The research emphasizes that rural banks are not independent entities and are influenced by the overall economic environment of the country. Therefore, the study considers economic growth, measured by GDP growth, to evaluate the potential interaction effect of economic growth on the relationship between non-performing loans (NPLs) and bank profitability.

2.5 Summary of the Chapter

The chapter reviews related literature surrounding the research area, the chapter includes the conceptual review where the various gaps and knowledge on the study area were analysed, the chapter also delved into reviewing empirically the various related research done around the study while looking at the banking industry in general in Ghana. It also considers the conceptual framework where the researcher handled the various variables to be used in a pictorial view for easy understanding and interpretation. The various approaches taken by the researcher to collect data for the study are discussed in the following chapter.



CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter discusses the approaches that the researcher utilized in order to obtain data and describes the procedures that were afterwards utilized in order to analyze the data. This chapter covers a wide range of topical aspects, such as research design, study

population, sampling and sample strategy, data sources, data analysis method, an empirical model for study, and the definition of research variables.

3.1 Research Philosophy

The research is grounded in a positivism research philosophy. The positivist philosophy, according to Morgan (2014), is when data is collected and analyzed to accept or reject a study's established hypothesis, usually by measuring variables using the quantitative method. By adopting a positivist stance, this research aims to find practical solutions to the pressing issue of non-performing loans (NPLs) and their impact on the profitability of rural banks in the Ashanti Region of Ghana.

3.2 Research Design

The design of a study refers to the systematic arrangement of circumstances that are employed to collect and analyse data, with the purpose of enhancing the significance of the issues being investigated and ensuring the study's durability. Research designs encompass three main types: exploratory, descriptive, and explanatory. According to Saunders, Lewis, and Thornhill (2009), these designs serve diverse purposes. For this study, descriptive and explanatory research designs are adopted. According to Kumar (2011), the purpose of descriptive research is to characterise the variables that are being investigated, whereas the purpose of explanatory research is to investigate the influence that independent factors have on the variables that are being investigated. Saunders et al. (2009) opined that the limitation of descriptive and explanatory research is that respondents may not be truthful when answering survey questions. This notwithstanding, the use of descriptive and explanatory research designs in this study is justified because it provides for quantitative analysis (Serrano, 2021; Gaur and Mohapatra, 2020; Nyarko-Baasi, 2018; Laryea et al., 2016).

In addition, a research panel approach was utilised throughout the study. (Kumar, 2011) explains that a panel study is made up of both time-series and cross-sectional investigations. Panel modelling is useful for locating a collection of characteristics that are shared by several entities while also taking into consideration the diversity that occurs between those entities. The research looked at the years 2013 through 2021.

3.3 Population of the Study

The population under study refers to the total count of individual elements possessing specific characteristics that are of interest to a researcher (Saunders et al., 2009). The population of the study comprised all 29 rural banks located in the Ashanti region of Ghana as of December 30, 2022 (refer to Appendix I).

3.4 Sample and Sampling Technique

Saunders et al (2009) define a sample as a sub-gathering of components of a whole population that is chosen for a study to fulfil the research objectives. The study uses a purposive sampling strategy. Purposive sampling, according to Kothari (2004), is a non-random sampling technique in which the researcher establishes a criterion for selecting the sample that is not based on chance. This method of sampling is appropriate in this study as it intends to achieve a certain objective. The availability of data within the study period (2013-2021) for the respective banks is the key criterion for sampling. This period is used for the research as it is considered the most current for the relevance of the study. Using this criterion, the sample size for the research is 10 rural banks (see Appendix I).

3.5 Source of Data

The data for this research originates from a number of secondary data sources. Secondary data is a type of data that is already in existence as a result of prior data collection or studies (Kumar, 2011). The data for bank-specific factors are primarily based on information provided in annual reports by the banks. The data are from audited annual reports over nine years (from 2013 to 2021). The data were manually collected from the office of the Association of Rural Banks Pakyi No:2 (ARB Apex Bank, Ashanti region). Regarding the macro-specific driver (economic growth) is gathered from a database maintained by the World Bank.

3.6 Research Methods

The current study utilises panel data analysis as a method to assess the influence of nonperforming loans on the profitability of a particular group of rural banks in Ghana. Panel data refers to a form of research data that is derived from multiple observations conducted over a period of time on diverse cross-sectional units, such as individuals, households, businesses, or governmental entities (Torres-Reyna, 2007; Wooldridge, 2010). Consequently, the dataset employed in this research comprises panel data obtained from a sample of 10 banks over a span of 9 years, ranging from 2013 to 2021. The utilisation of the panel data regression approach in this study is justified by two primary justifications. (i) Given that the data collected possesses both temporal and cross-sectional attributes, this study aims to investigate the impact of non-performing loans on the profitability of rural banks over time (time series) and among the selected banks (cross-section). (ii) Panel data regression produces superior findings since it increases the sample size and avoids the issue of degree of freedom.

When it comes to analysing panel data, there are two main techniques to consider. That is fixed effects (FE) and random effects (RE). The fixed effect model investigates the relationship between a predictor and an outcome variable that are both contained within a single entity. It is assumed that each entity has its own set of characteristics that may or may not have an impact on the predictor variables in the model (Torres-Reyna, 2007). For example, the policies of a particular bank may have an impact on its credit risk issues, but this impact may not necessarily be reflected in the performance of other similar banks in the same industry. This FE model takes into account the impact of time-variation factors with the goal of determining the net consequence of the analysis on the outcome variable and the need to account for this in the control strategy. As a consequence, the assumption that the entity's error term and the predictor variable are related has been advanced (Torres-Reyna, 2007).

The random effect model, on the other hand, is a distinct case of the fixed-effect model. It is employed in the analysis of panel data when one assumes random variations across firms that remain uncorrelated to the independent variables (Torres-Reyna, 2007). Thus, the individual characteristics which may or may not have an impact on the predictor variable must be specified.

The Hausmann specification test is used in this study to determine if random effects or fixed effects are the optimum estimating strategy. Because of the trade-off between fixed and random effect models in panel research, this test is critical (Torres-Reyna, 2007). The null hypothesis in the Hausmann test is given as "the differences in coefficients are not systematic." When the chi-square value is less than 0.05, the fixed effect model is used for the alternate hypothesis, and when the chi-square value is larger than 0.05, the random effect model is used for the null hypothesis. Furthermore, while the Hausmann test supports the random effect model, an additional test, the

BreuschPagan Language multiplier test, aids in determining if the random effect or pooled ordinary least square (OLS) model is preferable to the study (Torres-Reyna, 2007). The null hypothesis in this situation is phrased as "no significant changes across units." When the chi-square value is less than 0.05, suggesting a significant difference across units, the random effect model is preferred for the alternative hypothesis. However, when the chi-square value is more than 0.05, the pooled OLS is favoured. This signifies that the data is examined using an OLS regression.

3.7 Model Specification

The study uses the analysis method of a Panel Least Squares (PLS) technique. This allows for capturing the dynamics and interdependence of the variables over time in a panel setting. This technique has been used by prior research works of Do et al (2020), Nsobila (2015), Danquah (2018) and Kolapo et al (2012). The PLS model can be indicated as follows:

$$Y_{it} = \alpha + \sum \gamma_k X_{itk} + \epsilon_{it}$$

In the above equation, Y_{it} represents the dependent variable for entity i at time t , X_{itk} represents the independent variables for entity i at time t , α is the intercept term, γ_k represents the coefficients of the independent variables, and ϵ_{it} represents the error term.

Thus, the empirical analysis is conducted on three levels. In the first level, the research examines the internal factors that affect NPLs by estimating the following panel equation:

$$NPL_{it} = \gamma + \beta_1 CAR_{it} + \beta_2 BSIZE_{it} + \beta_3 ROA_{it} + \beta_4 OER_{it} + \beta_5 FDR_{it} + \mu_{it} \dots \dots \quad (3.1)$$

In this model, the symbol γ represents a constant in the given context, while NPL

denotes the NPL ratio. The CAR refers to the capital adequacy ratio. The variable "BSIZE" represents the size of the bank. The Return on Assets (ROA) metric is utilized to evaluate the profitability of a bank. The acronym OER refers to the operating expenses ratio. The financing to deposit ratio (FDR) represents the proportion of financing provided by a financial institution in relation to the deposits it holds. The symbols β and μ are utilized in this context as the parameters and error term, respectively. The variables "i" and "t" represent the individual bank and time effect, respectively.

In the subsequent tier, the research investigates the influence of NPLs on the profitability of rural banks, while accounting for the impact of bank characteristics. This is achieved by estimating the subsequent panel equation:

$$y_{it} = \gamma + \beta_1 NPL_{it} + \beta_x X_{it} + \varepsilon_{it} \dots \dots \dots (3.2)$$

Where; y = the bank profitability proxied by return on assets. NPL is the nonperforming loan ratio. X_{it} is a vector of the control variables proxied by capital adequacy ratio, size of bank, operating expenses ratio, and financing to deposit and β_x is the coefficients of the control variables.

In the final step, the research examines the moderating effect of economic growth on non-performing loans and rural banks' profitability by estimating the following equation:

$$y_{it} = \gamma + \beta_1 (NPL * GDP)_{it} + \beta_x X_{it} + \varepsilon_{it} \dots \dots \dots (3.3)$$

Where GDP stands for economic growth and X_{it} is a vector of the control variables.

3.8.1 Diagnostic Testing

The research conducts the following diagnostics test, heteroscedasticity test, stationery test, and multicollinearity test.

3.8.1.1 Heteroscedasticity test

One critical presumption of straight relapse is that the fluctuation of the blunders is steady across perceptions (Muthusi, 2017). If the errors are constant, the errors are referred to as homoscedastic. Thus, to satisfy the regression assumption and be able to trust the results, the results should have a constant variance.

Normally, residuals are plotted to measure this hypothesis. In this study, the BreushPagan test was employed to examine the presence of heteroscedasticity in the regression model and verify the normal distribution of the error terms. The null hypothesis is stated as “variances of residuals are constant”. At the point when the probability value is more than 0.05, it implies that the residuals are homoscedastic, and this would prove the absence of heteroscedasticity in the study.

3.8.1.2 Multicollinearity

Multicollinearity refers to a statistical phenomenon wherein there exists a strong correlation between two or more independent variables within a multiple regression model (Wooldridge, 2010). If the correlation is 1 or -1, estimating the regression coefficients is impossible and unreliable. According to Muthusi (2017), multicollinearity is not a concern, but severe multicollinearity is since it increases the gap between the evaluated coefficients and makes the evaluations more susceptible to slight errors in the model. As a result, the coefficients are flimsy and difficult to understand. The Variance Inflation Factor (VIF) was consequently employed in the

study to assess for multicollinearity issues in the regression variables. Collinearity occurs when the VIFs values exceed 10. When the VIFs values are less than 10, however, collinearity is not a concern, and there is no major collinearity in the data to impede the regression analysis.

3.8.1.3 Stationarity test

A panel data is regarded as stationary if a temporal shift does not alter the pattern of the distribution. The mean, variance, and covariance are among the fundamental characteristics of the distribution that remain consistent across time. Because most forecasting methods assume stationarity in a distribution, stationarity is crucial. For instance, the stationarity assumption is required for auto-covariance and autocorrelation. Non-stationarity may cause unpredictable behaviour, such as t-ratios that do not follow a t-distribution or high r-squared values ascribed to variables that are not even closely related. As a result, the unit root test is employed to evaluate if the data are stationary.

3.9 Variables Description and Measurement

The subsequent sub-sections provide an exposition of the definitions of the independent and dependent variables.

3.9.1 Dependent variable – bank profitability

Profitability is a critical aspect of business performance and is a key metric used by investors and stakeholders to evaluate a company's financial health. The assessment of profitability is frequently conducted through the utilisation of financial metrics, including but not limited to return on assets (ROA), return on equity (ROE), and gross

profit margin. These statistics show the company's ability to create profits from its assets and investments (Ihemeje et al., 2022). The ROA is employed to measure firm profitability in this study. The calculation of the variable is:

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$$

3.9.2 Independent variables

3.9.2.1 Non-performing loan ratio

The nonperforming loan (NPL) ratio refers to a sum of borrowed funds for which the debtor has failed to make scheduled payments for a set period of time. In banks, it is the single most essential element in calculating credit risk. It's the percentage of total loans that are nonperforming. As stated by Adusei (2015), the NPL ratio serves as an indicator of a bank's loan portfolio quality. This refers to the percentage of the overall amount of loans and advances that are at risk of defaulting. A higher ratio indicates a lower level of efficiency in the management's evaluation of loan applications. This finding once again illustrates the unlikelihood of recovering the majority of the loans.

The metric under consideration pertains to the proportion of gross NPLs, as defined by the Bank of Ghana Prudential guidelines (specifically referring to impaired loans), in relation to the total amount of gross loans and advances.

3.9.2.2 Capital adequacy ratio

Capital adequacy ratio (CAR) is a statistic that measures a bank's ability to manage its capital in relation to its risk-weighted credit exposures (risk-weighted assets) (Asare, 2015). Similarly, this is an independent variable that has been selected because,

according to regulators, it is the key predictor of a bank's credit risk. A healthy CAR boosts a bank's profitability. It also contributes to the financial system's stability and effectiveness. The Bank of Ghana mandates that banks maintain a capital adequacy ratio of at least 10% of their assets (BoG, 2018). However, rural banks are to maintain 5% of their total deposit with the ARB Apex Bank.

3.9.2.3 Bank size

Previous studies have employed bank size (Bsize) as an independent variable to elucidate its impact on bank profitability (Poudel, 2012; Kargi, 2011). The relationship between bank size and credit risk is subject to ambiguity as it is a topic of contention among scholars. The prevailing viewpoint posits that larger banks tend to enjoy advantages stemming from economies of scale, although there exist dissenting opinions on this matter. The estimation of bank size can be derived by applying the natural logarithm function to either the total sales value or the total value. Drawing on the research conducted by Taipi and Ballkoci (2017), Asare (2015), and Adusei (2015), this study employed the logarithm of total assets as a measure of bank size.

3.9.2.4 Operating Expense Ratio

The operational expense ratio (OER) measures how much it costs to run an investment in relation to the income it generates. The OER is used to compare the costs of investments with equal risks (Suryanto, 2015). An investor should be on the lookout for warning signs that can make him decide against buying a particular property, such as rising maintenance costs, operating income, or utilities. The OER between 60% and 80% is optimal, although the lower it is, the better. It is calculated as follows:

$$OER = \frac{\text{Total operating expenses}}{\text{Total operating income}}$$

3.9.2.5 Financing to Deposit Ratio

The finance to deposit ratio, which is alternatively referred to as the loan-to-deposit ratio, is a metric utilized to evaluate a bank's liquidity. This is achieved by contrasting the aggregate loans disbursed by the bank with the total deposits received by the bank within the same timeframe (Priyadi et al., 2021). The FDR is quantified as a percentage. In the event that the ratio is excessively elevated, the bank may face a shortage of liquidity to address any unanticipated funding requirements. Conversely, in the event that the ratio is insufficiently high, the financial institution may not be maximizing its profitability potential. This is calculated as:

$$FDR = \frac{\text{Total Loans}}{\text{Total Deposits}}$$

3.9.2.6 Economic growth

According to Sukirno (2019), the economic growth rate of a nation is ascertained by computing the disparity in value between all goods and services generated within a particular time frame and those produced earlier within the same time frame. The assessment of an economy's relative well-being over a period is determined by its growth rate. The customary practise is to gather and disclose the information biannually through quarterly reports. The rates of economic growth frequently indicate augmentations in the gross domestic product (GDP) of a nation. The Gross National Product (GNP) can be employed in nations where the economy relies heavily on foreign revenue. The latter figure includes net earnings from foreign investments. In this research, the annual GDP growth rate is used to determine economic growth.

Table 3.1: Summary of Variable Descriptions and Measurements

Notation	Variable	Expected sign	Data Source
<i>Dependent Variables</i>			
y	Return on assets	na	Annual Report
<i>Independent Variables</i>			
NPL	Non-performing loan ratio	-	Annual Report
CAR	Capital adequacy ratio	-/+	Annual Report
BSize	Bank size	-/+	Annual Report
OER	Operating expenses ratio	-/+	Annual Report
FDR	Financing to deposit ratio	-/+	Annual Report
GDP	GDP growth rate	-/+	WDI

Source: Author's Construct (2023)

3.10 Data Analysis Techniques

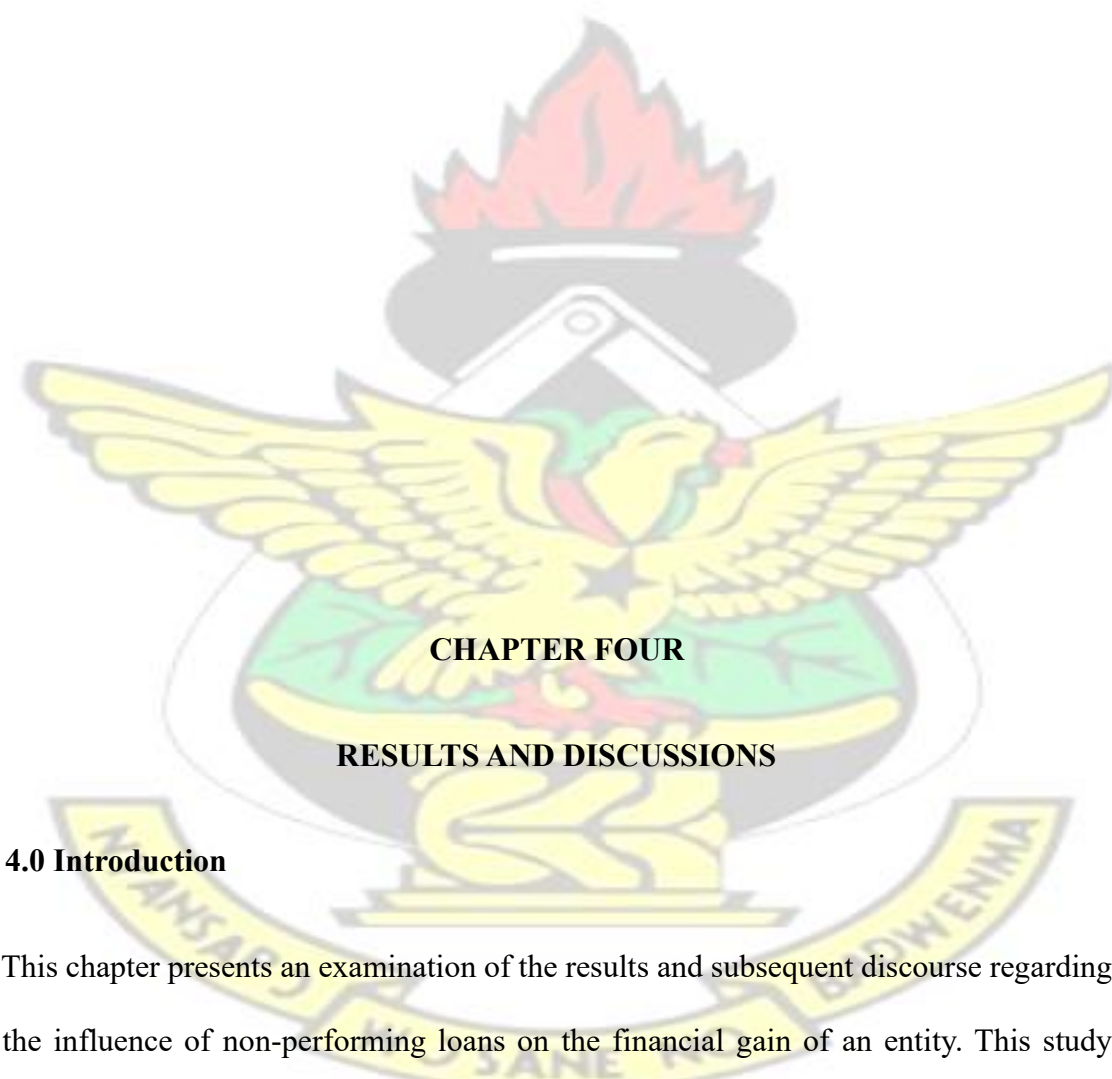
Figures from the financial statements were entered into Microsoft Excel to calculate the various ratios of the study variables. The data were then fed into Eviews to generate the results of the study variables. The results are tabulated and interpreted. The ability of this package to generate descriptive statistics and regression results efficiently made it the preferred choice.

The results were analysed by the use of both correlation and regression techniques. The utilization of correlation analysis empowers the researcher to definitively recognize the index of direction and the magnitude of the connection between two arrangements of scores without suggesting causality. The independent factors, just as the control factors, were regressed against the reliant variable to set up their likely relationship.

3.11 Chapter Summary

This chapter presents the methodology employed for conducting the research. The primary analytical approach employed in this study is a panel regression analysis. Panel

data models can be defined using fixed or random effects to reflect the effects of bank- and time-specific heterogeneities. The specification tests that could affect credit risks make it challenging to assess the relative importance of each independent variable in the regression model were also covered in this chapter. This chapter has described the study's data and measurement, including the sample, data selection criteria, and data sources. In this study, three types of data are used: credit risk variable, internal variables, and macro-economic variables.



CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents an examination of the results and subsequent discourse regarding the influence of non-performing loans on the financial gain of an entity. This study specifically examines a subset of rural banks situated in the Ashanti Region of Ghana. The chapter encompasses five prominent themes. In Section 4.1, an initial analysis of the data is presented. This analysis includes descriptive statistics of the study variables, an examination of the trends in rural banks' non-performing loans and profitability, a

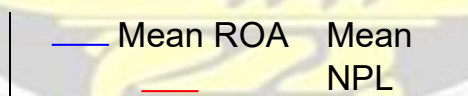
correlation analysis, and a diagnostic test of the regression models. The regression results pertaining to the internal factors influencing non-performing loans are presented in Section 4.2. Section 4.3 of this study undertakes an analysis and presents findings regarding the influence of non-performing loans on the profitability of rural banks. Section 4.4 presents an analysis of the outcomes pertaining to the impact of economic growth on non-performing loans and the profitability of rural banks. Section 4.5 serves as the concluding segment of the chapter, offering a concise overview of its key points and findings.

4.1 Preliminary Analysis of Data

This section of the study provides an overview of the descriptive statistics for both the dependent and independent variables, as outlined in the methodology. This describes the nature and direction of the variables accurately.

4.1.1 Trend Analysis of Banks' Non-Performing Loans and Profitability

The results show that average NPLs and profitability levels were investigated over time, and some intriguing patterns appeared. Figure 4.1 provides a trend analysis of rural banks' NPLs and profitability within the period of study.



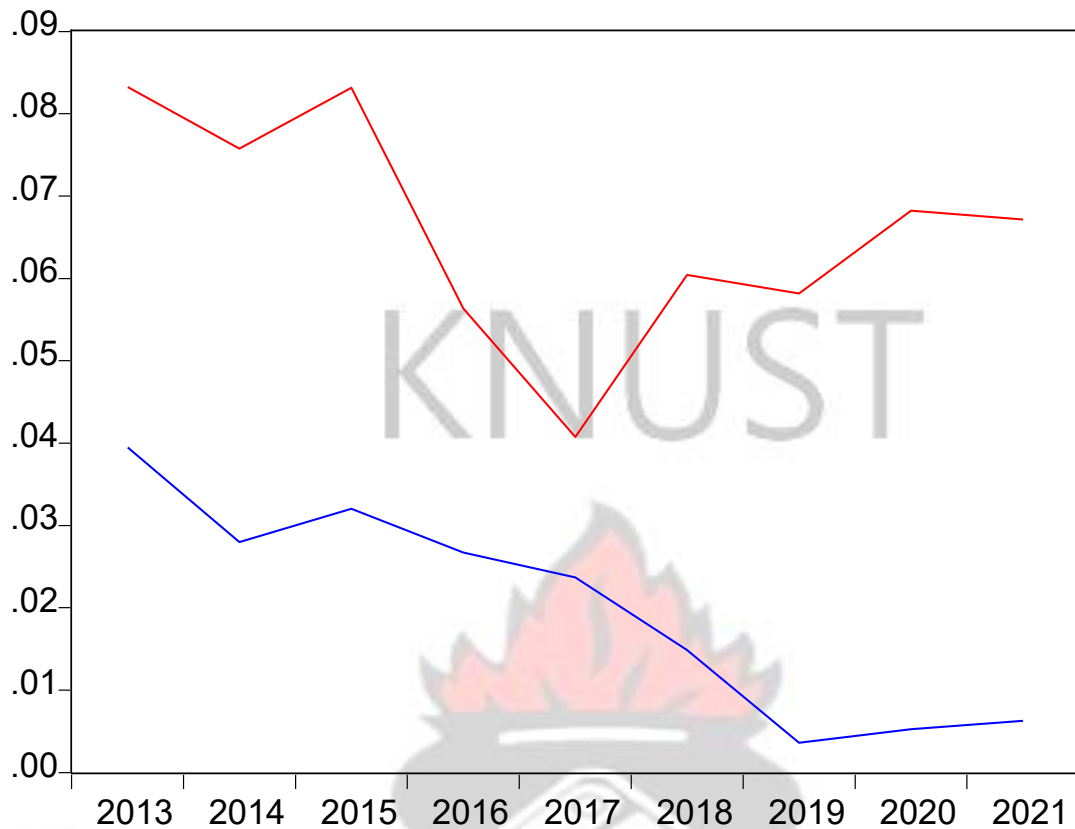


Figure 4.1: Trend analysis of banks' non-performing loans and profitability
Source: Author's Computation, 2023

Figure 4.1 shows that average NPLs dropped from 2013 to 2014, indicating an improvement in the banks under study's overall creditworthiness or riskiness during this time. Various elements, such as greater financial performance, better risk management procedures, or favourable economic conditions, may be responsible for this decline in credit risk. The average credit risk did, however, noticeably rise in 2015. This suggests that the creditworthiness of the organizations under investigation may be declining.

Economic downturns, rising default rates, or adjustments in the business environment that impacted the creditworthiness of the businesses are some of the causes of the growth in credit risk. The findings demonstrate a subsequent decline in credit risk following the 2015 apex. In 2017, the average credit risk fell to 0.04, indicating an improvement in creditworthiness. In 2018, however, the average NPLs increased again, rising to 0.06. Similar factors may have contributed to this increase as those observed

in 2015. The pattern of alternating increases and decreases in the average NPL persisted until 2021. This suggests that NPLs levels fluctuated over time, potentially as a result of a variety of economic, industry-specific, and company-specific factors. Overall, the findings demonstrate the dynamic nature of NPLs, as periods of improvement and deterioration were observed during the examined time frame.

An examination of profitability across the period in question on a yearly basis reveals some fascinating findings. As shown in Figure 4.1, the average profitability saw a decreasing trend from 2013 to 2021 with the lowest profit level being experienced in 2019. This reduction in the profit level might be as a result of various factors, such as inappropriate risk management procedures, inefficient management of banks resources, or unfavourable economic conditions.

4.1.2 Descriptive Statistics of the Study Variables

Nonperforming loans (NPLs) and bank performance are the primary focuses of descriptive statistics in this study. Table 4.1 lists the many variables that are explored in this study such as the number of observations, mean, standard deviation, skewness, and kurtosis for each variable.

Table 4.1: Descriptive Statistics of the Study Variables

Variable	Obs	Mean	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis
ROA	90	0.0199802	0.0174959	-0.02646	0.07528	3.675316	3.675316
NPL	90	0.0659153	0.0415106	0.00121	0.16702	0.4949958	2.71526
CAR	90	0.0606158	0.0538758	0.00003	0.47	5.295448	38.63913
BSIZE	90	7.790507	0.3703041	6.66637	8.47733	-0.748397	3.453464
OER	90	0.5875386	0.4853612	0.04831	4.25999	4.811913	37.45557

FDR	90	0.4684356	0.7150687	0.16178	5.18505	6.307466	41.55277
GDP	90	0.047078	0.0246015	0.0051394	0.0812889	-0.2478409	1.760932

Notes: ROA = return on assets; NPL = non-performing loan ratio; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = gross domestic product growth rate

Source: Author's Computation, 2023

As shown in Table 4.1, the rural banks' year-over-year profits averaged 1.99%, with a standard deviation of 1.75%. However, the profit level could range between -2.65% and 7.53%.

According to Table 4.1, non-performing loans (NPLs) exhibit an average value of 6.58% with a corresponding standard deviation of 4.151%. The upper limit of the observed values is 16.7%, while the lower limit is 0.12%. During the observation period, it was observed that the selected rural banks had a significant value of nonperforming loans. This is lesser than what Priyadi et al. (2021) reported for Indonesian Shari'ah rural banks.

As per Table 4.1, the CAR had a mean of 0.060616 and standard deviations of 0.0538758. This means that rural banks in Ghana have a CAR of 6.1%. However, the rural banking sector in Ghana is required to keep a CAR of 5% (BoG, 2018). This notwithstanding, the minimum and maximum values stood at 0.00003 and 0.47 respectively.

The mean score for the size of a bank is 7.790507. Additionally, the data reveals a standard deviation of 0.3703041, suggesting minimal deviation from the anticipated mean. The data set exhibited a minimum value of 6.66637 and a maximum value of 8.47733. The determination of the size of a bank lacks a universally accepted standard

value in theory. However, by considering the standard deviation, it is possible to infer that there are fewer deviations from the average bank size, which may impact the banks' performance.

The mean value of 0.587538 of operating expenses ratio in the research indicates that, on average, the operating expenses account for approximately 58.75% of the total revenue or income with a standard deviation of 48.54%, measuring the variability of the operating expenses ratio values around the mean. This notwithstanding, the lowest recorded operating expenses ratio is 4.83% and the maximum value is 425.99%.

The financing to deposit ratio is approximately 46.84% (standard deviation = 71.51%), suggesting that there is a moderate level of financing in relation to the total deposits. The lowest recorded financing-to-deposit ratio is 16.18% and the maximum value is 518.51%. The report suggests rural banks approximately depend on borrowed funds to support the entity's operations of 46.84%.

The findings suggest that the mean observed economic growth rate is 0.047078 (approximately 4.71%), accompanied by a standard deviation of 2.46%. The results show that Ghana's recorded positive growth over the study period, and this could have impacted banks performance. However, the minimum growth rate observed is 0.5% and a maximum of 8.13%.

4.1.3 Correlation Analysis

The present study examines the existence of a correlation between certain explanatory variables and the profitability of rural banks.

Table 4.2: Correlations Matrix

Variable	ROA	NPL	CAR	BSIZE	OER	FDR	GDP
----------	-----	-----	-----	-------	-----	-----	-----

ROA	1.000000						
NPL	-0.1192	1.000000					
CAR	0.1472	-0.2203**	1.000000				
BSIZE	-0.0916	-0.1776*	0.2581**	1.000000			
OER	0.1504	0.2614**	-0.1223	-0.4228***	1.000000		
FDR	0.1037	-0.1549	0.5475***	-0.0680	0.0408	1.000000	
GDP	0.0633	-0.1342	0.0856	-0.0576	0.0892	0.0206	1.000000

Notes: ROA = return on assets; NPL = non-performing loan ratio; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = gross domestic product growth rate *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Author's Computation, 2023

As indicated in Table 4.2, there is a positive correlation between profitability and capital adequacy ratio ($\beta=0.1472$), operating expenses ratio ($\beta=0.1504$), financing to deposit ratio ($\beta=0.1037$), and economic growth of ($\beta=0.0633$). Nonetheless, bank size ($\beta=0.0916$) and NPLs ($\beta=-0.1192$) are inversely correlated with profitability. The outcomes point out a moderate negative link between NPLs and bank performance.

4.1.4 Unit Root Test

The objective of performing stationary testing is to determine whether data exhibits integration of the same or different orders. The results of the stationary testing suggest that specific variables display stationarity at the stationary level, while others exhibit stationarity at the first difference level or show a lack of integration at the same order.

The stationary test utilises the Augmented Dickey-Fuller (ADF) test and the Levin-LinChu (LLC) test. Table 4.3 displays the achievable results of each unit root.

Table 4.3: Results of unit root test

Variable	ADF - Fisher	LLC test
ROA	28.5935*[0/d]	-1.99510**[0/d]

NPL	37.2637***[I/d]	-6.57553***[0/d]
CAR	30.2538*[0/d]	-7.81630***[0/d]
BSIZE	35.4120**[I/d]	-1.43618**[0/d]
OER	18.7698	12.7638
FDR	42.5252***[0/d]	-115.158***[0/d]
GDP	25.0870	-0.41321

Notes. ROA = return on assets; NPL = non-performing loans; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = gross domestic product growth rate

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Author's Computation, 2023

Table 4.3 presents the results indicating that the variables ROA, NPL, CAR, BSIZE, and FDR exhibit ADF probability values below the 10% alpha threshold, both at the level and when differenced. This implies that certain data exhibits stationarity at the level, while other data demonstrates stationarity at the first difference. The results of the LLC test indicate that the values of ROA, NPL, CAR, BSIZE, and FDR are statistically significant at the 5% level, suggesting that the data exhibit stationarity at the level. The stationarity testing results indicate the absence of integration among the variables, thereby suggesting that the panel least square (PLS) technique is an appropriate method for investigating the association between non-performing loans (NPL) and profitability of rural banks.

4.2 Internal Factors that affect Non-Performing Loans

Table 4.4 displays the findings pertaining to the impact of internal factors on nonperforming loans within rural banks in Ghana.

Table 4.4: PLS Results on the Internal Factors that affect NPLs

Variables/ Model	(1)
------------------	-----

ROA	-0.3408545 (0.3054333)
CAR	-0.0153732 (0.100742)
BSIZE	-0.0340022 (0.0225861)
OER	0.0107585 (0.0090227)
FDR	-0.0160947** (0.0071991)
_cons	0.3397699* (0.1809434)
Observations	90
R-square	0.1732
F-statistics	3.14
Prob > F	0.0125
Haussmann test	chi2(5) = 11.39 (p-value = 0.0442) (fixed effect model is preferred)

Notes: ROA = return on assets; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio. Standard errors in parentheses
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Author's Computation, 2023

As shown in Table 4.5, the coefficient of FDR is -0.0160947 which is statistically significant at a 0.05 level of significance. This implies a unit increase in financing to deposit ratio will result to a negative effect on the NPL ratio by 0.0160947 units holding all other variables constant. The findings are in line with findings of Priyadi et al. (2021), as they find significant effect of financing to deposit ratio on nonperforming loans.

Surprisingly, notable firm-level variables such as capital adequacy ratio, bank size, operating expenses ratio, and bank profitability are observed to be statistically insignificantly in determining rural banks NPLs in Ghana. This denotes that a unit

change in these factors will insignificantly affect the NPLs of Ghanaian rural banks. The findings differ from those of Louzis et al. (2012), Supriani and Sudarsono (2018), and Priyadi et al. (2021), although they are consistent with Sukmana (2015). According to Supriani and Sudarsono, a higher CAR indicates a larger monetary asset that can be used to retain losses and reduce the degree of bad debt. For Sukmana (2015), he expressed that CAR significantly affects NPF at Islamic banks in Indonesia. Sukmana (2015) indicates that a huge CAR empowers banks to utilize data innovation to completely evaluate the capacity of forthcoming financing clients or to utilize its funding to improve the capacity of risk assessors. The results align with the findings of Rajan and Dhal (2003) and Salas and Saurina (2002), who observed a lack of significant correlation between nonperforming loans and bank size in their respective research studies. In addition, the R-square value of 0.1732 indicates that the coefficient of determination for the overall model is moderately significant in its ability to predict the outcome. In a similar vein, it can be observed that the p-value of 0.0442 is below the conventional significance level of 0.05, thereby suggesting that the variables possess statistical significance in elucidating the outcome of the model.

4.3 Impact of Non-Performing Loans on Rural Banks' Profitability

In order to determine the impact of non-performing loans on bank performance, model 2 is developed. To determine whether or whether business financial performance may be influenced by the specified variables, the CAR, bank size, inflation rate, and GDP rate are all introduced into the regression equation (model 2) at the same time as control variables. The model 2's R^2 is 0.3877 with ROA as the dependent variable, indicating that this model accounts for 38.77% of the variance in rural banks' profitability. The results also revealed that all independent variables in the model are statistically

significant to the dependent variable, with a p-value of 0.0000. The panel regression findings are shown in Table 4.5.

Table 4.5: PLS Results on the Effect of NPLs on Rural Banks' Profitability

Variables/ Model	(2)
<i>Independent variable:</i>	
NPL	-0.0490204 (0.0440614)
<i>Control variables:</i>	
CAR	0.0320734 (0.0381718)
BSIZE	-0.0417478*** (0.0072142)
OER	-0.0000127 (0.0034473)
FDR	-0.001364 (0.0028236)
GDP	-0.0074883 (0.0581733)
_cons	0.347503*** (0.0578418)
Observations	90
R-square	0.3877
F-statistics	7.81
Prob > F	0.0000
Haussmann test	chi2(6) = 58.60 (p-value = 0.0000) (fixed effect model is preferred)

Notes: NPL = non-performing loans; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = economic growth.

Standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Author's Computation, 2023

According to the regression findings presented in Table 4.5, the coefficient associated with the NPL ratio is -0.0490204. This suggests that the NPL ratio has a negative impact on banks' return on assets, although the statistical significance of this relationship is not

established. Therefore, holding all other factors constant, an increase of one unit in the NPL ratio will result in a decrease in profitability for rural banks by 0.0490204. This finding aligns with the asymmetric information theory, which suggests that when borrowers have better information about their creditworthiness than lenders, adverse selection and moral hazard problems can arise.

The results further align with previous research conducted by Do et al. (2020) and Ihemeje et al. (2022). The research conducted by Do et al. find that there is a negative relationship between the increase in nonperforming loans and the return on assets (ROA) of banks in Vietnam. The research conducted by Ihemeje et al. concluded that NPLs demonstrated a negative and statistically insignificant correlation with return on capital employed in the Nigerian banking sector. According to Kingu et al (2018), there exists an unfavourable association between non-performing loans and profitability within the context of Tanzanian commercial banks. Gaur and Mohapatra (2020) analysis identified NPA as the key detractor of banking industry earnings in India. However, Nsobilla (2015) found that NPLs is statistically significant at 1%. The danger of liquidity was found to be statistically significant in determining on rural banks financial performance.

As shown in Table 4.5, CAR has a coefficient of 0.0320734 but is statistically insignificant. This means that a unit change in banks CAR will result in a positive effect on ROA by 0.0320734 units holding all other variables constant. Bank size appears to have a significant negative impact on ROA. Statistically, it reports a significant coefficient of -0.0417478. This means that a unit change in the size of a bank is likely to significantly decrease the return on assets by 0.0417478 units holding other variables constant.

The study further revealed that operating expenses ratio (coefficient = -0.0000127) and financing-to-deposit ratio (coefficient = -0.001364) have an insignificant effect on rural banks return on assets. This means that a unit increase in both operating expenses ratio and financing-to-deposit ratio will result to a decrease in rural banks return on assets by 0.0000127 and 0.001364, respectively.

The study also revealed that GDP growth rate have a negative effect on ROA but is statistically insignificant at any significance level. Specifically, the GDP growth rate generated a coefficient of -0.0074883 signifying as the country's GDP grows by one unit will result in an insignificant negative impact on rural banks profitability by 0.0074883.



4.4 Effect of Economic Growth on NPLs and Rural Banks' Profitability

This part of the study presents how general economic growth influence the effect of NPLs and rural banks' profitability. The research investigates the interacting effect of economic growth on the relationship between NPLs and banks' profitability in model 3. This model is tested with control variables. Table 4.6 displays a comparison of the results with and without the economic growth variables as a moderator.

Table 4.6: PLS Results on the Effect of Economic Growth on NPLs and Rural Banks' Profitability

Variables/ Model	(3)
<i>Independent variable:</i>	
NPL	-0.0490204 (0.0440614)
<i>Control variables:</i>	
CAR	0.0327673 (0.0385688)
BSIZE	-0.0405271*** (0.0072211)
OER	-0.000705 (0.0034922)
FDR	-0.0004603 (0.0027764)
<i>Moderator variable:</i>	
NPL* GDP	0.1584983 (0.8244739)
_cons	0.334041*** (0.0573578)
Observations	90
R-square	0.3778
F-statistics	7.49
Prob > F	0.0000
Haussmann test	chi2(5) = 64.85 (p-value = 0.0000) (fixed effect model is preferred)

Notes: NPL = non-performing loans; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = gross domestic product growth rate. Standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Source: Author's Computation, 2023

As indicated in Table 4.6, the results suggest that when moderated by GDP growth rate, NPLs have a positive effect on banks' return on assets (0.1584983), but although the statistical insignificance. This finding is different to the results in Table 4.5 when there is no moderation. This means that the general economic growth has a positive impact on the effect of NPLs on banks profitability. According to the asymmetric information theory, economic conditions and information imbalances can influence the relationship between NPLs and banks' performance. When the GDP growth rate is considered as a moderator, it implies that the overall economic growth of an economy plays a role in shaping the impact of NPLs on banks' profitability. The result is in consonance with the findings of Abdelmoneim and Yasser (2023), Iqbal and Nosheen (2023), and Obiora et al. (2022) as they found a positive impact of economic or external factors on the NPLs bank profitability nexus. However, the result refutes the findings of Do et al. (2020) as the observed that GDP growth rate have no impact on banks credit risks and performance in Vietnam.

4.5 Diagnostics Tests

4.5.1 Test for multicollinearity

The variance inflation factor (VIF) is applied to the predictors to see whether there are any issues with multicollinearity. As a rule of thumb, a VIF in excess of 10 is considered an indicator of harmful multicollinearity. All the explanatory variables' VIFs are less than 10, as shown in Table 4.7, suggesting that multicollinearity is not a concern.

Table 4.7: Test for multicollinearity

Variable	VIF	Tolerance (1/VIF)
NPL	1.15	0.866517
CAR	1.67	0.599286
BSIZE	1.37	0.732434
OER	1.29	0.774279
FDR	1.55	0.644687
GDP	1.05	0.953584

Notes: NPL = non-performing loan ratio; CAR = capital adequacy ratio; BSIZE = bank size; OER = operating expenses ratio; FDR = financing to deposit ratio; GDP = gross domestic product growth rate

Source: Author's Computation, 2023

4.5.2 Heteroscedasticity Test

Muthusi (2017) suggests using the Breusch-Pagan/Cook-Weisberg test to see if there is heteroscedasticity among the predictor variables. The χ^2 of 6.31 and p-value of 0.0120 ($p < 0.05$) means that the result rejects the null hypothesis that "variance of residuals is constant". This implies the presence of heteroscedasticity.

4.5.3 Test for Data Normality

Also, a normality test is conducted to evaluate the normality of the data variable in order to justify the parametric or nonparametric technique of analysis. The results are shown in Figure 4.2.

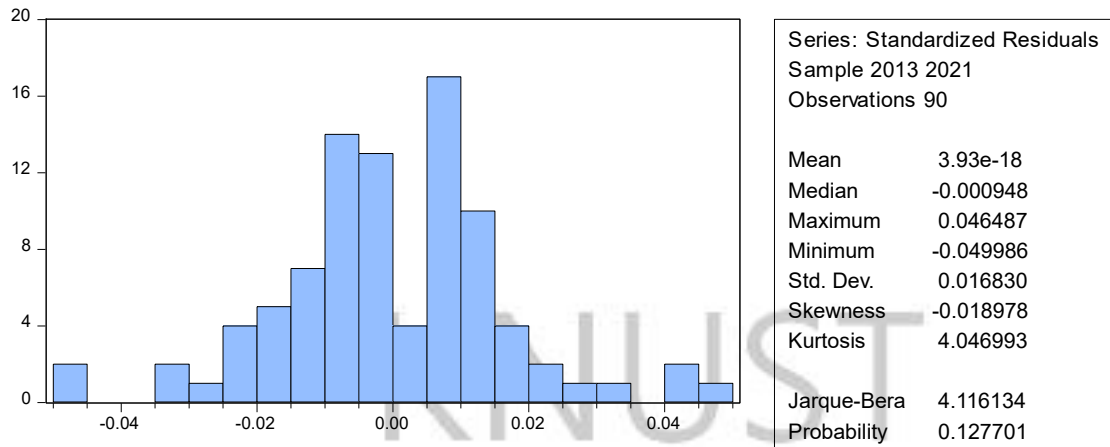


Figure 4.2: Test for Data Normality Source: Author's Computation, 2023

As shown in Figure 4.2, a Jarque-Bera statistic of 4.116134 and a probability of 0.127701 indicate strong evidence in favour the hypothesis that the data follows a normal distribution. Thus, the findings satisfied the assumption that the data is normally distributed.

4.6 Chapter Summary

This chapter analysed the influence of non-performing loans on the profitability of a distinct cluster of rural banks situated in the Ashanti Region of Ghana. This chapter offers a comprehensive examination of the study variables by presenting the findings and descriptive statistics. Moreover, it encompassed an investigation into the interplay between variables via correlation analysis. Additionally, the chapter explored the examination of a regression model and the subsequent analysis of the research variables.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter provides a summary of the content covered in chapter four. There are four separate sections. An overview of the research results is given in the first part. The second portion contains the study's conclusion. Policy implications and recommendations are presented in the third segment. Suggestions for future research are provided in the final section.

5.1 Summary of Findings

This study undertook an analysis of the internal factors that influence the nonperforming loan ratio in rural banks operating in Ghana. The study revealed that internal factors, particularly the financing to deposit ratio, exert a statistically significant impact on the occurrence of non-performing loans. Interestingly, the variables of capital adequacy ratio, bank size, operating expenses ratio, and bank profitability do not demonstrate a statistically significant impact on the NPLs of rural banks in Ghana.

The study reveals that there is a negative impact of the NPL ratio on the return on assets of rural banks. However, it is important to note that this relationship is not statistically significant. Additionally, it has been noted that various factors, including the capital adequacy ratio, operating expenses ratio, financing-to-deposit ratio, and GDP growth rate, have a negligible impact on the profitability of rural banks. Nevertheless, the size of a bank has a notable adverse effect on its profitability.

The study reveals that economic growth plays a moderating role in the relationship between non-performing loans and profitability of rural banks, resulting in a positive impact. Nevertheless, the observed effect lacks statistical significance.

5.2 Conclusion

The primary objective of this research was to assess the impact of non-performing loans (NPLs) on the profitability of rural banks. To achieve this, a panel research methodology was employed, selecting a sample of 10 rural banks from a population of 29 banks in the Ashanti region of Ghana. The study covers 9 full-year observations from 2013 to 2021, with data on internal factors obtained from the banks' annual audited reports. Fixed effect panel regression methodology was used to analyze the data and draw conclusions. The results of the study established that among the internal factors examined, the financing to deposit ratio was the only significant determinant of rural banks' non-performing loans. On the other hand, factors such as rural banks' capital adequacy ratio, bank size, operating expenses ratio, and bank profitability did not have a significant impact on the occurrence of NPLs in Ghana's rural banks. Furthermore, the research findings indicated that non-performing loans have an adverse effect on the profitability of rural banks. It was also found that economic growth has a positive influence on the relationship between NPLs and rural banks' profitability.

5.3 Policy Implications and Recommendations

Based on the findings in the research, the following recommendations are made industry or practice, research or academia, and policy.

5.3.1 Internal factors that have an impact on non-performing loans

It is recommended that rural banks in Ghana should focus on strengthening their risk management practices, particularly concerning the financing to deposit ratio. Developing and implementing effective internal risk assessment processes can help mitigate non-performing loans (NPLs) and improve asset quality.

Also, prospective researchers can extend the subject discussions by conducting more in-depth studies to understand the intricate dynamics of NPLs in rural banks. Exploring the reasons behind the observed impact of the financing to deposit ratio while the capital adequacy ratio and bank size were not significant could yield valuable insights.

Qualitative research methods or case studies might be useful in this regard.

5.3.2 Effect of NPLs on the profitability of rural banks

The study found a negative effect of NPL ratio on rural banks profitability. It is, therefore, recommended that rural banks should focus on diversifying their loan portfolios to mitigate the potential negative impacts of NPLs on profitability. A diverse portfolio can help distribute risks and ensure that the adverse effects of NPLs are offset by other income-generating assets.

It is also recommended that policymakers should consider providing rural banks with clear and flexible regulatory guidelines for managing NPLs. These guidelines should be designed to assist banks in mitigating NPL-related risks while supporting their core mission of providing financial services to underserved communities.

5.3.3 Effect of economic growth on the relationship between NPLs and rural banks profitability

It is recommended that rural banks should recognize the importance of economic growth as a moderating factor in their profitability. In periods of economic expansion, they should be cautious not to become overly aggressive in lending, leading to a surge in NPLs when the economic cycle turns. Comprehensive risk management strategies should be in place to balance profitability and risk, and these strategies should be adaptable to the economic environment.

Also, policymakers and regulators should maintain a monitoring system that assesses how economic growth affects rural banks' asset quality and profitability. This system can help detect early signs of stress in the banking sector and prompt necessary regulatory actions.

5.4 Suggestions for Future Research

This study examined how non-performing loans affect profitability in a sample of rural banks in Ghana's Ashanti Region. However, several areas for future research might improve and expand this domain's expertise. Longitudinal research over a prolonged period of time can shed light on the dynamic interaction between non-performing loans and rural bank profitability. Researchers may more clearly establish the causal link and pinpoint the temporal dynamics between these factors by studying data across time, taking into account changes in the banking industry, the state of the economy, and regulatory frameworks. Future research may evaluate the impact of non-performing loans on Ghanaian urban and rural banks' profitability. Researchers can pinpoint particular difficulties and possibilities particular to rural banking operations by evaluating the variations in loan performance and profitability metrics.

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APPENDIX I Lists of Rural Banks: Ashanti Region

S/N	Bank	Head Office
1	Adansi Rural Bank PLC	Fomena
2	Ahafo Ano Premier Rural Bank*	Wioso
3	Amanano Rural Bank	Nyinahin
4	Akrofuom Area Rural Bank	Akrofuom
5	Amansie Rural Bank PLC*	Antoakrom
6	Asante Akyem Rural Bank	Juansa
7	Asokore Rural Bank*	Asokore
8	Atwima Kwanwoma Rural Bank*	Kwanwoma
9	Atwima Mponua Rural Bank*	Toase
10	Atwima Rural Bank	Foase
11	Bosomtwe Rural Bank*	Kuntense
12	Bosome Freho Rural Bank	
13	Juaben Rural Bank	Juaben
14	Kumawuman Rural Bank	Kumawu
15	Kwamaman Rural Bank	Kwamang
16	Nsutaman Rural Bank	Nsuta
17	Nwabiagya Rural Bank*	Barekese
18	Odotobri Rural Bank*	Jacobi
19	Offinso Rural Bank	Offinso
20	Okomfo Anokye Rural Bank	Wiamoase
21	Otuasekan Rural Bank *	Kofiase
22	Sekyedumase Rural Bank	Sekyedumase
23	Sekyere Rural Bank*	Jamasi
24	Yaa Asantewaa Rural Bank	Ejisu
25	Ejuran Rural Bank	Ejura
26	Akumadan Rural Bank	Akumadan
27	Asokore Mampong Rural Bank	Asokore Mampong
28	Tepaman Rural Bank	Tepa

29	Kwabre Area Rural Bank	Kodie-Kumasi
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*Selected banks used in the study

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APPENDIX II Dataset for the Research

Comp	SN	year	NPL	ROA	CAR	Bsize	OER	FDR	GDP
Ahafo Ano Rural Bank	1	2013	0.08441	0.03559	0.04370	6.66637	4.25999	0.45586	0.073125
Ahafo Ano Rural Bank	1	2014	0.05972	0.03328	0.04060	6.89468	0.06543	0.54393	0.028562
Ahafo Ano Rural Bank	1	2015	0.03536	0.02766	0.04308	7.04415	0.09269	0.48254	0.021208
Ahafo Ano Rural Bank	1	2016	0.02101	0.01975	0.04350	7.20747	0.13837	0.32635	0.033735
Ahafo Ano Rural Bank	1	2017	0.03243	0.02988	0.04307	7.32468	0.18240	0.30918	0.081289
Ahafo Ano Rural Bank	1	2018	0.05004	0.02581	0.04901	7.45531	0.16569	0.32580	0.062001
Ahafo Ano Rural Bank	1	2019	0.05528	-0.01278	0.04894	7.54421	0.26656	0.30733	0.065078
Ahafo Ano Rural Bank	1	2020	0.06429	-0.00724	0.04705	7.73224	0.14670	0.23784	0.005139
Ahafo Ano Rural Bank	1	2021	0.02941	-0.02193	0.04907	6.76956	0.13813	0.24882	0.053565
Amansie West Rural Bank	2	2013	0.12178	0.03680	0.04855	7.56487	0.73947	0.47185	0.073125
Amansie West Rural Bank	2	2014	0.15183	0.02110	0.04808	7.67899	0.78711	0.42699	0.028562
Amansie West Rural Bank	2	2015	0.16086	0.02350	0.04910	7.74297	0.81941	0.41712	0.021208
Amansie West Rural Bank	2	2016	0.12847	0.01602	0.04842	7.85588	0.84219	0.44056	0.033735
Amansie West Rural Bank	2	2017	0.03283	0.01979	0.04941	7.90389	0.86116	0.48374	0.081289
Amansie West Rural Bank	2	2018	0.04881	0.00529	0.04781	8.01340	0.85349	0.47469	0.062001
Amansie West Rural Bank	2	2019	0.04145	0.00659	0.47000	8.12844	0.42302	5.10255	0.065078
Amansie West Rural Bank	2	2020	0.04043	0.01605	0.04825	8.28638	0.37486	0.46772	0.005139
Amansie West Rural Bank	2	2021	0.05187	0.01370	0.04802	8.32233	0.27338	0.48769	0.053565
Asokore Rural Bank	3	2013	0.09108	0.02945	0.00003	7.06033	0.83250	0.28022	0.073125
Asokore Rural Bank	3	2014	0.09249	0.00100	0.00331	7.10558	1.06391	0.27902	0.028562

Asokore Rural Bank	3	2015	0.15140	0.00097	0.00348	7.14302	0.80523	0.16178	0.021208
Asokore Rural Bank	3	2016	0.08344	0.01444	0.04814	7.33586	0.97945	0.33529	0.033735
Asokore Rural Bank	3	2017	0.06864	0.00951	0.05090	7.39996	1.03394	0.39964	0.081289
Asokore Rural Bank	3	2018	0.07246	0.00791	0.05292	7.47081	0.94957	0.38294	0.062001
Asokore Rural Bank	3	2019	0.07721	-0.02646	0.05072	7.52305	1.15050	0.38580	0.065078
Asokore Rural Bank	3	2020	0.07660	0.00278	0.03702	7.65156	0.46098	0.31843	0.005139
Asokore Rural Bank	3	2021	0.07483	-0.00457	0.05221	7.69482	0.04831	0.37193	0.053565
Atwima Kwanwoma Rural Bank	4	2013	0.13527	0.05646	0.04708	7.79603	0.57651	0.31025	0.073125
Atwima Kwanwoma Rural Bank	4	2014	0.13227	0.03432	0.04664	7.71766	0.65009	0.30393	0.028562
Atwima Kwanwoma Rural Bank	4	2015	0.00983	0.07528	0.17237	7.98048	0.57114	0.22453	0.021208

Atwima Kwanwoma Rural Bank	4	2016	0.04586	0.05882	0.15497	8.07196	0.60382	0.24114	0.033735
Atwima Kwanwoma Rural Bank	4	2017	0.00584	0.04309	0.14631	8.13993	0.17426	0.23959	0.081289
Atwima Kwanwoma Rural Bank	4	2018	0.01259	0.02800	0.14051	8.20323	0.20031	0.25876	0.062001
Atwima Kwanwoma Rural Bank	4	2019	0.01600	0.01606	0.14805	8.27582	0.21993	0.23823	0.065078
Atwima Kwanwoma Rural Bank	4	2020	0.02852	0.01520	0.04687	8.40274	0.18624	0.19601	0.005139
Atwima Kwanwoma Rural Bank	4	2021	0.03670	0.01639	0.05004	8.47733	0.18838	0.18862	0.053565
Atwima Mponua Rural Bank	5	2013	0.13518	0.05742	0.04728	7.79603	0.57555	0.31048	0.073125
Atwima Mponua Rural Bank	5	2014	0.00669	0.05027	0.05189	7.31257	0.79746	5.18505	0.028562
Atwima Mponua Rural Bank	5	2015	0.16002	0.02293	0.03741	7.59181	0.80098	0.44460	0.021208
Atwima Mponua Rural Bank	5	2016	0.00332	0.01916	0.04867	7.67034	0.82479	0.34790	0.033735
Atwima Mponua Rural Bank	5	2017	0.00422	0.02412	0.04743	7.74923	0.81743	0.28512	0.081289
Atwima Mponua Rural Bank	5	2018	0.16702	0.02081	0.04917	7.78481	0.82572	0.30074	0.062001
Atwima Mponua Rural Bank	5	2019	0.13677	0.00712	0.04452	7.88368	0.96807	0.27249	0.065078
Atwima Mponua Rural Bank	5	2020	0.12237	0.00554	0.04511	8.00445	0.28505	0.23112	0.005139
Atwima Mponua Rural Bank	5	2021	0.11221	0.00726	0.04945	8.05427	0.33134	0.23711	0.053565
Bosomtwe Rural Bank	6	2013	0.07183	0.03276	0.04449	7.49518	0.76925	0.52929	0.073125
Bosomtwe Rural Bank	6	2014	0.09329	0.02161	0.04802	7.55990	0.82122	0.50363	0.028562
Bosomtwe Rural Bank	6	2015	0.08673	0.02998	0.04688	7.65921	0.82092	0.42037	0.021208
Bosomtwe Rural Bank	6	2016	0.06389	0.02964	0.04700	7.75425	0.79676	0.35494	0.033735
Bosomtwe Rural Bank	6	2017	0.05684	0.03225	0.04731	7.81048	0.31081	0.35337	0.081289
Bosomtwe Rural Bank	6	2018	0.05103	0.01718	0.04866	7.88188	0.32210	0.38223	0.062001
Bosomtwe Rural Bank	6	2019	0.05872	0.02920	0.04553	7.42895	0.76602	0.56356	0.065078
Bosomtwe Rural Bank	6	2020	0.06207	0.00208	0.04538	8.09262	0.34132	0.25309	0.005139

Bosomtwe Rural Bank	6	2021	0.05551	0.01043	0.05048	8.13582	0.37997	0.27451	0.053565
Nwabiagya Rural Bank	7	2013	0.01446	0.04070	0.10277	7.72749	0.72723	0.63269	0.073125
Nwabiagya Rural Bank	7	2014	0.00494	0.03290	0.05718	7.79519	0.80097	0.51821	0.028562
Nwabiagya Rural Bank	7	2015	0.00139	0.03368	0.04746	7.91353	0.33795	0.40531	0.021208
Nwabiagya Rural Bank	7	2016	0.00121	0.02574	0.04211	7.99808	0.30046	0.37540	0.033735
Nwabiagya Rural Bank	7	2017	0.00426	0.02973	0.03946	8.05654	0.29334	0.34743	0.081289
Nwabiagya Rural Bank	7	2018	0.00753	0.00826	0.03609	8.11986	0.29910	0.34792	0.062001
Nwabiagya Rural Bank	7	2019	0.01068	0.00353	0.03406	8.13952	0.26357	0.35033	0.065078
Nwabiagya Rural Bank	7	2020	0.07171	-0.00781	0.04649	8.18603	0.92356	0.30507	0.005139
Nwabiagya Rural Bank	7	2021	0.11124	0.01425	0.04937	8.17579	0.85394	0.32131	0.053565
Odotobri Rural Bank	8	2013	0.03690	0.04717	0.04926	7.68102	0.73597	0.45421	0.073125
Odotobri Rural Bank	8	2014	0.03719	0.02930	0.03505	7.95319	0.76340	0.26097	0.028562
Odotobri Rural Bank	8	2015	0.04089	0.04353	0.04852	7.88870	0.75978	0.34864	0.021208
Odotobri Rural Bank	8	2016	0.03901	0.03341	0.05072	7.94203	0.68765	0.37723	0.033735
Odotobri Rural Bank	8	2017	0.03536	0.02063	0.04656	8.02890	0.72788	0.38570	0.081289
Odotobri Rural Bank	8	2018	0.05091	0.01377	0.05178	8.10286	0.23678	0.38695	0.062001
Odotobri Rural Bank	8	2019	0.04868	0.00216	0.05645	8.17421	0.28446	0.41831	0.065078
Odotobri Rural Bank	8	2020	0.07916	0.00858	0.04883	8.32208	0.25403	0.23139	0.005139
Odotobri Rural Bank	8	2021	0.07537	0.01232	0.04978	8.36084	0.21869	0.24612	0.053565
Otuasekan Rural Bank	9	2013	0.06412	0.02989	0.02505	7.42312	0.80718	0.48660	0.073125
Otuasekan Rural Bank	9	2014	0.07025	0.03099	0.02459	7.51673	0.79280	0.49901	0.028562
Otuasekan Rural Bank	9	2015	0.06868	0.04140	0.12936	7.65592	0.75833	0.48855	0.021208
Otuasekan Rural Bank	9	2016	0.07231	0.03837	0.16101	7.74089	0.35729	0.44148	0.033735
Otuasekan Rural Bank	9	2017	0.06792	0.03366	0.09808	7.83335	0.38561	0.39718	0.081289
Otuasekan Rural Bank	9	2018	0.05348	0.01384	0.05128	8.10296	0.24329	0.38290	0.062001
Otuasekan Rural Bank	9	2019	0.05945	0.00410	0.09219	7.95661	0.40034	0.37289	0.065078
Otuasekan Rural Bank	9	2020	0.05430	0.01194	0.08854	8.08593	0.34048	0.28928	0.005139
Otuasekan Rural Bank	9	2021	0.05549	0.007514527	0.0949	8.1292	0.2858	0.3112	0.053565
Sekyere Rural Bank	10	2013	0.07736	0.028563132	0.0475	7.553	0.7993	0.4922	0.073125
Sekyere Rural Bank	10	2014	0.10895	0.02507247	0.0467	7.639	0.7917	0.4053	0.028562
Sekyere Rural Bank	10	2015	0.11631	0.021358863	0.0446	7.7165	0.8394	0.3669	0.021208
Sekyere Rural Bank	10	2016	0.10495	0.01146636	0.0481	7.8142	0.8764	0.3808	0.033735
Sekyere Rural Bank	10	2017	0.09923	0.005948206	0.0498	7.9018	0.5194	0.3703	0.081289
Sekyere Rural Bank	10	2018	0.09048	0.00773391	0.0508	7.9569	0.3803	0.3667	0.062001
Sekyere Rural Bank	10	2019	0.07742	0.00654216	0.0489	8.0122	0.3354	0.338	0.065078
Sekyere Rural Bank	10	2020	0.08278	0.005395023	0.0476	8.1286	0.3846	0.2937	0.005139
Sekyere Rural Bank	10	2021	0.069	0.007208607	0.0527	8.1614	0.4323	0.3868	0.053565

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