

**UNIVERSITY OF CAPE COAST**

**CREDIT RISK MANAGEMENT AND PROFITABILITY: A CASE OF  
COMMERCIAL BANKS IN GHANA**



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## DECLARATION

I at this moment declare that this submission is my work towards the award of a MBA in Finance.

To the best of my knowledge, it contains no material previously published by another person that has been accepted for the award of any degree of the University, except where due acknowledgement has been made in the text.

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### Supervisor's Declaration

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

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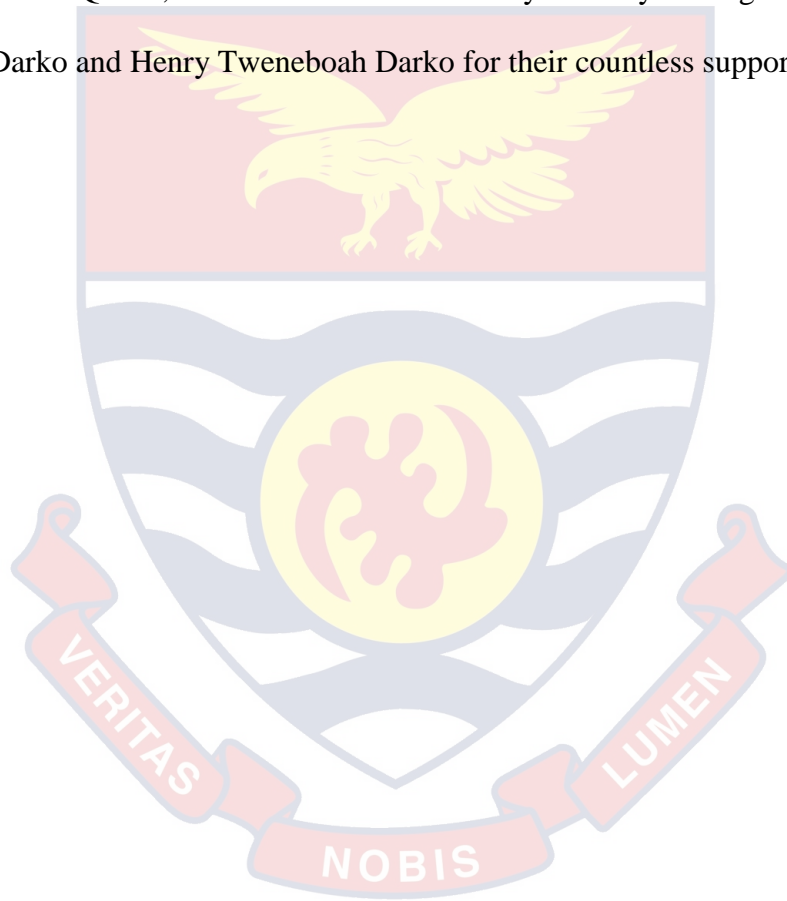
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## ABSTRACT

The study focused on credit risk management and profitability of local banks in Ghana. Profitability (return on equity) was the dependent variable and it was used to reveal the attitude of banks toward risk management. To achieve the overall purpose, credit risk management was measured using loan loss reserves, capital adequacy and credit solvency. The study followed quantitative analytical research approach and causal/explanatory design. The study used secondary source data compiled from audited financial statements of the local banks in Ghana. Data construction was undertaken to measure the relevant study variables using financial ratios. The data span from 2008 to 2019. Thus, annual data frequency was used for the investigation. Ordinary least square (OLS) econometric technique was employed to estimate the relationships the variables formulated in this study. The result from the findings revealed that loan loss provision showed a negative effect on the profitability of local banks as well as credit solvency. On the other hand, capital adequacy ratio had a positive impact on profitability. The study therefore concluded that following the high loan loss provision and the consequential effect on profitability, it is incumbent on the banks (local banks) to put up stringent measures to curtail the occurrence of non-performing loans. It is further recommended that owing to the negative effect of loan loss provision and credit solvency exposure, local banks in Ghana are expected to develop and implement credit policy aim at understanding the antecedents of loan loss and counteract these antecedents with prudent credit clearance prior to granting loans to prospective loan applicants.

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## DEDICATION

To my husband, Dr. Andrew Herzuah, and children, Kellie Adwoba Herzuah and Kenneth Kua Herzuah, I owe you my deepest sense of gratitude for your steadfast love and understanding throughout this journey. And my parents Madam Mary Korang Darko and the Late Mr. Stephen Otchere Darko.



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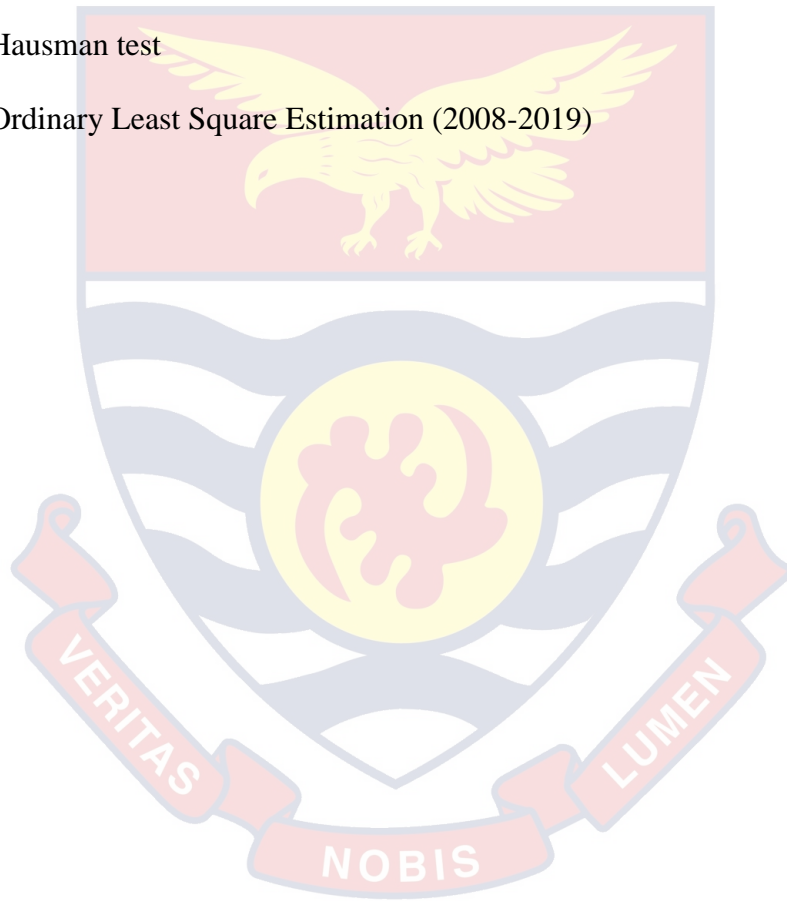
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## CHAPTER ONE

### INTRODUCTION

The study focuses on credit risk management and profitability of local banks in Ghana. Local banks under this study is the commercial banks owned solely by Ghanaians. The chapter deals with the background, problem and objectives of the study. Moreover, the hypotheses and how the entire study have been organized is also explained in this chapter.

#### **Background of the Study**

Banks are the leading financial institutions in the world with many subsidiaries and branches. Banks have now been differentiated in types depending on the services and products they offer to customers (Annor & Obeng, 2017). Some banks provide payment mechanisms, hold deposits and bundle them in a form of loans (Oheneaku, 2017). The contributions of banks to the economic development of countries through the financial services they provide cannot be under emphasised. The intermediation role of banks could be mentioned as the catalyst that facilitates economic growth (Annor & Obeng, 2017).

The intermediary role of banks includes credit provision, deposit taking, money transfers and currency exchanges. An economy's banking system strength plays a significant role because the failure of the system can affect the country's economic development (Cole, Giné, Tobacman, Townsend, Topalova & Vickery,

2013). However, the intermediary role of banks to provide credit and generate profit involves risk. The banks give out loans to their customers at profit. This activity is susceptible to credit risk.

Credit risk has been defined in varying terms depending on the approach used. According to Abu and Al-Ajmi (2012), credit risk is the possibility that a borrower will fail to meet the arranged contract on a financial requirements according to agreed terms. Annor and Obeng (2017) defined credit risk as the tendency for a debtor to be unable to pay an owed credit in time according to the financial institution's stated terms. Gizaw, Kebede and Selvara (2015) also defined credit risk management as method structured to manage uncertainties by the application of risk assessment, alleviating risk by applying managerial resources and developing strategies for controlling risk. Thus, credit risk management could also be defined as the application of strategies to alleviate any possible risk to emerge as related to credit in a financial institution.

Opoku (2014) explained that financial institutions see credit risk management as an important internal itinerary which helps financial institutions to make decisions. Banking institutions give much attention to credit risk because of their borrowers' characteristics and the type of business involved (Opoku, 2016). According to Muhammad and Garba (2014) there are six popular risk categories related to banks credit guidelines which include credit risk, operating risk, portfolio risk, interest risk, risk of credit deficiency and risk of trade union. Through analysis, it has been identified that the main risk causing the collapse of many banks is credit risk (Muhammad & Garba, 2014).

Pressure is often placed on the management of the credit risk to reduce the level of defaults (Erdoğan & Gurov, 2016). It could be viewed from this end that the management of credit risk is helpful for the performance of these financial institutions. According to Boahene, Dasah and Agyei (2012) the relationship established between economic malfunctioning and failure of banks made credit risk management an area of inquiry and much concern to both practitioners and academicians. Afriyie and Akotey (2012) connoted that credit risk management was constantly found as a main determinant in the sustenance, bottom-line performance and growth of financial institutions.

Bank credit risk management is an important policy in management of bank which necessitates the banks' appraisal of credits to measure the level as well as the size of banks' credit risk which is associated with the business of the bank (Gorowa & Igyo, 2017). Further sensitivity of bank credit can be drawn from the provisions of Basel Committee on Banking Supervision. Basel Committee provides twenty-five core principles which are fundamental principles for effective banking supervision. Out of the twenty-five, 28% (7 out of 25) is solely developed to address credit risk management (Basle, 1997). This explains that bank credit management has universal relevance and core to the very existence of banks. Therefore, it is important to evaluate bank credit management from the perspective of profitability.

In fact, one key performance indicator which receives direct effect of credit risk exposure is profitability (Brown & Moles, 2014; Tetteh, 2012). Although no bank can entirely and successfully eliminate credit risk, the level and

the degree of exposure could be controlled. Controlling the level of credit risk is fundamental to the going concern assumption of banks as credit risk variables such as loan loss provision, solvency exposure and capital adequacy (Apanga, Appiah & Arthur, 2016; Ara, 2009; Bank of Ghana, 2018; Tefara, 2011) could become antecedents of banks' profitability. Banks generate profits from the credits they lend out to their customers which if not managed properly will be defaulted.

Theoretically, one could borrow some relevant assumptions to justify the theoretical basis for assuming a relationship between credit risk management and profitability. Profitability is the ability for a company or firm to utilize its resources to create revenue more than its expenses (Junaidu & Sunusi, 2014; Li & Zou 2014). Banks profitability can be easily affected if credit risk is not properly managed. Some of the theories include; agency theory, financial crises theory, interest rate theory, portfolio theory, amongst others. The agency theory for instance posits that banks controlled by professional managers result in better credit monitoring and analysis as they lend to their customers and enhance the returns (Brown & Moles, 2014; Collins, 2016). Furthermore, theory surrounding interest rate assumes that effective credit risk management requires preference for short term loans with less risk to long term loans in balancing off the lenders profitability (Adjirackor, Oppong, Agarwal, Akuma & Gagakuma, 2016; Saeed & Zahid, 2016). In providing theoretical connection between credit risk management and profitability, Tetteh (2012) explained that when a financial institution or bank

is unable to control credit risk effectively, it creates a substantial adverse result on the profitability of the financial institution in both the long term and short term.

The empirical and theoretical arguments provided so far have demonstrated that the nature and extent of credit risk could have implications on profitability. This provides support for the entry of the current study. Thus, this study seeks to investigate the effect of credit risk management on profitability of local banks in Ghana. The choice of the local banking sector is influenced by the fact that banking analysts in Ghana including the regulator-Bank of Ghana have cited credit risk as one of the fundamentals for the 2017/2018 banking crisis (Akrong, 2017; PricewaterhouseCoopers, 2018). This assertion is not unique as studies embarked on banks failure worldwide have generally revealed that the main source of bank distress is the low quality of loans (Ogboi & Unuafe, 2013).

Although the Ghanaian banking crisis affected all banks, most of the victims were local banks. The collapsed banks include Sovereign Bank, Royal Construction Bank, UniBank, Capital Bank, UT Bank and Beige Bank (Afolabi, 2017; Akrong, 2017; BOG, 2018). All these banks are virtually local banks making the use of local banks for the study setting justified. It is against this backdrop that this study examines credit risk management and profitability of local banks in Ghana.

### **Problem Statement**

The role of effective credit risk management in prudent bank management and supervision has increasingly become global issue and its significance renewed due to series of corporate scandals and business failures. Although the various

BASEL principles which have evolved over time have considered credit risk as core, credit risk is still a challenge for financial institutions making credit risk literature insatiable. Credit risk management in Ghana was largely an academic exercise until the unexpected collapse of Capital Bank and UT Bank in 2017 (BOG, 2017; Afolabi, 2017) and the subsequent collapse of Sovereign Bank, Royal Construction Bank, UniBank, and Beige Bank (Afolabi, 2017; Akrong, 2017; BOG, 2018). Credit risk management has often been cited as chief among the causes of the banking crisis.

According to the Ghana Banking Survey Report from the PricewaterhouseCoopers (2018), some of the causes which led to the collapse of the banks are overstated loans and advances, declining loan portfolio and over 89% of non-performing loans. A critical evaluation of the Ghanaian banking crisis reveals that the local banks were believed to be the most affected banks. This raises questions about credit risk management of Ghanaian local banks. It is therefore important to use data from these banks to evaluate their credit risk vis-à-vis profitability as benchmark as profitability has a direct effect on credit risk management (Brown & Moles, 2014; Tetteh, 2012). It will therefore be a useful academic exercise to investigate the relationship between credit risk management and profitability of local banks in Ghana.

Notwithstanding, there are no enough empirical evidences to substantiate these theoretical relationships and assertions in the literature. Although studies exist, they have limited credit risk to only loan parameters such as non-performing loans or loan loss provisions (see Afriyie & Akotey, 2013; Annor &

Obeng, 2016; Asare, 2015; Boahene, Dasah & Agyei, 2012; Ofosu-hene & Amoh, 2016; Oheneaku, 2017). Important credit parameters such as loan cover or solvency and credit stress as defined in terms of capital adequacy (Ara, 2009; BOG, 2018 and Tefara, 2011) have not received much attention.

Given the recent banking crisis, it is relevant to expand the credit risk exposure parameters and test the consequence of these banks not only to fulfill theoretical requirements but also to provide evidences to support policy and practice. Furthermore, to the best of the researcher's knowledge no study has specifically considered the local banks in isolation in investigating credit risk management-profitability nexus. Filling this gap would not only confirm or otherwise the assertions about the failure of Ghanaian banks (local banks) but also provide policy and practical implication to contribute to the fight to sustain the Ghanaian banking sector.

In fact, the Bank of Ghana has issued directive in the implementation of IFRS 9 which is skewed to credit risk management to be adopted by all the banks in Ghana believing that this is the sure means in addressing the challenge. The findings from the present study could evaluate the BOG decision as whether credit risk management challenges have been over-relied upon as the cause of the banks' failure in Ghana.

### **Purpose of the Study**

The main purpose of the study was to examine the effect of credit risk management on profitability of commercial banks in Ghana. The study setting given the background for the purpose of this investigation is the local banks.



### **The Objectives of Study**

1. Examine the effect of loan loss provisions on profitability of local banks in Ghana.
2. Ascertain how loan solvency influences the profitability of local banks in Ghana.
3. Determine how capital adequacy affects profitability of local banks in Ghana.

### **Research Hypothesis**

The following hypotheses were formulated to test the relationship between credit risk management and profitability

Hypothesis 1:

H<sub>1</sub>: Loan loss provision has no significant effect on the profitability of local banks in Ghana

Hypothesis 2:

H<sub>2</sub>: Loan solvency has no significant influence on profitability of local banks in Ghana.

Hypothesis 3

H<sub>3</sub>: There is no significant relationship between capital adequacy and profitability of local banks in Ghana

### **Significance of the Study**

The findings from this study have theoretical, policy and practical significance.

Theoretically, the study is built on some key theories such as agency, interest rate

and financial crisis theory. The assumptions of these theories are the bases for the hypotheses developed in this study. The findings from this study therefore contribute to practical applications of these assumptions to the Ghanaian local banks.

At policy level, the results are beneficial to regulators of banks in Ghana-Bank of Ghana and Government in general. The evidence that good credit risk management mechanisms strongly lead to better profitability of local banks could provide literature for the Bank of Ghana (BOG) and Government to enforce all the stipulated policies geared towards effective credit risk management mechanisms including the strict enforcement of IFRS 9 as rolled out by BOG.

Additionally, the evidences from this study could also support the supervisory role of Bank of Ghana to ensure that banks especially the local banks comply strictly with other credit risk directives to enhance financial stability. This would reduce credit risk exposure which is part of the underlying problems causing the local collapse of the banks.

At practical level, the study is relevance to management of the local banks. The findings could provide the relevance of considering credit risk management as not just an integral part but core in the actualisation of good financial performance-profitability. The study further provides that banks could follow the findings in this study to set some minimum credit risk management requirement to reduce risk exposure and minimize risk appetite in order to deepen banks' profitability. Moreover, evidence from this study could reveal how local banks could not only focus on loan loss but also could seek to achieve predetermined

loan solvency and credit stressed capital adequacy in meeting the bottom line performance-profitability. The results will also help academicians and researchers who want to embark on related research and use the results from this research to discover more areas unexploited in this research. It provides measures to rectify the mismanagement of capital adequacy.

### **Scope of the Study**

The study is limited to the credit risk management and the effect it has on profitability in local banks in Ghana. Due to the situation the analyses, results and recommendations could not be related to the entire banking industry situated in Ghana. It may be found that studies focused on other banks will provide different result because they might employ different credit risk management approach for their risk management.

This study is scoped to fit its purpose of investigating the effect of credit risk management mechanisms on profitability of local banks in Ghana. The study therefore covers all local banks licensed by BOG. Choosing the local banks is very crucial as they were heavily hit by the recent banking crisis Ghana which is attributed chiefly to credit risk management flaws.

The study samples banks that operated from 2008 to 2017, given a data span of ten years (10) years. Secondary data coupled with quantitative analytical procedure are within the scope of this study. The credit risk management to assess include loan loss provision, loan solvency, and capital adequacy while profitability is limited to return on equity

### **Limitation of the Study**

The study is based solely on quantitative analysis where secondary data published on the banks' site and the BOG is used. This means that any miscalculation in the figures presented on the banks' site or from the BOG is going to affect the overall results of the study. Moreover, due to the use of local banks, the results could not be applied to other foreign owned commercial banks in the country.

### **Organisation of the Study**

The study covers five chapters. Chapter one introduces the study by presenting the background of the study, problem statement, research objectives, research questions, research hypotheses, significance of the study, scope of the study and the organization of the study. The chapter two considers the related literature relevant for the study. It's looked at both the theoretical and empirical literature.

Chapter three covers, the research approach, design and source of data description as well as measurement of variables. The chapter four considers, analysis and interpretation of results in relation to existing literature. The final chapter deals with summary, conclusions and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### Introduction

This chapter presents a detailed review of prior literature on the relationship between credit risk management and profitability of local banks in Ghana with evidences of the local banks. In 2013, Baumeister suggested that literature review is fundamental since it provides the researcher with a comprehensive idea of the subject matter under investigation. Similarly, Crano, Brewer and Lac, (2014); Belal, (2015) added that literature review does not just assess prior research on a topic, but it also analyses, compares and contrasts, correlates and summarises various intellectual books, articles, and other relevant research sources that are directly connected to a current research.

#### Theoretical Review

It has been argued that when a researcher seeks to investigate relationships in a study, the researcher is likely to provide theoretical suppositions underpinning such supposed relationships (Brower & Mahajan, 2013; Verbeke, & Tung, 2013). There is no general definition for what constitutes a theory (Bryman, 2015; Taylor, Bogdan & DeVault, 2015). It is believed that theories guides research and serve as the basis to conceive empirical relationship between

constructs (Payne, Dingwall, Payne & Carter, 2014; Taylor, Bogdan, & DeVault, 2015). Some of the theories to consider include credit risk theory, and portfolio theory

### **The Credit Risk Theory**

The credit risk theory was developed by Merton in 1974 and it is otherwise called the structural theory (Bizuayehu, 2015; Brown & Moles, 2012). The underlying assumption of the theory is that default events are derived from a firms' asset evolution which is modelled by constant parameters (Anbar & Alper, 2011). These parameters may be defined by the institution's profile. It is assumed that credit risk increases the possibility of a loss which is associated with decreasing credit quality, inability of borrowers to meet its commitment and reduction in the portfolio value (Hempel & Simonson, 1999).

A critical review of the contribution by Hempel and Simonson (1999), one may unearth three parameters in credit risk model relevant to the current study. The first parameter is the decreasing credit quality which may be associated with credit stress. Credit stress or deficient credit quality could also impair capital adequacy. Secondly, the inability of customers or borrowers to meet their credit commitment actual or notional could results in high loan loss provisions and finally, the loss of loan portfolio value may also be associated with credit solvency exposure. Thus, loan loss provisions, capital adequacy and credit solvency exposure as credit risk variables have theoretical significance.

The introduction of loan loss provision lessens the profit capacity of the banks. This is because the provision is made to supplement for eventual loan defaulters as assumed in the credit risk postulation (Brower & Mahajan, 2013). The general implication of the provision for loan loss for credit risk management of banks is that, banks which are able to reduce their occurrence of loan default through prudent credit risk management need not have high provision for loan default (Ehrhardt & Brigham, 2011).

Arguably, the credit extended to borrowers is expected to yield profit in the form of interest to the banks. Whenever, borrowers are able to pay the loans in addition to the associated interest, it stands to reason according to Al-Khoury (2011), then the loans are performing. On the other hand, if borrowers fail to pay loans and its interest, it means that the loans would not be performing. As already indicated, such non-performing loans may be attributed to credit risk management deficiencies. It is therefore incumbent on the banks and for that matter local banks to put up stringent measures to curtail the occurrence of non-performing loans. When these mechanisms are implemented, profit from interest on loans would be accrued leading to the general profitability of the banks. Following these theoretical analyses, it could be stated that there is a significant relationship between loan loss provision and profitability of local's banks in Ghana.

The proponents of credit risk theory provides that a careful analysis of loan loss provision confirms the need for introduction of credit policies aimed at reducing non-performing loans (Kargi, 2014). As asserted by Muhammed (2014), a sound credit policy would help establish a set of minimum standards, develop

vigilant lapses of asset quality, and to employ a general communication and technique for measurement and reporting of non-performing loans, categorization of loan and provisioning. The credit policy would be used as the hallmark for the bank's lending philosophy and specific procedures as well as means of monitoring the lending process (Maaka, 2013).

Using the underlying principles in the credit risk theory with regard to loan assessment, the guiding principle is to be certain that only those borrowers who require to access for loan and are capable to meet repayment contracts can access the loan. Thus, effective credit risk management may also be seen in the level of credit solvency. A strong and effective credit risk management could increase good loans and reduce bad loans through credit screening. Thus, the ratio of good loans to deposits would be reasonably high (Bizuayehu, 2015) and ultimately reduce non-performance and enhance interest income. This means that high credit solvency could increase the level of profitability and vice-versa. This means that there is a significant relationship between capital adequacy ratio and profitability of local's banks in Ghana.

Banks or lenders may decide not to give out loans although borrowers may be ready and willing to pay higher interest rate, or, grant loans but restrict the amount of loans to less than the borrowers would like to borrow (Boahene, Dasah & Agyei, 2012). This policy would invariably lower the rate of default, lower the degree of loan loss provision, increase credit solvency and consequently increase profitability. This also reinforces that the level of loan loss provision and credit solvency define the credit risk profile of banks.



## Portfolio Theory

The portfolio theory was developed in the 1950's through to the 1970's and was considered an important advance in the mathematical modeling of finance (Mwangi, 2012). Since the theory's introduction many theoretical and practical studies have been developed using the portfolio theory. The theory tries to maximise portfolio expected return for a given amount of portfolio risk or equivalently minimise risk for a given level of expected return, by carefully choosing the proportions of various assets (Negussie, 2012; Poudel & Prakash, 2012). The rationale behind the portfolio is much concerned about how risk is managed. The further assert that effective portfolio management begins with oversight of the risk in the management of financial resources of the organisation. Therefore, prudent risk selection is vital to maintaining favorable return.

Therefore, effective management of the loan portfolio and the credit function is fundamental to financial safety. This concept of loan portfolio management (LPM) which is the process by which risks that are inherent in the credit process are managed and controlled is more pronounced (Olweny & Shipho, 2011). To manage portfolios, bankers must understand not only the risk posed by each credit but also how the risks of individual loans and portfolios are interrelated. These interrelationships can have multiplier risk effects beyond what it would be if the risks were not related. Until recently, few banks used modern portfolio management concepts to control credit risk. Now, many banks view the loan portfolio in its segments and as a whole and consider the relationships among portfolio segments as well as among loans. These practices provide management

with a more complete picture of the bank's credit risk profile and with more tools to analyze and control the risk

Efficient loan portfolio management enhances reduces credit risk, enhance credit quality and could reduce capital impairment when subjected to dynamic stress testing (Anbar & Alper, 2011; Asare, 2015; Bizuayehu, 2015; Brown & Moles, 2012). Thus, the level of capital adequacy may determine the extent of effectiveness of credit risk management within a bank loan portfolio. Thus, effective loan portfolio construction and management could increase the capital adequacy ratio and enhance the ability to create credits and eventually increase profitability. However, with low capital adequacy ratio (i.e total capital to the risk of the banks), the tendency to deal with shocks would be low and this would expose the banks to high risk. This means that any credit risk management agenda which prioritize the use of high capital asset as a means of management portfolio is likely to maximize profit (Maaka, 2013).

### **Empirical Review**

In discussing the effect of credit risk management on profitability of local banks in Ghana, this section undertakes a thorough empirical review of the subject. The empirical review takes a critical assessment of the existing works and how these works provides direction to the current study. The review of these existing studies also provision opportunities to strengthen the current study by improving areas where the existing studies have not addressed.

Due to the focus of risk of commercial banks, Kithinji (2010) conducted a study to find the relationship between credit risk management and profitability of

commercial banks in Kenya. By this the author employed a regression model to establish the relationship between amount of credit, non-performing loans (NPL) and profits during the period of the study. These banks' data on the amount of credit, non-performing loans and profits were collected to aid in the construction of the study. The study revealed that most of the incomes of the commercial banks are not influenced by the level of non-performing loans and credits connoting that other variables other than credit and non-performing loans' affect the profits. Commercial banks that are interested in making huge profits were suggested to focus on other elements that will make the banks improve rather than concentrating highly on the amount of credit and non-performing loans.

Kithinji (2010)'s study provides the empirical basis for comparison. The focus of the present study (credit risk management and profitability) is similar to the study of Kithinji (2010) making it an important benchmark. Nevertheless, Kithinji (2010) limited the proxies of credit risk to amount of credit and non-performance loans. These variables are too related that it is not surprising that significant estimates were not obtained. Kithinji (2010)'s study also focused on the entire commercial banks (both foreign and local banks) and this could have affected the findings and conclusions as it is believed that foreign banks and local banks differ in terms of characteristics and operational profiles (Goyal, 2013). The present study does not only situate its setting in Ghana given differences in socio-economic characteristics of Ghana and Kenya but also tailor its investigation to local banks providing uniform base of analysis. Again, following the Ghanaian banking crisis, it is the local banks which were heavily affected

suggesting possible differences in risk profile. Additionally, credit risk variables go beyond loan losses as credit risk stresses capital and solvency (Apanga, Appiah & Arthur, 2016; Ara, 2009; BOG, 2018; Tefara, 2011). These variables have been absent. This study seeks to extend the proxies to include loan loss, solvency exposure and capital adequacy.

In Lagos state Alalade, Binuyo, and Oguntodu (2014), examines the impact of managing credit risk and profitability of banks. The research hypothesis was tested and analyzed in relation to credit risk and its significant effect on banks profitability. It was also the aim of this research to evaluate how effective it is for a bank to manage its credit enhance profitability. Data for the study was an obtained through the administering structured questionnaires which were answered by respondents. Correlation coefficient was used to decide whether or not credit risk management has an impact on profitability. The results revealed that credit risk reduces the profit and therefore management of credit risk should be of great importance to management of bank in Lagos state.

It could be observed from study of Alalade et al (2014) that primary data was the only source of data employed for the study. However, as argued in the literature, the effect of credit risk on the profitability of banks or otherwise of it appears on the banks' annual balance sheet (Boahene, Dasah, & Agyei, 2012). The current study therefore employs the use of secondary data through the use of banks; annual report as stated on their websites and also from the website of the central bank.

Concentrating basically on the relationship between credit risk management and profitability, Li and Zou (2014) conducted a research to examine the relationship between credit risk management and profitability of 47 commercial banks in Europe. The research was conducted to depict whether the relationship between the two variables is study or fluctuating. Data from the 47 largest European commercial banks on their annual report were collected from the year frame of 2007-2012. The proxies used to measure credit risk management were capital adequacy ratio (CAR) and non-performing loans ratio (NPLR) while profitability employed return on equity (ROE) and return on assets (ROA) as its proxies for its measurement. Li and Zou used the multivariate regression analysis because of the two available variables.

After the application of the multivariate regression analysis, it was proved by the study that credit risk management has positive effects on the profitability of the commercial banks. The proxies of credit risk management; non-performing loan ratio has a significant effect on Return on Equity (ROE) and Return on Assets (ROA) while Capital Adequacy Ratio has insignificant effect on both Return on Equity (ROE) and Return on Assets. Banks should enforce in efforts towards the credit risk management, specifically, to regulate the non-performing loan when considering that there is a positive relationship between the two variables at hand.

The study by Li and Zou (2014) is one of the closest and comprehensive prior research efforts to the present study in the literature. Li and Zou (2014) also recognised capital adequacy as an important proxy of credit risk even though

there was no evidence of significant influence on profitability. However, capital adequacy challenges have been cited strongly as one of the causes of banks failure in Ghana in the recent crisis where local banks were affected (Akron, 2017; BOG, 2018). Can one rely on the findings of Li and Zou (2014) to doubt the assertion that capital adequacy challenges contributed to failure of banks in Ghana? A conclusion can only be substantiated with empirical evidences based on Ghanaian data. This is what the present study seeks to fill.

As a contribution to the arising situation on credit risk management and profitability of commercial banks, Navoda (2015) conducted a study to observe the relationship between credit risk management and profitability of commercial banks in Sri Lanka. The study focuses to find out if credit risk management and profitability has a stable or fluctuating relationship. Compilation of the data was made from 2010-2014 about the impact of credit risk management on profitability of 24 commercial banks in Sri Lanka. Navoda used Return on Equity (ROE) and Return on Assets (ROA) as the proxies of profitability and Non-Performing Loan Ratio (NPLR) and Capital Adequacy Ratio (CAR) as the proxies of credit risk management.

The results from the study showed that between credit risk management and profitability there is a positive relationship. It also shows that there is a significant impact of credit risk management on profitability of commercial banks from 2010-2014. There is also a fluctuation between the relationships of all the representations. It is also recommended that much determination should be on

credit risk management to control the non-profiting loan to help improve their level of profitability.

The present study may be considered as replication of the evidence in the study by Navoda (2015). Like the study of Li and Zou (2014), Navoda (2015) also recognised capital adequacy as a proxy of credit risk. The current study tows the direction of these studies and conceptualises credit risk to embody capital adequacy. However, this study revises the scope of the measurement to include credit solvency exposure to comprehensive assess the credit risk exposure using profitability as benchmark.

Also in Ethiopia, Bizuayehu (2015) carried out a study on the impact of credit risk on the financial performance of banks using bank specific and macroeconomic factors covering a period of years from 2003 -2008. Return on equity used as a proxy for financial performance and nonperforming loan to total loan ratio, capital adequacy ratio and total loan to deposit ratio, bank size, interest rate spread, gross domestic product and inflation rate as a proxy for credit risk. The study revealed that both bank specific factors and macroeconomic factors have inverse association with return on equity but only the bank specific factors are significant factors influencing return on equity.

Bizuayehu (2015)'s study has considered among others credit solvency exposure in terms of loan-deposit ratio. By incorporating this variable (credit solvency ratio) in this study, the present study could compare the findings with the findings and conclusions reached by Bizuayehu (2015). This empirical comparison is relevant due to cross-border differences and their implications on

findings and conclusions (Bird, 2005). Relying on evidences from other regions or countries wholesale could have adverse effect on policy directions (Akron, 2017; BOG, 2018; PWC, 2017 and Li & Zou, 2014). For instance, although authorities in Ghanaian literature have attributed the banking challenges to factors such as capital inadequacy, the findings by Li and Zou (2014) in Europe suggest that capital adequacy has no such effect. Thus, cross-border differences should be considered in importing findings for policies making the current study using Ghanaian data quite relevant.

The study has provided empirical review of foreign based studies. It is important to turn to Ghanaian based literature to review the current development of the subject under investigation. Boahen et al (2012) also investigated the relationship between credit risk management and profitability in Ghana. This research used a balanced panel data model. These researchers employed both Fixed and Random effect model. They adopted Hausman Specification Test to determine whether or not fixed effect or random effect should be used. It was revealed that the fixed effects model was much more preferred to the random effects model was used for the analysis. The result showed that credit risk, size of bank, bank growth rate are keys factors which influence the profitability of sampled banks in Ghana. Surprisingly, the entire variables used in the research had a positive impact on firm profitability.

Boahene et al (2012) is one of the studies which have been developed in the Ghanaian literature. It thus becomes fundamental for empirical comparison. The study introduced some control variables. This lesson may be borrowed in the



present study. Nevertheless, the study and its data may suffer from currency effect as a lot have happened in the Ghanaian banking sector including the recent banking crisis making revisit of the subject a useful academic exercise. Additionally, Boahene et al was more generic, however, the exposure of the recent banking crisis seems to affirm the literature that even in the same banking industry, the exposure of foreign banks may be different from local banks (Goyal, 2013). The implication is that conducting bank specific category investigation (local banks) could provide cutting edge evidences to influence policy and practice. This is one of the bases of entry for the current study. Additionally, Boahene et al (narrowed credit risk, following some of the other reviewed literature and cited causes of the failure of Ghanaian banks, the present seeks to expand the proxies of credit risk to included other stressors besides loan loss.

In Ghana, Afriyie and Akotey (2014) also recognised that credit risk management in banks has become a barrier to their growth which aided them to embark on a study to examine the relationship between credit risk management and profitability of some selected rural banks in Ghana. For them to attain their objective, they collected data of the year 2006-2010 for their analysis. The panel data analysis approach was used to determine the relationship between credit risk management and profitability of rural banks. The panel data analysis consist of two main models that are employed and these models are fixed effect model which is employed when you want to regulate omitted variables that vary between cases but are constant overtime and random effect model which is employed when there is some omitted variables which are constant overtime but vary between

cases. The result reveals a significant positive relationship between the non-performing loans and profitability, indicating that even though there is high loan losses, these banks are still making profits. This therefore shows that, rural banks has effective credit risk management practices. Non-performing loans decrease the level of profit of rural banks but in a case where non-performing loans are rising regularly to profitability, then rural banks do not have effective organizational actions to deal with credit risk management.

Unlike Boahene et al Afriyie and Akotey (2014) limited the scope to rural banks. This implies that Afriyie and Akotey (2014) also recognise the need to conduct study based on some similar characteristics. Thus, the present study is seen as extension of the literature of Afriyie and Akotey (2014) toward the local banks in isolation. Though Afriyie and Akotey (2014) recognized capital adequacy as important credit stress variable and included it in their recommendations, the authors failed to integrate the variable in their analysis. This study may serve as a response to the recommendations by incorporating capital adequacy as credit risk indicator

On the verge to investigate the relationship between credit risk and profitability as a contribution to the topic, Asare (2015) conducted a study on how credit risk has an impact on profitability of some selected Banks in Ghana. The main rationale was to discover the connection between credit risk management and the profitability of some selected banks in Ghana. From 2005-2013 was the nine-year span in which the data from the seven selected banks was examined within random and fixed effects techniques.

The research was conducted through a historical research design by which the researcher discovers, describes and understands past phenomenon from already existing data. Panel data model was used to depict the connection between credit risk and profitability of some selected banks in Ghana. The two main techniques of the panel data for its analysis include fixed effect model which explores the connection between dependent and independent variables within an entity and random effect model which is used in study of classified or panel data when one suggests no fixed effect.

The results showed that, non-performing loans are negatively connected to profitability whereby loan loss provision ratio and loans and advances ratio are positively significant to the profitability of banks. The researcher also found that while capital adequacy and age have a positive connection with profitability the size of the bank has negative connection with profitability. The study therefore recommends that there is a need for management of the banks to implement effective measures in improving the credit risk management strategies to enhance their profitability.

Asare's (2015) study is very comprehensive in scope. The study measures credit risk by loan loss, non-performing loans and capital adequacy. Asare also included control variables such as age and size. The current study learns from Asare to operationalise credit risk by loan loss and capital adequacy. However, it is expanded to include credit solvency exposure which was not considered by Asare. Furthermore, though the current study considers Asare's study as one of

the bases of empirical comparison, it seeks to differ in terms of the study setting as it focuses primarily on the local banks.

To explore the relationship between credit risk management and profitability of commercial banks was conducted by Annor and Obeng (2017). They purposed their study on the impact of Credit Risk Management on the Profitability of Listed Commercial Banks on the Stock Exchange of Ghana. The study employed the balanced panel data from the period of 2007-2016 (ten years) to examine the relationship between the two variables at hand. Random effects model was employed for the study. The reason for random effects model is that contrary to the fixed effect model, the difference across the units is assumed to be random and disconnected with the independent variables included in the model.

The results indicated that non-performing loans (NPL) and the capital adequacy ratio (CAR) have positive impact on the profitability of the banks while loan loss provision ratio have a negative impact on the profitability of the banks. The results therefore connote that attempts of banks to merge liquidity will result in a decrease in profitability as funds that could have been invested in projects that could generate profits have been withheld to increase liquidity. The commercial banks in Ghana are recommended to keep sufficient liquidity, capital levels and keep quality assets on their books since the results from the study connote important relationship between credit risk indicators and profitability.

Similar to Asare (2015)'s study, Annor and Obeng (2017)'s study support capital adequacy as credit risk variables. Thus, the study of Annor and Obeng (2017) becomes relevant for empirical comparison. Notwithstanding, the current

study include credit solvency exposure which is has not received much attention in the Ghanaian literature in investigating the credit risk. This study also expands the literature by focusing on local banks unlike the listed banks used by Annor and Obeng (2017).

### **Conceptual Review**

This section deals with the broad concepts and other supporting concepts of the study. Some of the broad concepts include credit risk management and profitability. While capital adequacy ratio, loan loss provision and credit solvency exposure. However, the general overview of the banking sector in Ghana is first discussed.

### **Overview of the Ghana Banking Industry**

The financial system of Ghana in the early 1980s functioned under a shade of rigid and monetary policies on the expectation of sustaining the state developmental agenda. In any vibrant and developing country, banks form an integral and significant part in the country's economy and as a result offer a genuine part to explore into issues on banks credit risk management and profitability in the context of economic development (Adams & Agbemade, 2012). As at the year 2000, the Ghanaian banking industry had about 12 banks of which was being dominated by Barclays bank, Standard Chartered bank and GCB bank. The arrival of more foreign banks was introduced after the period of the year 2000 which strengthened the competition in the industry. To ensure the effectiveness of banks as major factors for financial intermediation controlling

savings into investment to promote higher economic growth, a competitive banking system is required.

The banking sector in Ghana has been responsive in its role and provides numerous benefits to the Ghanaian economy (Adusei, 2011). The industry has been able to chalk a lot of successes, efficiency and growth in the past. Banking sector report by the central bank reported that the sector is highly liquid, profitable and has strong asset growth (BOG, 2016). Despite the successes profitability in the past which may largely be attributed to the high interest spread in Ghana, the banks have been experiencing untold performance challenges recently. Data from the banking sector survey reveals that notwithstanding that the industry had relatively sound interest income growth rate was 43% in 2014 (2013: 49%), interest expense grew by 50% in 2014 (2013: 55%). The operating expenses of the industry grew by 52% from 2013 to 2014 (PWC, 2015). The industry recorded a slower net interest income growth rate of 19.4 percent in 2016 compared to 34.5% in 2015 (Otchere, Soumaré, & Yourougou, 2016). The industry's non-performing loans grew from 43% in 2015 to 45% in 2016.

Besides the data pointing to the general sectorial challenges, the situation is worsening at the individual banks level. The poor financial health and worsening asset quality has led to the collapse of two banks (UT Bank and Capital Bank) in 2017 and just last year, five other banks (Sovereign Bank, Royal Bank, Construction Bank, UniBank, and Beige Bank) also collapsed (Afolabi, 2017; Akrong, 2017; BOG, 2018). According to the Ghana Banking Survey Report from the PricewaterhouseCoopers (2018), some of the causes which led to the collapse

of the banks are over stated loans and advances, declining loan portfolio and over 89% of non-performing loans. This brings into question effectiveness of credit risk management in the banking sector. In fact a lot of authorities have attributed the crisis to among others poor credit management (Afolabi, 2017; Akrong, 2017; BOG, 2018).

Owing to the recent banking crisis in Ghana, credit risk management in Ghana has now become more of supervisory and policy issue rather than a mere theoretical and academic exercise. A critical evaluation of the Ghanaian banking crisis reveals that the local banks were the most affected banks. This raises questions about credit risk management of Ghanaian local banks. It is therefore important to use data from these banks to evaluate their credit risk vis-à-vis profitability as benchmark as profitability has a direct effect on credit risk management (Brown & Moles, 2014; Tetteh, 2012). It will therefore be a useful academic exercise to investigate the relationship between credit risk management and profitability of local banks in Ghana.

### **Credit Risk Management**

The concept of credit risk management is designed and applied both internally as an operational tool by banks' management and externally by banks' regulatory authority like the Bank of Ghana to manage the financial health of banking sector (Muhammad, Shahid, Munir, & Ahad, 2012). The focuses of such policies are needs for asset diversification; maintenance of balance between returns and risk. A good and soundness of credit risk management is an indicator

of a good financial performance of a bank at large (Poudel & Prakash, 2012). Han (2015) defines credit risk as the possible losses of banks coming from borrowers' failing to repay. According to the author, credit risk is made of three main forms: principal loss risk, interest loss risk and profit loss risk. From the above definitions and meanings given by these researchers, they bore down to the fact that, credit risk is a cancer which causes serious financial problems when it is not properly managed.

According to Al- khouri (2010) some major causes of credit risk and they include; inadequate institutional capacity, unsuitable loan guidelines, unstable interest rates, inefficient management, unfitting regulations, increasing number in banks, negligence in credit valuation, ineffective lending methods, government interference and insufficient monitoring by the central bank. Generally, the existence of banks is not only to take deposits from customers but also to give out credit facilities in the form of loans, and however, certainly exposing them to financial or credit risk. When a banks customer defaults in fulfilling debt obligations on a maturity date that could be said to be credit risk exposure. According to San and Heng (2013), the banking industry is packed with loads of menace and for this reason the ability for banks to generate profit and capitalize on the shareholders assets depends on their risk and management approach of the risk.

In fact, credit risk management forms an indispensable role of a bank's entire strategy on risk management. This management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit



in order to provide framework for understanding the impact of credit risk management on banks' profitability (Kargi, 2011). In this case, it could be deduced that, weak credit risk management is a major cause of many collapses in businesses. In core, credit risk arises from uncertainty in counterparty's ability or willingness to meet his/her contractual obligations. In the same vein, Naomi (2011) raised an argument that, credit risk signifies the prospective discrepancy in the net income from non-payment or delayed payment of credit facility approved to customers. There are different facets of credit risk management. However, following the literature, this study conceptualises credit risk as loan loss provision, capital adequacy and credit solvency exposure.

### **Capital Adequacy Ratio**

Capital adequacy ratio is defined as the proportion of a bank's own equity in relation to its risk exposure. It helps to protect depositors from banks who lend aggressively and in doing so do not get back most of the money lent. This is because when a bank makes large loan losses that wipe out its total equity, it may lead to an immediate bankruptcy hence making depositors lose their money. The directive clearly set out the computation mechanism and the conversion factors for both on and off-balance sheet items and strictly set for all banks not to maintain their capital level below 8% of their risk weighted assets. Irrespective of such regulatory framework, the main intention of holding capital is to build the internal strength of the bank to withstand losses during crisis (Dang, 2011).

The research by Boudriga, Taktak and Jellouli (2009) illustrates that CAR seems to reduce the level of problem of loans which means higher CAR leads to less credit risk exposures. Rufai, (2013) investigate the effects of capital regulations on the performance of banks in Egypt. The research provides a comprehensive framework to measure the impact of capital adequacy on two indicators of bank performance: cost of intermediation and profitability. The result of the research indicates that higher capital adequacy “increase the interest of shareholders in managing bank’s portfolio” which generates “higher cost of intermediation and profitability. It is a measure of bank’s financial strength since it shows the ability to withstand and tolerate with operational and abnormal losses. It also represents the ability to undertake additional business (Habtmu, 2012). As noted by Li & Zou (2014), CAR determines risk behavior of banks. It is a measure of banks solvency and ability to absorb risk. Thus, this ratio is used to protect depositors and promote stability and efficiency of financial systems. It is measured by total equity to total asset ratio. The ratio of equity to total assets is considered one of the basic ratios for capital strength. It is expected that the higher this ratio, the lower the need for external funding and the higher the profitability of the bank. It shows the ability of bank to absorb losses and handle risk exposure with shareholder. Equity to total assets ratio is expected to have positive relation with performance that well-capitalized banks face lower costs of going bankrupt which reduces their costs of funding and risks (Hurka, 2017; Han, 2015; Maaka, 2013).

### **Loan Loss Provision**

The possibility of non-performing loan raises a probability of loss which requires provision. The amount of provision is accounting amount which can be further subtracted from the profit. This phenomenon calls for loan loss provision. According to Agenor and Zilberman (2015) Loan loss provision is the expense or the allowance set aside to meet default loans and payments. These provisions are made to cover possible loan losses such as bad debts or loans, customer defaults and loan renegotiation terms which may decrease the previously expected payments.

Like any other lending institution, the Ghanaian banking institution generates its revenue primarily from the interests on loans. Non-performing loans can therefore be disturbing to the lenders. Non-performing loans affect all aspect of financial performance. It reduces net interest income and ultimately translates into lower residual income and net profit. Additionally, the liquidity position could be threatened by non-performing loans and banks' ability to grant credit is undermined. Moreover, the capital adequacy ratio is also reduced because of lower residual incomes. Therefore, investigating how this menace could be arrested through credit risk management is very critical.

### **Credit Solvency Exposure**

The solvency exposure deals with the ability of banks to respond to customers need. This is the ratio of banks total good loans to total deposits. If the ratio is high, it implies that the bank could recovery its obligations and credit risk

exposure is low. The loan to deposit ratio is used to calculate a lending institution's ability to cover withdrawals made by its customers. A lending institution that accepts deposits must have a certain measure of liquidity to maintain its normal daily operations (Hurka, 2017).

Loans given to its customers are mostly not considered liquid meaning that they are investments over a longer period of time. Although a bank will keep a certain level of mandatory reserves, they may also choose to keep a percentage of their non-lending investing in short term securities to ensure that any monies needed can be accessed in the short term (Rufai, 2013). To quantify banks liquidity, this research paper employed loan to deposit ratio. Which indicates that the ability of banks to withstand deposit withdrawals and willingness of banks to meet loan demand by reducing their cash assets. When the banks are more liquid, they can reduce risk of insolvency. This ratio provides more general information on the issue deposit because it takes no account the mix between time and demand deposit, and other issues.

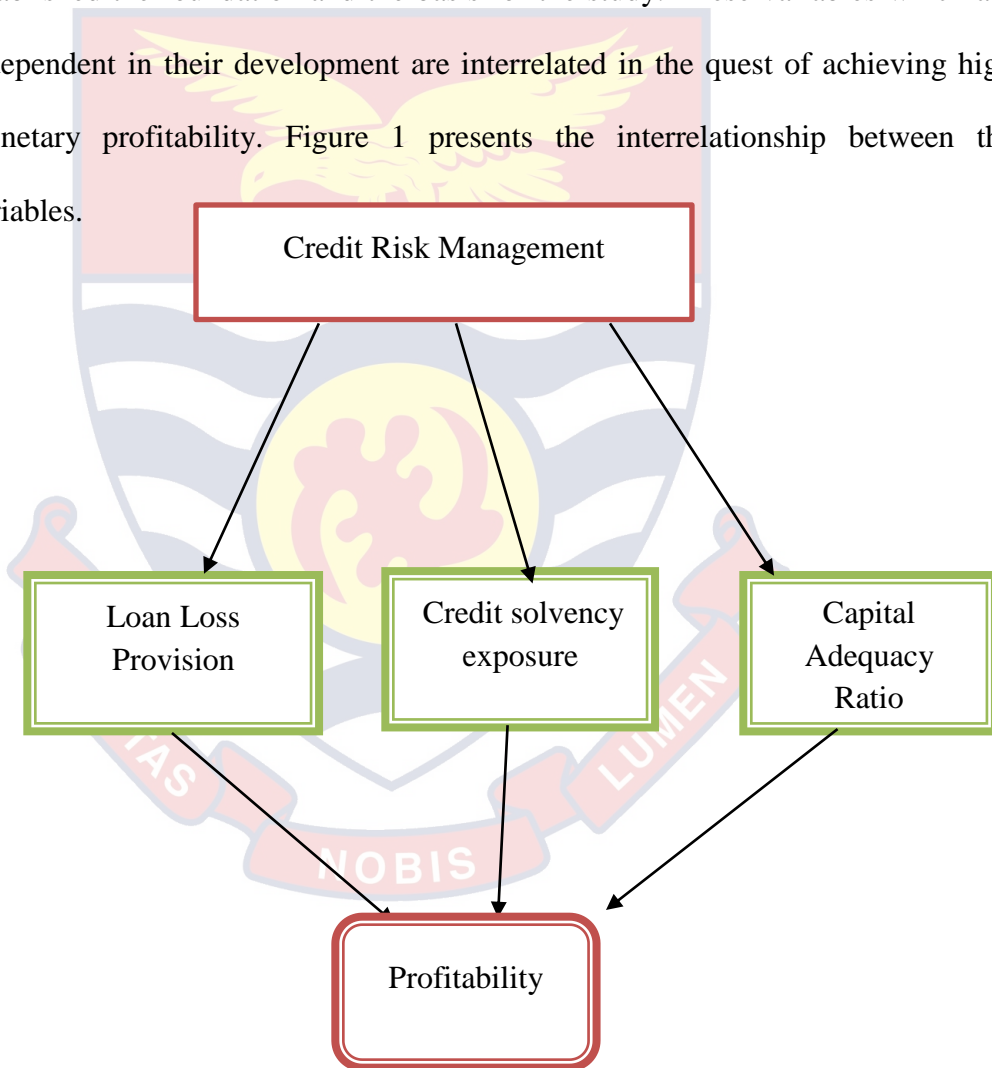
### **Profitability**

Profitability in banking sometimes demonstrates the attitude of management toward risk. Banks with huge profitability rate are not terrified when entering into risky activities. In a comparable approach, banks that are not effective in their management experience higher awful debt. The profitability level is very significant for a bank's shareholder because it gives a clear idea about how effective management has utilized their investments (Devinaga, 2010). To establish the financial health of banks, the level of profitability is principal.

According to Codjia (2010), profitability performance will concentrate on the income statement which shows how much is generated (revenue), how much is spent (expenses) net income.

### Conceptual Framework

In the review of the conceptual issues, certain key factors or variables established the foundation and the basis for the study. These variables which are independent in their development are interrelated in the quest of achieving high monetary profitability. Figure 1 presents the interrelationship between the variables.



**Figure 1: Conceptual framework for credit risk management and profitability of local banks**

Source: Authors Construct 2020

It can be observed from Figure 1 that credit risk management is conceptualised to mean loan loss provision, capital adequacy and credit solvency exposure. As discussed in both the theoretical and empirical reviews, these factors are important proxies for evaluating credit risk management. Therefore, these variables are used as proxies in establishing the relationship with the profitability. The arrows flow from these credit risk management to profitability indicating that they are independent variables while profitability is dependent variable.

### **Chapter Summary**

The chapter discussed relevant theories which underlined the investigation. Some of the principal theories reviewed include credit risk theory and portfolio theory. The assumptions of these were linked to explaining how credit risk management could influence banks profitability. A critical review of prior research works were also discussed and relevant evaluations presented. The lessons from the various reviews guided the study and in due course helped establish the conceptual framework of the study. The next chapter would discuss the methodology to report the study objectives and answer the research questions.

## CHAPTER THREE

### RESEARCH METHOD

#### Introduction

This chapter focuses on the methodology for the study. It specifically discusses the methods, techniques, approaches and procedures needed to address the study problem and achieve the objective of the study. According to Robson, (2010) research methodology is a way to systematically solve a research problem. It is the approach and technique for carrying out a study (Lunenburg & Frederick. 2008). The sub-themes in this chapter include study approach, the study design, sources and descriptions of data, theoretical model specification, empirical model specification, justification and measurement of study variables.

#### Study Approach

According to Babbie, (2010) when conducting a research it is necessary to determine which approach is being implemented, because “scientific inquiry in practice typically involves alternating quantitative and qualitative. The choice is important as the type of research approach defines the overall orientation and type of claims that researcher makes and follows in conducting a study. Although researchers have often alternated between qualitative and quantitative approach, there are three main types of research approach available to researchers (Creswell,

2009; Creswell, 2003; Zikmund, Babin, Carr & Griffin, 2011). These are the qualitative, quantitative and the mixed approaches

Nevertheless, it is the prerogative of the researcher to choose appropriately the approach to adopt, provide justification for the choice and how it will be applied. Given these facets, the current study employs quantitative approach. According to Zikmund et al (2011), a quantitative research typically explores specific and clearly defined questions and hypotheses that examine the relationship between two events, or occurrences, where the second event is a consequence of the first event.

Following the contribution by Zikmund et al (2011), the use of quantitative approach is justified as this study seeks to establish relationship between credit risk management and profitability where the relation is tailored into analysis of cause and effect relationship making the quantitative approach more suitable. The focus and all the specific objectives of this study require numerical data and this is also consistent with quantitative approach. Thirdly, this study formulates hypotheses to address the objectives based on theoretical assumptions.

As a feature of quantitative study, the findings from testing these hypotheses may affirm or disaffirm the theoretical postulation (Rovai, Baker & Ponton, 2014; Yesgat, 2009). To apply this approach in this study, the study ensured that collected data that can be quantified and subjected to statistical treatment in order to support or refute alternate knowledge claims. This would also require that the study uses econometric models as estimation technique for the data analysis. Furthermore, the study clearly defined the variables and their



proxies and determined the dependent variable and independent variable so as to support the cause and effect relationship assumption of this approach.

### **Study Design**

There is no one universal research design for investigating research problems. Therefore, like the research approach, the researcher is expected to evaluate relevant designs based on the focus of the study, the research problem, objectives and the approach chosen to arrive at the appropriate design to use. A research design is a procedural plan and road map for conducting a study (Kothari, 2005). This study uses explanatory design. This design is often termed a causal design. The explanatory or causal design involves analysing and explaining patterns of relationships that exist between study variables (Maylor & Blackmon, 2005).

Since this study seeks to determine how credit risk variables (independent variables) explain or influence profitability (dependent variable), then, explanatory design becomes more suitable (Brains, Willnat, Manheim & Rich, 2011). Additionally, it is expected that the research approach should be consistent with the design. Explanatory design can easily be married into quantitative approach as both are capable of handling cause and effect relationship and numerical data. To apply this design, the study relies on the existing literature to choose appropriate proxies for the study variables and conduct data measurements from secondary source (annual reports) to measure these variables. Subsequently, model specification is drawn for the proposed relationship and estimation technique

applied to test the cause-and-effect relationship as dictated by the explanatory design.

### **Sources and Description of Data**

Researchers traditionally use primary data source or secondary data source or both. This study uses mainly secondary data. Secondary data are data compiled by persons other than the researcher. The choice of this data is not influenced only by the nature of this study but also the quest to minimise data biases. Unlike primary data where the researcher can manipulate, secondary data are verifiable and therefore enhance data reliability. The study collects the relevant data for testing the hypotheses and addresses the objectives from annual reports of the local banks in Ghana. The data have annual data frequency spanning from 2008 to 2019. The reason for these periods is data availability and uniformity in accounting. The Ghanaian banking sector fully embraced IFRS from 2008 making 2008 an important starting point and 2019 since most of the financial statements available are up to 2019.

The study describes its data based on the variable class. The two classes are the dependent variable which is in this context is profitability and defined in terms of return on equity (ROE) and the independent variable which is the credit risk management and is also defined in terms of loan loss provision, capital adequacy and credit solvency ratio. Following the literature review, it was learnt that some control variables are relevant for the investigation; these are age and bank size (Asare, 2015; Bizuayehu, 2015; Boahene et al, 2012). These have also been considered in this study. The measurement and justifications are provided in

subsequent section of this chapter. Table 1 summarises these variables are their proxies.

**Table 1: Summary of Sources and Description of Data**

<b>Variables</b>	<b>Symbol</b>	<b>Sources of data</b>
<b>Dependent Variable (Profitability)</b>		
Profitability (Return on Equity)	ROE	Audited Annual Report
<b>Independent Variables (Credit Risk)</b>		
Loan Loss Provision	LLP	Audited Annual Report
Capital Adequacy Ratio	CAR	Audited Annual Report
Credit Solvency Exposure	CSE	Audited Annual Report
<b>Control Variables (Credit Risk)</b>		
Bank Size	BS	Audited Annual Report
Age	Age	Audited Annual Report

**Source: Herzuah (2020) Developed from the Literature**

### General Model Specification

Having defined the study variables, the study proceeds to formulate its theoretical model for the investigation. The general model follows panel specifications. This is suitable as the nature of this study requires the use of cross sectional characteristics (individual local banks) and longitudinal parameters (data spanning from 2008 to 2017) (Boahene et al, 2012; Li & Zou, 2014). The generalised panel model is presented as:

$$Y_{it} = \alpha_i + \beta_q \sum X_{it} + \varepsilon_{it} \quad (1)$$

Where ‘i’ represents the cross sectional characteristics and defined by the individual local banks to be used in this study

't' also represents the longitudinal characteristics as defines by the span of data from 2008 to 2019

'Y' is the dependent variable and it is defined as profitability

'X' with the sigma is collective independent variables and are defined as the credit risk parameters

$\alpha_i$  represents the constant variable

$\beta_q$  represents the estimates or the coefficient of the independent variables

'e' represents the error term.

### Empirical Model

The investigation and testing of the hypotheses require specific variables. Therefore, the study further operationalises the general model (1) and called it the empirical model. This is done by substituting the relevant proxies of the variables into eqn (1) and called it eqn (2). This is expressed as follows:

$$ROE_{it} = \alpha_i + \beta_1 LLP_{it} + \beta_2 CAR_{it} + \beta_3 CSE_{it} + \beta_4 BS_{it} + \beta_5 AGE_{it} + \varepsilon_{it} \quad (2)$$

The variables have already been defined in Table 1, Table 2 and Model (1). Thus, the meaning of the variables is as have been described in those specifications.

$\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  are the parameters or estimates to test the relevant hypotheses.

$\beta_1$  is the coefficient of loan loss provision and it is the basis for testing the relationship between loan loss provision (credit risk) and return on equity (profitability).

$\beta_2$  is the coefficient of capital adequacy and it is the basis for testing the relationship between capital adequacy ratio (credit risk) and return on equity (profitability).

$\beta_3$  is the coefficient of credit solvency exposure and it is the basis for testing the relationship between credit solvency exposure (credit risk) and return on equity (profitability).

### **Estimation Technique**

This study seeks to estimate the empirical model (2) using Panel Least Squares (PLS). Panel Least Squares (PLS) has become one of the powerful estimators when used correctly. One of the bases for choosing PLS is its ability to estimate the unknown parameters in a linear regression model. It is also capable of minimising the sum of the squares of the differences between the observed responses (values of the variable being predicted) in the given dataset and those predicted by a linear function of a set of explanatory variables (Greene & William, 2002). Furthermore when the unit root assumption is met, PLS estimates are more reliable than most of the traditional estimators (Wooldridge & Jeffrey, 2013).

## **Justification and Measurement of Variables**

The three main variables of the study are the profitability (dependent variable), credit risk management (independent variables) and control variables. The study provides description and measurement of these variables are as follows:

### **Profitability**

Profitability is the dependent variable and it can be used to reveal the attitude of banks toward risk management (Al-Khouri, 2011; Brown & Moles, 2012). There are several proxies often used to measure profitability. However, most of the reviewed studies about credit risk management-profitability relationship have used return on equity. Therefore, for empirical comparison and consistency, the present study also measures profitability by return on equity (ROE) (Bizuayehu, 2015; Li & Zou, 2014; Navoda, 2015). The return on equity is measured as earnings attributable to equity participants divided by the equity capital.

### **Loan Loss Provision**

This is a proxy for credit risk management. The level of loan loss provisions is a direct consequence of the effectiveness of credit risk management making it relevant in assessing credit risk of local banks (Agénor, & Zilberman, 2015; Han, 2015; Maaka, 2013). It is measured as the natural logarithm of annual loan loss provision.

### **Capital Adequacy Ratio**

Another proxy of credit risk which has been cited in the literature is capital adequacy ratio (Li & Zou, 2014; Navoda, 2015). The level of credit risk exposures can either render capital adequate or deficient. It is measured as the ratio of banks capital (tier one and tier two capital) to its risk weighted average asset.

### **Credit Solvency Exposure**

The solvency exposure deals with the ability of banks to respond to customers need when exposed to credit risk. This study follows some existing literature to measure credit solvency exposure as the ratio of banks total loans to total deposit (Bizuyehu, 2015)

### **Bank Size**

Bank size is one of the two control variables used in this study. It is measured as the natural logarithms of total assets of the bank (Asare, 2015; Boahen et al, 2012).

### **Age**

The age is also measured by the number of years in operation. It is considered in this study as one of the control variables consistent with some of the prior studies (Asare, 2015; Boahen et al, 2012; Bizuyehu, 2015).

The summary of these variables and their measurements are presented in Table 2.

**Table 2: Measurement of Study Variable**

<b>Variables</b>	<b>Symbol</b>	<b>Measurement</b>
<b>Dependent variable:</b>		
Profitability	ROE	Earnings After Tax-Preference Dividend/Equity Capital
<b>Independent variables:</b>		
Loan Loss Provision	LLP	Log annual loan loss provision
Capital Adequacy Ratio	CAR	Bank Capital/Risk Weighted Asset
Credit Solvency Exposure	CSE	Total Loans/Total Deposits
<b>Control Variables</b>		
Bank Size	BS	Log of Bank Total Assets
Age	Age	Log of Years in Operation

**Source: Herzuah (2020)'s**

**Summary**

The chapter had discussed the research methods, techniques and procedures adopted in this study. It discussed the approach, design and data needs and provided relevant justifications as well as how they would be applied. The chapter presented general and empirical model and the bases for the choice. The next chapter would demonstrate the applications of these methods to generate the results for discussion.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### Introduction

The study examined credit risk management and profitability of local banks in Ghana. This chapter of the study reports the data collected, applies the methodology discussed in Chapter three to conduct the data analysis, reports the results from the estimation, interprets the statistics and presents the discussions of the results. Some of the themes discussed in this chapter include the descriptive statistics of the study variables, trend analysis and the results of the main estimation. The discussions are structured in accordance with the specific objectives and control variables, and finally discusses the results base on the study objectives.

#### Descriptive Statistics

The descriptive statistics present the statistical properties of the data used in this study. The study analyses the descriptive statistics as part of the pre data analyses. The results are reported in Table 3. Table 3 presents the data characteristics according to the variables mean standard deviations, median, minimum and maximum values, Skewness, Kurtosis and Jarque Bera. The variables used in this investigation are the Loan Loss Provision (LLP), Capital

Adequacy Ratio (CAR), and Credit Solvency Exposure (CSE) and also return on equity (ROE) which is the proxy used for profitability of local banks and the dependent variable of the study.

Credit risk management, which depicts the independent variable, has proxies including Loan Loss Provision (LLP), Capital Adequacy Ratio (CAR), and Credit Solvency Exposure (CSE). These proxies have been used in this study, the details of which have been discussed in chapter three. Following the literature, two control variables have also been introduced. These are Bank Size (BS), and AGE.

It could be observed in Table 3 that all the study variables with the exception of LLP all the other variables have positive means and median values in absolute terms. The mean (median) values are 0.1893(0.1861), 0.6789(0.6616), 0.1372(0.1402), 20.6574(20.6334) and 36.67(36.0) for ROE, CAR, CSE, BS and AGE respectively. The mean and median for LLP in absolute terms were -0.0427(-0.0286). The implication LLP of the various local banks as used in the study is moderately high which ultimately affect the profitability of the banks. The mean statistics are presented outside the parentheses while the median values are enclosed in the parentheses. The table also reports the standard deviations. The standard deviations measure the extent to which the individual observations of the variable differ mean. It can be seen that other than capital adequacy ratio, bank size and age, the remaining variables have relatively high standard deviations referencing the mean values. The differential values between the

maximum and the minimum statistics (Range) are large other than the bank size and age. The implication is that the variables exhibit relatively wide range.

In addition to mean, median, range and standard deviation, statistics for Skewness are also reported in Table 3. The statistics for skewness for ROE, LLP, CAR, CSE, BS and AGE as reported in the table are 0.2272, -1.931, 0.1581, 0.2698, -1.9236 and -0.0199. This means that ROE, CAR and CSE are positively skewed and hence have right tail while LLP, BS and AGE have negative statistics and therefore have left tail. However, the level of negative statistics with respect to the skewness does not move further away from the line of normal distribution. Furthermore, traditionally, normality test from Skewness norm is zero (0), in practice skewness within -2 to +2 is considered to be normally distributed (Gravetter & Wallnau, 2014; Khan, 2016). Following these literatures, all the variables have normal distribution. It is therefore important to note that the data presents a normal form of distribution and far as the variables of distribution are concerned and hence provides reasonable justification for its use in the study.

Table 3 further reports the Jarque-Bera statistics. Regarding Jarque-Bera test, a variable has normal distribution when its Jarque-Bera statistics is insignificant. From Table 3, three of the variables meet this condition while the other three do not. Specifically, evidence from Table 3 vis-à-vis the Jarque-Bera reveals that ROE, LLP and Bank Size do not meet Jarque-Bera test condition; however, CAR, CSE and AGE have normal distribution. Another statistic observed in Table 3 is the Kurtosis. This statistics analyses whether data are heavy tailed or light tailed in relation to normal distribution. The general norm

for Kurtosis is that when the statistics is higher than 3 then there is heavy tailed, closer to 3 approximates normal distribution and less than 3 is light tailed. Similar to the Jarque-Bera statistics, the Kurtosis test shows that CAR, CSE and AGE statistics approximate normal distribution

Following the descriptive statistics reported and their implications, there is no conclusiveness about the normality status of the data. What may be reasonably certain is that CAR, CSE and AGE have normal distribution whiles ROE, LLP and BS may have asymmetric characteristics. Nevertheless, since the Skewness has been widely used, the study assumes normality for all the variables and therefore considers only the mean as the relevant average for the data.

**Table 3: Results of Descriptive Analysis of Study Variables**

	ROE	LLP	CSR	CAR	LTA	AGE
Mean	0.189305	-0.042760	0.678973	0.137252	20.65742	36.66667
Median	0.186083	-0.028699	0.661664	0.140224	20.63399	36.00000
Maximum	0.491582	-0.001596	1.173068	0.239839	21.96290	67.00000
Minimum	-0.238284	-0.220846	0.231015	0.053954	16.13629	3.000000
Std. Dev.	0.141073	0.041529	0.229120	0.039764	0.862759	21.48173
Skewness	0.227268	-1.930518	0.158131	0.269754	-1.923691	-0.019924
Kurtosis	4.170252	7.025038	2.256837	2.818766	11.65625	1.375208
Jarque-Bera	4.728279	93.32561	1.956937	0.971741	269.1991	7.924613
Probability	0.094030	0.000000	0.375886	0.615161	0.000000	0.019019
Sum	13.62995	-3.078724	48.88605	9.882168	1487.334	2640.000
Sum Sq. Dev.	1.413016	0.122448	3.727227	0.112264	52.84908	32764.00
Observations	72	72	72	72	72	72

Source: field data (2020)

### Correlation Matrix and Multicollinearity Test

The use of the correlation matrix as presented in the Table 4 is used to test for multicollinearity problem for the estimation of the variable. Within such estimation, a coefficient value greater than 0.7 is an indication that there is a multicollinearity problem and hence the independent variables cannot be estimated together. On the other hand, if the coefficient value less than 0.7 means that the independent variables could be estimated together. From Table 4, it could be observed that all the predictors are having coefficient values less than 0.7. This means that all the independent variables could be estimated together.

Moreover, the predictors are compared with the dependent variables to determine its relation. The dependent variables under Table 4 is the ROE. Comparing the values of the predictors, it could be observed that, all the values of the predictors have positive relationship with the ROE.

**Table 4: Results of Correlation Matrix Analysis of Study Variables**

	ROE	LLP	CAR	CSR	AGE	LTA
ROE	1.000000					
LLP	-0.362542	1.000000				
CAR	0.210494	0.022960	1.000000			
CSR	-0.261437	0.304045	0.041825	1.000000		
AGE	0.189676	-0.531103	0.558867	-0.227535	1.000000	
LTA	0.247878	-0.398728	0.134868	-0.326384	0.263746	1.000000

Source: field data (2020)

## Diagnostics to the Econometric Estimation

Prior to the estimation of the main model, the study conducts some pre-diagnostics to determine the suitability of the estimation technique. Some of the relevant diagnostics beside the normality are the panel unit root and Hausman test.

### Hausman test.

The panel ordinary least square is conducted after the Hausman test is run to determine the appropriate choice between fixed effect and random effect. The Hausman results are reported in Table 5. The Hausman test has the null hypothesis that the random effect is appropriate to use. The results from the Table reveal that that the fixed effects estimator is the most efficient to use in this case. This is primarily because the p-value needed to make the null hypothesis true is higher instead of being less than 0.05

**Table 5: Hausman test**

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	5	1.0000
Period random	0.000000	5	1.0000
Cross-section and period random	0.000000	4	1.0000

**Source: field data (2020)**

Ordinary Least Square (OLS) Estimation (2008-2019)

Having determined the best model through the Hausman test, the study proceeded to run the POLS using two-way fixed effect estimator. The model also shows significant f-statistic. The f-stat of 3.0115 has corresponding p-value of 0.001. The f-stat indicates the coefficients of all the explanatory variables are jointly significant. The Durbin –Watson statistics is closer to 2 (1.9899) indicating that there is no autocorrelation. This provides further evidence of the strength of the model. The model provides answers to three research questions and hypotheses formulated under this specific objective.

**Table 6: Ordinary Least Square Estimation (2008-2019)**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLP	-1.194670	0.557233	-2.143934	0.0357
CAR	1.479796	0.539235	2.744250	0.0078
CSR	-0.120940	0.075816	-1.595181	0.1154
AGE	-0.001750	0.001295	-1.351384	0.1812
LTA	0.004218	0.020408	0.206689	0.8369
C	-0.005726	0.425571	-0.013456	0.9893
R-squared	0.185767	Mean dependent var		0.142624
Adjusted R-squared	0.124083	S.D. dependent var		0.128318
S.E. of regression	0.120093	Sum squared resid		0.951873
F-statistic	3.011585	Durbin-Watson stat		1.989995
Prob(F-statistic)	0.0016497			

Source: field data (2020)

## Loan Loss Provision and profitability of local banks in Ghana

The study translates the estimates in Table 5 into addressing the specific objectives of the study. The first research objective focuses on investigating the effect of loan loss (LLP) on the profitability of local banks in Ghana. This objective comes with a formulated hypothesis that, loan loss provision has a significant effect on profitability of local banks in Ghana. It should however be noted that the use of loan loss provision follows standard practice and default. By default, although the loan loss provision value on the face of the financial statement is positive in absolute form, it is deductible from the operating income and therefore has negative implication. Therefore, when a positive coefficient is observed, the interpretation is that it has negative effect on the dependent variable (ROE) and when a negative coefficient is observed, it conveys a positive relationship with the dependent variable. The magnitude and direction of the relationship is based on the coefficient of LLP (Bizuyeyehu, 2015).

From Table 6, it was revealed that loan loss provision (LLP) has a negative coefficient of -1.1947. As noted earlier, a positive coefficient of LLP conveys negative relation and a negative coefficient depicts a positive effect on profitability. This suggests that positive coefficient indicates that loan loss provision has negative effect on the profitability of the local banks. The corresponding p-value for the coefficient is 0.0295. This means that the coefficient is significant at 5% as the p-value is greater than 1% but less than 5%. The implication is that the study upholds the alternative hypothesis and rejects the null hypothesis that loan loss provision has no significant influence on the level of



profitability. It is thus concluded that LLP has significant negative effect on profitability of local banks in Ghana. Further implication is that 1 percent increase in the level of LLP would lead to about 1.1947 point decrease in the level of profitability (Anbar & Alper, 2011)

The negative effect of loan loss provision on the profitability of local banks is not surprising. The finding is consistent with the expectation and supports the characteristics of the operations of banking sector worldwide. Since loan loss is profit deductible, any additional increase in loan loss will translate into an additional decrease in the level of profitability as exhibited by the finding in this study (Bizuyehu, 2015).

The finding also supports some assumptions of the credit risk theory. The credit risk theory assumes that default events are derived from firms' underlying asset evolution and therefore likelihood of default parameters occurring increases credit risk and provision of credit and reduction in the portfolio value (Anbar & Alper, 2011; Hempel & Simonson, 1999). This theoretical assumption has been confirmed by the significant negative effect of loan loss provision on profitability found in this study since the default parameter (loan loss) decreases the portfolio value (loan portfolio)-corresponding decrease in profitability (i.e. double entry principle).

Credit risk theory further posits that loan loss provision is a parameter to supplement eventual loan default and therefore increase in such provision connotes increase in credit risk and lessens the profit capacity of the banks

(Brower & Mahajan, 2013; Ehrhardt & Brigham, 2011). Following the finding and theoretical contribution emerging from the credit risk theory, it can be concluded that provision for loan loss is a credit risk management parameter and therefore banks which are able to reduce their occurrence of loan default through prudent credit risk management need not have high provision for loan default (Ehrhardt & Brigham, 2011).

The finding also has implications on the existing empirical literature. Unlike the conclusive consistency of the finding in this study with the credit risk theory, the empirical supports have been mixed. The finding disaffirms the results and conclusion drawn by Kithinji (2010). Contrary to the finding in this study, Kithinji (2010) concluded that non-performing loans (derivative of loan loss provision) do not have significant influence on the profitability of the commercial banks. Nevertheless, the empirical finding in this study supports some prior empirical findings such as Alalade, Binuyo, and Oguntodu (2014), Li and Zou (2014) and Navoda (2015). These prior studies also revealed and concluded that high loans loss provision is negatively related with profitability (ROE).

Besides the theoretical and empirical significance of the study as discussed earlier, the finding has practical contribution. The credit extension role of local banks like all other credit institutions is expected to yield profit in the form of interest to the banks. The practical contribution of the finding in this study is that failure to pay the loans and its interests may be attributed to credit risk management deficiencies and therefore the interest so recognised as profit need to be adjusted (or reduced) to reflect only the interest received or likely to be

received (receivable). The policy implication is it is incumbent on the banks (local banks) to put up stringent measures to curtail the occurrence of non-performing loans (i.e. to reduce loan loss provision or loan impairment). When these mechanisms are implemented, profit from interest on loans would be accrued leading to the general profitability of the banks.

Further implication of the evidence in this study is that loan loss provision is one of the militating variables on profitability. The findings from the present study suggests that local banks in Ghana are expected to develop and implement credit policy aim at understanding the antecedents of loan loss and counteract these antecedents with prudent credit clearance prior to granting loans to prospective loan applicants. This may bring down the loan loss provision and enhances the profitability (ie. Considerably decrease the inclusion of loan loss provision). Since coefficient of loan loss provision is undesirable for enhancing profitability, as the number of loan defaulters becomes high, the need for loss reservation by the local banks as payment for default also increases hence a decrease in banks' profitability (Bizuayehu, 2015). However, low default would culminate to low loss reserves, which would not negatively affect the cost of intermediation. Therefore, per the findings practical steps are expected to management loan default rates.

### **Credit Solvency Exposure and Profitability**

In financial practices, the solvency exposure deals with the ability of banks to respond to customers need when exposed to credit risk. This study follows some existing literature to measure credit solvency exposure as the ratio

of banks total loans to total deposit. It therefore stands to reason that credit solvency exposure has effect on the profitability of local banks. A solvent bank has the ability to grant more credit without sacrificing customers' deposits. Nevertheless, high credit to deposit ratio has its inherent risk and therefore poor management of this credit portfolio could have negative implication on profitability. Therefore, the second objective of the study is to determine the effect of credit solvency exposure on the profitability of local banks in Ghana.

The results for the magnitude and direction of credit solvency exposure are showed in Table 6. Table 6 reveals that the coefficient of credit solvency exposure is negative (-0.1209). This indicates that there is a negative relationship between credit solvency and profitability. The associated p-value, which determines the significant level, is 0.115. This p-value is even greater than 10%. This means that the coefficient of CSE is insignificant and therefore the negative relationship found is not significant. The study therefore fails to reject the null hypothesis that credit solvency exposure has no significant influence on the level of profitability of local banks. Thus, an increase or decrease in the level of credit solvency exposure has no significant implication on profitability.

The finding does not meet the study expectation. The study apriori was positive significant effect on profitability. It is generally believed that credit is the main source of revenue for credit institutions such as the local banks. The expectation is that a GHS1 increase in loan to customers increases the interest income and translates into profit. Thus, the relationship between CSE and ROE was expected to be positive rather than the negative found in this study.

The finding of the study has theoretical implication. Following the underlying principles in the credit risk theory with regard to loan assessment, the guiding principle is to be reasonably certain that those granting loans (borrowers) are capable to meet repayment contracts including interest. In this manner effective credit risk management may also be seen in the level of credit solvency. The assumption of the theory suggests that it is not the volume of credit that matters but the level of quality credit (Bizuayehu, 2015). The theory considers decreasing credit quality as the first parameter associated with credit stress, which could impair income and capital adequacy ratio (Brower & Mahajan, 2013; Brown & Moles, 2012). The implication of these assumptions is that even under high volume of credit (i.e. high credit to deposit) with decreasing credit quality (high loan impairment) evident by high loan provision; the loan could not translate into positive drive to returns. This is consistent with the negative but insignificant effect on profitability found in this study.

Additional theoretical contribution of the finding is its articulation of the portfolio theory to minimising local banks overall credit risk and improving profitability. Portfolio theory assumes that effective management of the loan portfolio and the credit function is fundamental to financial safety as it would minimise the overall risk and improve returns from loans (Olweny & Shiphoo, 2011). Therefore, negative effect of credit to returns found in this study provides that theoretically, the local banks in Ghana are inefficient in loan portfolio management capable of reducing credit risk, enhancing credit quality (Anbar & Alper, 2011; Asare, 2015; Bizuayehu, 2015; Brown & Moles, 2012). Practically,

local banks are thus expected to view the loan portfolio in its segments and as a whole and consider the relationships among portfolio segments as well as among loans. These practices provide management with a more complete picture of the bank's credit risk profile and with more tools to analyze and control the risk

The finding also supports some previous studies. For instance, Bizuayehu (2015) revealed among others that credit solvency exposure has inverse relationship with return on equity. The study is partly inconsistent with the findings in the current study in terms of the significance level.

As observed from the significant coefficient of loan loss provision as discussed earlier, the finding on the relationship between credit solvency exposure and profitability meets practical realities. It is evident in Table 5 that the magnitude of LLP estimate is very high (0.9713), almost 100% of any change translates into changes in return (profitability). Additionally, there is a strong correlation between LLP and CSE (-0.115) as exhibited in Table 6. By default, negative correlation of LLP and CSE conveys positive association, as LLP is negative by default. Marrying these analyses, one can suggest that for any change in credit (CSE) and the LLP increases unreasonable undermine the contribution to profit. Therefore so long as local banks remain weak in effective credit risk management increasing credit solvency is detrimental to profitability.

The results further explains that, local banks should develop strong and effective credit risk management in order to increase good loans and reduce bad loans through credit screening. Thus, the ratio of good loans to deposits would be reasonably high (Bizuayehu, 2015) and ultimately reduce non-performance and

enhance interest income. This could restore the normal relationship where a high credit solvency could increase the level of profitability and vice-versa.

Further implication of the finding is that a sound credit policy and strategy that set minimum standards, develop vigilant lapses of asset quality, and employ a general communication and technique for measurement and reporting of non-performing loans, categorization of loan and provisioning are expected to pursue by these local banks. The credit policy would be used as the hallmark for the bank's lending philosophy and specific procedures as well as means of monitoring the lending process. Pursuing these credit policies would not only enhance the credit solvency but also ensure that every credit granted could boost the bottom line returns-profitability of the banks.

The results provide new dimension of empirical evidence to bankers since credit risk exposure has not received much attention in the Ghanaian literature. Practitioners are advised that much as the risk exposure insignificant relationship with profitability, the negative coefficient as observed from the value is a cause for concern. Management of the local banks is expected to keep a balance between loans and deposit in order to absorb any uncertain shocks. This would not only improve the confidence of depositors but inure to an increment in their profitability.

### **Capital Adequacy Ratio and Profitability**

One of the proxies of credit risk, which has been cited in the literature, is capital adequacy ratio (CAR) (Li & Zou, 2014; Navoda, 2015). The level of credit risk exposures can either render capital adequate or deficient. It is predominantly

subject to regulatory requirements. It is believed that CAR has implications on profitability of banks and for that matter for local bank in Ghana. Testing this assertion is the focus of this specific objective. Therefore, the focus of the third objective is to assess the effect of CAR on the profitability of local banks in Ghana. The results of the hypothesis testing this relationship are captured in the coefficient and p-values of CAR as reported in Table 6.

The OLS estimation reported in Table 6 shows a positive coefficient of CAR (1.4797) and it's statistically significant at 5%. This is because the p-value is 0.0078. The resulting implication is that CAR has a positive significant relationship with profitability.. The results thus indicate that 1% increase in CAR will result in 1.4797 point increase in profitability.

The finding supports the study expectation. The study assumes that when the level of capital is high, local banks are to benefit from economy of scale, grants loans and manage loans at relatively lower cost than those with relatively low capital adequacy ratio. High CAR is capable of protecting depositors from banks who lend aggressively and in doing so do not get back most of the money lent. Thus, banks with high CAR is assumed to be credit disciplined and minimise risk exposure and improve returns. Following these assumptions, the present study posits that CAR would exhibit significant positive influence on profitability consistent with the actual finding in this study.

Besides meeting the study expectation, the results have theoretical significance. The portfolio theory posits that the level of capital adequacy determines the extent of effectiveness of credit risk management within a bank



loan portfolio (Bizuayehu, 2015; Brown & Moles, 2012). Thus, effective loan portfolio construction and management could increase the capital adequacy ratio and enhance the ability to create credits and eventually increase profitability. However, with low capital adequacy ratio (i.e total capital to the risk of the banks), the tendency to deal with shocks would be low and this would expose the banks to high risk. This therefore means that any credit risk management agenda, which prioritize the use of high capital adequacy ratio as a means of management portfolio, is likely to maximize profit (Maaka, 2013). This is affirmed by the significant positive influence of CAR on profitability.

The finding in the current study also contributes to the credit risk theory. The theory posits that high credit risk decreases credit quality, enhances credit stress and also impairs capital adequacy (Brower & Mahajan, 2013; Hempel & Simonson, 1999). However, improving capital adequacy ratio minimises risk and enhances return. The implication is that theoretically, there is a positive relationship between capital adequacy ratio and profitability. Therefore, the evidence found in this study suggesting that an increase in the level of capital adequacy ratio of local banks increase the level of profitability and vice-versa affirms the position of the credit risk theory.

Empirically, the finding is partly consistent and partly inconsistent with the conclusion reached by Li and Zou (2014). The study conducted by Li and Zou (2014) found that although capital adequacy ratio has positive effect on the level of profitability of local banks, the effect was found to be insignificant. The direction of the relationship (positive) affirms the results in this study; however,

while the coefficient is significant in the present study, it was insignificant in the study of Li and Zou (2014). The finding is also consistent with some other studies. The positive significant influence on the profitability affirms some prior studies such as Annor and Obeng (2017); Asare (2015); Bizuayehu (2015) and Navoda (2015).

The finding suggests that high local bank profit margins are driven by factors including the capital of banks. The findings provide that under high operational efficiency, increasing banks capital requirement could decrease the risk improve the depth of profitability. The results from the study showed that between capital adequacy and profitability, there is a positive relationship. It also shows that there is a significant impact of credit risk management on profitability of local banks. The policy implication is that local banks could develop strategies towards effective credit risk management, specifically, to regulate and enhance their capital adequacy while minimising factors, which could impair their capital when considering that there is a positive relationship between the two variables at hand.

### **The Control Variables and Profitability**

The control variables used in the study are bank size and age. The measurement of bank size in the current study is banks' total asset. The assumption is that large banks are able to undertake expanded income driven projects, financing viable investment opportunities and resilient in handling credit shock and hence becoming antecedent of profitability.

Similarly, older banks are more experienced in handling risk and responding to shocks. Older banks can easily win customers' confidence, increase mobilisation and translates these funds into viable business. Thus, aged banks are more likely to have increasing profitability than new banks. Thus, it is very important to control for age and size in investigating credit risk management-profitability nexus.

Contrary to the assumptions, only age exhibited significant relationship with profitability: 0.0347 (0.1326) and -0.0548 (0.0454) for bank size and age. The coefficients are outside the parentheses while the p-values are in the parentheses. Although the bank size exhibited positive effect, it is insignificant. Age though significant, the effect is negative. This is inconsistent with some earlier studies such as Asare (2015)

### **Summary**

The chapter has discussed the descriptive statistics and nature of credit risk management and profitability of local banks in Ghana. Moreover, the chapter presented the statistical results of the estimation technique. The magnitude and direction of the independent variables, which are loan loss provision, capital adequacy ratio and credit solvency exposure have been examined. The theoretical and empirical implications of the results have also been discussed.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

This chapter summarizes the major and relevant information in this study. There are four thematic sections in this chapter. The first theme of this chapter is the summary. Under this theme, the study provides synopsis of the study including major findings and methodologies. The conclusions are also drawn from the relevant and major findings from the specific objectives and presented as the second theme of the chapter. Third part of the chapter structure covers the recommendations emanating from the findings and conclusions reached in this study. The final theme of the chapter discusses opportunities for further studies, which emerged from the study.

#### Summary

The study investigated credit risk management and profitability of local banks in Ghana. Profitability was the dependent variable and it was used to reveal the attitude of banks toward risk management. There are several proxies often used to measure profitability. However, most of the reviewed studies about credit risk management-profitability relationship have used return on equity. Therefore, for empirical comparison and consistency, the present study also measured profitability by return on equity (ROE).

The study followed quantitative analytical research approach and causal/explanatory design. The study used secondary source data compiled from audited financial statements of the local banks in Ghana. Data construction was undertaken to measure the relevant study variables using financial ratios. The data span from 2008 to 2017. Thus, annual data frequency was used for the investigation. Ordinary least square (OLS) econometric technique was employed to estimate the relationships the variables formulated in this study.

The results from the investigation revealed the following: It was evident from the estimation that loan loss provision showed a negative effect on the profitability of local banks. The level significant level of the estimate was 5%. The statistical implication of the negative effect of loan loss provision is that a percentage increase in loan loss provision leads to almost the same level decrease in profitability

The results further revealed that credit solvency exposure has negative effect on profitability. The implication is that even though high credit level is positive solvency indicator, Ghanaian bank can benefit fully only when the credit has positive consequence. The negative effect suggests that local banks suffers very high-risk exposure from every credit they extent which is detrimental to their profitability. Finally, it was found that capital adequacy has a positive effect in profitability. The implication is that a high level of capital adequacy ratio would reduce the risk of operation and increase profitability.

## Conclusions

Following the empirical findings in this study, the study draws relevant conclusions appropriate for stakeholders' considerations. It emerged from the findings of the study that loan loss provision negatively affects profitability of local banks. Consistent with the deductibility of loan loss from operating income and profits, it is concluded from the negative effect of loan loss provision found in this study that an increasing loan loss provision emanating from non-performing loans could consume the profitability of local banks in Ghana. Further conclusion is that likelihood of default parameters occurring increases credit risk and provision of credit and reduction in the portfolio value and profitability.

Concerning credit solvency exposure, the study concluded that relationship between credit solvency exposure and profitability of local banks is insignificant. The findings indicate that, a strong and effective credit risk management could increase good loans and reduce bad loans through credit screening. Thus, the ratio of good loans to deposits would be reasonably high and ultimately reduce non-performance and enhance profitability. This means that high credit solvency could increase the level of profitability and vice-versa. It is further concluded that local banks profitability drive is not necessarily about increasing the volume of credit but also about increasing credit quality as increasing credit volume without corresponding increasing credit quality decreases the profitability as evident in this study.

The study further concluded that capital adequacy is an important parameter in managing risk within the local bank setting. It was found that when

the local banks build their capital adequacy ratio, they are more likely to minimize the level risk in daily operation. This could increase the level of profitability. Evidence from this study provides that effective loan portfolio construction and management could increase the capital adequacy ratio and enhance the ability to create credits and eventually increase profitability. This therefore means that any credit risk management agenda which prioritize the use of high capital adequacy ratio as a means of management portfolio is likely to maximize profit.

### **Recommendations**

Based on the key findings and conclusions, the following recommendations are made for bank management and stakeholder like the central bank. The recommendations are therefore structured according to key stakeholders. These stakeholders are the regulators and the management of the banks

It is recommended that management employ a general communication and technique for measurement and reporting of non-performing loans, categorization of this loan and provide proper monitoring. The credit policy would be used as the hallmark for the bank's lending philosophy and specific procedures as well as means of monitoring the lending process. This would curb the tenacity of loan default exhibited by high loan provision and negative effect of credit solvency found in this study.

Following the high loan loss provision and the consequential effect on profitability, it is incumbent on the banks (local banks) to put up stringent measures to curtail the occurrence of non-performing loans (i.e. to reduce loan loss provision or loan impairment). When these mechanisms are implemented, profit from interest on loans would be accrued leading to the general profitability of the banks.

It is further recommended that, the negative effect of loan loss provision and credit solvency exposure that local banks in Ghana are expected to develop and implement credit policy aim at understanding the antecedents of loan loss and counteract these antecedents with prudent credit clearance prior to granting loans to prospective loan applicants. This may bring down the loan loss provision, translate increasing credit solvency exposure into good loans and enhances the profitability (ie. Considerably decrease the inclusion of loan loss provision).

To minimise credit risk and increase profitability of local banks, it is suggested that management set sound credit policy to help establish a set of minimum standards and develop vigilant lapses of credit quality. This suggestion is very critical as it is evident in this study that additional volume credit, which is expected to yield additional profit, rather erodes profitability due to high loan loss

It emerged from the study that capital adequacy ratio has potential to reduce the operational risk and increase the profitability of local the banks as shown by the positive significant effect on profitability in this study. It is recommended that local banks should continue to comply with the minimum capital requirement regulation as this could increase the capital adequacy ratio



and reduce the operational risk emanating from cost of financial operations. Besides, the minimum capital requirement, local banks should consider voluntary increase in capital of their banks. This may include risk-based capital requirement. As found in this study, increasing the capital requirement in this form may also minimize the risk of operations.

The banks should pay keen attention to its credit policy and monitor the probability of loan default. They should implement policies to explore the antecedents of loan loss and counteract with mechanism so as to minimize its growth and reduce the overall that it has on profitability. The banks should develop internal policy to regulate and manage the level of capital adequacy. The policy could be developed to ensure match between credit risk exposure and capital adequacy. Thus, they should review at regular interval the level of risk exposure vis-à-vis the level of capital adequacy so as to adjust the capital accordingly in order to minimise the risk and reduce the dangers that might be caused by shocks

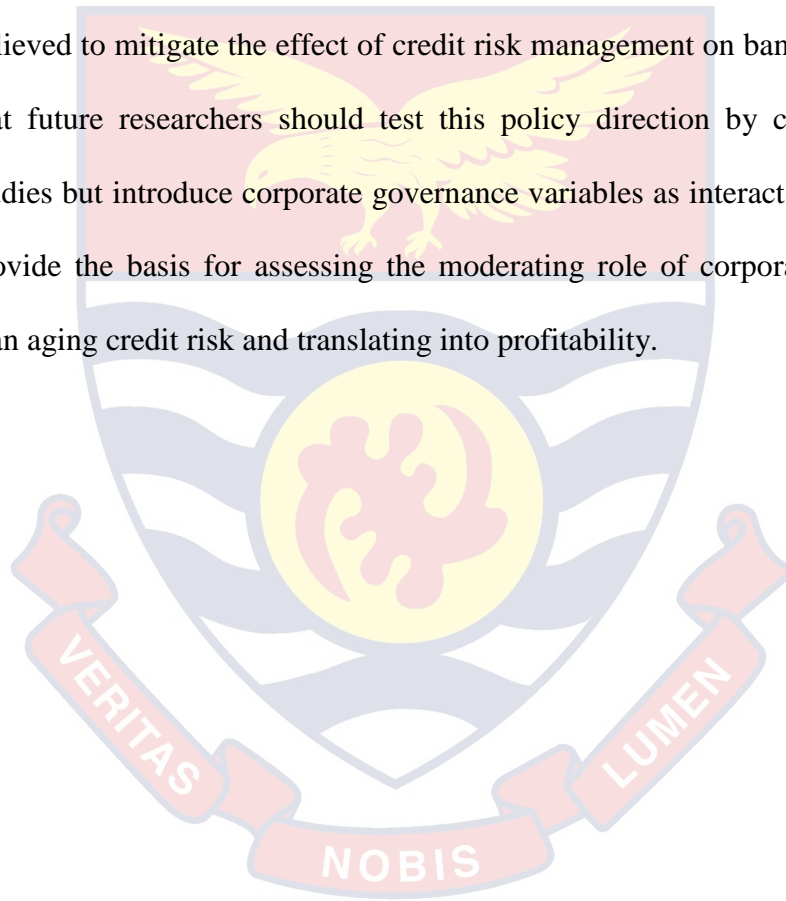
### **Suggestions for Further Studies**

The scope of this study focused on data of local banks. Future studies may consider data from foreign banks. The results from foreign-based analysis may be compared to results generated from this study, which is based on data from local banks. This may provide empirical evidence for policy and practical orientation of banking operation in Ghana.

This study found that credit solvency exposure generated negative effect on profitability. The finding was extrapolated attributing to high loan loss

provision. Although this extrapolation is sound given the high loan loss effect and the positive correlation with credit solvency exposure, future researchers may test this empirically by moving away from the traditional measurement of credit solvency exposure to measurement of the numerator (loan) based on ex post due loans. This could introduce a cut-off point for assessing desirable credit volume.

Bank of Ghana has introduced sharp corporate governance guidelines believed to mitigate the effect of credit risk management on banks. It is suggested that future researchers should test this policy direction by conducting similar studies but introduce corporate governance variables as interact terms. This could provide the basis for assessing the moderating role of corporate governance in managing credit risk and translating into profitability.



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