UNIVERSITY OF CAPE COAST

LIQUIDITY RISK, CREDIT RISK AND PERFORMANCE OF LISTED BANKS IN GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work and that it has not been presented in part or in whole for another degree in this university or elsewhere.

Candidate's Signature: ..... ……. Date: .....

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Supervisors' Declaration

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

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ABSTRACT

Credit risk and liquidity risk management practices have become very critical for efficient operations and survival of banks. This is because they have the tendency to affect the core existence of banks (profitability). However, the impact of credit risk and liquidity risk on the performance of banks is yet to be fully explored in Ghana. The recent takeover of UT bank Ltd and Capital bank Ltd by GCB bank Ltd; where issues of insolvency were cited by BoG as reason for the takeover is a prove of credit risk and liquidity risk management challenges in Ghana. This study investigated the effect of credit risk and liquidity risk on the performance of listed banks in Ghana. The study used a quantitative research approach in the analysis of the data. Annual secondary data from the financial statements of listed banks were analysed for the period 2011 to 2014. A fixed effect model was used in the analysis. The results showed that the capital adequacy ratio, cost per loan assets ratio and loan advance total deposit ratio had significant negative effect on listed banks' liquidity risk. The results also showed that liquidity risk had significant negative effect on the performance of listed banks but credit risk generally had insignificant effect on listed banks' performance. The study recommends; management to be cautious in setting up a credit policy that will not negatively affects liquidity risk and liquidity of listed banks. BoG for policy purposes should regularly assess the lending attitudes of listed banks; one direct way is to assess the degree of credit crunch by isolating the impact of supply side of loan from the demand side taking into account the opinion of firms about listed banks' lending attitude.

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DEDICATION

To my mother Elizabeth Ohemeng

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LIST OF ABBREVIATIONS

BS	Bank Size
CAR	Capital Adequacy Ratio
CLAR	Cost per Loan Asset Ratio
CR	Credit Risk
LATDR	Loans-Advance Total Deposits Ratio
LATDR	Loans-Advance Total Deposits Ratio
LR	Liquidity Risk
NIM	Net Interest Margin
OEXP	Operating Expenses
ROA	Return on Asset
ROE	Return on Equity

CHAPTER ONE

INTRODUCTION

Credit risk and liquidity risk management are very critical to banks' operations and survival. A well and sound credit risk as well as liquidity management system has the potential of putting banks on a high pedestal to achieving their goals. It is for this reason that banks all over the world place much premium on credit risk and liquidity risk management. However, the subject matter is yet to be fully examined, paid much attention to and practiced in by Ghanaian banks. This could be one of the reasons why most financial institutions are struggling in Ghana. The study therefore sought to examine the effect of credit risk and liquidity risk on the performance of banks in Ghana.

Background to the Study

Financial systems all over the world play a crucial role in economic growth and development. They are said to be the life blood of economies. The banking sector constitutes a larger portion of the world's leading companies and play a critical role in the economy of every country. According to Halling and Hading, (2006) banks play a major role in the financial intermediation process of every economy. The efficiency and effectiveness in roles executed by banks are essential requirements towards ensuring economic stability and growth. Banks, in the execution of their mandate, are engaged in a lot of valuable economic activities. The survival and profitability of these banks heavily depend on the efficiency and the effectiveness with which banks are able to carry out these economic activities. Paramount among these economic activities carried out by

banks is the promotion of the financial intermediation role; channeling funds from surplus spending units to deficit spending units among economic agents. This transformational process normally occurs on the balance sheet of banks. The assets side of the balance sheet, ensures the free flow of funds by lending to deficit spending units whereas the liabilities side provide liquidity to savers of funds. In addition, banks also facilitate trade through the provision of payment and settlement systems and enhancing the provision of investment capital.

Jenkinson (2008), asserted that the varied number of economic activities provided by banks expose them to a large number of risks. These risks when not properly managed, could threaten the profitability and survival of banks. Some of these risks include liquidity risk, credit risk, foreign exchange risk, market risk, interest rate risk among others. Amidst all these risks that banks are exposed to, it is the responsibility of management to ensure the profitability and survival of banks. This calls for a proper management system in place in order to minimize if not eliminate the effects of these risks. According to Mishkin and Eakins (2009), managers of banks have the prerogative to make sure that banks have adequate ready cash to pay their depositors when there are deposit outflows or run into cash trap. That is when deposits are lost because depositors make withdrawals and demand payment. According to Bonfim and Kim (2012), the execution of the core mandate of banks with respect to financial intermediation gives rise to an intrinsic risk that lies very deep in their daily operations and poses threats to them on daily basis.

Out of the many risks that banks are exposed to, liquidity risk and credit risk pose a lot of threats and with much implications on the performance of banks. The Basel Committee on Banking Supervision (2008) defined liquidity of a bank as the ability of a bank to fund increases in assets and meet current obligations as and when they fall due, without incurring unacceptable losses. However, banks are said to be facing liquidity problems when they find it difficult settling their maturing debts as and when they fall due. The Basel Committee on Banking Supervision (2008) indicated that the susceptibility of banks to liquidity risk arise when banks play the fundamental role of maturity transformation of short-term deposits into long-term loans, both of an institution-specific nature and that which affects markets as a whole. Iion and Dragos (2006) defined liquidity risk of banks as the expression of the possibility of losing the capacity of financing their transactions, or the probability that banks cannot honour their daily obligations to their clients which include the withdrawal of deposits, maturity of other debt, and cover additional funding requirements for the loan portfolio and investment. Effective liquidity risk management ensures a bank's ability to meet cash flow obligations which are uncertain as they are affected by external events and other agents' behavior (Siaw, 2013). Crowe (2009), indicated that even a bank with good asset quality, strong earnings and sufficient capital may still fail if management does not maintain adequate liquidity management practices. This is because inadequate liquidity can be a source of bank failure and therefore to avoid insolvency, holding an optimal value of liquid assets with easy transformation into cash becomes very crucial.

In the normal scheme of banks' operations, aside the grievous effects that banks are exposed to in the midst of liquidity problems (Liquidity risk), credit risk is one of the major risks that normally confront the smooth operations of banks. It is often argued that, credit risk of banks has enormous effects on the liquidity and performance of banks. Credit risk is the possibility that a bank's borrower or counterparty will fail to honour or meet their obligations in accordance with specific agreed terms. Chijoriga (1997) indicated that credit risk is the most expensive risk bedeviling the operations of financial institutions. It has much significant effect compared to other risk as it directly threatens the solvency of financial institutions. The degree and level of losses caused by credit risk in banks' operations as compared to other forms of risks is very severe to cause high scale of loan losses and even bank failure (Ogilo, 2012). According to Basel Committee on Banking Supervision (1999), While financial institutions have encountered difficulties over the years for a number of reasons, the main cause of serious banking problems is directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or a lack of attention to change in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties.

Loans are the major source of credit risk to banking institutions. However, other sources of credit risk exist during the course of banks' operational activities. Banks are increasingly being exposed to credit risk in various financial instruments other than loan advancements, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures,

swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions (Ogilo, 2012). However, the objective of credit risk management is to minimize if not eliminate a bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable ranges. In the management of credit risk, Sinkey (1992), indicated that such should be done within the entire portfolio as well as the risk in individual credits as transactions. This will help avoid the negative ramifications associated with credit risk in bank operations.

Liquidity and Credit risk management should be at the core of banks operations for the maintenance of financial sustainability and expanding the scope of banks' clients. However, amidst these facts, there has been an increased number of significant bank problems in both, developed as well as developing economies (Brownbridge & Harvey, 1998 and Basel, 2004). Bank problems, commonly failures and financial distress have affected a lot of banks, many of which have been closed down by banking regulatory authorities (Brownbridge & Harvey, 1998). A current case at hand is the recent takeover of UT bank Ltd and Capital bank Ltd by GCB bank limited in Ghana. Among other factors, weakness in liquidity and credit risk management have all along been cited as the main cause for bank problems (Richard Chijoriga, Kaijage, Peterson & Bohman, 2008 and Chijoriga, 1997). Exposure to liquidity risk and credit risk continue to be the principal source of problems in banks world-wide, (including Ghanaian Banks). However, in the Ghanaian financial environment, especially listed banks, less attention has been paid to the subject matter. The recent statement issued by the

Bank of Ghana (BoG) regarding the takeover of UT bank Ltd and Capital bank Ltd calls for a holistic examination of the effect of credit risk and liquidity risk on bank performance, especially listed banks. In the said statement, the BoG cited among other things reasons of deeply insolvency as a cause of the takeover. This in sum, could be attributed to liquidity and credit issues. The problem however should not be seen to be a case for only UT bank Ltd and Capital bank Ltd. In fact, the issue cuts across the entire banking sector. This is the thrust for the present study. The study sought to assess the impact of liquidity risk and credit risk on the performance of listed banks in Ghana.

Statement of the Problem

Given the rapid development of the financial sector in Ghana, banks are exposed to intense competition. Performance management standard, has as a result of the intense competition, become insufficient to meet the needs of strategic developments in financial institutions (Derbali, 2011). Coupled with the declining of the industry profit in an increasingly complex banking sector, management in the industry must know and understand the nature of risks that have the potential to influence and impact on the performance (profitability) of the banks. This is very necessary considering the fact that banks play a crucial role in the development of the economy. Risk management is considered a major yard stick for determining failure or success of financial institutions (Banks). However, it has not been given much attention in Ghana and in most developing countries. Fundamentally, financial institutions' core business involves the taking of risks under conditions of uncertainty. The financial sector of Ghana is

expanding greatly with additional banks springing up every day, and some getting listed on the Ghana Stock Exchange. This coupled with world financial crises and financial instability make it imperative to determine the risk levels of listed banks in Ghana and in addition examines the effects it has on their performance.

Within the scope of risk factors that affect the performance of listed banks in Ghana, limited number of studies have been conducted. Amidst the limited number of studies that have been conducted, most of these studies in Ghana concentrated on liquidity risk and credit risk management in rural banks and mostly use primary data. However, rural banks operate under different settings and regulations as compare to listed banks in Ghana, with different market target altogether. There is therefore, the need to examine whether investment in liquidity risk and credit risk management is viable to listed banks in Ghana. For example, Afriyie and Akotey (2013), indicated in a study of the Ghanaian rural banking industry that, the level of loan delinquencies or impaired loans in an RCB's loan portfolio is usually considered the best leading indicator of the institution`s financial performance. Also, Nair and Fissha (2010) revealed that the percentage of default loan in the portfolios of sampled banks for more than one month was 16 percent. This is too high and unacceptable given the global average of 3 percent for the worldwide micro-banking industry. These raise a question of whether these findings of Afriyie and Akotey (2013) and Nair and Fissha (2010) could be true listed banks in Ghana, and the implications of such findings (loans default-credit risk) on the performance of listed banks. Also, a few of the limited number of studies concentrated on listed banks on the Ghana Stock Exchange. For

instance, Djan, Stephen, Bawuah, Halidu Kuutol (2015) investigated credit rissk management and its impact on financial performance of listed banks in Ghana, the results indicated that credit risk had a negative effect on the performance of listed banks in Ghana. Also, Boahene, Dasah and Agyei (2012) examined credit risk and profitability of selected Banks in Ghana, where in all six banks were considered. Their findings indicated that credit risk had a positive relationship with the performance of the considered banks. That is to say banks enjoyed high performance level in spite of the high credit risk they were exposed to. These findings of Boahene et al (2012) are contrary to that of Djan et al (2015). However, in both studies, only a few of banks in Ghana were considered. The subject matter therefore demands further probe.

Also, Landskroner and Paroush (2008) indicated that there have been far-reaching academic and regulatory discussions on major banking risks including credit risk, market risk and operations risk. However, little attention has been paid to liquidity risk which has become one of the major risks faced by banks and other financial institutions. Shen et al. (2009) indicated that under normal circumstances, banks seldom battle with liquidity crisis, but lately much attention has been drawn to it by researchers, regulators and financial institutions after the various economic and banking crisis across the globe confirming the fact that liquidity risk has not been sufficiently covered by the prevailing risk management practices (Crowe, 2009). This was equally confirmed in the Ghanaian literature given the scanty number of studies that have tried to examine the issues in

perspective. The study therefore equally sought to examine the rarely considered; liquidity risk and listed banks performance in Ghana.

Purpose of the Study

The main objective of this study is to examine the impact of liquidity risk and credit risk on the performance of listed banks in Ghana.

Research Objectives

Specifically, the study seeks to achieve the following;

1. Assess the effect of credit risk on liquidity risk of listed banks in Ghana.
2. Examine the effect of credit risk on performance of listed banks in Ghana.
3. Assess the effect of liquidity risk on performance of listed banks in Ghana.

Hypotheses

The following working hypotheses were formulated to achieve the objectives stated above. Hypotheses 1 and 2 relate to the first and second objectives while hypothesis 3 relates to the third objective.

H1. Credit risk has significant effect on liquidity risk of listed banks in Ghana.

H2. Credit risk has significant effect on performance of listed banks in Ghana.

H3. Liquidity risk has significant effect on the performance of listed banks in Ghana.

Significance of the Study

Bank performance and survival will continue to be a central point in the framework of financial markets development. To date, there have not been doubts on the contributions of banks to the growth and development of economies. However, there are a countless number of factors that militate against the

performance of banks. For this reason, it become pretty much difficult to exhaust studies on factors that affect the performance (profitability) of banks.

However, the findings of the study will be significant for a number of reasons;

Firstly, the study will have great importance to the government, Bank of Ghana and other regulatory bodies. It will help the regulators to understand the scope and impact to financial risks (liquidity risk and credit risk) and how to strengthen the systems in the financial sector in terms of policies and regulations in order to determine the adequacy of the risk management practices provided for by the regulators themselves.

Secondly, the study is also of great benefit to oversight boards, management and investors of financial institutions in Ghana. The managers in all listed banks will clearly understand more on the impact of financial risk (liquidity risk and credit risk) on the financial performance of listed banks in Ghana. They will have the advantage of adopting the recommendations made on the study and engage the relevant stakeholders to determine whether to mitigate financial risk in a bid to maximize returns. These research findings will further advance the course of addressing the existing knowledge gap in literature of financial risk affecting financial performance of listed banks in Ghana.

Delimitation of the Study

In the assessment of financial risks that affect the performance of listed banks, a number of financial risks areas could be observed. All of these forms of financial risks could have serious implications on listed banks performance. This study, however, does not focus on all of the different forms of financial risks but

put much emphases on liquidity risks and credit risk on the performance of listed banks in Ghana.

Limitations of the Study

The results of the study largely depend on secondary information analyses. For this reason, the study results are subjected to the limitations of the banks' financial statements as reported to the general public and the business community which were under custody of the Bank of Ghana Supervision Department. The data available was only for the period year 2011 to 2014. The study had limitation of not having access to all data as targeted and hence 7 out of the 10 listed banks were considered.

Organization of the Study

The study is organized into five chapters. Chapter one dealt with the introduction to the study. It described the background to the study and outlined the relevance and limitations of the study as well as delineated the areas of interest to which the study relates. Chapter Two presents a review of related literature on liquidity risk, credit risk and banks performance. The methodology that was used to conduct the study is described in chapter Three. Chapter Four discusses the findings from the study while the summary, conclusions and recommendations are presented in Chapter Five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter presents a critical review of literature and the theoretical basis for the study, as well as issues advanced in prior empirical studies. The review is aimed at providing the intellectual context for the study, acknowledging and examining prior knowledge on the topic and appreciating modes of presentation and discussions on research findings. The chapter begins with a theoretical review underlying liquidity risk, credit risk and performance of banks. This is followed by an empirical review of liquidity risk and bank performance as well as credit risk and bank performance which are captured in prior empirical studies.

Theoretical Review of the Study

A theory is a group of coherent and tested general propositions, usually regarded as accurate, that can be adopted as principles in offering explanations and making predictions with regard to a phenomenon (Kombo & Tromp, 2009). This section of the study provides a theoretical underpinning for the study. The section relates theory to empirical studies and also provides a link of the theory with liquidity risk, credit risk and bank performance. The study anchored the variables of interest on two main theories, namely: (i) Finance distress theory which is linked swith the credit and liquidity risks and (ii) Shiftability Theory is linked with liquidity risks.

Finance Distress Theory

The theory of financial distress has its roots from the liquidity and credit risks facing a firm. The theory is of the view that the level of financial distress that a firm is exposed to emanates from its liquidity and credit risks ratings. The theory offers a non-biased perceptiveness on the relationship between credit risk and financial performance variables. By indicating that the effects of financial distress occur prior default risk, the theory provides a neutral platform to undertake an incisive empirical analysis of this relationship within the listed banks.

Baldwin and Scott (1983) postulated that when a firm's business deteriorates to the level where it cannot meet its financial obligation, the firm is deemed to have entered the state of financial distress. This means that the first indicators of a financially distressed firms are the violations of debt payments and failure or sharp reduction of dividends payouts. The obvious way in identifying firms in financially distressed state is their inability to meet contractual or debt obligations. However, substantial financial distress effects are incurred well prior to default. Wruck (1990) stated that firms enter into financial distress as a result of economic distress, declines in their performance and poor management especially on risks. Boritz (1991) depicts a process of a financial distress that begins with an incubation period characterized by a set of bad economic conditions and poor management which commits costly mistakes. In the case of commercial banks, the in ability to provide cash to depositors and loans to borrowers as and when they demand may constitute a liquidity crisis. Other

creditors also need to be taken into account when firms are putting in place risk management measures. Credit risks in banks also need to be addressed since it may lead to financial distress. Loan portfolio management is an important determinant of the firm's liquidity. The banks should manage the credit and liquidity risk in order to avoid financial distress.

Shiftability Theory of Liquidity

This theory was propounded by Harold G. Moulton, in the year 1915. The shiftability theory is of the view that banks could most effectively guard themselves against massive deposit withdrawals by holding, as a form of liquidity reserve, credit instruments for which there existed a ready secondary market. The theory is based on the proposition that banks' liquidity can be maintained if it holds assets that could easily be transformed to cash. Also, these assets should be such that they can be shifted to the Central Bank for cash without material loss in case of necessity than relying on maturities to solve their liquidity problems (Ngwu, 2006). This theory postulates that a bank's liquidity is preserved if it holds assets that could be transformed or sold to other lenders or investors for cash. The point of view of the theory is that a bank's liquidity could be enhanced provided it always has assets to sell and provided the Central Bank and the discount market stands ready to purchase the asset offered for discount. Thus this theory recognizes and contends that shiftability, marketability or transferability of a bank's assets is a basis for ensuring liquidity.

The liquidity shiftability theory provides for explicit understanding of how the liquidity risk affects the financial performance using liquidity coverage and

net stable funding ratios as stated by new Basel III framework. The analysis of this study provides the information as to whether liquidity maintained by the commercial banks affect the performance of banks.

Linkage of theory, liquidity risk, credit risk and performance of banks

The financial distress theory tries to provide justifications and conditions that promote the occurrence of financial distress in firms' operational lives. The theory postulates that liquidity risk and credit risk management processes are among the major causes of financial distress in organizational life. The theory also postulates that financial distress firms are mostly faced with performance problems. That is to say, a firm that is bedeviled with financial distress is most likely not to put up good performance. It is therefore imperative that in the promotion of firms' performance, proper measures are put in place in order to avoid financial distress and this will include liquidity risk and credit risk management processes. The liquidity shiftability theory provides for explicit understanding of how the liquidity risk affects the financial performance. The theory postulates that an inefficient liquidity management systems demonstrated by an organization will lead to liquidity problems (liquidity risk) and affect financial performance.

Empirical Review of the Study

The section examined prior empirical studies on liquidity risk, credit risk and bank performance. The review made some propositions and deductions from literature. The review also made manifest the gaps in knowledge on the subject matter and attempted to address such gaps in knowledge.

The relationship between liquidity risk and credit risk

There is a plethora of empirical studies that tried to examine the relationship between liquidity risk and credit risk variables. Majority of the said studies have been conducted in advanced economies. This section of the study examines the literature on the relationship between liquidity risk and credit risk.

Liquidity is very key in bank operations. Dermine (1986), indicated that liquidity risk is mostly seen as a profit-lowering cost. It has been widely acknowledged that loans default augments liquidity risk, this is because it has the potential of lowering cash inflow. In the thinking of most finance and economic theories, such as the theory of financial intermediation (Bryant, 1980; Diamond & Dybvig, 1983) as well as the industrial organization approach to banking, which was examined in the Monti-Klein model of banking organizations (Prisman, Slovin, & Sushka, 1986), there is a relationship between liquidity and credit risk.

According to Samartin (2003), these should be a positive relationship between liquidity risk and credit risk. This same proposition was espoused by Iyer and Puri (2012), where an indication of a positive relationship between liquidity risk and credit risk was established. Diamond and Rajan (2005) equally showed that there is a positive relationship between liquidity and credit risks. They made the clarification that if too many economic projects are financed with loans to the extent that banks cannot meet the demand of the depositors; thus, these depositors will claim back their money if these assets deteriorate in value. This implies that liquidity and credit risks increase simultaneously.

In the natural scheme of bank operations, there comes a time where banks make use of all loans and thus reduce the overall liquidity. The resultant of this is that, higher credit risk experienced by banks will cause higher liquidity risk by depositors' demand. Financial institutions raise debts that must be constantly renewed and advanced in financing assets, as more debts in the banking system provide a higher -bank-run risk (Acharya & Viswanathan, 2011). In such reasoning, Nikomara, Taghavi, and Diman (2013) studied the relationship between credit and liquidity risks for Iranian banks. The study made use of all the private and government banks over the period 2005 to 2012. Nikomara et al. (2013) conclude that there is a positive and significant relationship between credit and liquidity risks.

On their part, Ejoh, Okpa, and Inyang (2014) investigated the relationship and the effects of credit and liquidity risks on the default probability of Nigerian banks. The study made use of the First Bank of Nigeria Plc and adopted an experimental research design where questionnaires were issued out to a sample of eighty respondents. Ejoh et al. (2014) found that there is a positive relationship between liquidity risk and credit risk. Imbierowicz and Rauch (2014) equally tested the relationship between liquidity risk and credit risk in the US banks. Their study included a sample of all commercial banks in the United States for the period 1998 to 2010. Their results showed a positive relationship between liquidity risk and credit risk, but there was no reciprocal relationship between both risks.

In a similar vein, Louati, Abida, and Boujelbene (2015) investigated and compare the behavior of Islamic and conventional banks in relation to the ratio of the capital adequacy. The study examined data from 12 MENA and South East Asian countries for the period 2005 to 2012. Louayti et al. (2015) observed that there is a significant negative relationship between liquidity ratio and credit risk of conventional banks.

The empirical review conducted above indicate that there is a positive relationship between liquidity risk and credit risk. This means that a bank with credit risk is most likely to have liquidity challenges.

The relationship between credit risk and bank performance

In commercial banking lending processes, commercial banks play a dominant role (Allen & Gale, 2004). According to Gande (2008), in many jurisdictions, commercial banks regularly perform investment banking activities by providing new debt to their customers. This is mostly referred to as the credit creation process. The credit creation process works efficiently when funds are transferred from ultimate savers to borrowers (Bernanke, 1993). The creation of credit by commercial banks often expose them to credit risk. Credit risk is the biggest risk faced by banks and financial intermediaries (Gray & Cassidy, 1997). The indicators of credit risk include the level of bad loans (Non- performing loans), problem loans or provision for loan losses (Jimenez & Saurina, 2006). Credit risk is the risk that a loan which has been granted by a bank, will not be either partially repaid on time or fully (Campbell, 2007), and where there is a risk of customer or counterparty default (Gray, et al., 1997). In the view of Basel

Committee of Banking Supervision BCBS (2001) and Gostineau (1992), credit risk is the possibility of losing the outstanding loan partially or totally, due to credit events (default risk). Credit events generally include events such as bankruptcy, failure to pay a due obligation, repudiation/moratorium or credit rating change and restructure.

According to Robert and Gary (1994), the most obvious characteristic of failed banks is not poor operating efficiency, but the increased volume of non-performing loans. Non-performing bank loans in failed banks have been associated with regional macroeconomic problems. DeYoung and Whalen (1994) indicated that the US Office of the Comptroller of the Currency observed that the difference between the failed banks and those that remained healthy or recovered from problems was the quality of management. Superior mangers not only operate their banks in a cost efficient manner, and thus generate large amounts of profits relative to their peers, but also execute better loan underwriting and monitoring standards than their peers which ensure to better credit quality.

Also, Djan, et al. (2015), examined Credit Risk Management and Its Impact on Financial Performance of Listed Banks in Ghana, the study considered parameters such as default rate, cost per loan assets and capital adequacy ratio. Nine banks listed on the Ghana Stock Exchange (GSE) were considered out of the sample banks for a 10-year period (2005-2014). Comparing performance ratio to default rate, capital adequacy ratio and cost per loan assets which was presented in descriptive, correlation and regression was used to analyze the data. The study

revealed that all these parameters have an inverse impact on banks' performance; however, the default rate is the most predictor of bank financial performance.

Kargi (2011) investigated the impact of credit risk on the profitability of banks in Nigeria. The study collected financial ratios as measures of bank performance and credit risk from the annual reports and accounts of sampled banks from 2004-2008. The analysis was done using descriptive, correlation and regression techniques. The findings indicated that credit risk management has a significant impact on the profitability of Nigerian banks. Kargi (2011) therefore concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress. A similar study was also conducted by Epure and Lafuente (2012), where in bank performance in the presence of risk for Costa-Rican banking industry were subjected to scrutiny over the period 1998-2007. The results revealed that performance improvements are associated with regulatory changes and that risk is a major fact responsible for differences in banks and that non-performing loans negatively affect efficiency and return on assets. Capital adequacy ratio was also observed to have a positive impact on the net interest margin (performance of banks).

Also, Kithinji (2010) examined the effect of credit risk management on the performance of commercial banks in Kenya. The study collected data on the amount of credit, the level of non-performing loans and profits for the period 2004 to 2008. The findings of Kithinji (2010) revealed that profits of commercial banks are not influenced by the amount of credit and non-performing loans. This

therefore suggested that other variables other than credit and non-performing loans impact on banks' profitability. Chen and Pan (2012) equally examined the credit risk efficiency and performance of 34 Taiwanese commercial banks over the period 2005-2008. Chen and Pan (2012) used financial ratio to assess the credit risk and the analysis was done using Data Envelopment Analysis (DEA). The study examined the following as credit risk parameters; credit risk technical efficiency (CR-TE), credit risk allocative efficiency (CR-AE), and credit risk cost efficiency (CR-CE). The results revealed that only one bank is efficient in all types of efficiencies over the evaluated periods. Overall, the DEA results show relatively low average efficiency levels in CR-TE, CR-AE and CR-CE in 2008.

Felix and Claudine (2008) examined the relationship between bank performance and credit risk management. The findings revealed that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the credit risk of banks, leading to a decline in profitability. Al-Khouri (2011) investigated the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Examining the fixed effect regression analysis, the results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets.

In a similar fashion, Ben-Naceur and Omran (2008) examined the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and

North Africa (MENA) countries from 1989-2005. Ben-Naceur and Omran (2008) found that bank capitalization and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability. Also, Ahmed, Takeda and Shawn (1998) in their study found that loan loss provision has a significant positive influence on non-performing loans. Therefore, an increase in loan loss provision indicates an increase in credit risk and deterioration in the quality of loans consequently affecting bank performance adversely.

The relationship between liquidity risk and bank performance

Liquidity risk can be measured by considering a bank's liquidity gap, various liquidity risk measures have for some time in the past focused on the use of liquidity ratios and have thus achieved varied results in relation to bank performance. The most widely used measures of liquidity risk are the ratio of liquid assets to total assets, the ratio of loans to total assets, the ratio of liquid assets to total deposits, the ratio of liquid assets to customer and short term funding, the ratio of net loans to customer and short term funding among others.

In most studies, the ratio of liquid assets to total assets is used to measure the liquidity risk of banks. This is because, the ratio normally gives much information about the general liquidity shock absorption ability of a bank. As a universal rule, the higher the ratio, the higher the capacity of a bank to soak up a probable liquidity shock, given that market liquidity is the same for all banks in the sample. This notwithstanding, a higher value of the ratio could also be interpreted as a sign of inefficiency, since keeping much liquid assets on the balance sheet results in lower net interest margins hence the need to optimize

liquidity and profitability and thus reduce opportunity cost of the bank. Various studies have used this ratio to determine the relationship between liquidity risk and bank performance, for instance, Molyneux and Thornton (1992) and Barth et al. (2003) both of whom established a negative relationship between this liquidity ratio and return on assets (ROA). However, in a similar study Bourke (1989) established a positive relationship between the bank liquidity risk and performance. Demirguc-Kunt et al. (2003) therefore concluded that banks that held a high fraction of liquid assets had lower net interest margins and this is consistent with banks receiving lower returns on holding cash or securities but facing competitive market for deposits.

Another commonly used liquidity risk ratio is the ratio of liquid assets to deposits. This liquidity ratio is more centered on the bank's sensitivity to selected types of funding. The ratio thus captures the bank's vulnerability to liquidity risk in relation to its funding sources. The bank is able to meet its obligations in terms of funding if the volume of liquid assets is high enough to cater for the deposits and this can be signified by a ratio of more than one. Ratios lower than this value signal a bank's vulnerability to liquidity risk with respect to the withdrawal of deposits. Studies that used this ratio as a measure of bank performance have observed mixed findings. Shen et al. (2001) investigated the effect of liquidity risk on the performance of banks. The findings established that banks with higher fractions of liquid assets had lower net interest margins and thus profitability. However, Kosmidou et al. (2005) found that the ratio of liquid assets to total

deposits had a positive effect on the return on assets (ROA) but a negative effect on net interest margins.

In furtherance of gaining much and a better understanding of the subject matter, other studies also relied on the ratio of loans to total assets to assess the correlation between liquidity risk and bank performance. This liquidity ratio measures the proportion of total assets made up of net loans, thus a relative measure of illiquidity of a bank's total assets. This means that the higher this ratio, the less liquid the bank is and the higher the vulnerability to bank liquidity risk. Demirguc-Kunt and Huizinga (1999) in examining the impact of liquidity risk on bank performance used this ratio where it was established that there exists a negative relationship between liquidity risk and return on assets (ROA) but a positive relationship with net interest margins (NIM). However, Athanasoglou et al. (2006) made the conclusion that ratio had no effect on either return on assets (ROA) or return on equity (ROE).

The ratio of net loans to customer (deposits) and short term funding has also been used significantly as a measure of liquidity risk. Kosmidou (2008) indicated that the ratio of net loans to customer and short term funding is negatively related to return on assets (ROA). However, Naceur and Kandil (2009) established that the ratio of net loans to customer and short term funding was positively and significantly related to net interest margin (NIM) of domestic banks, indicating a negative relationship between net interest margins (NIM) and the level of liquid assets held by the bank. Nonetheless, they found out that bank's

liquidity risk does not have any significant effect on return on assets or return on equity.

Conceptual framework of liquidity risk, credit risk and bank performance

The conceptual framework presented in this study was constructed after a careful review of major theories relating liquidity risk, credit risk and bank performance as well as underlying concepts and prior empirical studies. The review revealed that the effects of liquidity risk and credit risk on bank performance are inconclusive; thus, present a technical difficulty in affirming the exact relationship. However, based on the theoretical review conducted in the study, the relationship as demonstrated in the conceptual framework was established.

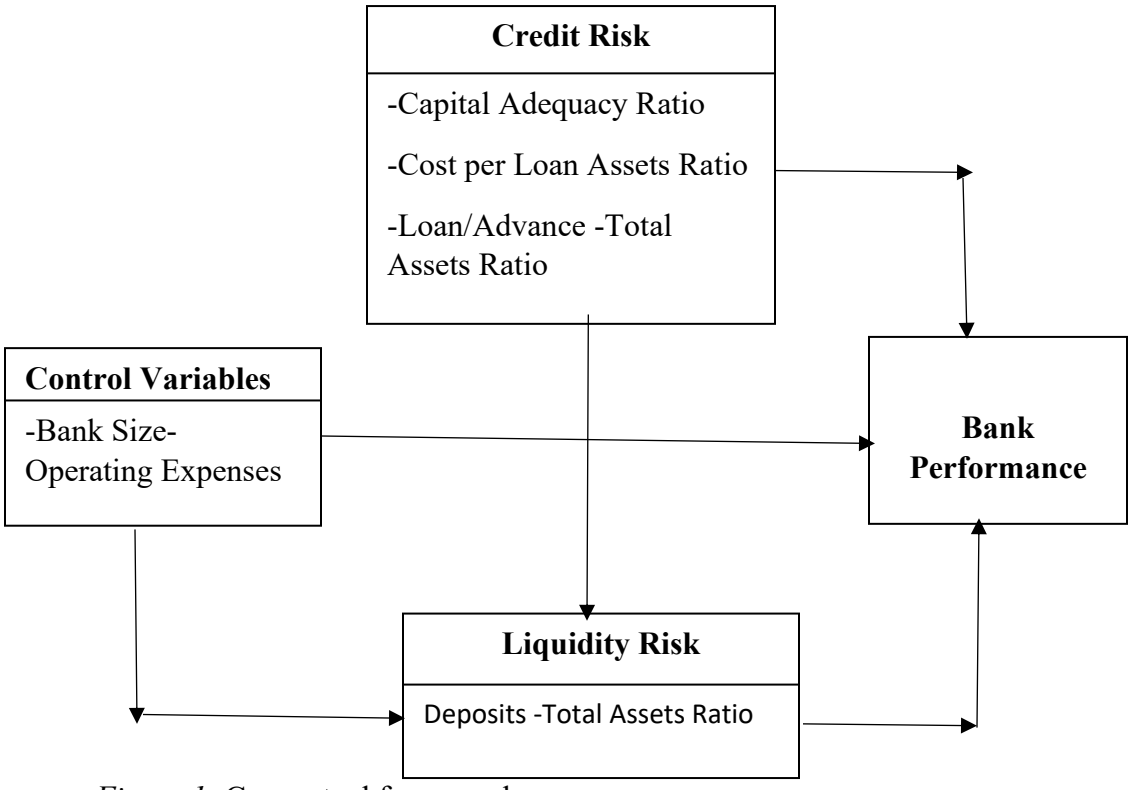

Figure 1: Conceptual framework
Source: Author's construct for the study, Kyei (2017)

The choice of the variables for this study is based on earlier studies done in and around the world. This is because in the Ghanaian context, the subject matter is yet to be fully explored. From the framework, liquidity risk, credit risk and bank performance are studied. All these variables can be studied within the framework of the financial distress theory and the shiftability theory of liquidity. The conceptual models were structured to reflect and assess the general impact of liquidity risk and credit risk on bank performance as well as the effect of credit risk on liquidity risk.

Summary and Conclusion

This chapter has reviewed literature on theoretical, empirical and conceptual issues relating to liquidity risk, credit risk and bank performance as adduced in prior studies. Important issues and lessons from the review informed the presentation of the conceptual framework in the study. The review is beneficial in the methodology, analyses, presentation of findings, discussions, conclusions and recommendations.

CHAPTER THREE

RESEARCH METHODS

Introduction

The chapter provides a critical perspective of the study setting, research approach and research design. It also examines the data collection method, data sources, models specification, data analyses procedure and measurement of variables. The chapter examined the quantitative research methodology chosen to achieve the research objectives. According to Pallant (2007), quantitative research helps in deepening the understanding of the work plan, enabling comparisons with other studies while enhancing possible replication of the study in future.

Study Setting

The study was conducted in Ghana with much focus on listed banks' performance. In the natural scheme of things, a lot of scholars have examined the determinants of banks and nonbanks financial institutions performance in Ghana. All these studies have contributed in diverse ways in improving the performance of these institutions in Ghana. However, listed banks operate largely in an environment of risk and under a more regulated environment. The study therefore sought to examine the effect of liquidity risk and credit risk on the performance of listed banks in Ghana. The focus of the study was therefore on listed banks in Ghana.

Research Approach

The use of a quantitative research approach was considered for the study owing to the kind of data sought and the kind of research objectives set out for the study. Creswell (1994) intimated that a quantitative research is a kind of research where the researcher seeks to explain a phenomenon numerically and mathematically. Leedy and Ormorod (2010) added that this approach is appropriate when the purpose of the study is to explain, confirm and validate, or to test theory.

A quantitative approach was deemed well suited for this study on liquidity risk, credit risk and bank performance given the need to explain causal relationships between risk variables and listed banks' performance in Ghana. A quantitative approach offers a number of useful benefits; these may include providing results that could be reduced to statistics, allowing for statistical comparison among entities and offering precision, definitiveness, and standardization (Sukamolson, 2005).

This study is mainly explanatory in nature owing to the objectives that are set to be achieved. According to Saunders, Lewis and Thornhill (2009), explanatory research focuses on "studies that establish causal relationships between variables", For instance, in analyzing the effect of risk variables on the performance of listed banks in Ghana.

Research Design

The study sought to examine the effect of liquidity risk and credit risk variables on the performance of list banks in Ghana. Thus, an explanatory

research design was best suited for the study. This design is used where there is the need to investigate the effect of one variable on another variable. Explanatory research design offers the following advantages, it may play a vital role in terms of identifying reasons behind a range of processes and assessing the impact of changes on existing norms and processes, it may aid in replication of the study if necessity arises and offer greater levels of internal validity due to systematic selection of variables. An explanatory research design was employed for this research in order to gain a thorough understanding of how credit risk and liquidity risk variables impact on performance of listed banks. This design has been used by Kumo (2015) to assess the effect of inflation targeting on the economy of South Africa.

Population of the Study

The population of a study looks at the group or collection of individuals or objects that are being studied under the study and from which the study wishes to draw conclusions. The present study considered listed banks in Ghana. The study however used 7 listed banks out of the total of 10 banks. The 7 banks were selected because of the availability of data in relation to these banks.

Sources of Data

The source of the data used in the study was the annual financial statements of listed banks. For the purpose of the study, the data was extracted from these annual financial statements and the various ratio calculated. These ratios are liquidity ratios and credit ratios serving as measures of liquidity risk and credit risk. The performance of listed banks was determined using ROA and ROE.

Data Collection Method

Data is very relevant in every study, according to Polit and Hungler (1999) data is the information obtained in the course of an investigation or a study. The study employed secondary annual data for the period 2011 to 2015. The data was obtained given considerations to its relevance to the objectives and hypotheses of the study. Data was collected from the financial statements of banks. The period for the study was selected due to availability of data in relation to the financial statements of listed banks. The exclusion of 2016 was because, at the time of the study, three listed banks have no much information with regard to their financial statements. These banks were therefore excluded from the study. The purpose of this study was to assess the effect of liquidity risk and credit risk on the performance of listed banks in Ghana.

Analytical Approach and Methods

This study employed purely quantitative analytical methods. After the data were collected, it was organized and analysed in an orderly manner for the purposes of analysis. For analysis, a statistical package called E-views was used. E-views supports a wide range of basic statistical analyses, encompassing everything from simple descriptive statistics to parametric and non-parametric hypothesis tests. The results were presented in tabular form. Basic descriptive statistics such as mean to show central tendency, maximum and minimum values to show the range as well as the standard deviation were computed over the entire data for the study.

Regarding the effect of liquidity risk and credit risk variables on the performance of listed banks in Ghana, a multiple regression was used for the analysis so as to ascertain the impact of these variables on listed banks' performance. According to Gujarati and Sangeettha (2007), if T, which is the number of time series data, is large and the number of cross-sectional units is smaller, the fixed effects model is more appropriate compared to the random effects approach and vice versa. Since our data are from 2011 to 2015 (5 years) and the number of banks under consideration is 7, this study adopts the fixed effect model. Also, Hausman Test was conducted to determine the best model for the estimation and the fixed effect model was deemed appropriate.

Model Specification

The model specification was done given credence to the research objectives as well as the variables considered in the study. The general specification of the model adopted for the study is presented below;

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \mu_{it} \quad \text{.........1}$$

Where;

Y_{it}= LR, ROA and ROE (Dependent variables)

X_{it} = Independent Variables

μ_{it}= Error term

$$Y_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 CLAR_{it} + \beta_3 LATDR_{it} + \beta_4 BS_{it} + \beta_5 OEXP_{it} + + \mu_{it} \quad \text{.........2}$$

Where;

Y_{it}= Liquidity Risk

CAR= Capital Adequacy Ratio

CLAR= Cost per Loan Assets Ratio

LATDR= Loans-Advance Total Deposits Ratio

BS = Bank Size (Total Assets)

OEXP= Operating Expenses

μ_{it} = Error term

$$Y_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 CLAR_{it} + \beta_4 LR_{it} + \beta_5 BS_{it} + \beta_6 OEXP_{it} + \mu_{it} \quad \ldots\ldots 3$$

Where;

Y_{it}= ROA and ROE

CAR= Capital Adequacy Ratio

CLAR= Cost per Loan Assets Ratio

LATDR= Loans-Advance Total Deposits Ratio

LR = Liquidity Risk

BS = Bank Size (Total Assets)

OEXP= Operating Expenses

μ_{it} = Error term, β0 = Value of intercept which is constant, β1, β2, β3, β4, β5, β6, = Proportionate change in dependent variable due to independent variables, i = 1 to 7 Banks, t = 2011-2015.

Measurement of Variables

Dependent variables

Guru *et al*., (1999), Murthy and Sree (2003) and Alexandru and Romanescu (2008) asserted that ratios instead of the real value of profits be used in measuring bank performane, this is because ratios are not influenced by variations in the general price level.

Return on asset (ROA)

Return on Assets (ROA) show how effectively a bank manages its assets to generate revenue (Davydenko, 2010). This is computed as the after tax profit of banks over total assets. Flamini et al., (2009) observed that the ROA may be biased due to off-balance-sheet activities, but believes such activities are negligible in Sub Sahara African banks.

Return on equity (ROE)

Return on Equity ratio reflects the effectiveness of a bank's management to transform shareholder's equity into profit (Samad, 1999; & Tarawneh, 2006). It is measured as net income over shareholder's equity.

Table 1: Dependent variables and their Measurement

Variable	Variable Name	Measurement
ROA	Return on Assets	Net Income/ Total Assets
ROE	Return on Equity	Net Income/ Shareholder's Equity

Justification for use of ROA and ROE as performance measures

Return on assets (ROA

Return on assets offers a different take on management's effectiveness and reveals how much profit a company earns for every dollar of its assets. Assets include things like cash in the bank, accounts receivable, property, equipment, inventory and furniture.

ROA is calculated as:

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

Return on equity (ROE)

In the spirit of organizational performance analysis, and of all the fundamental ratios that investors look at, one of the most important ones is return on equity. The ROE is a basic test of how effectively a company's management uses investors' money. It shows whether management is growing the company's value at an acceptable rate.

ROE is calculated as:

$$ROE = \frac{\text{Annual Net Income}}{\text{Average Shareholders' Equity}}$$

The big factor that separates ROE and ROA is financial leverage or debt. The balance sheet's fundamental equation shows how this is true: assets = liabilities + shareholders' equity. This equation tells us that if a company carries no debt, its shareholders' equity and its total assets will be the same. It follows then that their ROE and ROA would also be the same if not, they must be

analysed and considered differently. So, it is important to always look at the ROA as well as ROE. They are different, but together they provide a clear picture of management's effectiveness. If ROA is sound and debt levels are reasonable, a strong ROE is a solid signal that managers are doing a good job of generating returns from shareholders' investments. ROE is certainly a "hint" that management is giving shareholders more for their money. On the other hand, if ROA is low or the company is carrying a lot of debt, a high ROE can give investors a false impression about the company's fortunes. The two are therefore very critical in helping management and shareholders in performance evaluation and analysis and therefore should be considered separately.

Independent Variables

Table 2: Independent Variables and their Measurement

Variable	Variable Name	Measurement
CAR	Capital Adequacy Ratio	Shareholders' fund/Total Assets
CLAR	Cost per Loan Assets Ratio	Operating costs/Total loans and advances
LATDR	Loans-Advance Total Deposits Ratio	Loans and advances/Total deposits
LR	Liquidity Risk	Total deposits/Total assets

Correlation

Correlation is concerned with finding out whether there is an association between variables and if there is, determines its strength and direction. This study

used correlation coefficients obtained from the correlation matrix to determine if there exists correlation between bank risk variables and the performance of listed banks in Ghana.

Data Presentation

Oso and Onen (2009) intimated that tables and figures are useful in presenting findings; this is because they can summarize a lot of information in a small space while aiding understanding. This study used tables and figures for presentation of data and results.

Summary and Conclusion

This chapter considered the research methods that were adopted for the study. The chapter looked at the study setting, the research approach, the research design, sources of data and data collection methods. The analytical approach, definition and measurement of variables were equally considered in the chapter.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter provides a detailed discussion of the findings of the study in relation to the objectives and hypotheses espoused in chapter one. This is to facilitate valid conclusions and recommendations to be drawn in chapter five on the basis of the empirical studies, economic policy framework and theory. The chapter begins with a descriptive analysis of the variables considered in the study. This was done using descriptive statistics including mean, median, standard deviations, minimum and maximum observations. The chapter proceeds with a correlation analysis to establish the relationship between the independent variables and the dependent variables and also to know the level of correlation so as to avoid the problem of multicollinearity. The chapter closes with an analysis and discussion of the panel regression model formulated and ran to identify the effect of liquidity risk and credit risk variables on the performance of listed banks in Ghana. This is achieved by means of a random effect regression model analysis.

Descriptive analysis of variables

The study conducted a descriptive statistics analysis of the variables considered in the study. The descriptive statistics featured in the study include the mean, median, maximum value, minimum value and standard deviation. These statistics are illustrated extensively in Table 3. This was necessary to identify the basic features of the data and also to determine if there are major discrepancies

and variations among the variables. This will help in further evaluation and analysis of the data. From Table 3, it can be seen that all the variables have positive average values (mean).

Table 3: Descriptive summary of variables

Variables	ROA	ROE	CAR	CLAR	LATDR	LR	OEXP	BS
Mean	3.830	25.210	0.157	0.207	0.722	0.659	210m	2.3b
Median	4.266	28.694	0.151	0.157	0.702	0.696	170m	2.1b
Maximum	6.961	49.070	0.350	0.688	1.228	0.840	850m	6.5b
Minimum	-3.701	-23.724	0.069	0.064	0.231	0.461	11.7m	28m
Std. Dev.	2.315	16.410	0.046	0.131	0.257	0.096	200m	1.5b

Source: Author's computation, kyei (2017)

Descriptive Analysis of Dependent Variables

The mean ROA for the sampled banks for the period was 3.830 with a maximum of 6.961 and minimum of -3.701. This means that on the average listed banks have over the period obtained a return of about GHS 38.30 for every GHS 1,000 of investment in assets. The maximum ROA of 6.961 means that in the period under consideration, banks could manage a maximum return of GHS 69.6 for every GHS 1,000 of investment made in assets. Surprisingly, it could also be observed that a minimum return of -GHS37 was also made for every GHS 1,000 of investment in assets by some listed banks in the period under consideration. These observations are very worrisome, especially where the maximum and minimum returns (loss) recorded by banks are almost at par in absolute terms. The standard deviation of 2.315 indicated a relatively low distribution among the banks with regards to profitability (ROA).

Also, the mean ROE for the listed banks for the period under consideration was 25.210 with a maximum of 49.07 and minimum of -23.274. This means that on the average listed banks have over the period obtained a return of about GHS 252.1 for every GHS 1,000 of shareholders' equity investment made. The maximum ROE of 49.070 means that in the period under consideration, listed banks obtained a maximum return of GHS 490.7 for every GHS 1,000 of shareholders' equity investment made. However, it could also be seen that a minimum return of -GHS237.2 was also made for a GHS 1,000 of shareholders' equity investment made by some listed banks. These observations are very worrisome, especially where the negative minimum return is almost half the maximum positive ROE in absolute term. The standard deviation of 16.410 indicates a relatively disperse distribution among the listed banks with regard to profitability (ROE).

Descriptive Analysis of Independent and Control Variables

The independent variables considered in the study were bank risk factors whose behaviour to some extent may influence the performance of listed banks in economic theory and practice. These variables are capital adequacy ratio, cost per loan advance ratio, loan advance total assets ratio and liquidity ratio. From table 3; the average capital adequacy ratio for the period under consideration was around 0.16 this means that shareholders equity could on the average fund only 16% of listed banks total assets. This is a demonstration of the fact that much of banks assets are being financed by liabilities which is a sign of high risk. This is because, owners' equity will not be enough to absorb loans that have gone bad.

Surprisingly the maximum CAR was 0.350, this means that none of the listed banks could even finance half of their total assets from owner's equity. The situation for a fact reveals the low absorption of bad loans capacity by listed banks. A minimum CAR of 0.07 was recorded in the period under consideration. This is on a lower side and have the potential to gravely affect the performance of listed banks. A standard deviation of 0.046 means that variations in the CAR were not much over the period.

Also, cost per loan asset ratio had a mean of 0.207. This means that on the average, CLAR is about 21% of the loans granted. This for a fact is on a high side. A maximum value of 0.688 was recorded in relation to CLAR and a minimum value of 0.064. A standard deviation of 0.131 was also recorded for the period under consideration. The LATDR had a mean of 0.722 over the period under consideration. This means that on the average, loans advance form 72% of customers deposits. Thus of all the loans granted were made out of customers deposits. A maximum and minimum values of 1.227 and 0.231 respectively were also recorded as well as a standard deviation of 0.257. The liquidity risk of listed banks also recorded a mean of 0.659 and a maximum value of 0.840 and minimum value of 0.461 were also recorded. The size of the banks and the level of operating expenses were also considered. In the current study, the average of operating expenses was GHS $210m$ in the period under consideration. A maximum value of GHS $850m$ and a minimum of GHS 11.7m were also recorded. A standard deviation of GHS $200m$ portrays a wide variation in operating expenses of the banks under consideration. This could be as a result of

the differences in banks size. The sizes of the banks were determined through their total assets. The average size of the banks under consideration was GHS2.3b. A maximum size of GHS 6.5b and minimum size of GHS 280m were also recorded.

Correlation Analysis

Before conducting the regression analysis pursuant to specific objectives one, two and three, there was the need to ascertain the correlations between the dependent variables (ROA and ROE) and the independent variables. Correlation analysis is used as a preliminary test to measure the relationship between the variables and the strength of their association (Pallant, 2007). Correlation among variables could be carried out using two main tests, namely: parametric and non-parametric tests. Suwaidan (1997) indicated that the question as to whether to use parametric or non-parametric tests is a potential dilemma in statistical analysis. The major decision regarding the use of parametric or non-parametric tests is dependent on the assumption of normal distribution. The current study employed the Pearson product-moment correlation analysis. This is because from the skewness values observed, the variables were relatively normally distributed. Table 4 presents the Pearson product-moment correlation matrix testing the association between the variables.

Table 4: Pearson product-moment correlation matrix

Variables	ROA	ROE	CAR	CLAR	LATDR	LR	OEXP	BS
ROA	1.000							

ROE	0.937	1.000						
	0.000	-----						
CAR	0.075	-0.190	1.000					

	0.668	0.250-						
CLAR	0.102	0.137	-0.204	1.000				

	0.559	0.432	0.241	-				
		-		-				
LATDR	-0.118	0.245	0.174	0.521	1.000			
	0.498	0.156	0.319	0.001	-----			
	-		-		-			
LR	0.077	0.105	0.399	0.371	0.807	1.000		
	0.662	0.550	0.018	0.028	0.000	-----		
			-		-			
OEXP	0.262	0.320	0.249	0.721	0.317	0.308	1.000	
	0.128	0.061	0.149	0.000	0.063	0.072	-----	
			-					
BS	0.324	0.452	0.405	0.302	-0.306	0.351	0.770	1.000
	0.058	0.006	0.016	0.078	0.073	0.039	0.000	-----

Source: Author's computation, Kyei (2017)

Based on Table 4, it is observed that CAR, CLAR, OEXP and BS correlate positively with return on assets (ROA) with the exception of LR and LATAR which had a negative correlation. It was also observed further that these

correlations were weak in form with a maximum of 0.32 and a minimum of 0.075. Also, in relation to the return on equity (ROE), CLAR, LR, OEXP and BS were equally observed to have a positive and weak relationship and CAR, LATAR had a negative weak relationship. These weak relationships observed between each dependent variable and the independent variables is an indication that they can all be featured in the same model.

Also, from Table 4, there was the need to examine the correlation between the independent variables, this was necessary in order to avoid the issue of multicollinearity. Addressing the issue of multicollinearity, Bryman and Cramer (2001) viewed that multicollinearity is when correlation exceeds 0.80. Whereas Anderson, Sweeney and Williams (1990) used 0.70 and Kennedy (2008), stated that correlation is high when its value is above 0.90. In the event that there is the problem of multicollinearity, it is not advisable to include variables that are highly correlated in the same model. From Table 4, it can be seen that the correlation between the independent variables does not violate most of the standards set by Bryman and Cramer (2001), Anderson, et al (1990) and Kennedy (2008). The study therefore mindful of that included all variables in same model during the estimation process.

Estimation of Results

In the estimation of the results, the study employed the fixed effect model. This was deemed appropriate after conducting the Hausman Test where the p-values of the test results for all the models were significant which is an indicative of the fact that the fixed effect model is the best.

The effect of credit risk on liquidity risk

In the analysis of the relationship between liquidity risk and credit risk, several studies have tried to examine the issues in perspective. However, in the listed banks in Ghana, relationship is yet to be fully explored. Also, not much has be done with regard to the effect of credit risk and liquidity risk on the performance of listed banks in Ghana. These and other reasons formed the basis for the study and the results presented in Tables 5, 6 and 7. Table 5 presents the results on the relationship between liquidity risk and credit risks.

Table 5: The effect of credit risks on liquidity risk

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR	-0.923	0.218	-4.24	0.0003
CLAR	-0.412	0.167	-2.48	0.0212
LATDR	-0.136	0.074	-1.84	0.0782
OEXP	2.91E-10	1.29E-10	2.26	0.0336
BS	-3.77E-11	1.56E-11	-2.42	0.0238
C	1.014	0.075	13.57	0.0000
R-squared	0.869008	Mean dependent var		0.659372
Adjusted R-squared	0.806360	S.D. dependent var		0.095789
S.E. of regression	0.042151	Akaike info criterion		-3.229233
Sum squared resid	0.040865	Schwarz criterion		-2.695971
Log likelihood	68.51158	Hannan-Quinn criter.		-3.045151
F-statistic	13.87120	Durbin-Watson stat		1.786374
Prob(F-statistic)	0.000000			

Source: Author's computation, Kyei (2017)

From Table 5 are the results of a model estimated to examine the effect of credit risk on liquidity risk of listed banks in Ghana. The R-square of the model showed the percentage of variations in the dependent variable that are being explained by the independent variables. An R-square of 0.87 as shown in Table 5 is an indication that about 87% of variations in Liquidity risk are being explained by the independent variables. This shows a significant explanatory power. This was confirmed by the F-statistics of 0.000. The F-statistic value explains the joint significance of the independent variables in explaining variations in the dependent variable and the results as portrayed in table 5 suggested that the overall strength of the models is good. The Durbin Watson test statistic was also within the acceptable range (1.5 – 2.5) for the model. This as seen in Table 5 was 1.79. This indicated the absence of serial or autocorrelation in the error terms. The model therefore can be considered reliable.

From Table 5 and as presented in model, it can be seen that capital adequacy ratio had a significant negative effect on liquidity risk (Total deposits/total assets) at 1% level of significance. Thus, a unit increase in the capital adequacy ratio will lead to liquidity risk falling by a 0.923. In a similar vein, the cost per loan assets ratio was also observed to have a significant negative effect on the liquidity of listed banks in Ghana at 5% level of significance. This means that a unit increase in the cost per loan assets ratio will lead to a reduction in liquidity risk by 0.412. Loans-Advance Total Deposits Ratio as a measure of credit risk was also seen to have a significant negative effect on liquidity risk of listed banks at 10% level of significance. This means that a unit increase in the

Loans-Advance Total Deposits Ratio will lead to a fall in the liquidity risk of listed banks by 0.136. Bank operating expenses were also seen to have a significant positive effect on the liquidity risk of listed banks in Ghana at 5% level of significance. However, Bank size had a significant negative effect on liquidity risk at 5% level of significance. A detailed discussion of the results is presented under the discussions section of this chapter in pursuant to objective one of the study.

The effect of liquidity risk and credit risks on listed banks performance (ROA)

In the business of investment, investors are much interested in knowing the extent to which the investment made yield returns and that anything that has the tendency to affect the returns on investment is of much interest to them. The studying in full knowledge of this, sought to examine the effect of liquidity risk and credit risk on the return on assets of listed banks in Ghana. Table 6 presents the results of the effect liquidity risk and credit risk variables on the return on Assets of listed banks.

Table 6: The effect of liquidity risk and credit risks on listed banks performance (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR	-11.313	13.777	-0.82	0.4200
CLAR	-8.936	8.342	-1.07	0.2952
LR	-24.845	9.338	-2.66	0.0140
BS	-1.00E-09	8.37E-10	-1.19	0.2435
OEXP	8.92E-09	6.62E-09	1.34	0.1909
C	24.279	9.136	2.65	0.0141
R-squared	0.483667	Mean dependent var		3.830394
Adjusted R-squared	0.236725	S.D. dependent var		2.314886

Table 6 continued

S.E. of regression	2.022414	Akaike info criterion	4.512322
Sum squared resid	94.07368	Schwarz criterion	5.045584
Log likelihood	-66.96563	Hannan-Quinn criter.	4.696404
F-statistic	1.958625	Durbin-Watson stat	2.074642
Prob(F-statistic)	0.084012		

Source: Author's computation, kyei (2017)

From Table 6 are the results of a model estimated to examine the effect of liquidity risk and credit risk on the return on assets of listed banks in Ghana. The R-square of the model showed the percentage of variations in the dependent variable that are being explained by the independent variables. An R-square of 0.48 as shown in table 6 is an indication that about 48% of variations in return on assets are being explained by the independent variables. This shows a significant explanatory power. This was confirmed by the F-statistic p-value of 0.08. The F-statistic value explains the joint significance of the independent variables in explaining variations in the dependent variable and the results as portrayed in table 6 suggested that the overall strength of the models is good. The Durbin Watson test statistic was also within the acceptable range (1.5 – 2.5) for the model. This as seen in Table 6 was 2.07. This indicated the absence of serial or autocorrelation in the error terms. The model therefore can be considered reliable.

From Table 6 and as presented in the model, it can be seen that capital adequacy ratio had an insignificant negative effect on the performance (ROA) of listed banks in Ghana at all levels of significance. Thus, a unit increase in the capital adequacy ratio will not have any impact on the performance of listed banks in Ghana, meaning the level of a bank's capital has no impact on performance. In a similar vein, the cost per loan assets ratio was also observed to have an insignificant negative effect on the return on assets of listed banks in

Ghana at all levels of significance. This means that a unit increase in the cost per loan assets ratio will not have any effect on the performance of listed banks in Ghana. However, bank liquidity risk had a significant negative effect on the return on assets of listed banks in Ghana. This was observed at 5% level of significance. This means that a unit increase in the liquidity risk of listed banks will lead to a fall in the return on assets of listed banks by 24.84%. Bank operating expenses were also seen to have an insignificant positive effect on the return on assets of listed banks while Bank size had an insignificant negative effect on the return on assets of listed banks in Ghana. A detailed discussion of the results is presented under the discussions section of this chapter.

The effect of liquidity risk and credit risks on listed banks performance (ROE)

The return on equity measures how well management used the owners' equity in generating returns. The study sought to examine the effect of liquidity risk and credit risk on the return on assets of listed banks in Ghana. Table 7 presents the result of the effect of liquidity risk and credit risk on the return on assets of listed banks in Ghana.

Table 7: The effect of liquidity risk and credit risks on listed banks performance (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAR	-162.495	92.588	-1.76	0.0926
CLAR	-77.600	56.061	-1.38	0.1796
LR	-170.974	62.758	-2.72	0.0121
BS	-8.30E-09	5.63E-09	-1.48	0.1537
OEXP	6.75E-08	4.45E-08	1.52	0.1429
C	184.604	61.400	3.01	0.0063

Table 7 continued

R-squared	0.535969	Mean dependent var	25.21032
Adjusted R-squared	0.314042	S.D. dependent var	16.41045
S.E. of regression	13.59156	Akaike info criterion	8.322636
Sum squared resid	4248.802	Schwarz criterion	8.855898
Log likelihood	-133.6461	Hannan-Quinn criter.	8.506718
F-statistic	2.415064	Durbin-Watson stat	2.125313
Prob(F-statistic)	0.035967		

Source: Author's computation, kyei (2017)

From Table 7 are the results of a model estimated to examine the effect of liquidity risk and credit risk on the return on equity of listed banks in Ghana. The R-square of the model showed the percentage of variations in the dependent variable that are being explained by the independent variables. An R-square of 0.54 as shown in table 7 is an indication that about 54% of variations in return on equity are being explained by the independent variables. This shows a significant explanatory power. This was confirmed by the F-statistic p-value of 0.04. The F-statistic value explains the joint significance of the independent variables in explaining variations in the dependent variable and the results as portrayed in table 7 suggested that the overall strength of the models is good. The Durbin Watson test statistic was also within the acceptable range (1.5 – 2.5) for the model. This as seen in table 7 was 2.13. This indicated the absence of serial or autocorrelation in the error terms. The model therefore can be considered reliable.

From table 7 and as presented in the model, it can be seen that capital adequacy ratio had a significant negative effect on the performance (ROE) of listed banks in Ghana at 10% level of significance. Thus, a unit increase in the capital adequacy ratio will reduce the average performance of listed banks in Ghana by 162.50%. The cost per loan assets ratio was also observed to have an

insignificant negative effect on the return on equity of listed banks in Ghana at all levels of significance. This means that a unit increase in the cost per loan assets ratio will not have any effect on the performance (ROE) of listed banks in Ghana. However, bank liquidity risk had a significant negative effect on the return on equity of listed banks in Ghana. This was observed at 5% level of significance. This means that a unit increase in the liquidity risk of listed banks will lead to a fall in the return on equity of listed banks by 171%. Bank operating expenses were also seen to have an insignificant positive effect on the return on equity of listed banks while Bank size had an insignificant negative effect on the return on equity of listed banks in Ghana. A detailed discussion of the results is presented under the discussions section of this chapter.

Discussions

This section gives a detailed discussion on the results of the study. It tries to relate the findings of the study to previous works as provided in the literature and theory in order to justify the different results of the different models and provide interpretation and justification of the results for policy formulation and implementation.

The effect of credit risk on liquidity risk of listed banks in Ghana

From Table 5 and as presented in the model, it can be seen that capital adequacy ratio had a significant negative impact on the liquidity risk of the banks. The results, therefore suggest that capital adequacy ratio and liquidity risk move in opposite directions. That is to say that, as capital adequacy ratio increases, there is a decrease in the liquidity risk of listed banks in Ghana. The findings are so

because, an increase in the capital adequacy ratio of listed banks has the tendency to increase the absorption capacity for bad loans and thus increase banks liquidity which invariably decreases their liquidity risk. The findings of the study are consistent with Louayti et al. (2015), where in studying the relationship between credit risk and liquidity risk, a significant negative relationship between liquidity risk ratio and credit risk was observed. The extent of this consistency in findings could be as a result of the measurement of the variables. In Louayti et al. (2015), credit risk was measured using the capital adequacy ratio, which was the same measurement adopted by the current study. The findings of the study are however contrary with the findings of Samartin (2003), where credit risk was observed to have a significant positive effect on the liquidity risk of banks. The extent of the contrary results in findings could be as a result of the differences in the measurement of the variables. The findings of the current study are also inconsistent with the findings of Iyer and Puri (2012), where an indication of a positive relationship between liquidity risk and credit risk was established. Also, the cost per loan assets ratio and the Loans-Advance Total Deposits Ratio which are measures of credit risk of listed banks were found in the current study to have a significant negative effect on the liquidity risk of listed banks in Ghana. These findings of the current study are however inconsistent with the findings of Nikomara, Taghavi, and Diman (2013) and Nikomara et al. (2013) where a significant positive relationship was found between credit risk and liquidity risks for banks. The findings of the current study in relation to the relationship between

credit risk and liquidity risk are inconsistent the finance distress theory and the shiftability theory of liquidity.

The effect of liquidity risk and credit risk on the performance of listed banks in Ghana (ROA & ROE)

From Table 6 and 7 are the results of the effect of liquidity risk and credit risk on the performance (ROA & ROE) of listed banks in Ghana. As presented in both models under each table, it can be seen that liquidity risk has significant negative effect on the performance (ROA & ROE) of listed banks in Ghana. The results therefore are an indication that liquidity risk and performance of listed banks in Ghana move in opposite direction. That is to say increases in liquidity risk will reduce the performance of listed bank in Ghana. The findings are as a result of the fact that a bank that is bedeviled with much liquidity risk is most likely to have liquidity challenges which can affect its performance as portrayed by the results in table 6 and 7. The findings of the study are consistent with the findings of Molyneux and Thornton (1992) and Barth et al. (2003), where a significant negative relationship was established between liquidity risk and bank performance. The findings of the current study are however contrary with the findings of Bourke (1989) where it was established that banks liquidity risk has a significant positive relationship with bank performance. Shen et al. (2001) also found that banks with higher fractions of liquid assets had lower net interest margins and thus profitability, establishing a positive relationship between liquidity and performance. The findings also indicated that capital adequacy ratio and cost per loan assets ratio which are measures of banks credit risk have

insignificant negative effect on the performance (ROA) of listed banks in Ghana. These findings indicate that credit risks do not directly impact on the performance of listed banks in Ghana, but show an indirect effect on performance through their impact on liquidity risk which in turn has a significant negative effect on banks performance. The findings of the study are consistent with the findings of Kithinji (2010), where credit, credit risk and non-performing loans were observed not have any influence on the performance of banks in Kenya.The findings of the study are however inconsistent with the findings of Djan et al, (2015) where credit risk measure were seen to have significant adverse effect on performance of listed banks in Ghana. The findings however, in relation to ROE as a measure of performance, capital adequacy ratio was seen to have a significant negative effect on the performance of listed banks in Ghana, these findings are consistent with Djan et al, (2015) where credit risk had a significant adverse effect on the performance of listed banks in Ghana. These findings generally are inconsistent with theory where credit risk is being thought to have an adverse effect on the performance of banks.

Summary and Conclusion

This chapter has examined the analysis and discussion of the results. The chapter linked the findings of the study to empirical literature and tried to provide justification for the results. The following are the key findings of the study. Capital adequacy ratio, cost per loan assets ratio and Loans-Advance Total Deposits Ratio had a significant negative effect on the liquidity risk of listed banks in Ghana. However, with regard to the performance of listed banks, Capital

adequacy ratio and cost per loan assets ratio had an insignificant negative effect on ROA but Capital adequacy ratio was significant on ROE of listed banks in Ghana. Liquidity risk demonstrated a significant negative effect on performance of listed banks in Ghana. These findings will help in coming out with valid conclusions and recommendations in chapter five.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter provides a summary, conclusion and policy recommendations emanating from the results of the study for policymakers and analysts as well as management of the banks. The purpose of the chapter is to bring out the major findings of the study and thereafter suggest policy recommendations that are to be considered. The chapter first provides a brief summary of the overview of the research problem, objectives, research methods and findings whereas the conclusion encapsulates the overall outcomes regarding the study in the light of the hypotheses advanced in chapter one. The chapter then concludes on the major findings of the study before advancing policy recommendations. Directions for future studies are equally featured in the study. The target of the research was to investigate empirically the effect of credit risk on liquidity risk as well as the effect of credit risk and liquidity risk on the performance of listed banks in Ghana. The empirical results showed that the objectives of the research were met within the period.

Summary

The existence of a well-developed and efficient financial system is very critical to the growth and development of economies all over the world, with Ghana not an exception. The backing sector is a major component of the Ghanaian financial system; playing an important role of ensuring that funds are mobilized and diverted from surplus spending agents to deficit spending agents

and the real sectors of the economy. In the light of the critical roles play by the banking sectors, the operations and performance of banks are a source of concern to government and economic agents in every country. In recent years however, the performance of banks in the baking sectors has not been encouraging (financial statements). This performance and the attributing factors as espoused by the market power theory and the efficiency structure theory could be as a result of external and internal factors. However, the finance distress theory and shiftability theory of liquidity are of the view that liquidity risk and credit risk can impact on the performance of banks. This notwithstanding, in the Ghanaian context, not much studies have been conducted to know the effect of credit risk and liquidity risk on the performance of banks especially listed banks as well as the relationship between credit risk and liquidity risk. Also, the recent acquisition of capital and UT banks by GCB bank calls for a proper dissection in to the factors affecting the performance of banks in Ghana, the Bank of Ghana in a statement issued regarding the causes of the acquisition, cited liquidity problems as the major cause for the acquisition. The study therefore was set out to investigate the relationship between credit risk and liquidity risk as well as their impact on the performance of listed banks in Ghana.

The main objective of this study was to examine the effect of credit risk and liquidity risk on the performance of listed banks in Ghana using annual data for the period 2011 to 2015. The study specifically investigated the effect of credit risk on liquidity risk as well as the effect of credit risk and liquidity risk on the performance of listed banks. Fixed regression models were estimated in a quest

to achieve the objectives set out in the study. A brief discussion on the descriptive statistics as well as the correlation matrix was also advanced.

The empirical models were specified based on an extensive review of the literature on the impact credit risk and liquidity risk on the performance of banks. The variables included in the models are, return on assets, return on equity, liquidity risk, capital adequacy ratio, cost per loan assets ratio, Loans-Advance Total Deposits Ratio, bank operating expenses and bank size.

The first objective was to assess the effect of credit risk on liquidity risk of listed banks in Ghana. Firstly, it was found that capital adequacy ratio had a significant negative effect on the liquidity risk of listed banks in Ghana. This is because, an increase in the capital adequacy ratio will increase the absorption capacity of banks for bad loans and reduce liquidity problems. Secondly, cost per loan assets ratio was seen to have a significant negative effect on the liquidity risk of listed banks in Ghana. This is because; the high cost per loan assets ratio may trigger higher interest charge by banks, which may generate more funds for the banks and thus liquidity. Finally, Loans-Advance Total Deposits Ratio was seen to also have a significant negative effect on the liquidity risk of listed banks in Ghana.

The second and third objectives were to assess the effect of credit risk and liquidity risk on the performance of listed banks respectively. The findings of the study with regard to the effect of credit risk on the performance of banks generally were that, credit risks do not directly affect the performance of listed banks in Ghana. However, capital adequacy ratio was seen to have a significant negative effect on the return on equity of listed banks in Ghana. The third

objective of the study indicated that liquidity risk had a significant negative effect on the performance of listed banks in Ghana.

Conclusion

Empirically, the study examined the effects of credit risk on liquidity risk as well as the effect of credit risk and liquidity risk on the performance of listed banks in Ghana. In empirical literature, it has been proven that credit risk affects liquidity risk of banks and that the two together affect financial performance of banks. However, what is current in contention is the direction of influence and the magnitude of such influence, as well as the insufficient exploration of the subject matter in Ghana especially with regard to listed banks. While per the empirical literature, some studies argue credit risk and liquidity risk have negative effect on financial performance of banks, other studies argued otherwise. This study therefore tested the hypotheses that credit risk and liquidity risk have significant effect on the performance of listed banks in Ghana. The conclusions of this study validates the findings of other studies as far as banking sector development is concerned in Ghana.

The study considered some credit risk and liquidity risk proxies and some performance measures of banks. The study revealed that capital adequacy ratio, cost per loan assets ratio and loan-advance total deposit ratio had negative and statistically significant effect the liquidity risk of listed banks in Ghana.

Furthermore, the study found that capital adequacy ratio and cost per loan assets ratio had no statistically significant effect on banks' performance (Return on Assets-ROA) however, capital adequacy ratio was seen to have a significant

effect on the return on equity of listed banks in Ghana. Finally, the study observed that liquidity risk had a significant negative effect on the performance of listed banks in Ghana.

Recommendations

The study investigated the impact of credit risk on liquidity risk as well as the impact of credit risk and liquidity risk on the performance of listed banks in Ghana. From the findings it is concluded that banks liquidity risk is inversely influenced by the levels of capital adequacy ratio, cost per loan assets ratio and loan advance total deposit ratio, which means that inappropriate management of these ratios could expose listed banks to great risk of illiquidity and distress. Therefore, management need to be cautious in setting up a credit policy that will not negatively affects liquidity risk and liquidity of banks and also they need to know how credit policy affects the operation of their banks to ensure judicious utilization of deposits and maximization of profit. Improper credit risk management will increase liquidity risk and consequently bank performance (profitability), which affects the quality of its assets and increase loan losses and non-performing loan which may eventually lead to financial distress. BoG for policy purposes should regularly assess the lending attitudes of listed banks. One direct way is to assess the degree of credit crunch by isolating the impact of supply side of loan from the demand side taking into account the opinion of the firms about listed banks' lending attitude. Finally, strengthening the securities market will have a positive impact on the overall development of the banking sector by increasing competitiveness in the financial sector.

Direction for Future Research

This study is based on data for 5 years, so data from this and other published sources may be insufficient to make a solid conclusion. Hence, further studies should be undertaken to expand the period, unbalanced panel data can also be used to incorporate the banks which are recently listed, and thus these will help make solid the conclusions arrived at in this study and also increase the reliability of the conclusions made.

The study focused only on listed banking institutions. The examination of only the listed banking institutions provides a conclusion that may not be the same with the rest of the non-listed banking institutions, hence this provides new areas for further research where the non-listed banks can be looked at and also a combination of the two. Lastly, other econometric techniques can be applied to verify the relationship.

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