The Relationship Between Credit Risk Management and the Profitability of Banks in Ghana

Vztahy mezi řízením úvěrových rizik a rentabilitou bank v Ghaně

ROGER OWUSU-BOAFO
ERNEST OBENG
JONE YEBOAH ADDO

Abstract
Banks are faced with several types of risks. Prominent among these risks is credit risk. Profitability is key to the growth and survival of banks. This study therefore seeks to investigate the relationship that exists between credit risk and the profitability of banks in Ghana. To achieve this objective, eight banks were sampled out of a population of twentynine (29) banks over a ten (10) year period from 2005 to 2014. A panel regression was run using Return on assets (dependent variable) as a proxy for profitability while non-performing loan ratio and net charge off to total loans and advances (independent variables) were used as proxies for credit risk. Other variables such as size, growth and debt ratio which influence profitability were controlled for in the model. Secondary data comprising annual reports of the selected banks was used for the study. The study established a positive and significant relationship between credit risk and the profitability of banks in Ghana. This implies that banks in Ghana enjoy profit in the midst of all the credit risk. The study also confirmed the findings of previous studies that, size and debt ratio are factors that influence profitability as there was a positive and significant relationship with profitability.

Keywords
credit risk, profitability, return on asset, non-performing loans, debt ratio

JEL Codes
G11, G14

DOI
http://dx.doi.org/10.37355/acta-2020/2-01

Abstrakt
Banky čelí několika druhům rizik. Mezi těmito riziky je významné úvěrové riziko. Rentabilita je klíčem k růstu a přežití bank. Tato studie se proto snaží prozkoumat vztah, který existuje mezi úvěrovým rizikem a rentabilitou bank v Ghaně. K dosažení tohoto cíle bylo vybráno osm bank z populace dvaceti devíti bank v období deseti let od roku 2005 do roku 2014. Byla provedena panelová regrese s využitím návratnosti aktiv (závislá proměnná) a jako zástupce proxy úvěrového rizika byla použita rentabilita, zatímco poměr špatných úvěrů a čistého odúčtování celkových půjček a záloh byla nezávislá proměnná. V modelu

byly kontrolovány další proměnné, jako je velikost, růst a poměr dluhu, které ovlivňují rentabilitu. Pro studii byla použita sekundární data z výročních zpráv vybraných bank. Studie prokázala pozitivní a významný vztah mezi úvěrovým rizikem a rentabilitou bank v Ghaně. To znamená, že banky v Ghaně používají zisk jako základ posouzení veškerého úvěrového rizika. Studie také potvrdila zjištění předchozích zkoumání, že velikost a poměr dluhu jsou faktory, které ovlivňují rentabilitu, protože mají k rentabilitě pozitivní a významný vztah.

Klíčová slova
úvěrové riziko, rentabilita, návratnost aktiv, nesplácené půjčky, poměr dluhu

1 Introduction

Individuals (Households), Businesses, and Governments access credit to enable them undertake purchases, investments and other spending. Credit creation is therefore important for the economic activities of players in the economy. Banks are among the financial institutions that facilitate access to credit through the process of accepting deposits from surplus units and transforming those deposits into credit (loans) for deficit units. This intermediary role played by Banks exposes them to several types of risks, prominent among them is credit risk.

A bank may be defined on three bases: 1. Economic function basis, 2. Services rendering basis 3. Legal basis. In accordance with their economic functions, banks accept deposits from savers and transform those deposits into credit for borrowers. Banks also provide services such as current accounts, savings account, demand deposits, underwriting, insurance, financial planning, leasing and many others. On a legal basis, a bank is a corporate body with the license to operate a banking business, that is, they accept deposits, make loans or operate any other business or activity that may be authorized by the Bank of Ghana (Banking Act 2004).

The types of banks operating in Ghana include but are not limited to the following: Commercial Banks, Investment Banks, Savings Banks, Community Banks, Universal Banks and the likes. Banks play an important role in the economy through the provision of the various services including facilitating financial intermediation by accepting deposits from surplus units and translating same into credit for deposit units and undertaking payments of goods and services on behalf of their customers. Banks also pay debts for their customers through the offering of lines of credit when such customers are not able to pay. They keep the valuables of customers as well. Banks also serve as a platform where government seeks to regulate the growth of the economy through its policy. Banks therefore play a critical role in the economy hence their successes and survival will be inured to the benefit of not only the shareholders or owners, but also to the economy as a whole, hence a study on banks is necessary.

Banks are faced with several risks in the course of business which they need to deal with or manage in order to remain in business. These include interest rate risks, liquidity risks,

credit risks, market risks, operational risks and the likes but prominent among these risks is the credit risk. The management of this risk is important because most banks earn a greater portion of their income from the loans they give out.

Credit risk is the risk of default of a debt obligation. That is, the risk that a loss will occur when a borrower does not repay the principal, interest or both, on a loan within the specified time and terms of repayment.

Based on the role banks play in the development of the economy, that is making credit available to deficit units and accepting deposits from surplus units, making payments, facilitating the circulation of money in the economy, among others, credit risk management has become a topic of interest for many researchers.

Also, the subject matter of credit risk caught the attention of many researchers following the economic downturn that the world experienced between the periods of 2007 to 2009, that is, the credit crunch. There is therefore the need for further research to establish the relationship between credit risk management and profitability, so that the necessary attention will be given to credit risk management. Many studies have been conducted across the world which has either established a positive or negative relationship between credit risk management and the profitability of banks. Bourke (1989) established a positive relationship between credit risk and the profitability of 12 European, North America, and Australian Banks. In their study, Abiola & Olausi (2014) found, that credit risk impacted positively on the profitability of banks in Nigeria. Kithinji (2010) found a positive relationship between credit risk management and profitability of banks in Kenya. Boahene, Dasah & Agyei (2012), in their study on credit risk and profitability of selected Banks in Ghana, established a positive and significant relationship between credit risk and profitability. Whereas the studies above have all established a positive relationship, others have also established a negative relationship between credit risk management and profitability. Bakaeva, Hosna, Ara & Sun (2009) in their study found that there exists a negative relationship between credit risk management and profitability of commercial banks in Sweden. Ruziqa (2013), in his study in Indonesia, found that credit risk is negatively related to profitability. Kolapo, Ayeni & Oke (2012) also established a negative relationship between credit risk management and profitability of Nigerian Banks.

From the above, it can be deduced that the debate on the relationship that exists between credit risk management and profitability is inconclusive, hence there is the need for further research to find out what relationship exists between credit risk management and profitability of banks in Ghana. Although some work has been done on this subject matter in Europe and some parts of Africa, not much has been done in Ghana; hence a further study is recommended.

The primary objective of this study is to ascertain the relationship between credit risk management and profitability of commercial banks in Ghana. Given the importance of Credit Risk Management to the survival and stability of Commercial Banks, this study will provide adequate information to stakeholders of Commercial Banks and also contribute to literature on this subject matter.

1.1 Review of Related Literature

Businesses and for that matter banks are faced with uncertainties regarding their decisions and actions in their day to day operations. For instance, banks may have to decide whether to invest deposits in securities or give them out as loans to their customers, whether to open a new branch or not and the likes, and the outcomes of these decisions may not be certain. These results in risk to the Banks as the projected outcome may either deviate from projections or be obtained as projected. Santomero (1995) documents that risk in the context of banking is the probability that an outcome of a decision or action may lead to the loss of earnings or capital, an imposition of constraints to achieve a set objectives or possible impacts on a bank's operations. Froot, Cresswell & Johnson (1993) also posit that risk in banking is the reduction in a firm's value due to changes in the business environment.

1.2 Risk in Banks

Generally, risk can be divided into six types: Credit risk, Market risk, Liquidity risk, Operational Risk, Legal risk and Reputational risk (Koch & MacDonald, 2009). Once the activity of a counter party is involved, factors such as the size, volume and type of the business activity may determine the level of such risks, which has the effect of influencing the market value, profitability and thus the value of the firm.

Nicholl (2007) documents that market risk is the possibility or probability of a decrease or reduction in the value of an asset as a result of changes in market variables such as prices, exchange rates and interest rates. Santomero (1997) also posit that market risk cannot be totally diversified; hence it is also called non-diversifiable or systematic risk. It however can be hedged to reduce its impact on a portfolio.

Liquidity risk is the risk of inadequate funds, or marketable assets to meet immediate and future cash obligations to counterparty and on time (Smith, 1985). Such a situation can be described as a funding crisis as a bank or financial institution faced with liquidity risk may not have sufficient funds to meet its loan requests, its interest on deposits, the salaries and wages of workers, and to undertake investments and the likes.

Operational risk is associated with the challenges of accurately processing, settling and making delivery on trade in exchange of cash (Santomero, 1997). Stewart (2007) is also of the view that operational risk may also arise from costs borne out of transactions such as refusal or failure to meet regulatory requirements, untimely collections and failure to honour settlements.

Legal risk relates to financial contracts and is separated from the legal implication of credit, counter-party and operational risk (Santomero, 1997). Transactions that were properly entered into and were well established run the risk of being abolished as a result of new regulations, court opinions and legislations, among others. Violations of the laws and regulations, perpetration of fraud by a bank's employees or management could also pose legal risk to a bank or financial institution.

Reputational risk involves the negative opinions from customers and other stakeholders about a bank or financial institution which has the tendency of affecting the profit or value of the institution (Protiviti, 2013). It demonstrates a decrease in value in an institution's brand, or a lack of ability to persuade potential customers to patronize the firm's products or services. Reputational risk leads to lost sales.

Credit Risk is by far one of the greatest risks financial institutions face in their operations (Boffey & Robson, 2007). It is the probability that counter-party will default in the principal or interest owed and hence fails to repay debts owed on a timely basis (Koch & Macdonald, 2000). Naomi (2011) opine that it is the likelihood of variation in the net income or profit of a bank or financial institution resulting from the non-payment or delay in payment of credit advanced to its customers. Choudhry (2011) also opined that apart from defaults in the loans issued to borrowers, credit risk may also result from different activities banks undertake, such as losses emanating from derivative activities, a downgrade in credit rating by rating agencies, as well as investment in debt-to-high quality customers whose risk profile has reduced. The real value of a loss or risk on credit is dependent on the value and condition of the collateral pledged in respect of the security advanced. Where the collateral is retrievable, the percentage of risk on default is less. As cited in Afriyie & Akotey (2012), a bank may have a high level of credit risk, inadequate institutional capacity, inefficient credit guidelines, an inefficient board of directors, low capital adequacy ratios and liquidity, compulsory quota-lending resulting from government policies and interference and inadequate and improper supervision by the central bank. As this study concentrates on the relationship between credit risk management and profitability, an effective system of credit risk management will help improve performance and reduce the adverse effect credit risk may pose to banks.

1.3 Credit Risk Management

Risk management in banks is a daunting task, but comes with many benefits. It is at the heart of all financial institutions and it is involved in all activities of its risk portfolio. The main aim of reducing or managing risk in a financial institution is to reduce its impact on earnings or to avoid incurring large losses. Among a host of other risk management procedures, Gestel & Baesens, (2008) enumerate the following: 1. Identification of the risk, 2. Measurement and quantifying the risk. 3. Developing strategies to manage the risk. They detail these procedures in the diagram below:

The identification process of risk involves the definition and analysis of potential sources of risks to be dealt with. This stage of the process is very important because the firm or bank must first of all know what kind or type of risk(s) it is dealing with. The next stage involves the measurement stage which deals with the quantification of the risk identified. A statistical analysis may be used to determine the level of probability of default or how a change in the drivers of risk can result in an actual level of default. Treatment of the risk is a four-step approach which includes risk avoidance, risk reduction, risk acceptance and risk transfer (Gestel & Baesens, 2008). Risk avoidance involves investment in low risk or minimum risk products. This approach is geared towards avoiding risk. Risk

acceptance measures adopt diversification by investing in numerous products that cut across industries to lower the impact of risk on the investment. Risk transfer is a process of transferring the impact of risk to other financial institutions such as banks, insurance companies, investment companies etc., by engaging in derivative services. All of these processes can be adopted in the treatment of risk. The final stage is the implementation of a strategy. This involves putting people, systems, technology and statistical models in place to assess, measure and monitor the current and future level of risk in the firm.

The Basel Committee on Banking Supervision (1999) established a four stage approach to managing credit risk in the banking system, these include: 1. Establishing an appropriate credit risk environment. 2. Operating under sound and acceptable credit granting process. 3. Maintaining an appropriate credit administration, measurement and monitoring process. 4. Adequate control over credit risk.

By establishing an appropriate credit risk environment, banks are required to implement their own systems, policies and strategies of assessing, approving, issuing, reviewing and retrieving credit in their firms. There must also be seen to be the existence of sound internal control systems and clear lines of communication and responsibilities in reporting potential risk within the firms. In that regard, management and the board must be seen as key players within the system of managing credit risk, hence the responsibilities of the key players must be spelt out. Under a sound credit granting process, banks are enjoined to establish credit granting criteria with limits of credits to be granted, the authority of loan officers and a conduct analysis of the credit worthiness of loan applicants. As regards the maintenance of an appropriate credit administration, a measurement and monitoring process, banks are enjoined to develop internal credit risk rating systems and techniques as well as establish a credit administration and monitoring systems internally. Finally, ensuring adequate control over credit risk requires banks to continuously review credit, proper management of the credit granting systems as well as to ensure a well-functioning loan workout situation.

Miller (1996) also argues that, a credit risk management process begins with the decision making prior to the allocation of credit thereby ensuring that managers assess the credit worthiness of customers before granting the loans, a follow up of all credit commitments to ensure customers adhere to the terms and conditions under which the loans are granted such as payments of interest on a regular basis, and monitoring and reporting at each stage of the loan process to ensure that, for example, the collaterals pledged in the event of default are existent and in good condition.

Several researchers have studied and identified the reasons behind bank failures and poor performances (Chirochiga, 1997; Santomero, 1997; Brownbridge & Harvey, 1998). Chief among these reasons is the weaknesses in credit risk management. Loans account for a greater proportion of credit of banks, which is usually 10–15 times their equity (Kitua, 1996). Banks are therefore faced with some difficulties when there is a deterioration in the quality of loans (Boahene, et al., 2012) which is brought about following the information processing mechanism (Liukisila, 1996), and further increased at the loan approval, monitoring and controlling stage. This problem is further exacerbated when credit risk management policies, strategies and procedures are either non-existent or are weak

in their implementation (Boahene, et al., 2012) which brings about a high level of poor quality loans resulting in poor performances of banks.

1.4 Credit Risk and Bank Performance

Banks strive to improve on their performance all the time. One of the measures they adopt to achieve this goal is to lower their credit risk as much as possible. Credit risk management is therefore vital in ensuring banks optimize their profitability. Banks with a high level of loan portfolio and minimal credit risk improve on their profitability (Boahene, et al., 2012). Angbazo (1997) points out those banks with larger loan portfolio usually demand higher net interest margin to compensate for the likelihood of higher risk of default. Ducas & McLaughlin (1990) are of the opinion that the variation in a bank's profitability is largely due to its credit risk. In other words, changes in a bank's performance are as a result of changes in their respective credit risk, because a higher exposure to credit risk leads to lower bank performance or profitability. Cooper, Jackson & Patterson (2003) also posit that variation in credit risk leads to variation in the health of a bank's loan portfolio, which eventually affects the performance or profitability. As suggested by Koehn & Santomero (1980), Kim & Santomero (1988) and Athanasoglou, Brissimis & Delis (2005), risks in banks affect both the safety and profitability of the banks. Bobakova (2003) posit that the profitability of a bank is dependent on its ability to foresee, avoid and monitor risk, and possibly to cover the losses that may arise from such risk.

Empirical Review

Following the fact that credit risk is one of the greatest and most important risks faced by banks and other financial institutions, and following the impact such risk has on their profitability or performance, many researchers have taken a keen interest in finding out the exact relationship that exists between credit risk and profitability of banks and have come out with varied findings regarding this relationship. While some findings established a negative relationship between credit risk management and profitability, others find a positive relationship.

Negative Relationship

Bakaeva, Hosna & Sun (2009) in their study on credit risk management and profitability of commercial banks in Sweden, sampled four banks for their study. The study revealed a negative relationship between credit risk management and profitability. A simple regression was run to estimate or establish the relationship, as non-performing loan ratio (NPLR) and capital adequacy ratio (CAR) represent credit risk management, while profitability was measured by return on equity (ROE) using secondary data from the financial reports of the sampled banks. In their study to determine the presence of credit risk on bank performance, Costa Rica, Epure & Lafuente (2012) observed, through a regression analysis, that credit risk which is measured by Non-Performing Loans Ratio was inversely related with performance as measured by Return on Assets. They observed that, credit risk accounted for the differences in banks' performance, therefore banks which are able to control or manage credit risk have the tendency to produce high performance or profitability. Corroborating the findings of Epure & Lafuente (2012) is a study on the effects

of credit risk management on the performance of Nepalese banks by Poudel (2012). By using a regression analysis, the study establishes an inverse relationship between credit risk factors and bank performance or profitability. The study therefore recommends, that banks should not only fashion out policies to control, reduce or manage the level of credit risk in their operations, but should also take steps to improve their profitability. Kolapo, Ayeni & Oke (2012) also sought, through an empirical investigation, to explore the relationship and the effects of credit risk on the performance or profitability of commercial banks in Nigeria. Seven commercial banks were selected for a cross sectional study for a period of eleven (11) years ranging from 2000 to 2010. The traditional Return on Assets (ROA) was used as a measure of profitability, while the ratio of Non-Performing Loans to Total Loans and Advances (NPL/LA), ratio of Total Loans and Advances to Total Deposits (LA/TD) and the ratio of loan loss provision to classified loans (LLP/CL) were used as proxies for credit risk. In applying a panel model analysis, the research showed a negative relationship between credit risk and profitability and the effect of credit risk on profitability of the selected banks was cross-sectionally invariant. Based on their findings, the study recommended that banks in Nigeria should improve their credit analysis capacity, loan and risk management, while the regulatory agencies ensure strict compliance to relevant provisions of the laws by banks. In assessing the efficacy of credit risk management on the performance of banks in Nigeria, Rufai (2013) assert in his study that, managing credit risk was critical to the growth and survival of banks and other financial institutions. A purposive sampling technique was used to select the banks for the study and secondary data was sourced in which a simple regression and Pearson correlation were carried out to establish the relationship. ROE and ROA were proxies for profitability or performance while non-performing loan ratio (NPLR) proxied credit risk. The study established an inverse (negative) relationship between credit risk and profitability. Banks with sound credit risk management systems tend to have lower rate of defaults and higher interest income (profitability). The study further revealed that banks with higher profit prospects tend to absorb credit losses as and when they occur, thereby resulting in a better performance. The findings of Felix & Claudine (2008) indicate that profitability as measured by ROA and ROE was negatively related to credit risk which was proxied by NPLR. In a study by Ahmed, Takeda and Shawn (1998) using a multi-variant regression model, it was established that a loan loss provision was important and had a positive impact on non-performing loans, hence an increase in loan loss provision implies a direct increase in credit risk which has the effect of reducing the value of loans and subsequently diminishing bank performance, hence credit risk has a negative relationship with performance (profitability). In the work of Al-Khouri (2011) on the effects of bank specific risk on their performance, 43 commercial banks were sampled in six of the Gulf Cooperation Council (GCC) countries over a ten-year period. A regression analysis tool was used and the findings were that credit risk, liquidity risk and capital risk have key influence on the profitability of a bank.

Positive Relationship

In their study, Ben-Naceaur & Omran (2008) on the impact of bank regulations, concentration, financial and institutional developments on commercial banks' margin and profitability in the Middle East and North Africa, established that credit risk and capitalization have a positive influence on interest margins, cost efficiency and profitability of the banks. A panel regression model was applied for a time horizon of 1989 to 2005 for the study. Also, in his study to determine the impact of effective credit risk management

on the survival of banks, Njanike (2009) established that poor management of credit risk resulted in a high level of bank failures in Zimbabwe from 2003 to 2004. The study therefore advised banks to establish and implement credit scoring methods, loan review policies and good corporate governance practices. Kithinji (2010) sought to measure the effect of credit risk management on banks' profitability in a study conducted in Kenya, through a regression model. Through the use of records on total credit, the level of non-performing loans and profits for a five-year period, the study revealed that banks' profit are not influenced by the level of credit and non-performing loans, hence, a positive relationship exist between credit risk management and profitability of banks. It was the opinion of Kithinji (2010) that banks' profits are influenced by factors or variables other than credit and non-performing loans. Kargi (2011) in his study on the impact of credit risk on the profitability of Nigerian banks, data used was from a time period spanning from 2004 to 2008. To determine the relationship between credit risk management and profitability, a descriptive correlation and regression model was used. The study thus supports the claim that bank profitability is negatively controlled by the loans and advances, non-performing loans and levels of deposits. In their study on managing credit risk to optimize bank's performance, Alalade, Babatunde & Oguntodu (2014) in a survey of selected banks in Lagos State, Nigeria, established a positive and significant relationship between credit risk management and profitability. In order to establish this relationship, structured research questions were administered to respondents which were analysed through statistic measures. It was established that banks that had a high level of credit risk management systems produced high performance or profitability, hence a positive and significant relationship. This implies that, as credit risk management increases, profitability also increases and vice versa. In a study by Abiola & Olausi, (2014), on the impact of credit risk management on the performance and profitability of commercial banks in Nigeria, it was established that credit risk has a positive relationship with profitability. The study relied on secondary data from the financial reports of seven commercial banks for a period of seven years (2005–2011). In applying a panel regression to estimate the model, profitability or performance was proxied by return on assets (ROA) and return on equity (ROE) while non-performing loans ratio and capital adequacy ratio were variables used to measure credit risk. Although the study revealed a positive relationship between credit risk and profitability, it was observed that the banks lacked effective credit risk management practices and high interest rates were charged on loans to compensate for the defaults and that explained the seemingly high level of profitability in the face of a high credit risk.

Quite surprising, but consistent with the findings of Kithinji (2010) and other studies, is a recent study by Boahene, et al., (2012) in Ghana on credit risk and profitability of selected banks. Six commercial banks were sampled for the study covering the five-year period: 2005 to 2009. Credit risk was proxied by a non-performing loan rate, net charge-off (impairment) rate and pre-provision profit as a percentage of net total loans and advances while profitability was proxied by Return on Equity. A regression analysis was used to determine the relationship. The findings revealed that credit risk has a positive and significant relationship with the profitability of banks. That is to say that banks in Ghana enjoy high profitability even in the midst of high credit risk. This implies that factors other than credit risk affect the profitability of banks in Ghana and one such factor is the interest rate.

From the above reviews, it can be inferred, that the actual relationship that exists between credit risk management and profitability, remains inconclusive as some studies find a positive relationship between credit risk management and profitability while others find a negative relationship. A further research to ascertain the relationship that exists between credit risk management and profitability is encouraged, especially in Ghana where non-performing loans have been on the increase in recent times and the purpose of this paper to explore the relationship further.

2 Research Methodology

The acceptability, reliability and validity of a research are dependent on the methodology adopted for the study. The research methodology must be scientific and therefore follow the acceptable procedure in the field of study; the process must in addition be conventional, rigorous and unbiased to ensure general acceptability of the findings and this is what this paper adopted.

Varying research designs can be adopted to study business problems or undertake business research (Hair, et al, 2011). Research design could therefore be classified into three categories namely: exploratory, descriptive and explanatory studies (Saunders, Lewis & Thornhill, 2009).

This paper adopted an explanatory research approach since the main objective of the study is to establish the relationship between credit risk management and profitability of commercial banks in Ghana. In the exploratory research category, there is little or limited information available to the researcher (Hair, et al., 2011). This research design is suitable when the researcher seeks to clarify his or her understanding of a problem or an issue.

According to Mason & Bramble (1997), the population of a study involves a group of all possible individuals, objects or measurements of interest for consideration. Moore (2009) also define a population as the entire group of individuals about which a set of information is to be derived. For the purpose of this study, the population under consideration involves all banks operating under a universal license in Ghana. This however excludes the Bank of Ghana, the Rural and Community Banks and the ARB Apex Banks. As at December 2013, the number of banks issued or operating under a universal license in Ghana were 29. Hence the population of this study is made up of the 29 banks operating or issued with a banking license in Ghana. However, A sample size of, eight (8) banks were selected to represent the population in this study. This was due to the difficulty the researcher faced in getting the data of the other banks. Since all the selected banks operate in the same environment and are faced with the same market or systematic risks, their outcomes can be deemed to represent the population. Also, most of the selected banks are the big players in the banking industry and hence are better placed to represent the entire population. The samples selected for this study are made up of banks with a large customer base and include: GCB Bank Limited, Cal Bank Limited, Standard Chartered Bank Ghana Limited, UT Bank Ghana Limited, Unibank Ghana Limited, Ecobank Ghana Limited, SG-SSB Limited and HFC Bank Limited. The purposive sampling method was used for this research work.

The purposive sampling technique enables the researcher to conveniently select data or instruments that suit the research or will enable the researcher answer the research questions or achieve the research objectives.

This study covers a time period of ten (10) years spanning from 2005 to 2014. The main consideration for selecting this time period is mainly the availability of data. Prior to this date, most of the banks in Ghana were using the manual system of banking, hence access to data such as their annual financial statements was quite cumbersome (and herculean).

This study adopted the secondary sources of data. The data was extracted from the annual financial reports of the banks selected for the study. Specifically, data relating to non-performing loans, total loans and advances, net charge off (impairment), profit before tax and total assets were extracted from the financial statements of each bank to measure credit risk management and profitability respectively for the study duration.

To enable this study, achieve its aim of establishing the relationship between credit risk management and the profitability of commercial banks in Ghana, a panel regression model was used in its form as below:

$$Pıt\ (ROA) = F\ (Yıt, Zıt) + \ominus it,$$

Where Pıt represents the profitability of Bank i at time t. Yıt is the vector of the variable of Bank

i at time t, Zıt represents the features of Bank i at time t and ⊖it is the error term taking care of all other factor that may affect the dependent variable. In that sense, Profitability as defined by ROA and ROE is the dependent variable, while credit risk as defined by NPLR and CAR is the explanatory variable.

To further explain the model, it is expressed in the form as below:

$$Pıt = \beta 0 + \beta 1NPLR\ ıt + \beta 2NCOTLıt + \beta 3SIZEıt + \beta 4GROıt + \beta 5DRıt + \ominus ıt$$

Model specification

$$ROA = \beta 0 + \beta 1NPLR\ ıt + \beta 2SIZEıt + \beta 3GROıt + \beta 4DRıt + \ominus ıt$$
$$ROA = \beta 0 + \beta 1NCOTLıt + \beta 2SIZEıt + \beta 3GROıt + \beta 4DRıt + \ominus ıt$$

Proxies/Variables for Measurement

In order to establish the relationship between credit risk management and the profitability of commercial banks in Ghana, non-performing loan ratio (NPLR) and net charge off (impairment) were used as variables in measuring credit risk, while profitability was measured as return on assets (ROA).

As indicated above, non-performing loan ratio is one of the variables used to measure credit risk management in this research. Non-performing loans are loans due for more

than 90 days but are unpaid or not redeemed (Louzis, Vouldis & Metaxas, 2012) and the amount used must be the gross value of the loan as recorded on the balance sheet (World Bank, 2013). In other words, non-performing loans are the total losses of a bank, within a specified time out of the total amount given out as loans and advances to customers. NPLR is a popular measure of credit risk as many researchers have used it in their work (Kolapo et al, 2012; Abiola & Olausi, 2014; Boahene, et al., 2012), hence the choice of it as a measure of credit risk management. This variable is a direct measure of credit risk because it shows the percentage or proportion of loans and advances that has not been paid back, hence a larger proportion of non-performing loans relative to total loans and advances, indicates a high level of credit risk within a bank. Non-performing loan ratio is expected to have a positive or negative relationship with profitability. As has been exhibited in literature NPLR can either be positive or negative.

Non-Performing Loan Ratio (NPLR) is calculated as:

$$NPLR = NPLs/TotalLoans$$

Net Charge Off to Total Loans and Advances (NCOTL) is a variable measuring credit risk. It is defined as the amount charged against profit as loan default or credit loss divided by Total Loans and Advances. This measure of credit risk was used in a similar work by Boahene, et al., (2012). Net Charge Off to Total Loans Advances (NCOTL) is expected to have a positive or negative relationship with profitability as previous studies have established.

NCOTL is calculated as:

$$NCOTL = Net\ Charge\ Off\ (Impairment)/Total\ Loans\ and\ Advances$$

The two proxies for credit risk management (NPLR and NCOTL) are independent variables in the model used to establish the relationship between credit risk management and profitability of commercial banks in Ghana.

3 Proxy for Profitability

Paramount in the objective of this study is to establish the relationship between credit risk management and profitability. It is therefore important to define the variables that represent profitability in this study. As dependent variable, Return on Assets (ROA) was used as a measure of profitability. Whereas there are other measures of profitability, ROA was selected as a measure of profitability in this study because of its wide usage in previous studies (Abiola & Olausi, 2014; Appa, 1996; Kolapo, et al., 2012; Boahene, et al., 2012; Ahmed, Takeda & Shawn, 1998).

ROA is a measure of how efficiently the management of a bank is able to use the assets of the bank or firm to generate profit. That is, it indicates how efficiently firms or banks use their assets to generate earnings. A higher ROA indicates a better performance; however, banks that require large initial outlays or investments could have lower ROA. Return on

assets could also indicate the capital strength of a bank. Since ROA is a dependent variable, there is no expected output sign for it. ROA is calculated using the formula as below:

ROA = Net Income/Total Assets

Net Income is defined as profit before tax.

4 Control Variables

Taking a cue from previous studies of this nature and from the researcher's own point of view, there are other variables that can affect the dependent variable (Profitability) in the model. Halsem (1968) posits that profitability depends on a number of factors, such as the size of the firm, the management of the firm, location and time. In the view of Guru, Staunton & Balashanmugam, 1999), the profitability of a bank is influenced by factors which are both internal and external. This research is focussed on the internal factor of credit risk management and therefore has controlled for other variables, such as size of the bank, growth of the bank as measured by the increase in interest income as was used in the model of Boahene, et al., (2012) as well as the debt ratio of the bank.

Bank Size is defined as the log of total assets of the bank. Bank size is expected to have a positive relationship with profitability as larger banks benefit from economies of scale. This implies that profitability increases with larger banks. Bank Size = Log of Total Assets

Growth of the bank is measured as the increase in interest income for the years under review. Growth is expected to have a positive relationship with profitability as banks aim to increase their interest income year on year. Growth is calculated as:

Growth = (Interest Income in current year – Interest Income in previous year)/Interest income in previous year

Debt Ratio is another control variable that affects profitability. Boahene, et al., (2012) used this variable in their study. It is measured as the ratio of Total Liability to Total Assets. Debt ratio is expected to have a positive relationship with profitability as a greater portion of the assets of banks is financed by liability through the deposits of customers. Debt ratio could also be negative for other firms. Debt ratio is calculated as:

Debt Ratio = Total Liability/Total Assets

Table 4.1: Summary of proxies for profitability, credit risk and control variables

VARIABLE	DEFINITION	EXPECTED SIGN
ROA	Return on Assets (ROA) is measured as the profit after tax divided by the total assets of a Bank. This is a measure of Profitability.	
NPLR	Non-Performing Loan Ratio (NPLR) is measured as Non-Performing Loans divided by Total Loan and Advances. This is a measure of credit risk.	Negative/Positive
NCOTL	NCOTL is defined as Net Charge Off (Impairment) divided by Total Loans and Advances.	Negative/Positive
SIZE	Bank Size is a control variable that may also affect the profitability of a bank in the measure of the relationship. It is measured as the log of Total Assets of Bank i in time t.	Positive
GRO	Growth is also a control variable and is measured as the increase in interest income year on year of Bank i.	Positive
DR	It measures the leverage of the bank. It is defined as Total Liability divided by Total Assets.	Positive/Negative
ERROR TERM (ϵ_{it})	These measures all other variables that might have explained the dependent variable but are not included in this model	

Source: Own processing by authors

The STATA software (13.0) was used to run the regression to establish the relationship among the variables.

5 Data Analysis and Discussion of Findings

This section presents data which was run in a regression model to establish the relationship between credit risk management and the profitability of banks in Ghana. A brief descriptive statistic provides an overall assessment of the observed data. A total observation of eighty (80) for each variable (dependent, independent and control variable) has been provided. A mean, standard deviation, minimum and maximum values of each variable has been provided in this section. The section also contains regression results establishing the relationship between credit risk and profitability of banks in Ghana. Detailed discussion explaining the findings of the study has also been provided.

Table 5.1: Descriptive Statistics

VARIABLE	OBS	MEAN	STD.DEV	MIN	MAX
ROA	80	0.042701	0.021284	0.0048	0.0918
NPLR	80	0.092504	0.06972	0.016	0.33
NCOTL	80	0.023875	0.028121	-0.011	0.1424
DR	80	0.861475	0.050874	0.61073	0.927644
GROWTH	80	0.374375	0.288802	-0.3377	1.1588
SIZE(LNTA)	80	20.27182	1.227787	16.9027	22.45839

Source: Own processing by authors

The table above presents a brief descriptive statistics of the dependent, independent and control variables of the regression model.

From the above, it is evident that banks in Ghana enjoy a high level of profitability, as banks were able to generate an average profit of 4.27% with their assets (ROA of 4.27%). Although the average (mean) profitability for the banks was impressive, some banks performed below average with a minimum Return on Assets (ROA) of 0.48%, while others performed above average with a maximum ROA of 9.18%. The variation from the mean profit, as measured by the standard deviation, showed a relatively low figure of 2.13% as shown above.

The sampled banks appear to be enjoying relatively low credit risk, as the statistics above report an average Non-Performing Loan Ratio (NPLR) of 9.35% and the Net Charge Off to Total Loans and Advances (NCOTL) averaging 2.38%. The NPLR and NCOTL has been declining over the period of the study, and this may partially be resulting from the increased regulations in the banking sector, such as the credit risk reserves, which require banks to keep a percentage of profit against credit risk, Capital Adequacy Ratio (CAR) which requires banks to have a minimum CAR of 10% (Bog, 2007) as well as the improvement in the processes of granting loans by the respective banks. The standard deviation for NPLR and NCOTL was 6.96% and 2.84% respectively. Some banks however were faced with a high level of credit risk as the maximum NPLR and NCOTL were 14.24% respectively, while others showed prudent management of credit risk by reporting a minimum NPLR and NCOTL of 1.6% and 1.1% respectively. The standard deviation for NPLR and NCOTL were 6.97% and 2.81% respectively.

The Debt Ratio for the banks averaged 86.15%, showing a high percentage of debt finance by the respective banks. This implies that on average, 86.15% of banks' assets is financed by debt or liabilities. This is expected because the majority of the assets of banks are generated from the loans and advances to customers which are financed by customer deposit. The Debt Ratio also showed a low standard deviation of 5.09% with a minimum and maximum value of 61.07% and 92.76% respectively.

Growth in interest income averaged 37.42% with a standard deviation of 28.88% and a maximum and minimum 115.88% and -33.77% respectively. This is encouraging, as the growth in interest income is most likely to result in increased profit. The size of the banks as measured by the log of total assets averaged 20.27182.

5.1 Correlation Results

To test for the existence of multicollinearity in the model, a correlation was run which gave the results as presented below. It was found that NPLR and NCOTL were highly correlated, as they had a correlation coefficient of 0.7980 (79.80%). This is expected as both NPLR and NCOTL are measures of credit risk. This implies that the regression results could be biased if these two variables were put together in the same regression model. To avoid the problem of multicollinearity, NPLR and NCOTL were run in separate regression models

Table 5.2: Correction output

	ROA	NPLR	NCOTL	DR	GROWTH	LNTA
ROA	**1.000**					
NPLR	**0.1726**	**1.000**				
NCOTL	**0.2008**	**0.7929**	**1.000**			
DR	**-0.2097**	**-0.1127**	**-0.0761**	**1.000**		
GROWTH	**-0.0523**	**-0.2372**	**-0.094**	**0.0234**	**1.000**	
LNTA	**0.3646**	**-0.2667**	**-0.4027**	**-0.0401**	**-0.0139**	**1.000**

Hausman Test
Hausman

Source: Own processing by authors

Chi2 (4) = 14.14
Prob > Chi2 = 0.0014

A hausman specification test was conducted to select between the Fixed-Effect and the Random-Effect. As per the results of the test as shown above, the Fixed-Effect was selected for the study.

Fixed-Effects (within) Regression

R-Sq:	Within = 0.1970	Number of obs. = 80
	Between = 0.0082	Number of groups = 8
	Overall = 0.1140	Group variable = id

Table 5.3: Regression results with NPLR

ROA	COEF	STD. ERR.	t	P>t	[95% Conf.	Interval]
NPLR	0.088807	0.036206	2.45 0.014		0.017844	0.159769
DR	-0.08178	0.042377	-1.93 0.054		-0.16484	0.001276
GROWTH	0.009041	0.007238	1.25 0.212		-0.00515	0.023227
SIZE (LNTA)	0.003899	0.001887	2.07 0.039		0.000201	0.007596
_CONS	0.022526	0.057637	0.39 0.696		-0.09044	0.135491
SIGMA_U	0.009478				F(4, 68) =	4.17
SIGMA_E	0.015901				Prob > F = 0.0044	
RHO	0.262139					

Source: Own processing by authors

Fixed-Effects (within) Regression

R-Sq:	Within = 0.2340	Number of obs. = 80
	Between = 0.3462	Number of groups = 8
	Overall = 0.2530	Group variable = id

Table 5.4: Regression Results with NCOTL

ROA	COEF	STD. ERR.	t	P>t	[95% Conf.	Interval]
NCOTL	.2915555	0.0844571	3.45 0.001		0.1260226	0.4570884
DR	-.078161	0.0405288	-1.93 0.054		-0.1575961	0.001274
GROWTH	.0061898	0.0068992	0.90 0.370		0.0073323	0.0197119
SIZE (LNTA)	.0052634	0.0019011	2.77 0.006		0.0015374	0.0089895
_CONS	-.0059425	0.0562345	-0.11 0.916		-0.1161602	0.1042751
SIGMA_U	.00884324				F(4, 68) =	5.61
SIGMA_E	.0153877				Prob > F = 0.0006	
RHO	.24827578					

Source: Own processing by authors

6 Discussion of Findings

From the regression results above, the two measures of credit risk had a positive and significant relationship with profitability at 5% and 1% significance levels for NPLR and NCOTL respectively. This means that, as credit risk increases, the banks tend to make higher profit. That is, as default rate increases, banks make more profit. This result, although curious, makes sense, because banks in Ghana charge relatively high interest rates which compensate for the defaults. That is, because of the high interest rates charged by the banks, even though some customers default, the high interest rates charged are high enough to compensate for the defaults, hence the banks are able to make profit in the midst of defaults. Therefore, the banks direct the cost of loan defaults to other customers by charging high interest rates. Buchs & Mathisen (2005) posited that there is a high overhead cost (which includes impairments on loan defaults) and sizeable provisioning due to large non-performing loans. Banks in Ghana are among the highest earning banks in Sub Saharan Africa, as they have high ROA's and ROE's. It stands to reason that the existence of credit risk compels banks to charge high interest rates which leads to high interest income and eventually, high profitability. In a similar report by the Bank of Ghana (2004) on 'The Cost of Banking in Ghana', it was revealed that Banks in Ghana enjoy high profitability in spite of the existence of high overhead cost which includes non-performing loan charges. This is largely explained by the high interest or lending rates charged by the banks in Ghana. The Ghana Banking Survey Report (2010) also proves this assertion of high profitability in the midst of high credit risk among Ghanaian Banks. As non-performing loans increased by 343.33% from 2007 to 2009, total income also increased by 87.97% over the same period.

Although the usual expectation is a negative relationship between credit risk and profitability, the regression results proved otherwise and the above reasons explain why such results were possible. The regression result is consistent with the findings of some previous studies one of whom is Boahene, et al., (2012), who conducted a study on the impact of credit risk management and the profitability of selected banks in Ghana and found a positive and significant relationship between credit risk and profitability. Kithinji (2010) also found a positive relationship between credit risk and profitability of Banks in Kenya in a study conducted in Kenya. Abiola & Olausi, (2014) also found a positive relationship between credit risk and profitability in Nigeria.

Size of a bank as per the regression results showed a positive and significant relationship with profitability or performance. This implies that, bigger and larger banks are more likely to make profit than smaller banks. This is quite expected, because larger banks are able to attract more deposits, hence they have more credit available to issue to customers, which in effect leads to an increase in profitability. Larger banks are also able to benefit from economies of scale, as a result of their size, which leads to a reduction in cost and consequently an increase in profit. The results are consistent with previous studies such as Demirguc-Kunt & Huizinga (2012); Kupiec & Lee (2012) and Boahene, et al., (2012) who have all found a positive relationship between bank size, as measured by the log of total assets, and profitability.

Debt ratio had a negative and significant relationship with profitability. That is, banks that use high debt are less profitable than banks with equity finance. This is quite surprising

as previous research works have found a positive relationship between Debt Ratio and profitability of Banks (Agyei, 2010; Boahene, et al., 2012). This result however may partly be explained as being influenced by the choice of banks used for this study, as the majority of the banks used for the study are listed banks. Also, banks with a high debt ratio may contend with paying high interest to their lenders which limits their potential for profit.

7 Conclusion

From the above findings, it has been established that, there exist a positive relationship between credit risk management and profitability of banks in Ghana. Bank size and debt ratio has been established as variables that influence profitability as there exist a positive and significant relationship between them respectively. The outcome of this research is consistent with previous studies which established same (Boahene, et al., 2012; Kithinji, 2010).

The researchers recommend for further research on the relationship between Interest Rate Risk and Default Rate Risk.

References

ABIOLA, I. & A. S. OLAUSI (2014). The Impact of Credit Risk Management on the Commercial Banks Performance in Nigeria. *International Journal of Management and Sustainability*, 3(5): 295–306.

AFRIYIE, H. O. & J. O. AKOTEY (2012). *Credit Risk Management and Profitability of Selected Rural Banks in Ghana*. Catholic University College of Ghana.

AGYEI, S. K. (2010). *Capital Structure and Bank Performance in Ghana*. University of Ghana. Unpublished Thesis.

AHMED, A. S., TAKEDA, C., & SHAWN, T. (1998). *Bank loan loss provision: A re-examination of capital management and signaling effects* (pp. 1–37). Working Paper, Department of Accounting, Syracuse University.

ALALADE, A. S., O. B. BABATUNDE & J. A. OGUNTODU (2014). Managing Credit Risk to Optimize Banks' Profitability: A Survey of Selected Banks in Lagos State, Nigeria. *Research Journal of Finance and Accounting*, 5(18), pp. 2222–2847.

AL-KHOURI, R. (2011). Assessing the risk and performance of the GCC banking sector. *International Research Journal of Finance and Economics*, 65, 72–78.

ANGBAZO, L. (1997). Commercial banks net interest margins default risk interest rate risks and off balance sheet banking. *Journal of Banking and Finance*, 2:55–87.

Annual Reports (2005–2014): GCB Bank Limited, Cal Bank Limited, Unibank, UT Bank Limited, Standard Chartered Bank Ghana Limited, SG-SSB Limited, Ecobank Ghana Limited, HFC Bank Limited

APPA, R. (1996). *The monetary and financial system* (3rd Ed.). London Bonkers Books Ltd.

ARMSTRONG, J. S. (1970). How to Avoid Exploratory Research. *Journal of Advertising*.

ATHANASOGLOU, P., S. N. BRISSIMIS & M. D. DELIS (2005). *Bank-specific, industry specific and macroeconomic determinants of bank profitability*. MPRA Paper No. 153.

BAKAEVA, J., A. HOSNA, M. ARA & SUN (2009). *Credit Risk Management and Profitability in Commercial Banks in Sweden*: gupea.ub.gu.se

Bank of Ghana (2004) Policy Brief: Cost of Banking in Ghana. An empirical assessment and implications. December 15, 2004.

Bank of Ghana (2011) Monetary Policy Committee Press Release. 18 February, 2011.

Bank of Ghana (2008) Capital Adequacy Framework – S. A (Capital Requirement Director).

Bank of Ghana Act (2004) Act 673.

Bank of Ghana (2010). Monetary Policy Report: Financial Stability Report. Volume 5 NO. 5/2010.

Basel (1999), "*Principles for the management of credit risk*", Consultative paper issued by the Basel Committee on Banking Supervision, Basel.

Basel Committee on Banking Supervision (1999, June). *A New Capital Adequacy Framework*.

BEN-NACEUR, S. & M. OMRAN (2008). *The effects of bank regulations, competition, and financial reforms on MENA banks' profitability*. Economic Research Forum Working Paper No. 44.

BOAHENE, S. H., J. DASAH & S. K. AGYEI (2012). *Credit risk and profitability of selected banks in Ghana. Research Journal of Finance and Accounting*, 3(7), 6–14.

BOBAKOVIA, I. V. (2003). *Raising the profitability of commercial banks*, BIATEC.

BOKPIN, G. A. (2013). *Ownership structure, corporate governance and bank efficiency: an empirical analysis of panel data from the banking industry in Ghana.*

BOURKE, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 13(1): 65–79.

BROWNBRIDGE, M., C. HARVEY & A. F. GOCKEL (1998). *Banking in Africa: The Impact of Financial Sector. Reform since Independence*. James Currey Publishers, Oxford.

BUCHS, T. & J. MATHISEN (2005). *Competition and Efficiency in Banking Behavioral Evidence from Ghana*.

International Monetary Fund Working paper, WP/05/17.

CHEN, K. & C. PAN (2012). *An empirical study of credit risk management*.

CHIJORIGA, M. M. (1997). *An Application of Credit Scoring and Financial Distress prediction. Models to commercial Bank Lending: The case of Tanzania*. PhD Dissertation Wirtschaftsuniversität Wien (WU) Vienna.

CHOUDHRY, M. (2011). *An introduction to banking*. Chichester, U. K.: John Wiley & Sons.

COYLE, B. (2000). *Framework for Credit Risk Management*. Chartered Institute of Bankers, United Kingdom.

COOPER, M J., W. E. JACKSON III & G. A. PATTERSON (2003). Evidence of predictability in the cross-section of bank stock returns. *Journal of Banking and Finance*, 27(5), 817–850.

DEMIRGÜÇ-KUNT, A. & H. HUIZINGA (2012). *Do we need big banks? Evidence on performance, strategy and market discipline*. Bis.org. Retrieved from: http://www.bis.org/bcbs/events/bhbibe/demirguc.pdf

DUCAS, J & M. M. MCLAUGHLIN (1990). Developments affecting the profitability of commercial banks. F*ederal Reserve Bulletin*, 76(7) 477–499.

EPURE, M. & I. LAFUENTE (2012). *Monitoring bank performance in the presence of risk*. Barcelona GSE Working Paper Series No. 61.

FATEMI, A., & I. FOOLAD (2006). *Credit risk management: A survey of practices*. Retrieved from http://www.emeraldinsight.com

FELIX, A. T. & T. N. CLAUDINE (2008). *Bank Performance and Credit Risk Management*. Masters Dissertation in Finance, University of Skovde.

FROOT, D., J. W. CRESWELL & B. JOHNSON (1993), Risk management: coordinating investment and financing policies. *Journal of Finance*, December, 1993.

GESTEL, T. V. and B. BAESENS (2009). *Credit risk management*. Retrieved from:http:// www.oxfordscholarship.com.proxy.ub.umu.se/view/10.1093/acprof:oso/978019 9545117. 001.0001/acprof-9780199545117.

GREUNING, H. and S. B. BRATANOVIC (2003) *Analyzing and Managing Banking Risk: A framework for Assessing. Corporate Governance and Financial Risk* (2nd Ed.): The World Bank, Washington D. C.

GURU, B. K., J. STAUNTON and D. B. BALASHANMUGAM (1999). Determinants of Commercial. Bank profitability in Malaysia. In: *Paper presented at the Proceedings of the 12thAnnual Australian Finance and Banking Conference*. Sydney, Australia, December 16–17, 1999.

HASLEM, J. A. (1968). A statistical analysis of the relative probability of commercial Banks. *Journal of Finance*, 23(1), 167–176.

HOSNA, A., M. BAKAEVA and J. SUN (2009). *Credit risk management and profitability in commercial banks*. Master degree project No. 2009: 36, school of business, economics and law, University of Gothenburg.

KARGI, H. S. (2011). *Credit Risk and the Performance of Nigerian Banks*. Ahmadu Bello University, Zaria

KIM, D. & A. M. SANTOMERO (1988). Risk in banking and capital regulation. *Journal of Finance*, 43(5): 1219–1233.

KITHINJI, A. M. (2010). *Credit risk management and profitability of commercial banks in Kenya* (School of Business, University of Nairobi, Nairobi).

KITUA, D. Y. (1996). *Application of multiple discriminant analysis in developing a commercial banks loan classification model and assessment of significance of contributing variables: a case of National Banking of Commerce*. MBA Thesis, UDSM, Dar'es Salaam.

KOCH, T. W. & S. S. MACDONALD (2000). *Bank management*. The Dryden Press / Harcourt collage publishers, Hinsdale, IL / Orlando, FL.

KOEHN, M. & A. M. SANTOMERO (1980). Regulation of bank capital and portfolio risk. *Journal of Finance*, 35(5): 1235–1244

KOLAPO, T. F., R. K. AYENI & M. O. OKE (2012). Credit risk and Commercial Banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research*, 2(2): 31–38.

KUPIEC, P. & Y. LEE (2012) *What Factors Explain Differences in Return on Assets Among Community Banks?* Federal Deposit Insurance Corporation. Available at: https://www.fdic.gov /regulations/resources/cbi/report/cbi-roa.pdf

LIUKISILA, C. (1996). *IMF survey, "Healthy Banks are Vital for a strong Economy, Financial and Development"*. Washington D. C.

LOUZIS, D. P., A. T. VOULDIS & V. L. METAXAS (2012). Macroeconomic and Bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking & Finance*, 36 (4), pp. 1012–1027.

MASON & BRAMBLE (1997). *Financial management of Commercial Banks*. Warren Gorham Lamont: Boston.

MILLER, G. P. (1996). Is deposit insurance inevitable? Lessons from Argentine. *International Review of Law and Economics*, 16(2), 211–232.

MOORE, D. S. (2009). *The practice of business statistics: using data for decisions*. (2nd Ed.). New York: W. H. Freeman and Co.

NAOMI, H. (2011). *Risk and records management: Investigating risk and risk management in the context of records and information management in electronic environment*. Retrieved from http://www.Northumbria.openrepository.com

NICHOLL, P. (2007). *Financial and operational risk management for central bankers*. Central banking annual training course/seminar series – autumn 2004.

NJANIKE, K. (2009). The impact of effective credit risk management on bank survival. *Annals of the University of Petroşani, Economics*, 9(2), 173–184.

OWOJORI, A. A., I. R. AKINTOYE & F. A. ADIDU (2011). The challenge of risk management in Nigerian banks in the post consolidation era. *Journal of Accounting and Taxation*, 3(2): 23–31.

POUDEL, R. P. S. (2012). The impact of credit risk management on financial performance of commercial banks in Nepal. *International Journal of Arts and Commerce*, 1(5), 9–15.

PROTIVITI INC. (2013) *The Bulletin: Ten Keys to Managing Reputation Risk*. Available through: http://www.protiviti.com/en-US/Documents/Newsletters/Bulletin/The-Bullet in -Vol-5-Issue-2-10-Keys-Managing-Reputation-Risk-Protiviti.pdf

RUZIQA, A. (2013). *The impact of credit and liquidity risk on bank financial performance*.

RUFAI, A. S. (2013). Efficacy of Credit Risk Management on the Performance of Banks in Nigeria: A Study of Union Bank PLC. *Global Journal of Management and Business Research Administration and Management*, Volume 13; Issue 4.

SANTOMERO, A. (1995). Financial Risk Management: The Whys and Hows. *Journal of Financial Markets, Institutions and Investments*, 4, 1995.

SANTOMERO, A. M. (1997). Commercial bank risk management: an analysis of the process. *Journal of Financial Services Research*, 12 (2–3), pp. 83–115.

SANTOMERO, A. & J. TRESTER (1997). Structuring Deposit Insurance for a United Europe. *European Financial Management*, 1997 forthcoming.

SAUNDERS, M., P. LEWIS & A. THORNHILL (2009). *Research methods for business students*. (5th edition). Harlow: Financial Times Prentice Hall.

SAUNDERS, A. & M. M. CORNETT (2014). *Financial Institutions Management: A Risk Management Approach*. New York: McGraw-Hill Higher Education.

STEWART (2007). *Establishing a culture of operational risk governance*. Central banking publications limited, Tavistock House, Tavistock Square, London WC1H 9JZ, UK.

ZIKMUND, W. (1991). Business Research Methods. *Development Policy Review Journal.* Dryden, New York.

Contact Address

Roger Owusu-Boafo
Business School, University of Ghana, Legon, Ghana
(rowusuboafo@yahoo.com)
corresponding author

Ernest Obeng, PhD.
School of Finance and Economics, Jiangsu University, China
(nestolibjsu@gmail.com)
co-author

Jone Yeboah Addo
Accounting Department, University of Education, Winneba, Ghana
(joneyebs@gmail.com)
co-author