EFFECTS OF NON-PERFORMING LOANS ON THE PROFITABILITY OF COMMERCIAL BANKS - A CASE OF SOME BANKS ON THE GHANA STOCK EXCHANGE

BY
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AUGUST, 2017
DECLARATION

STUDENT’S DECLARATION
I Addae Emmanuel declare that this dissertation with the exception of quotation and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE:…………………………………….

DATE:………………………………………..

SUPERVISOR’S DECLARATION
I hereby declare that the preparation and presentation of this work was supervised by me in accordance with the guidelines for supervision of this project work as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: REV. DR. JOHN OPOKU

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DATE:………………………………………..
ACKNOWLEDGEMENT

I would like to thank the Almighty God for my life, strength and wisdom which have helped me come to the successful completion of this work.

I am indebted to Rev. Dr. John Opoku for his pieces of advice, patience, insight, guidance and supervisory role throughout the development of this work.
DEDICATION

I dedicate this piece of work to the Almighty God for His faithfulness and mercies over my life all these years and also to my dear wife, Rita Adomko and our children, Nhyria, Oheneba, Adepah and Nyamkye
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ABSTRACT

The aim of this study was to establish the effect of non-performing loans on profitability of four of the major banks listed on the Ghana Stock Exchange (GSE) as this could enhance profitability in banks and consequently contribute to a healthy financial system. Panel regression analysis was employed to establish the relationship between credit risk and profitability in order to account for heterogeneity among selected banks; Agriculture Development Bank (ADB), EcoBank Ghana (EBG), Ghana Commercial Bank (GCB) and CalBank (CBG) for a data span of 2006 to 2015. By the use of Eviews, the analysis was conducted based on Fixed effects model and Correlated Random fixed effects - Hausman test. The study proxied return on equity (ROE) for profitability-dependent variable. Non-performing loan ratio (NPLR) and capital adequacy ratio (CAR) were the two key explanatory variables. The study revealed that NPLR negatively affect profitability of banks but rate of CAR showed a significant positive relationship with profitability. Bank Size equally showed a positive relationship with profitability. The $R^2$ explained 89% of the variations on profitability performance of the banks. Managers of banks are to comply strictly with the rules that regulate the operations of banks in Ghana especially on the issue of capital adequacy ratio. Banks should also be cautious on the rate they expand since bank size can equally affect the fortunes of banks. The central bank must also be up and doing to ensure that banks keep to all ratios set down by the Central Bank, the banking regulations and the various bards.
CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Industry in Ghana has been driven largely on credit facilities from the banks and other financial sectors in the Ghanaian economy and has played a pivotal role in our socio-economic development, (Hamisu, 2011). The banking industry has to be applauded for this prominence and influential role.

This means that the other industries in Ghana have depended mostly on the financial sector especially the banks for various financial supports and this has contributed to the survival of the Ghanaian economy.

However, many banks in Ghana today are making huge losses due to the problem of non-performing loans in their books. The possibility of a bank to make losses as a result of loans defaults by debtors often happens in the financial sector especially banks. This is clearly a negative effect against the intermediary role the banks play towards the growth of the economy. The rate at which these institutions give credit to businesses and some individuals step up the pace of economic growth of the nation (Kolapo, Ayeni, Oke, 2012).

Ghana banking system is regulated and monitored by the bank of Ghana with the Banking Act made by the parliament of Ghana. The Acts has regulations which guide the activities of all banks and some other financial institutions in the country. Unfortunately, records show that profits in the sector fell sharply in the years 2005 to 2007 to numerous reasons amongst the non-performing loans ratio (NPLR) on the books of most banks but however saw a better liquidity and profitability performance at the close of 2009 (Bank of Ghana, 2012).
Financial institutions all over the world face several risks of nonperforming loans, it is however prudent for these institutions to introduce monitoring mechanisms to follow up with the activities of borrowers. It is well noted that importance of credit risk management has increased particularly in the developing countries for both lenders and borrowers.

It is a fact that average bank asset quality worsened sharply due to the global economic meltdown. It is argued however that the poor performance of loans was very uneven in a number of countries. It is also established that a number of variables significantly affect NPL ratios which includes but not limited to lending interest rate, share prices and some risk factors.

Non-Performing Loans is the possibility of a borrower defaulting an unpaid loan either partly or in full (Basel Committee on Banking Supervision, 2001). This is in line with Ahmad and Ariff (2007), who stated that NPL is a percentage of loans that are not repaid within three months. The committee further emphasized on credit risk management practices due to the rise of NPLs which is unfavorable to banks achievement of core targets.

Balasubramaniam (2013) outlined some effects that NPLs can have on bank’s activities. He argued that dealing with NPLs takes essential part of management’s time and effort to the detriment of other essential activities of the bank since management could have engaged in fruitful activities to bring good return with the time and effects wasted on NPLS.

The author further mentioned that banks do not earn interest income on NPLs and end up losing asset but also waste money to institute specialised departments and hired specialised financial engineers to deal with NPLs. According to Balasubramaniam (2013) NPLs in addition, block income which compels banks to borrow and these
results in additional cost to the bank, hence a reputational risk to the bank. If a bank faces NPL problems, it negatively affects its good standing, merging with other institutions to take advantage of better business opportunities.

The study of the impact of credit risk on banks is important because they affect the financial intermediation role of commercial banks which is a core source of income to the banks and ultimately, the financial stability of an economy (Klein, 2013). In this regard, NPLs have gradually drawn attention with the recognition that a result of huge NPL ratios on the books of banks shows clearly the level of inactivity of the economy. This is largely because commercial banks measure their profit performance among other things by the level of loan recoupment and failure to do so adversely impact on the performance (Balasubramaniam, 2013). Khemraj and Pasha (2012) explain that high percentages of NPLs are highly correlated with banks’ performances especially in emerging economies. Fofack (2005) also associated banks’ heavy accumulation of NPLs with profitability and observed that the NPLs can heavily contribute possible financial distress.

Ghana Banking Survey conducted in 2013 showed that most commercial banks in Ghana are facing huge bad loans, a situation the central bank considered as serious because key banks such as GCB Bank, ADB, CAL Bank, and Ecobank-Ghana were not spared. The report did not however indicate the actual outcomes of it but other proofs suggest that bad loans adversely affect the banks’ financial condition.

According to Karim, Chan and Hassan (2010), the main effect of bad loans is the ability to hinder the bank to grow financially. This is because bad loans drag banks into liquidity problems and make them unable to extend funds to other potentially viable businesses. Karim et al. also maintained that the banks cannot take up some
procreative investment opportunities because of locked up capital due to bad loans and makes banks experience shortfalls in revenue generation.

1.2 Statement of Problem

Ensuring strong credit risk management for building quality loan portfolio is of paramount importance to robust performance of commercial banks as well as overall economy (Charles and Kenneth, 2013). The growing stock of literature in finance and economics underscores that failure in credit risk management is the main source of banking sector crises which possibly leads to economic failure experienced in the past including 2008 global economic financial crises (Fofack, 2005; Onaolapo, 2010; Charles and Kenneth, 2013).

Loan portfolio constitutes the largest operating assets and source of revenue of most financial institutions. However, some of the loans given out become non-performing and adversely affect the profitability and overall financial performance of the lending institutions. Many lending institutions in Ghana are confronted with the challenge of rising non-performing loan portfolios despite efforts at stemming the tide. Nonetheless very little work has been done in the past to extensively digest the effects NPL has on profitability of banks in Ghana.

This work sought to investigate extensively into how NPL can affect commercial banks profitability performance in Ghana. Thus, this work aims to establish whether credit risk management has an effect on profitability.
1.3 Objectives of the Study

The general objective of the study is to investigate the effects of Non-Performing Loans on the profitability of the banks understudy.

Specifically, the study seeks to address the following objectives;

1) To investigate the relationship between Non-Performing Loan Ratio (NPLR) and the banks’ profitability.

2) To examine the correlation between Capital Asset Ratio (CAR) and the profitability of the selected banks.

3) To assess the relationship between Bank Size and profitability.

4) To investigate whether inflation has any relationship with profitability.

1.4 Research Questions

Related to the problem, the research seeks to address the following questions;

1) How far NPLs affect the profitability performance of commercial banks in Ghana?

2) Is there a statistically significant relationship between NPLR and profitability of the selected banks?

3) Is there a statistically significant relationship between CAR and profitability of the selected banks?

4) Is there a statistically significant relationship between bank size and profitability?

1.5 Justification of the study

The core objective of the study is to discover how credit risk can affect the profitability performance of the banks understudy and suggest ways management can
improve on their bank’s NPL ratios. First this study will adequately inform shareholders and potential investors on the risk in banking so that they can make well informed investment decisions.

Second, the study may offer the banks under review some solution to their challenges since secret surrounding banks profit maximization in our part of the world might be unraveled. The information which will be provided by this thesis could also offer investors some background information on some commercial banks in Ghana and further contributes to academic literature.

Third, it is expected that the recommendations of this study will complement the policies by the regulatory bodies and the efforts of the banking institutions in addressing problems of default and the unnecessary legal tussles that characterizes repayments of bank facilities. Fourth, to other researchers, studying on a related subject, this study will serve as a good literature.

Fifthly, the Central bank policy makers will find the results from the study informative and helpful in the formulation of policies.

Sixthly, this be useful information for banks and financial institution that may or may not adopt Basel II framework as one of the primary responses to the current economic recession. Finally, Banks would benefit from a study such as this in determining whether the frameworks and the policies they have adopted to manage credit risk have an impact on bank’s profits.
1.6 Scope of the Study

The work investigates the effect of Non-Performing Loans on the profitability of four commercial banks out of the many commercial, development and investment banks in Ghana.

The data will be collected from audited financial reports of the banks under study for eight years, from 2009 to 2016.

1.7 Limitations of the Study

The study considers only four commercial banks (Ghana Commercial Bank, Agricultural Development Bank, Cal Bank and Eco Bank Ghana) out of the many commercial, development and investment banks in Ghana and therefore represents a relatively small proportion of the commercial banks in Ghana. This means that the sample size will not be statistically significant for the generalization of the results. Similarly, the credit risk which the study sought to investigate is only one of the factors that might influence profitability of banks. If other factors are also considered the result and the conclusions might change.

Moreover, the data which will be used might not give the true picture of the study on the premises of an IMF assertion that Ghanaian banks are engaged in a lot of unethical practices which result in overstatement of profitability, liquidity and capital (IMF country report, 2011).

Furthermore, the eight years of study duration might also be too short to generalize the results. Finally, there are also resource constraints, in terms of time and logistics.
1.8 Organization of the study

The study is grouped into five chapters. Chapter one covers the background study, problem statement, objective and research questions. Chapter two reviews related literature, this includes the determinants of credit risk, theories of credit risk and empirical review. Chapter three presents the methodology. The methodology deals with the model specification and method of estimation. Chapter four analyses and discusses the findings, conclusion and the recommendation to the study. The major finding of the research, conclusions and recommendations on the overall work are presented in chapter five.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature relevant to the study of the impact of credit risk on profitability of selected commercial banks in Ghana. There are three main sections in this chapter. The first section surveys the conceptual and theoretical foundations of the subject. Here, the definitions of concepts and theories among other subthemes are presented. The second section considers the review of empirical studies that previous scholars have conducted in this area of research. The third section draws conclusions from the theoretical and empirical literature.

2.2 Non-Performing Loans

Many and varied definitions of non-performing loans as a proxy can be extracted from the literature, but these definitions virtually mean the same thing. For instance Paterssson and Wadman (2004) considered non-performing loans as credit facilities that banks do not profit from because they have been in default. Non-performing loans are loans which the banks cannot recoup within a specified period as governed by the rules and regulations in a country. It is any loan in which the principal and the interest payments are more than 90 days overdue; or more than 90 days” worth of interest has been refinanced (the International Monetary Fund (IMF), 2009). Non-performing loans generally refer to loans which for a relatively long period of time do not generate income; that is the principal and/or interest on these loans has been left unpaid for at least 90 days (Fofack, 2009). Non-performing loans are further defined as loans whose cash stream is so uncertain that the bank does not recognize as income until cash is received, and whose interest rate has been lowered because of problem
with the borrower (Machiraju, undated). Machiraju expresses non-performing loans as a leading indicator of credit quality. Under the Ethiopian banking business directive, non-performing loans are defined as “loans or advances whose credit quality has deteriorated such that full collection of principal and/or interest in accordance with the contractual repayment terms of the loan or advances in question” (NBE, 2008).

The classification of a loan as bad or doubtful may result from a specific act by the borrower, for example, petitioning for bankruptcy, or from circumstances that have the potential to place the loan at risk. For example, the borrower may have defaulted on one or more of the terms of the loan, or a substantial part of its assets may be in an industrial sector or country that is suffering from an economic recession (Taylor, 1993). The criterion for identifying non-performing loans varies. Some countries use quantitative criteria to distinguish between “good” and “bad” loans. For example, the number of days of overdue schedule payments while others rely on qualitative norms like the availability of information about the client’s financial status, and prospects of future payments. Nonperforming loans could be detected early from the violation of the terms of agreement by the borrower.

2.3 Determinants of non-performing loans

The effects of non-performing loans on profitability levels of commercial banks do not occur in a vacuum. There are a number of factors responsible for their existence. This section presents a brief look at these factors. For the purpose of this study, consideration is given to macro factors and bank specific factors.
2.3.1 Macroeconomic factors

Gross Domestic Product (GDP) // According to Vong et al (2009) the economic growth, which is measured by the real GDP growth rate was expected to affect banking profitability positively by its inclusion in the profit determinants model. According to the author there is a perception that loan defaults are normally lower in times of favorable economic growth and vice versa. Besides, higher economic growth may lead to a greater demand for loans which will result in both interest and non-interest incomes hence increase in the profits of commercial banks. However, empirical studies have revealed a mixed effect on the relationship between economic growth rate and banks profitability. As some studies support the general expectation of positive relation between these two variables others too exhibits a contradictory findings in terms of negative or insignificant relation between the two. Karkrah and Ameyaw (2010) cited that study done by Sufian et al. (2008) on the relationship between macroeconomic and return on equity (ROE) regarding Philippian banks revealed a positive relationship between GDP and banks profitability. Also Husni (2011) observations on the Jordanian banking shows a significant and negative relationship between ROE and annual growth rate of Gross Domestic Product (GDPGR) of the commercial banks in Jordan and the findings of Vong et al (2009) also exhibited an insignificant relationship between GDP and commercial banks profitability.

According to Kaufman (2004), literature has indicated that there is a linkage between the phases of the business cycle and banking stability such that macroeconomic stability and banking soundness are inevitably related and economic theory and other
evidences strongly indicate that instability in the macro economy is associated with instability in banking and financial markets and vice versa (Geanakoplos, 2009).

The relation between the macroeconomic environment and loan quality has been investigated in the literature linking the phase of the business cycle with banking stability. In this line of research, the hypothesis formulated is that the expansion phase of the economy is characterized by a relatively low number of NPLs, as both consumers and firms face a sufficient stream of income and revenues to service their debts. However, as the booming period continues, credit is extended to lower-quality debtors and subsequently, when the recession phase sets in, NPLs increase (Fisher 1933, Minsky 1986, Kiyotaki and Moore 1997). According to Salas and Saurina (2002) there is a significant negative contemporaneous effect of GDP growth on the NPL ratio and infer a quick transmission of macroeconomic developments to the ability of economic agents to service their loans.

Unemployment
The other macroeconomic variables, apart from GDP growth, such as unemployment and interest rates have got an impact on household and firms that they have a relation with NPL ratio. More specifically, an increase in the unemployment rate influences negatively the cash flow streams of households and increases the debt burden (Salas and Saurina, 2002). With regards to firms, increases in unemployment may signal a decrease production as a consequence of a drop in effective demand. This may lead to a decrease in revenues and a fragile debt condition.

Interest rates
Interest rate affects the difficulty in servicing debt as in the case of floating rate loans (Kaufman, 2004). This implies that the effect of the interest rate should be positive,
and as a result the increasing debt burden caused by rising interest rate payments should lead to a higher number of NPLs. The choice of GDP, unemployment and interest rate as the primary determinants of NPLs may also be justified from the theoretical literature of life-cycle consumption models. Lawrence (1995) examines such a model and introduces explicitly the probability of default. The model implies that borrowers with low incomes have higher rates of default. This is explained by their increased risk of facing unemployment and being unable to pay. Additionally, in equilibrium, banks charge higher interest rates to riskier clients. Further, Rinaldi and Sanchis-Arellano (2006) extend Lawrence’s model by including the possibility that agents can also borrow in order to invest in real or financial assets. After solving the optimization problem of an agent, they derive the probability of default which depends on current income, the unemployment rate (which is linked to uncertainty regarding future income) and the lending rate.

Rasiah (2010) advocates that interest rate have been captured in most studies as profitability determinant of commercial banks because net interest income which results from the difference between interest income and interest expenses has enormous impact on banks profitability. He stated that most research papers on banks” profit determinants present the interest rate as external variable because changes in interest rates is mostly caused by government economic policies and supply and demand market conditions. Moreover, he mentioned that the impact of interest rate changes on the commercial banks profitability depend on the extent and speed at which the change have on short and long term period of banks portfolio. And also the speed and flexibility with which the bank can amend its revenue sources and cost of funds to match up to the change. According to Rasiah (2010), commercial banks
normally alter the rate of return on their assets to offset any differences caused by interest rates fluctuations resulting from economic policies. This is because most of the commercial banks assets for instance short term loans have short maturity and the rates on short term loans are normally flexible and because of that it is easy for banks to change the rate of return to suit the changes with the interest rate.

Empirical evidence on the impact of the interest rate on commercial banks profitability shows a positive relation between interest and profitability. For instance, Uhomoibhi, (2008) investigation on the impact of macroeconomic variables on commercial banks profitability in Nigeria over the period of 1980-2006 reveal that real interest rate is a significant macroeconomic determinants of banks profitability in Nigeria. The finding also exhibits a positive relation between interest rate and profitability. Moreover, a research done by Pasiouras and Kosmidou (2007) on factors influencing the profitability of domestic and foreign commercial banks in the European Union also revealed a positive relation between interest rate and banks” profits with regards to domestics banks.

**Inflation**

Macroeconomic instability would have consequences for the loan quality of banks in any country (Salas and Saurina, 2002). High inflation increases the volatility of business profits because of its unpredictability, and because it normally entails a high degree of variability in the rates of increase in prices of goods and services which make up the overall price index. The probability that firms will make losses rise as does the probability that they will earn windfall profits. Generally, the effect of
macroeconomic instability on the financial sector and banking in particular makes it a cause for non-performing loans.

Rasiah (2010) in his study asserted that central banks in their capacity to control inflation increase the cost of borrowing and reduce the credit creating capacity thus the funds being given to the commercial banks as loans. As result of this the cost of borrowing becomes higher and the banks become more stringent in their lending policies which will subsequently lead to lower demand for funds and a fall in the volume of spending. Obviously the advent of such situation may adversely affect the profitability of the commercial banks because banks earn their revenue mostly from the loans they give to the customer so if the demand for loans falls as a result of the higher cost of borrowing then definitely earnings as well will fall hence the profit. Rasiah (2010) further stated that inflation impact negatively on commercial banks profitability by decreasing the real value of bank’s assets as compared to their liabilities. This is because commercial banks nominal assets might be larger than their nominal liability due to their nature of being net monetary creditors and because of this in times of high inflation the value of the nominal assets would decrease more relative to the increase in the value of nominal liability.

Empirical evidence seems to support this notion that inflation impact negatively on the profitability of commercial banks. Husni (2011) revealed a significant and negative relationship between the ROA of Jordanian commercial banks and inflation rate. To this extent Rasiah (2010) in his study documented that the impact of inflation on banks profitability to large extent depend on banks’ ability to anticipate the occurrence of the inflation. This is because if banks are well assured of the possible
inflation then interest rate would be increase to offset the imbalance and this would make the real value of the bank’s assets and liabilities to stay unchanged and vice versa. This is in line with the findings of Pasiouras and Kosmidou (2007) which reported that inflation was positively related to profitability of domestic banks in Europe because the levels of inflation were anticipated by domestic banks. This gave them the opportunity to adjust the interest rates accordingly and consequently earned higher profits. This result is similar to those results cited by Husni (2011) in his observation which includes (Sudin, 2004; Uhomoibhi, 2008, and Benaceur and Goaied (2010). Rasiah (2010) also indicated that Bourke (1989), and Molyneux and Thornton (1992) are some of the researchers in this area of study who have assessed the effect of inflation on commercial banks profitability and it has been revealed that their researched posted a significant positive relationship between the rate of inflation and bank profitability.

2.3.2 Bank Specific factors
Macroeconomic factors which are viewed as exogenous forces influencing the banking industry should not be sought exclusively in determining the credit risk (CR). In contrast, the typical nature of the banking sector along with the specific policy choices of a particular bank with regard to its efforts to maximize efficiency and improve its risk management are expected to exert a vital influence on the evolution of NPLs (Brownbridge, 1998). Thus, bank specific factors also ascribe to the causes of nonperforming loans. Due to the nature of their business, banks are exposed to default risk from borrowers.

Moral hazard
According to Brownbridge (1998) many of the bad debts were attributable to moral hazard—the adverse incentives on bank owners to adopt imprudent lending strategies, in particular insider lending and lending at high interest rates to borrowers in the most risky segments of the credit markets. The author observed that the second major factor contributing to bank failure was the high interest rates charged to borrowers operating in the high-risk segments of the credit market. This involved elements of moral hazard on the part of both the banks and their borrowers and the adverse selection of the borrowers.

According to Husni (2011) the internal determinants of banks profitability are normally consisting of factors that are within the control of commercial banks. They are the factors which affect the revenue and the cost of the banks. Some studies classified them into two categories namely the financial statement variables and non-financial variables. The financial statement variables include factors that are directly related to the bank’s balance sheet and income statement. Whiles, the non-financial statement variables include factors like the number of branches of a particular bank, location and size of the bank (Haron Sudin, 2004).

**Loan quality**

As mentioned above, one of the major roles of banks is to offer loans to borrowers and loans serve as one of the ultimate source of earnings for commercial banks. In other words, loans represent one of the highest yielding assets on banks’ balances sheet. It is obvious that the more banks offer loans the more it generates revenue and more profit (Abreu and Mendes, 2000). But banks have to be courteous in offering more loans because as they offer more loans to customers, they expose themselves to
liquidity and default risks which impacts negatively on banks’ profits and survival (Rasiah, 2010).

Empirical evidence from Suffian et al. (2008) on the profit determinants of banks in Philippi reveals that the proportion of loan loss provisions to total loans was statistically significant. As the amount of loan loss provisions indicates the level of credit risk, the results claims that Philippines banks with higher credit risk tend to exhibit lower profitability levels. Also a study conducted by Vong et al. (2009) indicated that the asset quality, as measured by the loan-loss provisions, negatively impacts on the performance of banks in Macao. With regards to the loan to total assets, Vong et al. (2009) findings revealed that instead of positively affecting profitability, it rather decrease profitability and according to these authors, this result was in confirmation with the initial finding of Vong (2005). According to them the reason is that it is due to stiff competition in the credit market and interbank placement of idle funds in foreign countries. Their finding was also in line with the citation they made on the observations of Bashir and Hassan (2003) and Staikouras and Wood (2003) which reveals that a higher loan ratio actually impacts negatively on profits because banks that depend more on non-loan earning assets are more profitable than those that rely heavily on loans. On the other the investigation of Husni (2011) reveals that interest margin on loans provided by the banks in Jordan is a significant driver of profitability and poses a positive relationship with profitability. This is in line with a citation made by Vong et al. (2009) on findings of Abreu and Mends (2000) which exhibit a positive relationship between the loan ratio and profitability.
To measure the quality of loans on the banks’ balance sheet Rasiah (2010) suggested the use of non-performing loans as an indicator of the loans quality. And Vong et al (2009) used the amount of loan-loss provision to total loans (PRTO) as proxy to non-performing loans. In addition, in order to incorporate loans and advances (interest income) as a variable in the profit determinants model, Vong et al (2009) used loans as a percentage of total assets (LOTA) as variable in the model. LOTA is measured by total loans divided by total asset.

**Deposits**

Banks are said to be heavily dependent on the funds mainly provided by the public as deposits to finance the loans being offered to the customers. There is a general notion that deposits are the cheapest sources of funds for banks and so to this extent deposits have positive impact on banks profitability if the demand for bank loans is very high. That is, the more deposits commercial bank is able accumulate the greater is its capacity to offer more loans and make profits (Rasiah, 2010). However, one should be aware that if banks loans are not high in demand, having more deposits could decrease earnings and may result in low profit for the banks. This is because deposits like Fixed, Time or Term deposits attract high interest from the banks to the depositors (Rasiah, 2010). Investigation done by Husni (2011) on the determinants commercial banks performance in Jordan disclosed that there is significant positive relationship between ROA and total liability to total assets. To capture deposits in the model Vong et al (2009) presented the effect of deposits on profitability as deposits to total assets ratio.
Capital ratio

Rasiah (2010) and Vong et al (2009) included capital ratio as a variable in their study of determinants of banks profitability and performance because capital also serves as a source of funds along with deposits and borrowings. They argue that capital structure which includes shareholders’ funds, reserves and retained profit affect the profitability of commercial banks because of its effect on leverage and risk. They documented that, commercial banks assets could be also financed by either capital or debt. But debt financing could be very risky as compared to capital financing with regards to credits and liquidity risks with which commercial banks are exposed to. This is because for instance, if a commercial bank experience loss of profit as result of credit default or liquidity problem the bank still has the obligation to services its debt, on the other hand a commercial bank with enough capital is able take higher risk and also absorb shocks which emanate from liquidity and credits risks. Sufian et al (2008) argued that banks in developing countries needs a strong capital structure, because it provides them strength to withstand financial crises and offers depositors a better safety net in times of bankruptcy and distress macroeconomic conditions. And according to Molyneux (1992) banks with high level of equity can reduce their cost of capital and that could impact positively on profitability.

Expenses

Expenses as a variable in the profit determinants model of commercial banks is found in almost all the studies done in this area of study; examples are Vong et al (2009) and Rasiah (2010). According to some of these researchers especially Rasiah (2010) the commercial banks expenses reflect the expenditures that fall within the control of banks management and they could be classified into two categories thus interest and
non-interest expenses. One of the major expenses incurred by the commercial banks as they generate revenue is interest paid out to depositors which is termed as interest expenses. On the other hand, non-interest expenses include overhead expenses, operating expenses, salaries and wages paid to employees and miscellaneous expenses. Even though it is obvious that the more expenses incurred by the bank, the less profit the bank will make. But according to Vong et al (2009), the effect of expenses as a variable on banking performance and profitability is mixed. They stressed that investigations of Bourke (1989) and Jiang et al. (2003) revealed a negative relationship between expense and profitability which implies that banks with low operation cost makes high profits. This is in line with the observations of Karkrah and Ameyaw (2010) which revealed that non-interest expense represent a significant driver of profitability of commercial banks in Ghana and impacts negatively on profitability.

On the other Vong et al (2009), further document that the findings of Molyneux and Thornton (1992) show that, the expense variable impact positively on European banks profitability because the payment of high wages and salaries to employees reflects higher level of productivity of the employees which is in line with the efficiency theory. Moreover, Bennaceur (2003) and Guru et al. (2002) also observed positive relationship between profitability and expenses. Both researchers argued that this relationship exist because banks are able to pass on their overheads cost to depositors and borrowers in terms of lower deposit rates and larger lending rate Vong et al (2009). In order to include the expense variable in their model, Karkrah and Ameyaw (2010) and Vong et al (2009) presented the ratio of non-interest expenses to total assets (NETA) as proxy for total expenses.
Bank Size

According to Karkrah and Ameyaw (2010) market share or size of banks is normally used to capture potential economies or diseconomies of scale in the banking sector. Secondly, the size of banks as a variable control for cost differences and product and risk diversification. They argue that the first factor (economies or diseconomies of scale) is expected to lead to a positive relationship between bank size and profitability if there are significant economies of scale and their argument was based on the empirical evidence of Bikker & Hu (2002), Molyneux & Wilson (2004). This argument also seems to be supported by the investigation of Andreas & Gabrielle (2011) on determinants of bank profitability before and during the financial crisis in Switzerland. Their investigation revealed a positive relationship between larger and smaller banks and profitability. Karkrah and Ameyaw (2010) further presented that the second part which has to do with risk diversification could lead to a negative relationship between bank size and profitability. In the sense that, increased diversification may lead to lower credit risks and as a result cause lower returns. There are quite a number of researchers which seems to support this notion of negative relationship which exists between the bank size and profitability. For example, according to Dietrich, Wanzenried (2011) large banks in Switzerland were less profitable than small and medium-sized bank in the years of the financial crisis. And their main reasons for this negative relationship between size and profitability was that larger banks in Switzerland had relatively higher loan loss provisions during the crisis and that larger banks were found to have significantly lower net interest margins in times of turmoil than smaller banks. Observation of Sufian et al. (2008) on Philippines banks also shows a negative relationship between bank size and profitability. To these researchers the negative correlation was an indication of
smaller banks earning higher profits than larger banks and in support to the earlier studies which observed economies of scale and scope for smaller banks or diseconomies of scale for larger banks. Eichengreen and Gibson (2001) suggest that the impact of a growing bank's size on its profitability may be positive up to a certain limit. Beyond this limit, the effect of its size could be negative due to bureaucratic and other factors; Karkrah and Ameyaw (2010).

2.4 Factors that affect NPL

Keeton and Morris (1987) indicated that commercial banks with greater risk appetite tend to record higher losses. This also leads to leniency. Salas and Saurina (2002) attribute the leniency to disaster myopia, herd behavior and agency problems that may entice bank managers to lend excessively during boom periods of economic expansion. Sinkey and Greenwalt (1991) also indicated that there is significant positive relationship between the loan-loss rate and internal factors such as high interest rates, excessive lending, and volatile funds. Keeton (1999) also indicated a strong relationship between credit growth and impaired assets. Specifically, Keeton (1999) shows that rapid credit growth was associated with lower credit standards.

Salas and Saurina (2002) reveal that rapid credit expansion, bank size, capital ratio and market power explain variation in NPLs. Fofack (2005) also indicated that the real interest rate, net interest margins, and inter-bank loans are significant determinants of NPLs. Moreover, Hu et al (2006) analyzed the relationship between NPLs and ownership structure of commercial banks and found that banks with higher government ownership recorded lower non-performing loans. Generally, robustness and prudence of the credit process largely contribute to loan qualities banks maintain.
In this regard, appropriateness of customer selection process, quality and depth of credit assessment, thoroughness of the sanctioning process, and mechanisms of post disbursement follow up will have a significant role in determining where a specific bank stands when it comes to loan performance. In other words the credit risk management frameworks banks adopt and implement is very crucial in keeping loan default to minimum level. Amuakwa-Mensah & Boakye-Adjei (2015) studied the factors that influence NPLs in the banking industry in Ghana within a panel regression procedure. Findings from the study indicated that internal factors such as the size of the bank, net interest margin, the past year’s NPL as well as the present year’s loan growth influence NPL. The study also reported real GDP per capita growth, the past year’s general price levels and real effective exchange rate were some of the external factors that affect NPLs of large banks; but these factors were not significant in influencing NPLs in small banks.

2.5 The effects of NPLs on banking operations

The repercussions of the issue of credit risk on the activities of banks are huge and diverse and that banking authorities are always concerned with this phenomenon. According to Balasubramaniam (2013) the impact of credit risk on the operational activities of financial institutions are many and varied. In the first place, the amount of time and effort required in the management of credit leave much to be desired such that it imposes substantial implicit costs on operations. The real cost of time and effort used in managing credits may be the returns sacrificed from engaging in handling „meaningful” activities. Again, some financial institutions have set up special units with skilled financial engineers whose main work involves the handling of credits. This initiative adds up to the operational expenses of such institutions. Further, NPLs
do not attract interest and this deprives the banks of the interest income that may have been received as well as the lost opportunity of investing the funds locked in NPLs in an equally rewarding alternative investment project or asset. This negatively affects the future cash flows and therefore profits. Related to this issue is the fact that working capital and liquidity position of the banks may be seriously affected. Moreover, the existence of high levels of NPLs in the banks” books is a signal of managerial inefficiencies regarding credit risk. This may translate into affecting the reputation, credit rating and status as well as the goodwill that have long been earned. The prospects of providing joint financial services in the form of syndication with other financial institutions may become blurred. The economic and financial costs of these impaired loans are significant. Potentially, these loans may negatively affect the level of private investment, increase deposit liabilities and constrain the scope of bank credit to the private sector through a reduction of banks” capital, following falling saving rates as a result of runs on banks, accumulation of losses and correlative increased provisions to compensate for these losses.

According to Brown, Mallett and Taylor (1993), the losses bad loans cause, by reducing the capital resource of the bank, affect its ability to grow and develop its business. Disclosure of the extent of these losses in its financial statements may lead to a loss of confidence in the bank”s management and a reduction in its credit ratings. This will in turn increase the bank”s cost of borrowing in the wholesale market and make it more expensive or more difficult to raise capital. In extreme cases, it can lead to a loss of deposits, the withdrawal of the bank”s authorization and ultimately insolvency (Taylor, 1993). Thus, NPL is one of the concrete embodiments of credit
risk which banks take. They have greater implication on the function of the banks as well as the overall financial sector development.

2.6 The relationship between NPLs and financial Performance

The relevance of non-performing loans relates to its ability to influence the intermediation task of financial institutions that serves as the major avenue of income generation to the banks, and ultimately, the financial stability of an economy (Klein, 2013). For this reason, NPLs have increasingly attracted attention recognizing that a consequence of large amount of NPLs in the banking system is bank failure as well as a symptom of economic slowdown (Lata, 2014). This is largely because the financial performance of any commercial bank is measured in terms of profitability and NPLs have a direct adverse impact on the bottom line due to the provisions which the banks are forced to make on account of the NPLs (Balasubramaniam, 2013). Other researchers have commented that an increase in NPLs rate is a reflection of the failure of credit policy (Saba, Kouser and Azeem, 2012). Khemraj and Pasha (2012) explain that high percentages of NPLs are often associated with performance problems of banks and financial crises in both developing and developed countries.

Fofack (2005) associates the occurrence of banking crises with a massive accumulation of NPLs and further observes that the NPLs account for a significant portion of total assets of insolvent banks and financial institutions. These loans also have potential for reducing private consumption, and in the absence of deposit guarantee mechanisms to protect small depositors, can be a source of economic contraction, especially when coupled with declining gross capital formation in the context of a credit crunch caused by erosion of banks’ equity and assets (Fofac, 2009).
Historically, the occurrence of banking crises has often been associated with a massive accumulation of non-performing loans which can account for a sizable share of total assets of insolvent banks and financial institutions, especially during periods of systemic crises. Deterioration in banks’ loan quality is one of the major causes of financial fragility. Past experience shows that a rapid buildup of bad loans plays a crucial role in banking crises (Demirgüç-Kunt and Detragiache, 1998, and González-Hermosillo, 1999).

It is widely accepted that the quantity or percentage of non-performing loans (NPLs) is often associated with bank failures and financial crises in both developing and developed countries (Sorge, 2004). In fact, there is abundant evidence that the financial/banking crises in East Asia and Sub-Saharan African countries were preceded by high non-performing loans. The global financial crisis, which originated in the US, was also attributed to the rapid default of sub-prime loans/mortgages. In view of this reality it is therefore understandable why much emphasis is placed on non-performing loans when examining financial vulnerabilities (Sorge, 2004). It is apparent that insolvency of banks is costly to the macro economy per se, but this cost can be increased or decreased by the regulators and the policies they use in resolving the insolvencies. The faster banks can be resolved before their economic capital turns negative, the smaller are both losses to depositors and costs to the macro economy (Kaufman, 2004).

2.7 Corporate financial performance and measurement of profitability

Corporate financial performance may be thought of as a firm’s capacity to create more assets in its operational activities during a particular period of time. It is usually determined by net income and cash from daily activities. Thus, financial performance
is mostly measured by profitability performance of an institution as seen in the works of Gizaw et. al., (2015) and Ali (2015) who measured financial performance in terms of profitability of companies studied. Performance can be determined by the use of economic measures and accounting or financial measures. Economic Value Added (EVA) is one of the methods of measuring economic performance of a firm. It can be thought of as the earnings a company has after accounting for the cost of capital. The intuition behind this measurement is that a company increases in value only if the return on its capital is greater than the opportunity cost of the capital investment. Studies on financial performance of commercial banks have measured profitability using ratios that are calculated from annual financial statements (see for instance Gizaw et. al., 2015; Olawale, 2014 and Ali, 2015). Thus, in analyzing a firm’s performance using financial statements, it is helpful to define a set of ratios to facilitate comparison over time and across companies. A firm’s published financial statement can often offer some clues about its financial condition and insights into its past performance that may be relevant for the future. It has been pointed out that ratios are not vulnerable to price fluctuations. When dealing with time series data, ratios are cited as one of the most suitable indices that can be used to determine profitability performance and that the real value of profits may not be influenced by unstable price changes (Rasiah, 2010). Five different ratios can be used to analyze different aspects of a firm’s performance but for the purposes of this study, emphasis is laid on profitability ratios which can be measured with respect to sales (return on sales), assets (return on assets) or with respect to equity (return on equity). Other profitability indicators include net interest spread (NIS), net interest margin (NIM), cost to income ratio, return on earning assets (ROEA). There has been a widespread use of these ratios to measure profitability in the literature (see for example Chimkono
et al., 2016; Ali, 2015; Nkegbe & Yazidu, 2015; Gizaw et al., 2015 and Olawale, 2014). This study used return on assets (ROA) and return on equity (ROE) as proxies for profitability. The details of their measurements are presented in chapter three of this study.

2.8 Theoretical foundations of the study

In this section the researcher presents a review of the theories that have been propounded to explain the effects of non-performing loans on bank profitability performance. For the purpose of this study, five major theories are reviewed. These are the loan pricing theory, firm characteristics theory, the theory of multiple lending, the signaling arguments and the credit market theory.

2.8.1 Loan Pricing Theory

Banks cannot always set high interest rates. Banks should consider the problems of adverse selection and moral hazard since it is very difficult to forecast the borrower type at the start of the banking relationship (Stiglitz and Weiss, 1981). If banks set interest rates too high, they may induce adverse selection problems because high-risk borrowers are willing to accept these high rates. Once these borrowers receive the loans, they may develop moral hazard behaviour or so-called borrower moral hazard since they are likely to take on highly risky projects or investments (Chodecai, 2004). From the reasoning of Stiglitz and Weiss, it is usual that in some cases we may not find that the interest rate set by banks is commensurate with the risk of the borrowers.
2.8.1 Firm Characteristics Theories

These theories predict that the number of borrowing relationships will be decreasing for small, high-quality, informationally opaque and constraint firms, all other things been equal (Godlewski and Ziane, 2008). Robert and Gary (1994) state that the most obvious characteristics of failed banks is not poor operating efficiency but an increased volume of non-performing loans. Non-performing loans in failed banks have typically been associated with regional macroeconomic problems. DeYoung and Whalen (1994) observed that the US Office of the Comptroller of the Currency found the difference between the failed banks and those that remained healthy or recovered from problems was the caliber of management. Superior managers not only run their banks in a cost efficient fashion, and thus generate large profits relative to their peers, but also impose better loan underwriting and monitoring standards than their peers which result to better credit quality (Hamisu, 2011).

2.8.3 Theory of Multiple-Lending

It is found in literature that banks should be less inclined to share lending (loan syndication) in the presence of well-developed equity markets. Both outside equity and mergers and acquisitions increase banks”” lending capacities, thus reducing their need of greater diversification and monitoring through share lending (Carletti, 2006; Ongene and Smith, 2000; Karceski, 2004; Degryse, 2004).

2.8.4 The Signaling Argument

The signaling argument states that good companies should provide more collateral so that they can signal to the banks that they are less risky type borrowers and then they are charged lower interest rates. Meanwhile, the reverse signaling argument states that
banks only require collateral and or covenants for relatively risky firms that also pay higher interest rates (Chodechai, 2004; Ewert and Schenk, 1998).

2.8.5 Credit Market Theory

A model of the neoclassical credit market postulates that the terms of credits clear the market. If collateral and other restrictions (covenants) remain constant, the interest rate is the only price mechanism. With an increasing demand for credit and a given customer supply, the interest rate rises, and vice versa. It is thus believed that the higher the risk of the borrower, the higher the interest premium (Ewert, 2000).

2.9 Empirical review

This section of the study presents a review of previous studies that earlier scholars have conducted by considering the methodologies employed, variables used as dependent and independent characters and the findings reported. Such a review will enable the researcher understand and appreciate the extent of the debate thus far and more importantly tailor the current study so as to achieve the set objectives. Olawale (2014) studied how commercial banks in Nigeria performances are affected by credit risk during the period of 2008 to 2012. The study used a secondary data collected from the companies audited annual accounts published in their websites and also from the publication of the Central Bank of Nigeria. OLS method of analysis was employed. Profitability was measured with ROA as a function of NPLR and Loan and Advances ratio (LA/TD). The author’s results show a negative relationship but not significant between loan ratio and total advances in terms of deposits and further shown a significant negative relationship between non-performing loans and advances rate and banks” profitability. The paper further mentioned that banks profitability
could be affected inversely by the levels of non-performing loans and advances, thus affecting greatly the banks’ liquidity.

Wangai et al., (2014) also examined how the Financial Performance of Kenyan Microfinance Industry has been impacted by Non-Performing Loans and the effects on the survival of small and medium enterprises. This study aimed at establishing how far microfinance banks (MFBs) in Nakuru, Kenya have been affected by non-performing loans over a period of time. They used primary data which was collected from the respondents with a structured questionnaire. The paper analyzed data collected both descriptively and inferentially. It was established that risk associated with credit significantly affected MFBs in Nakuru town’s financial performance. The authors further concluded that, increase in credit risk would significantly reduce the financial performance of the MFBs.

Gizaw et. al. (2015) also in their paper examined how far the profitability performance of commercial banks in Ethiopia has been affected by risk associated with credit. The study used a secondary data collected from the companies’ respective audited annual accounts published in their websites and also from the publication of the Central Bank of Ethiopia. The authors were collected from eight commercial banks from a period of twelve year (2003 to 2014). The data was then analyzed using descriptive statistics. Their results showed that variables such as non-performing loans, loan loss provisions and capital adequacy which were used as proxy for credit risk had a significant impact on commercial banks profitability performance in Ethiopia. A panel data model was adapted by the paper in line with Kolade et al. (2012). Return on Asset (ROA) and Return on Equity (ROE) were used by the paper as the indicators of profitability performance. The study recommended that
commercial banks in Ethiopia need to institute policies and programmes to check credit risk to ensure their profitability and survival.

Chimkono et al (2016) carried out a study that was intended to examine the relationship that exists between non-performing loan ratio and other factors and financial performance of commercial banks in Malawi covering a 7-year period from 2008 to 2014. Correlation research methodologies and multiple regression analysis were adopted. Census study applications were used to collect secondary data from the audited financial statements of 10 commercial banks. In this study, financial performance was measured in terms of return on assets (ROA) while non-performing loans (NPL) was measured as the NPL ratio (which was calculated as a percentage of non-performing loans to gross loans ie Gross NPLs/ Gross loans). It was discovered that non-performing loan ratio, cost efficiency ratio and average lending rate significantly affected bank performance whereas cash reserve ratio directly associated with performance but was insignificant. The authors suggested that the monetary authorities should provide specific support systems to the banking sector and the banks themselves must provide innovations that would enhance their operations.

Bentum (2012) conducted empirical assessment of the determinants of profitability of commercial banks in Ghana during the global financial rises. To address the research problem, the study aimed at evaluating the impact of bank-specific factors, industry characteristics and macroeconomic factors on profitability in the commercial banking sector in Ghana. Secondary data from the annual reports of the banks for 10 years from 2001 to 2011 were used. Multiple linear regression in the form of fixed effect model (FEM) was used. The dependent variable, ROA was used as a proxy for profitability whereas internal and external factors were used as independent variables.
The study reported that profitability was determined by bank-specific variables, industry factors as well as macroeconomic factors. Bank factors that influence profitability, according to the study are capital and reserve to total assets, non-interest income to gross income ratio and the natural log of total deposits. Macroeconomic factors that affected profitability during the study period were real GDP growth rate, annual growth rate of inflation and annual growth rate of money supply.

Ali (2015) conducted an investigation into the effects of credit risk management on the financial performance of commercial banks in Jordan during the period 2005 - 2013. The purpose of the study was to examine the influence of credit risk management indicators (such as capital adequacy ratio (CAR), ratio of non-performing loans to gross loans (NPL/GL), ratio of credit interest to credit facilities (CI/CF), leverage ratio and the ratio of facilities loss to net facilities (FL/ NL)) on financial performance (profitability) of commercial banks. Profitability was measured by ROA and ROE. Panel regression in the form of pooled least squares and correlation analysis was carried out along with descriptive statistics. Stationarity of the variables was tested with the ADF. Secondary data from the annual reports of 13 banks were used and analyzed. Empirical findings indicate that the ratio of non-performing loans to gross loans positively related to financial performance and an inverse relationship was found between the ratio of facilities loss to net facilities and financial performance but no impact of CAR and CI/CF on financial performance was recorded. The study recommended an improvement in the credit management procedures through an establishment of appropriate policies.

Nkegbe & Yazidu (2015) investigated the trends and determinants of bank performance in Ghana. Panel data regression models were estimated for analysis
along with trend graphs and equations. Secondary data from the annual reports of 27 banks covering the period 2000-2010 were used for the study. Performance which was represented by profitability was measured in terms of ROE, ROA and NIM (Net Interest Margin). Among the independent variables used as determinants of profitability were liquidity, non-performing loans (NPL), bank size (MSL) and operational efficiency. The study reported a negative trend in bank performance and a positive relation between market of loan and bank performance. Macroeconomic factors that the study cited as drivers of profitability were GDP, CPI and broad money supply (M2+). Results further indicated that liquidity, market share of loans and operational efficiency had a positive association with all profitability indicators. But NPL was reported as having negative relation with ROE and ROA. Provision of training to the informal sector on financial statement preparation was suggested as a means of dealing with NPL.

Beck et al (2013) conducted an empirical study on the determinants of non-performing loans (NPL) in seventy-five countries in a dynamic panel regression, fixed and random effects framework. Secondary data set for the period 2000-2010 was used. The ratio of NPL to gross loans was used as the dependent variable. Empirical results indicate that real GDP growth, share prices, exchange rates and lending rates significantly influenced NPL. Of these factors, real GDP growth was mentioned as the main driver of CR.

Asantey & Tengey (2014) studied the effects of bad loans on banks’ lending ability and financial performance using secondary data from the annual reports of four listed commercial banks (Ecobank, GCB Bank, CAL Bank, and Agricultural Development Bank) for a 5-year period covering 2008 to 2013. The aim of the paper was to
examine the effects of bad loans on the lending ability and net profit (return on investment) of the banks. Pearson correlation test and OLS were used to examine the data. The study discovered a high negative correlation between bad loans and lending ability at 0.05 alpha level and a high negative correlation between bad loans and financial performance, measured as return on investment or net profit at 0.05 level.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction
The researcher in this chapter presents the systematic processes through which the study followed in addressing the research problem and achieving the set objectives. The chapter particularly describes the data type and sources, collection and analysis of data procedures, definition and measurement of variables used as well as the models’ specifications. The techniques applied in estimating the data and tests conducted to capture relationships are discussed in this chapter.

3.2 Research design
The study uses positive quantitative research paradigm which is appropriate because it enables the capturing of knowledge through measurements of phenomena in which mathematical and statistical procedures are used to describe, predict and explain behavioral phenomena (Krasuses, 2005). The study is basically a quantitative research that aimed at examining the effect of non-performing loans on the profitability of commercial banks as it involves the collection and analysis of audited financial reports using statistical methods. The use of statistical modeling enables the researcher estimate and establishes the existence of causal relationships between the variables of interest.

3.3 Data type and sources
The study used secondary data that span from 2009 to 2016. Annual time series data for each of the variables; return on equity (ROE), Non-Performing Loan Ratio (NPLR), Bank Size (BS) and Capital Adequacy Ratio (CAR) were sourced from
audited annual financial reports of the GCB Bank, ADB, CAL Bank, and Ecobank-Ghana. Data on consumer price index used as a proxy for inflation (INFL) was obtained from the Ghana Statistical Services annual bulletin. The choice of these variables was informed by literature on the effect of non-performing loans on the profitability of commercial banks in Ghana.

3.4 Model Specification

With the central aim of investigating the effect of non-performing loans on the profitability of commercial banks understudy, the present study followed a panel data model employed by Gizaw et al. (2015) in their investigation of the impact of credit risk on profitability performance of commercial banks in Ethiopia. In that study, ROE were used as dependent variables whereas Loan Loss Provision Ratio (LLPR), Non-Performing Loan Ratio (NPLR) and Capital Asset Ratio (CAR) were used as independent variables in the model. The present study modified the model by including Bank Size (BS) due to data limitations from some of the banks under study. This study also added inflation (INFL) as a control variable to the model to capture the role of price volatility on profitability of banks. Profitability (ROE) is therefore stated as a function of NPLR, CAR, BS and INFL and it is expressed mathematically as:

\[ ROE = f(NPLR, CAR, BS, INFL) \]  

The regression models are thus formulated as

\[ P_1 = \beta_0 + \beta_1 NPLR_i + \beta_2 CAR_i + \beta_3 BS_i + \beta_4 INFL_i + \varepsilon \ldots \ldots \]  

From equation (2) : \( P_1 \) refers to profitability measured by \( ROE \); \( \beta_0 \) is a constant term; \( \beta_1, \beta_2, \beta_3 \) and \( \beta_4 \) are coefficients of explanatory variables to be estimated; \( NPLR_i \) refers to non-performing loan ratio, \( CAR_i \) represents capital adequacy ratio,
$BS_i$ represents bank size, $INFL_i$ represents the rate of inflation and $\varepsilon$ is the error term assumed to be normally and independently distributed with zero mean and constant variance, which captures all other explanatory variables which impact profitability but were not captured in the model.

### 3.5 Definition of variables and expected signs

Return on equity (ROE) refers to the proportion of net income in total equity. Total equity is the amount of funds invested by owners (shareholders) of a company. ROE is calculated as net income divided by total owners’ equity and it gives an indication of the rate of return made by owners’ equity. Thus, it is a financial ratio that compares the earnings attributable to ordinary shareholders with the book value of their investment in the business. A higher value of ROE means that the company has the ability to generate cash internally and the better for the company in terms of profit generation. ROE has also been extensively used in the literature as a measure of how profitable it is for investors (shareholders) to invest their funds in companies (Hassan & Bashir, 2003).

Non-Performing Loan Ratio (NPLR) is the ratio of non-performing loans to total loans and advances. It is one of the major indicators of credit risk and a measure of credit quality and it shows the proportion of total loans and advances that are in default or overdue for more than 90 days. The major source of income is interest earned on loans. The ability to actually earn this interest is a function of the efficiency in recovering the amount loaned and the interest accrued. A higher NPL ratio means a higher chance of loan recovery/repayment problems and a greater possibility of assets being locked up in default loans. Some studies have reported a negative linkage
between NPLR and profitability (see for example Nkebe and Yazidu ,2015; Gizaw et al., 2015; Chimkono et., al. 2016 and Olawale ,2014). A negative relationship is therefore expected between NPL and profitability, thus, $\beta_1 < 0$.

Capital adequacy ratio (CAR) refers to the percentage of total owners” equity and reserves that the banks are expected to hold against risky assets. It is meant to safeguard depositors against unanticipated losses. CAR is measured as tier 1 capital plus tier 2 capital divided by risk adjusted assets. Literature has shown that CAR can be negatively or positively related to profitability. For example, Aruwa and Musa (2012) and Kurawa and Garba (2014) reported a positive relationship between capital adequacy ratio and financial performance measured profitability. Other authors have also reported a negative relationship between the two variables whilst others found no relationship at all as in the studies of Ali (2015), Abdelrahim (2013) and Li and Zou (2014). Therefore, $\beta_2 < 0$ or $\beta_2 > 0$.

Bank size ($BS_i$) is proxied for the book value of total assets of each bank. This representation was adopted from the empirical studies of Alper and Anbar (2011). Positive effect of bank size on profitability has been reported in the literature (see the works of Alper and Anbar (2011), Molyneux and Wilson (2004) and Davydenko (2010)). Other authors have however recorded a negative linkage between bank size and profitability as seen in the works of Naceur (2003) and Javaid et al., (2011). In this study, the relationship between these two variables is expected to vary. Therefore, $\beta_3 < 0$ or $\beta_3 > 0$. 
Inflation (INFL_t) refers to the rate at which general price level rises in an economy in a year. The consumer price index is used as a proxy for inflation in this study. Accurate and precise prediction of inflation can have a positive impact on profitability and vice versa (Ali, 2015). Empirical research works have mainly reported positive effect of inflation on financial performance. For example Athanasoglou et al., (2008); Bourke (1989) and Davydenko (2010) reported direct relationship between profitability and inflation. There is still the chance for a negative association. In this study, it is assumed that inflation has a negative effect on profitability. That is $\beta_5 < 0$.

3.6 Method of Estimation and Testing

3.61 Unit Root Test

This study began with the test for stationarity of the endogenous and exogenous variables within the framework of Augmented-Dickey-Fuller (ADF) test procedure. This test is important in order to avoid spurious regression which is a common problem when estimating a regression line with data whose generated process follows a time trend. The ADF test requires estimating an equation of the form:

$$\Delta Y_t = \beta_0 + \beta_1 y_{t-1} + \beta_2 t + \sum_{i=1}^{p} A_i \Delta y_{t-1} + Z_t$$

where, $y_t$ is a vector for all-time series variables under consideration in a particular regression model ie variables of interest; $t$ is a time trend variable; $\Delta$ represents the first difference operator; $p$ is the optimal lag length of each variable chosen automatically by E-views Version five according to the Schwarz Information Criteria (SIC) such that first-differenced terms make $z_t$ is the error term, white noise.

The ADF test is principally concerned with the estimate of $\beta_1$, that is, the study tests the hypothesis $H_0$: $\beta_1 = 0$. The rejection of the null hypothesis in favor of the
alternative hypothesis implies that $y_t$ is stationary and integrated of order zero, that is, $I(0)$. If the null hypothesis of unit root for the first difference is rejected, then the first difference is stationary and the variable is integrated of order one, that is, $I(1)$ (Johansen 1988; Maddala, 1977; Adenutsi, et al., 2007). The objective of unit root test is to check whether the variables of interest are integrated of order one, $I(1)$ before proceeding to the estimation procedure (Engle and Granger, 1987).

3.6.2 Panel data regression model specifications

Panel data can be estimated and analyzed in three different specification models. These are the correlation matrices, the Fixed Effect Model (FEM) and the Random Effect Model (REM). In this study, the pooled OLS regression and the fixed effect models are used. Given the data available, statistical tests are used to select the best model for analysis.

3.6.3 Pooled Regression Model: To obtain a reliable and unbiased estimates for analysis, this estimation method uses the classical linear regression assumptions which according to Albright, Zappe and Winston, (2011) stipulate that the error term should be independently and normally distributed with zero mean and constant variance and more importantly must not correlated with the independent variables. The pooled OLS linear regression is given as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{4it} + \beta_4 X_{5it} + U_{it} \ldots \ldots \ldots \ldots \ldots (3)$$

where $Y_{it}$ is the dependent variable; $\beta_0$ is a constant term; $X_1$ to $X_4$ are the independent variables; $\beta_1$ to $\beta_4$ are slope parameters; $i$ refers to the cross sectional units and $t$ is the time period. Using this regression specification, the model for this study is thus written as:
Gujarati (2009) opined that pooled OLS regression model has the advantage of being the simplest, easy to understand and interpret as compared to the other models but the model is associated with some weaknesses. It assumes that cross-sectional units are homogeneous. This assumption may not be realistic. For example, the slope coefficients and intercept must be the same for all the three banks that constitute cross-sectional units in this study. This may not be possible and it may be wrong to make this assumption. The error term is assumed to have taken care of the individual bank specific effects and the time components of data. Another weakness of pooled OLS regression may be the existence of autocorrelation in the model which results in errors and invalid conclusions.

3.6.4 The fixed effect model (FEM)

It has been mentioned that the fixed effect model is highly comparable to the pooled OLS regression model in the sense that the slope coefficient is the same for all cross-sectional units and that the intercept remains unchanged across time. One difference between them is that the fixed effect model recognizes heterogeneity among cross-sectional units as against homogeneous units in the case of the pooled OLS regression model. Thus, under the fixed effect model, individual specific effects of cross-sectional units are captured (Batalgi, 2005). In this study individual bank specific effects may include the level of innovation, policies, location, marketing strategies, skills of workforce, clientele base etc. Employing the fixed effect least-squares dummy variable (LSDV) approach, the issue of heterogeneity is taken care of by providing different intercepts for every cross-sectional unit (Brooks, 2008). The fixed model can be specified as:

\[ ROE_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 NFL_{it} + U_{it} \ldots \ldots (4) \]
\[ Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + U_{it} \ldots \ldots \ldots \) \( (8a) \)

Where \( i \) in \( \alpha_i \) refers to the cross sectional units representing the intercept values for each cross sectional unit. Now, inserting the independent variables of this study into this model yields the following equations:

\[ ROE_{it} = \alpha_i + \beta_1 NPLR_{it} + \beta_2 CAR_{it} + \beta_3 BS_{it} + \beta_4 INFL_{it} + U_{it} \ldots \ldots \) \( (8b) \)

Among other things, the fixed effect least-squares dummy variable (LSDV) approach is limited by its inability to deal with large samples. It has been stated that larger number of cross sectional units results in a bigger decrease in the degree of freedom (Hsiao, 2006). But Batalgi, (2005) believes that this issue is solved with the use of the fixed effect within-group estimator methodology. This approach makes use of demeaned values of variables to estimate associations. It also does away with large decreases in the degree of freedom associated with large samples. One central weakness of this model according to Hsiao, (2006), has to do with the issue of multicollinearity, which emerges in large samples of cross-sectional units. A linear relationship between two or more independent variables describes the concept of multicollinearity where standard errors are extremely higher hence estimations are distorted. Moreover, the FEM is able to deal with time variant variables only at compared to time invariant ones in estimating coefficients.

3.7 Data Analysis and Processing

According to Brooks, (2008), panel data is one that consists of the features of both time series and cross-section data. Pane data analysis was adopted for this study because of its ability to deal with heterogeneous nature of the banks understudy. The data employed is made up of ten observations each of the three banks under study.
This makes a total of 30 pooled observations in a panel data set. In this study, panel regression in the form of fixed model is used to analyze the data. Trend analysis is also carried out so as to identify patterns that may be useful in explaining relationships among the variables. Descriptive statistical analysis of the variables under study was also conducted. This was done in the form of the mean, maximum and minimum values, standard deviations and coefficient of variation that give a summary of the characteristics of the variables of concern. Data processing was done using Eviews software version 9 to run the panel regression models as well as the descriptive statistics and the output generated used for the analysis of the data.

3.8 Data Reliability and validity

Research procedures, data collection instruments, tests and estimations are said to be reliable when results are identical under different circumstances. On the other hand, validity implies the degree of similarity between the actual measurement and the intended measurement. To achieve these, the researcher collected the data on both dependent and independent variables from the annual audited financial statements of the banks under consideration. Since the financial reports are audited by credible accounting firms, we can only assume that their accuracy is assured. Verification of such data is relatively straightforward since they are available to the general public. Data used for this study can therefore be said to be very reliable as they were sourced from credible sources. On data processing, the EViews econometric package is used to run the panel regression models and the output generated is used for the analysis of the data. This package is more reliable since it is extensively used by researchers across the globe.
3.9 Ethical Consideration

Ethical considerations encompass the use of suitable means of conduct in activities especially business related which includes upholding of good morals standards (Zikmund, 2010). The study followed all ethical procedures in collecting the data. The data is strictly for academic purposes and non-other.
CHAPTER FOUR

ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents the analyses, interpretations and discussion of the results of the empirical tests. The paper investigates the effect of non-performing loans on the profitability of commercial banks. The chapter is divided into three sections. The first section contains the descriptive statistics of the individual banks and Correlation analysis as they summarize the characteristics of data which are valuable for the study. The second section deals with the mean comparison of the standard deviations of Agricultural Development Bank (ADB), Ecobank, Ghana Commercial Bank and Cal Bank used for the study. Finally, the entire data analysis process and the results from the analysis are discussed.

4.2 Descriptive Statistics

It is essential to discuss the descriptive statistics in addition to the other estimations to be able to summarize some important characteristics on the data collected. This paper discusses the maximum, minimum, mean and the standard deviation for each bank on Return on Equity (ROE), Capital Adequacy Ratio (CAR), Non-Performing Loan Ratio (NPLR) and Bank Size (BS) for the period understudy. The Inflation (INF) is not reported differently because it is a macroeconomic variable and thus have same impacts on all the banks.

According to Albright (2011), mean is the average of all the total values on specified variable, maximum and minimum values are the largest and smallest values respectively.
The standard deviation indicates the extent to which the values of the observations are distributed around the mean (Macfie and Nufrio, 2006). This means that large standard deviations suggest that the values of a set of observations are distributed away from the mean whiles a small standard deviation shows the values of a set of observations are concentrated around the mean.

### 4.2.1 Descriptive statistics for Agricultural Development Bank (ADB)

The descriptive statistics for Agricultural Development Bank for the period extending from 2006 to 2015 are illustrated in table 4.1. below.

<table>
<thead>
<tr>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.26293</td>
<td>0.161420</td>
<td>13.02000</td>
<td>0.033380</td>
</tr>
<tr>
<td>Median</td>
<td>21.31830</td>
<td>0.161150</td>
<td>11.25000</td>
<td>0.015950</td>
</tr>
<tr>
<td>Maximum</td>
<td>21.97780</td>
<td>0.220000</td>
<td>19.30000</td>
<td>0.174500</td>
</tr>
<tr>
<td>Minimum</td>
<td>20.38220</td>
<td>0.120000</td>
<td>8.700000</td>
<td>0.003700</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.586340</td>
<td>0.026888</td>
<td>3.724931</td>
<td>0.051250</td>
</tr>
</tbody>
</table>

Source: Agricultural Development Bank (2006 – 2015) and field study, 2016

The bank has ROE of 48.8% on average, this is an indication that the bank has a ROE of 48.8% on average each year within the 10 year period. Additionally, the maximum and minimum values for ROE are 51.8% and 16.4% respectively.

CAR has a mean of 16.14%; thus Agricultural Development Bank expects to have a CAR of 16.14% on average. The maximum value of CAR is 22% and a minimum value of 12% on average.
The standard deviation of CAR is approximately 1, meaning that the individual values of CAR are concentrated close to their mean. On average, Agricultural Development Bank expects to have a 3.3% value of NPLR each year over the 10 year period as shown by the mean value of 3.3%.

The maximum value of NPLR is about 17.45% however the minimum is 0.37%. In addition to these values, the standard deviation of NPLR of 5.1% which indicates a high volatility in the variable. The mean for bank size is 21.26 units, which shows that the size of Agricultural Development Bank is 21.26 units on average over the 10-year period commencing in 2006. The bank size values ranges from about 20.38 units to 21.98 units as revealed by the minimum and maximum values.

Agricultural Development Bank has a high standard deviation of 0.58 on bank size, which is an indication that bank size annual values are spread far around their mean.

Annual inflation statistics are not specific to the individual banks, therefore affect all the banks the same so will be reported once.

Inflation has a mean of 13%. This means that the average annual inflation rate over the 10 year period was 13%. The lowest value of INF is 8.7% whereas the highest rate is 19.3% with a standard deviation of 3.72 indicating high volatility in the variable over the period. The high volatility variable could however be attributed to the global recession.
4.2.2 Descriptive statistics for Ecobank Ghana

Table 4.2 below shows the descriptive statistics of Ecobank from the year 2006 to 2016.

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.37726</td>
<td>0.178320</td>
<td>13.02000</td>
<td>0.016160</td>
<td>0.487270</td>
</tr>
<tr>
<td>Median</td>
<td>21.31065</td>
<td>0.176650</td>
<td>11.25000</td>
<td>0.013350</td>
<td>0.496650</td>
</tr>
<tr>
<td>Maximum</td>
<td>22.60840</td>
<td>0.227600</td>
<td>19.30000</td>
<td>0.037100</td>
<td>0.673700</td>
</tr>
<tr>
<td>Minimum</td>
<td>19.88360</td>
<td>0.128000</td>
<td>8.700000</td>
<td>0.002000</td>
<td>0.326500</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.933795</td>
<td>0.040522</td>
<td>3.724931</td>
<td>0.010002</td>
<td>0.109601</td>
</tr>
</tbody>
</table>

Source: Eco Bank (2006 – 2015) and field study, 2016

Table 4.2 above shows that on average, Eco Bank has a mean of 48.7% on ROE, with the maximum and minimum values being 67.37 and 32.6%. Eco Bank’s ROE has a standard deviation of 10.9 which indicates that there is high volatility in ROE. Eco Bank also has a CAR of 17.8% on average for the years 2006 to 2015 (as indicated by the mean in Table 4.2). The highest value of CAR recorded was 22.7% and the lowest value was 12.8% as represented by the maximum and minimum values respectively. The standard deviation for CAR is 4.0 which shows that there is low volatility in CAR.

The average value of NPLR for the 10 years is 1.6%. As indicated by table 4.2. above, 2% is the minimum value of NPLR whereas 3.7% is the maximum value of NPLR over the same period. It has a standard deviation of 1 which shows that NPLR is highly volatile throughout the period. Table 4.2 above shows that the average size of EcoBank is 21.37 units with the maximum and minimum values being 22.6 units and 19.8 units respectively.
The standard deviation of 0.9 on BS is low which indicates that the values of BS do not vary much over the 10 year period.

### 4.2.3 Descriptive statistics for Ghana Commercial Bank

The descriptive statistics for Ghana Commercial Bank for the years 2006 to 2015 are illustrated by Table 4.3. below.

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.55060</td>
<td>0.228300</td>
<td>13.02000</td>
<td>0.023730</td>
<td>1.090880</td>
</tr>
<tr>
<td>Median</td>
<td>21.54590</td>
<td>0.223750</td>
<td>11.25000</td>
<td>0.015900</td>
<td>1.005050</td>
</tr>
<tr>
<td>Maximum</td>
<td>22.25570</td>
<td>0.332800</td>
<td>19.30000</td>
<td>0.070700</td>
<td>1.559100</td>
</tr>
<tr>
<td>Minimum</td>
<td>20.77290</td>
<td>0.106900</td>
<td>8.70000</td>
<td>0.010800</td>
<td>0.826500</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.508731</td>
<td>0.072886</td>
<td>3.724931</td>
<td>0.024368</td>
<td>0.251186</td>
</tr>
</tbody>
</table>

Source: Ghana Commercial Bank (2006 – 2015) and field study, 2016

Table 4.3 above shows that on average Ghana Commercial Bank has a 109% value for ROE for the years 2006 to 2015. ROE’s maximum and minimum values for the above time period is 155% and 82.65% respectively. ROE also has a low standard deviation of 0.25 indicating low volatility in the variable over the period under study.

The mean value for CAR is 22.83%, which points out that, on average Ghana Commercial Bank”s CAR for the years 2006 to 2016 is 22.83%. The minimum value of CAR is 10.69% whereas the maximum value is 33.28% with a standard deviation of 7.3 for the period under review which indicates high variability in the ratio.

On average, the GCB has approximately a 2.4% NPLR for the 10 years beginning in 2006. The highest rate of NPLR is around 7.0% whereas the lowest rate is 1.08%. The
standard deviation which is 2.4 is high and therefore reveals high volatility in the ratio.

Table 4.3 shows that the average size of Ghana Commercial Bank for 2006 to 2015 is 21.55 units with the highest and lowest Values of BS being 22.26 units and 20.77 units respectively. The standard deviation of 0.5 on BS is low which indicates that the Values of BS for the 10 years are concentrated around their mean.

4.2.4 Descriptive statistics for Cal Bank

The descriptive statistics for Cal Bank for the years 2006 to 2015 are presented by Table 4.4. below.

<table>
<thead>
<tr>
<th></th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>20.39199</td>
<td>0.165500</td>
<td>13.02000</td>
<td>0.019488</td>
<td>0.216600</td>
</tr>
<tr>
<td>Median</td>
<td>20.25605</td>
<td>0.158000</td>
<td>11.25000</td>
<td>0.017027</td>
<td>0.201500</td>
</tr>
<tr>
<td>Maximum</td>
<td>21.93250</td>
<td>0.218000</td>
<td>19.30000</td>
<td>0.050067</td>
<td>0.358000</td>
</tr>
<tr>
<td>Minimum</td>
<td>18.87220</td>
<td>0.116000</td>
<td>8.700000</td>
<td>0.003233</td>
<td>0.044000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.023933</td>
<td>0.038417</td>
<td>3.724931</td>
<td>0.012798</td>
<td>0.097208</td>
</tr>
</tbody>
</table>

Source: Cal Bank (2006 – 2015) and field study, 2016

Table 4.4 above reveals that Cal Bank has an average value of 21.66% on ROE for the 10 year period under study. The highest value of ROE during the same time period is 35.8% whereas the smallest value of ROE is 4.4%. ROE also has a high standard deviation of 9.7 indicating high variability in the variable. On average, Cal Bank has a CAR of 16.6% with maximum and minimum values of 21.8% and 11.6% respectively over the 10 year period. CAR has a standard deviation of 3.8%, which points out that there is high volatility in the ratio. The mean value of NPLR is about 1.9% on average.
for the 10 year period. The maximum value recorded is approximately 5.1%, whereas
the minimum value is approximately 0.32%. The standard deviation for NPLR is
about 1.2.

The mean value of BS reveals that, on average, the size of Cal Bank over the 10 years
under study is equivalent to 20.39 units with a maximum value of 21.9 units and a
minimum value 18.9 units. BS has a low standard deviation of 1.0 which signifies that
the annual values of BS are concentrated around the mean and therefore do not vary
much.

4.2.5 Comparison of the mean between the different banks under review

Table 4.5 below shows the comparison of the mean between the different banks under
review.

<table>
<thead>
<tr>
<th>MEAN</th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>21.26293</td>
<td>0.161420</td>
<td>13.02000</td>
<td>0.033380</td>
<td>0.488180</td>
</tr>
<tr>
<td>EBG</td>
<td>21.37726</td>
<td>0.178320</td>
<td>13.02000</td>
<td>0.016160</td>
<td>0.487270</td>
</tr>
<tr>
<td>GCB</td>
<td>21.55060</td>
<td>0.228300</td>
<td>13.02000</td>
<td>0.023730</td>
<td>1.090880</td>
</tr>
<tr>
<td>CBG</td>
<td>20.39199</td>
<td>0.165500</td>
<td>13.02000</td>
<td>0.019488</td>
<td>0.216600</td>
</tr>
</tbody>
</table>

Source: Field study, 2016

4.2.6 Comparison of the standard deviations between the different banks under
review

Table 4.7 below shows the comparison of the mean between the different banks under
review.
Table 4.6: Comparison of the standard deviations between the different banks under review

<table>
<thead>
<tr>
<th>Standard Deviation</th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>0.586340</td>
<td>0.026888</td>
<td>3.724931</td>
<td>0.051250</td>
<td>0.117971</td>
</tr>
<tr>
<td>EBG</td>
<td>0.933795</td>
<td>0.040522</td>
<td>3.724931</td>
<td>0.010002</td>
<td>0.109601</td>
</tr>
<tr>
<td>GCB</td>
<td>0.508731</td>
<td>0.072886</td>
<td>3.724931</td>
<td>0.024368</td>
<td>0.251186</td>
</tr>
<tr>
<td>CBG</td>
<td>1.023933</td>
<td>0.038417</td>
<td>3.724931</td>
<td>0.012798</td>
<td>0.097208</td>
</tr>
</tbody>
</table>

Source: Field study, 2016

Tables 4.6 and Table 4.7 above respectively compare the mean and standard deviations for ROE, CAR, NPLR and BS between the four different banks. Even though the four banks are different, the means and standard deviation values for ROE, and CAR generally do not differ significantly amongst the banks. For example, the mean value for ROE for all the banks vary between 9% and 11% except GCB which differs more to 25.12%. Similarly, the mean values of CAR vary between 16.5% and 22.8% whilst the standard deviation values vary between 0.027 and 0.071. Equally, very little variation is found in the mean and standard deviations of BS and NPLR when they are compared between the banks. The minor variations could be characterized by the fact that the banks are all listed on Ghana Stock Exchange and that they operate quite similarly.

However, from Tables 4.6 and 4.7 above, there is a high volatility in ROE for SCB, GCB and Ecobank and Bank size as represented by the standard deviations for each of the banks. Some reasons may contribute to the high volatility in ROE and BS, but the key amongst them might be the changes in the general health of the economy which had both positive and negative effects on profitability and non-performing loans over
the 10-year period. For example, in the years 2010 to 2011, the Ghanaian Economy was growing, as was revealed by the GDP growth rate increases due to the oil revenue and however a devastating effect due to high exchange rate and energy crises the country went through around 2013, 2014 through to 2015.

Bank Size (BS) shows largely low volatility due to the fact that there is a narrow range between the maximum and minimum values coupled with generally low standard deviation values of the variables. The BS’s low volatility seems to have been to a fact that the banking sector is quite saturated and thus the four banks under review seem to have exhausted a huge portion of growth opportunities in the Ghanaian banking sector and for that reason can no longer continue to grow at an increasing rate. This could be perhaps amongst the reasons why most of these banks are exploiting inter-country expansion potentials.

CAR also have generally low volatility with evidence from the fact that its standard deviations among the four banks, ranges from 0.026888 and 0.072886 coupled with the fact that it has small differences between the minimum and maximum values. This revelation might be ascribed to the fact that per Basel II requirements, CAR is prescribed to be at least 8% of risk weighted assets and for compliance purposes banks calculate CAR in line with the Basel requirements which results in low volatility in the CAR ratio over the period.

4.4 Data Analysis

According to Brooks (2008), panel data is a data which comprises both cross-sectional and times series characteristics. Panel data analysis is appropriate and
significant for this study as it is able to capture heterogeneity among the banks under study. This study uses the fixed effect model to analyse panel data.

4.5 Correlation analysis

The importance of correlation analysis is to ensure that independent variables are not correlated with each other to avoid multicollinearity. Correlation also provides information regarding the linear association between the dependent variable and each of the independent variables. Correlation refers to the strength of linear associations between two or more Variables (Albright et al., 2011).

Table 4.7: Correlation Matrix

<table>
<thead>
<tr>
<th>Correlation</th>
<th>BS</th>
<th>CAR</th>
<th>INF</th>
<th>NPLR</th>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAR</td>
<td>0.306883</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>0.142691</td>
<td>0.174249</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPLR</td>
<td>0.286683</td>
<td>-0.001812</td>
<td>0.273259</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.541974</td>
<td>0.497600</td>
<td>0.014432</td>
<td>-0.055613</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

From table 4.8 above all the independent variables have weak to moderate correlation and therefore do not pose any problem of multicollinearity. Interestingly, NPLR is negatively correlated to ROE while CAR is positively correlated which satisfy the prepositions on the effects of NPLR and CAR on profitability. More so, ROE are highly positive correlated also fulfil the condition that ROE can be good proxy for profitability.
4.6 Fixed effects model

According to Batalgi (2005), the fixed effects model is akin to the pooled regression model in that it follows classic linear regression assumptions, and that its slope coefficients remain the same for the cross-section units under study. One of the advantages of the fixed effects model is that unlike the pooled regression model it considers heterogeneity among the cross-section units by giving a different intercept for each cross-section unit. In this study, the four banks have different intercepts.

Table 4.8: Fixed effects model: Dependable Variable (ROE)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-statistic</th>
<th>P-Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPLR</td>
<td>-2.071178</td>
<td>0.797842</td>
<td>-2.595975</td>
<td>0.0130*</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.619268</td>
<td>0.436040</td>
<td>-1.420209</td>
<td>0.1631</td>
</tr>
<tr>
<td>BS</td>
<td>0.057950</td>
<td>0.028339</td>
<td>2.044898</td>
<td>0.0473*</td>
</tr>
<tr>
<td>INF</td>
<td>-0.002487</td>
<td>0.005611</td>
<td>-0.443180</td>
<td>0.6600</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.531453</td>
<td>0.575378</td>
<td>-0.923659</td>
<td>0.3611</td>
</tr>
<tr>
<td>R2</td>
<td>0.885643</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.863329</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Statistic</td>
<td>39.69073</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob(F-Statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*, ** and *** indicate significance levels at 1%, 5% and 10% respectively.


Table 4.9: Correlated Random fixed effects- Hausman test

<table>
<thead>
<tr>
<th>Effects test</th>
<th>Statistic</th>
<th>Chi-Sq. d.f</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross section Chi-square</td>
<td>13.013826</td>
<td>4</td>
<td>0.0112</td>
</tr>
</tbody>
</table>

Tables 4.9 and 4.10 above presents the fixed effects model results. The results are based on 40 balanced observations pooled from the four major banks for the years 2006 to 2015 with ROE as the dependent variables respectively. The results are in conformity with the prepositions for all the research variables. The p-values for almost all research variables are less than 0.05 which indicates a significant relationship between the dependent variables and the independent variables. The annual inflation is however insignificant since the p-value is greater than 0.05, which is consistent with Chin'Anga (2015) and Wangai, Bosire and Gathogo, (2014).

After the pooled regression model and the fixed effects model estimations to ascertain the relationship between the independent variables and the dependent variables it then becomes essential to select the best model and give a more detailed summary of the results of the best model.

In order to choose the most appropriate model a fixed effect redundant test was employed to estimate whether the cross-section units are the same. The null hypothesis for fixed effect redundant testing is, „The fixed effects are redundant” (De Sousa-Brown, 2008:87).”

**Table 4.10: Presents the fixed effect redundant test results.**

The null hypothesis is rejected at the 0.05 level of significance as indicated by the test statistic and the p-values on the table. This indicates that heterogeneity exists among the five banks. Since the pooled regression model does not consider heterogeneity among the banks, the most appropriate model to use is the fixed effects model.
The standard errors of the estimators are made to be robust in order to control the presence of heteroskedasticity and autocorrelations in the variables. As indicated in tables 4.9 and 4.10 the $R^2$ for the model is 89% which shows that the nonperforming loans indicators, thus the independent variables in the model (NPLR, CAR, BS) explains 89% of change in profitability performance of Ghanaian Commercial banks measured by ROE.

Coming to the effect of each independent variable, the results in tables 4.9 indicates that the rate of nonperforming loan to total loan and advances (NPLR) negatively affect profitability measured by ROE at 1% significant level. This implies that a unit increase in credit risk amount will result in 25% decrease in ROE. Contrary to this, the rate of CAR shows a positive effect at 0.05 significant level. This means that holding all other variable constant, a unit increase in CAR brings a 11% unit change on ROE. BS equally shows a positive relationship with ROE, this means a unit increase in BS will increase ROE by 1% at 1% significant level. The results from the model, presented by table 4.11 also show $R^2$ to be 89% suggesting that the independent variables in the model explained 89% of the variations on profitability performance measured by ROE.

In reference to the effect of each independent variable, the result in table 4.11 indicates that NPLR and BS negatively and positively affect ROE at 0.01 and 0.05 significant levels respectively. This means that a unit increase in BS will results in approximately 6% increase in ROE.

The results in table 4.11 in general show ROE of commercial banks in Ghana is highly sensitive to ratio of nonperforming loan to total loan and advances (NPLR), CAR and BS. However, the effect CAR has on ROE is not statistically significant.
The Adjusted R-squared value of 0.863329 implies that about 86% of the variations in the ROA and ROE are explained by variations in the independent variables used for this study. This means that other variables which can explain 14% of variations of ROE. Further, the F-statistics values of 41.47419* for ROE indicates that the independent variables used for this study jointly and significantly affect profitability.

4.7 Discussion of results

Tables 4.9 and 4.11 show the results of the study using the fixed effect model. Balanced panel data are used for 2006 to 2015 with a total of 40 observations from four sampled banks with ROE as the dependent variables. NPLR and CAR are the study’s main independent variables which represent nonperforming loans of profitability.

The results for the first proposition (P1) on CAR; CAR has a positive effect on profitability are confirmed in the ROE model. That means that a unit increase in CAR will result in an equal increase in the banks’ profit and are consistent with Molyneux and Thornton (1992), Berger et al. (1995), Naceur (2003), Goddard et al. (2004) Brewer and Jackson (2006). Havrylchyk et al. (2006), Athanasoglou et al. (2008), Ara et al. (2009), Ramlall (2009) and Oladele et al. (2012).

Consistent with the findings of Buyuksalvarci and Abdiogiu (2011) and Qin and Dickson (2012), this study shows that CAR has a significant negative effect on ROE. In this regard, Ezike and Oke (2013) stated that holding capital beyond the optimal level would inversely affect the efficiency and profitability of banks. Though the minimum CAR requirement of Commercial banks in Ghana is 10%, (Banking Act, 2004, Act 673), the descriptive statistics indicated average CAR of the banks under
study was 16%, higher than the minimum requirement. Taking the argument of Ezike and Oke (2013) the prevalent negative relationship between CAR and profitability appears to result from having reserves beyond the necessary amount enough to handle unexpected risk the banks may encounter.

However, the results for the second proposition (P2), Contrary to the CAR results, NPLR has a negative relationship with ROE. Interpretations from the table 4.9 and 4.11 suggest that NPLR which measures the extent of nonperforming loans show a statistically significant large negative effect on profitability measured by ROE. It thus means that a unit increase in NPLR will cause an equal decrease in the profitability of the banks under review.

This results is consistence with studies by Godlewski (2004), Achou and Tenguh (2008), Ara et al. (2009) and Aduda and Gitonga (2011), Poudel (2012), Funso et al.(2012) and Chen (2008), who found that increases in NPLR reduce profitability in banks. Consistence with findings of previous studies in Ghana and elsewhere, the criticality of risk nonperforming loans have on efficient utilization of asset by Ghanaian commercial banks is illustrated here.

The empirical results of bank size (BS) were in line with the third proposition (P3). BS has a positive relationship with profitability explained by ROE which is inconsistent with similar studies by Goddard, Molyneux and Naceur (2003) and Javaid et al. (2011) who found bank size to impact on bank profits negatively. Bank size prove to have a positive effect on profitability in Ghanaian banks as shown by the positive coefficient.
Even though the proposed effect on profitability (P4), the effect of inflation on profitability is confirmed, it is insignificant since its p-values is 0.6600, far above the benchmark probability value of 0.05. This is consistence with studies by Revel (1979) and Perry (1992) who found that inflation could have either a positive or negative effect on profitability.

The model as a whole indicates a high prediction of the percentage of variation in ROE explained by all independent variables as revealed by the adjusted $R^2$. Adjusted $R^2$ shows that 86.33% of the variations in ROE can be explained by the explanatory variables.

The interestingly from the descriptive statistics and the observation of the trend on NPL in Ghanaian banks as per the study of Getahum (2012) and Metahun (2012) showed some decline which indicates that managers and policy makers in Ghana have strengthen their credit management strategies in the banking industry.
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of findings, conclusion, and recommendations to various stake holders and offers recommendations for further research.

5.2 Summary of the Findings

This study provides an empirical analysis of the effect of non-performing loans on the profitability of commercial banks a case of four major banks listed on the exchange with the use of panel data obtained from the banks understudy.

The study found the fixed effects model to be the most appropriate method to analyse the data. A detailed analysis of the results from the fixed effects model is presented. The study finds that the effect of non-performing loans has an effect on profitability in Ghanaian banks as expected, with CAR having a positive significant effect and NPLR having a negative significant effect on profitability at the 1% level of significance in line with the study by Ara et al (2009). This suggests that credit risk management could be used to enhance profitability in banks by increasing capital adequacy requirements. Increasing capital requirements reduce risk since capital absorbs any unexpected losses which also results in enhanced profitability as shown by the positive sign of CAR. The study also finds that by setting up measures to minimise non-performing loans profitability is enhanced as revealed by the negative sign of NPLR.
The result from the Fixed effects model and Correlated Random fixed effects models suggest that credit risk negatively affect profitability of banks. This implies that a unit increase in nonperforming loan amount will result in decrease of banks profit. This is an indication that credit risk can be one of the major issues that affect banks’ profitability and that if management of banks would ensure profitability then they must do more to ensure that credit risk is well managed.

The study however, shows a significant positive relationship between CAR and profitability. This means that holding all other variables constant, a unit increase in CAR will bring a change in profit positively. This further indicates that banks should manage very well their tier one and tier two capital to ensure sustained and increase in profitability. Bank Size equally showed a positive relationship with profitability.

Non performing loans is a cost to the bank as they are losses from loans extended which ultimately reduce profitability in banks.

The control variable (bank size) was also significant at the 1% level of confidence. This indicates that nonperforming loans is not the only factor which has an effect on profitability and shows that banks combine managing loan performance with other factors such as the bank size in order to maximise profitability.

5.3 Conclusion

The paper was set out to identify the prevailing relationship between credit risk and profitability performance of commercial banks in Ghana. Previous studies in Ghana are few and studies in general were inconclusive. Motivated to fill this gap a descriptive statistics and panel data regression analysis were employed on secondary data collected from five commercial banks listed on the Ghana Stock Exchange for a period of 10 years (2006 - 2015).
The result revealed that nonperforming loans (credit risk) profile of Ghanaian banks had been improving during the study period. The ratio of nonperforming loan (credit risk) is gradually declining in past years. The CAR of commercial banks was also found to be higher than the regulatory requirement ((Banking Act, 2004, Act 673) at local and international level, but the descriptive analysis proved commercial banks in Ghana have adequate capital to absorb shocks resulting from credit (non-performing loans) and other operational risks.

The study found that credit risk and capital adequacy have a negative and positive significant impact respectively on profitability of commercial banks in Ghana.

5.4 Recommendations

The following recommendations are forward:

A. Having underscore a significant overall effect of the effect of non-performing loans on the profitability of commercial banks in Ghana, it is suggested that a rigor credit risk management process is of paramount importance to the banks. Hence managers are advised to employ a modern credit risk management technique and diversify the earning activity of their respective banks.

B. Managers of banks are to comply strictly with the rules that regulate the operations of banks in Ghana especially on the issue of capital adequacy ratio.

C. Banks should also be cautious on the rate they expand since bank size can equally affect the fortunes of banks.

D. The central bank must also be up and doing to ensure that banks keep to all ratios Central bank it sets down, particularly by the Central Bank, the banking regulations such as the minimum capital adequacy and liquidity ratios.
E. Government has to team up with the central bank to control the macro-economic variables such as inflation and exchange rate (cedi depreciation) since they also impact on profitability of banks.

5.4 Recommendations for further research

The study used a quantitative approach where only secondary data extracted from the annual reports of the sampled banks. Future research could provide more information by adding a qualitative dimension to the study. The sample size could also be expanded to include banks which are not listed on the stock exchange in Ghana and other banks in emerging countries in order to do a comparative analysis. The time period could also be increased to enable the study to incorporate recessions or banking crises as well.
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