UNIVERSITY OF CAPE COAST

LIQUIDITY AND BANK PROFITABILITY IN GHANA

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LIQUIDITY AND BANK PROFITABILITY IN GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

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

Name …………………………………………………………………………..

Supervisor's Declaration

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

Supervisor's Signature………………………… Date: …………………….

Name …………………………………………………………………………..

ABSTRACT

Bank liquidity and profitability are of very great concern to stakeholders – regulators/supervisors, the public, depositors, borrowers, debt holders and shareholders. In performing their financial intermediation role, banks' must have an optimal trade-off between the profitability and firm value maximization objective of shareholders and liquidity objective of depositors. A critical understanding of the relationship between liquidity and profitability in banks is useful in determining the optimal trade-off. The study sought to establish the relationship between the liquidity and bank profitability of 23 licensed Ghanaian banks over the ten-year period 2009-2018. The study employed correlation and regression analysis to study the relationship between profitability (ROA and ROE) and liquidity measures (loans-to-deposit ratio (LDR) and cash-to-deposit ratio (CDR). A pairwise correlation presents a negative relationship between profitability and liquidity. The regression analysis shows that the profitability ratios - ROA and ROE have a strong significantly negative and positive relationship with cash-to-deposit ratio (CDR) liquidity measure respectively. Further research is recommended on how to achieve the optimal liquidity level in banks. The result will help to solve the problem of excess liquidity and its reducing effects on profits, and arbitrary high profitability with its consequent reduction of liquidity position. I suggest that interested researchers should dwell on the same area of this research extensively using a wider data and area of coverage.

KEY WORDS

Liquidity

Profitability

Return on Equity (RoE)

Return on Assets (RoA)

ACKNOWLEDGEMENTS

DEDICATION

To my wife Samilia Enyamah Mintah

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LIST OF ACRONYMS

BoG	Bank of Ghana
CDR	Cash to Deposit Ratio
LDR	Loan to Deposit Ratio
ROA	Return on Assets
ROE	Return on Equity

INTRODUCTION

This introductory section gives the foundation of the study, expresses the issue spurring the research and presents the reason, objectives and questions the researcher looks to address. Additionally, the significance, limitations and the organization of the study are also discussed.

Background to the Study

Liquidity and profitability are significant ideas in banking. Liquidity alludes to the administration and management of current assets and current liabilities of an organization to successfully deal with its short-term commitments. In this manner, firms are relied upon to keep up an extent of its benefits in real money, money counterparts and additionally protections that can without much of a stretch be changed over into money to meet their short-term commitments. In any case, there is opportunity cost of keeping assets in cash and cash equivalent, denying the firm of better yield on speculations and investment. Along these lines, firms must keep up an ideal liquidity required for firm efficiency, effectiveness and profitability.

The ongoing financial crisis that has tormented the Ghanaian financial service sector is a proof of the significance of liquidity and profitability in banking. Liquidity and profitability are successful pointers of strength and execution of business banking. Along these lines, liquidity and profitability are of exceptionally incredible worry to partners. Bank liquidity management and profitability has gotten significant consideration by supervisory and regulatory standards.

Banks play a very important financial intermediation role in economies. As indicated by Schumpter (1911), financial intermediation is basic for mobilizing savings, assessing ventures, overseeing hazard, observing directors, and facilitating transactions as referred to in Zumanu (2016). Sound, feasible and skillful financial institutions assume a fundamental job in financial development and advancement (Schumpter, 1911; King and Levine, 1993; Zumanu, 2016). Banks just as other corporate bodies face three key corporate financial management decisions – financing (capital structure), investing (capital budgeting) and operating (liquidity management). Capital structure and capital budgeting are long haul while liquidity management is short term in nature.

Basically, shareholders and debt holders invest equity capital and long-term debt respectively to finance banks to financially intermediate between surplus economic agents who supply funds through savings and time deposits and deficit economic agents who demand bank loans by borrowing to fund risky projects. Banks diversify their risk by lending to a large number of borrowers and the comparative advantage of monitoring borrowers. Banks therefore play the role of ensuring a balance between excess liquidity and profitability, taking into consideration the returns to Shareholders whilst being circumspect with the associated risk in managing this relationship. (OpenStax Economics, Principles of Economics, OpenStax CNX. May18, 2016)

Banks seek to maximize profits by choosing how much capital and deposits to accept, how much to lend, who to lend to and how to monitor their borrowers in order to satisfy all stakeholders. The key stakeholders of banks include the public, depositors, borrowers, debt holders and shareholders

(Coopers, 2018). Therefore, a bank's key operating objective is to find the optimal trade-off between the profitability and firm value maximization objective of shareholders and liquidity objective of depositors. Although, maximizing firm value is a long-term objective, it is highly dependent on the short-term liquidity objective of depositors.

Van-Horne and Wachowicz (2004) highlights the negative relationship between liquidity and profitability and the positive relationship between profitability and risk. Thus, increased liquidity reduces the risk of firms. Bank liquidity and profitability are inversely related such that in the bid to increase profit, banks invest depositor funds in risky and long-term lending portfolios thus reducing the liquidity profile of its assets. Alternatively, banks invest in low earning, safe and liquid assets in the bid to manage liquidity and thus reduce risk and profitability.

The assets of banks consist of cash, cash equivalents, investments in government securities, deposits with central bank and other banks, loans and advances; with loans and advances as the major component. In managing liquidity to meet obligations to depositors by investing in liquid assets, banks face the opportunity cost of exposing depositor funds to higher earning but risky lending with higher potential profits. However, optimal liquidity is a good basis for continued profit generation through the stability of depositor funds arising from increased deposits and the absence of unwarranted withdrawals, associated with lack of public confidence and trust arising from poor liquidity management. Banks rely on public confidence to effectively and efficiently perform their intermediation role. To sustain public confidence and trust, banks must be liquid to meet their short-term financial obligation (Coopers, 2018).

The effective management of liquidity affects the profitability, solvency, survival of banks (Shin & Soenen, 1998). Corporate financial managers of banks seek efficient and effective liquidity management to maximize profitability, and value of banks. Liquidity management and credit management have impacts on the monetary policy of the economy (Rehman, Khan, & Khokhar; 2015). The consequence of poor management of liquidity leads to bank runs, failures and taxpayer bail outs. Sound liquidity management and profitability are indispensable to banks, the public and the economy as a whole.

Financial intermediation of banks is very critical for economic development and growth. Banks can efficiently and effectively intermediate between surplus economic and deficit economic agents if the objectives of all stakeholders are met optimally. Banks must have an optimal trade-off between the liquidity and profitability objectives of depositors and shareholders respectively. This research seeks to study how liquidity and profitability are interrelated in the banking industry.

Statement of the Problem

With respect to liquidity and bank profitability, liquidity is a major determinant of bank profitability (Bourke, 1989; Bashir, 2000; Karasulu 2001; Guru, Staunton and Balashanmugam, 2002; Staikouras & Wood, 2003). Other studies have focused on relationship between liquidity and profitability in banking. Tran et al. (2016), found that the highly liquid banks which exhibited high illiquid risk tend to have lower profitability in the study of the relationship between liquidity and bank profitability in the US.

Bank liquidity and profitability relationships have been studied in the Ghanaian context. Lartey, Antwi, and Boadi (2013) studied the relationship

between the liquidity and the profitability of banks listed on the Ghana Stock Exchange for the period 2005-2010 and found a very weak positive relationship.

The study differs from prior studies in the following ways. Firstly, most researchers limit the bank liquidity –profitability relationship within the context of financial crisis whilst this study analyses bank liquidity on profitability relationship within a broader context which goes beyond financial crisis. Secondly, previous studies in Ghana are limited to listed banks. However, this study focuses on wider scope of banks in Ghana. Thirdly, this study uses a longer time frame to capture both the short and long-term liquidity effects on profitability. Thus, sample size is much higher.

Therefore, the study addresses research gaps in the literature relating to the analysis of the relationship between liquidity and profitability.

Purpose of the Study

The purpose of this research is to understand the relationship between liquidity and bank profitability in Ghana. This study aims to explore and examine the effect of liquidity on profitability - Return on Equity (RoE) and Return on Assets (RoA) of banks in Ghana as well as the factors that influence their relationships.

Research Objectives

Research Hypotheses

The key objective of this study is to identify the relationship between profitability and liquidity of banks in Ghana.

The research seeks to accomplish the following. objectives:

1. Effect of LDR on ROE

2. Effect of LDR on ROA

3. Effect of CDR on ROE

4. Effect of CDR on ROA

5. Effect of Liquidity on ROE

6. Effect of Liquidity on ROA

Significance of the Research

There are potential benefits or implications of this study on practice, policy and future research. The significance of this research is to contribute to the literature on the effects of liquidity on bank profitability and inform practitioners and policymakers about the importance of effective and efficient management of liquidity.

Delimitations

The scope of the study covers relationship between liquidity and profitability using expected signs, descriptive statistics, correlation and regression analysis of variables in the estimations. The study geographically covers Ghana.

Limitations

The study is limited in terms of the data size used. The researcher in the presence of time constraints asserts that the depth of work of this study was limited. Thus the conclusion will not be a generalization across time. Time limited the number of liquidity and profitability measures used in the study.

A longer time frame will allow room to explore other dimensions of the study. Thus, further research may delve into these dimensions.

Organisation of the Study

The dissertation is organised and structured into five main chapters. The first chapter gives an introduction and overview of the study, consisting of the

background, discussion and makes recommendations for policy, practice, and research. The next chapter provides a theoretical review on the concepts of bank liquidity and profitability and their relationship. The second section of the literature review also provides an overview of empirical literature on the subject matter.

The third chapter describes research methodology: the data, model and methods employed. Furthermore, the penultimate section discusses the results of the analysis. Finally, the concluding chapter summarizes the study results, concludes the discussion and makes recommendations for policy, practice, and research.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter offers a contextual review of the banking industry in Ghana as well as theoretical and empirical review of concepts in liquidity and profitability in line with the relationship that exists between them in the banking industry. In this chapter, the study documents and discusses liquidity and profitability theories. Also, the chapter is at the intersection of different strands of the literature, addressing banking liquidity and profitability.

Measures of Liquidity in Commercial Banking

Liquidity - the capacity of banks to meet their money related commitment is generally estimated quantitatively by a few markers. A portion of these incorporate the credit to-store proportion, money to-resource proportion, money to-store proportion, advance to liabilities proportion and advance to resources proportion. From the assortment of bank liquidity proportions, two most usually utilized proportions were utilized in the examination, to be specific the credit to-store proportion and the money to-store proportion.

Loan to deposit ratio (LDR)

Loan to deposit ratio (LDR) relates illiquid advantages for fluid liabilities (for example stores). It is the portion of advance and advances to client store. The credit to-store proportion is the proportion of a bank's complete exceptional advances and advances to its all out stores from clients. LDR figure of 0.05 demonstrates that a bank loans 0.50 cedi to clients for each cedi of stores. LDR implies that the measure of money a bank needs to meet withdrawals. The higher LDR, the less fluid the bank is. This proportion additionally gives data on

the bit of credits financed by customers' stores. Qualities lower than 100% imply that credits are completely financed from customers' stores and not from other wellspring of subsidizing, for example, interbank advances or assets from obligation protections issuance.

Cash to deposit ratio (CDR)

Cash to deposit ratio (CDR) relates liquid assets to liquid liabilities (i.e. deposits). It is the share of cash to customer deposits. The CDR is a more conservative variant of the cash ratio – the ratio of cash and cash equivalents to current liabilities. A higher CDR is indicative of higher bank liquid.

Other non-liquidity measures that influence profitability

Bank-specific independent variables

In addition to liquidity, other bank-specific variables affect bank profitability. As control variables, non-liquidity bank-specific variables such as bank size and cost to-income ratio were used in the analysis and estimations. The natural logarithm of assets (ln Assets) of a bank was used as a proxy for bank size.

Macroeconomic independent variables

Banks profitability is expected to be sensitive to macroeconomic variables. Literature supports three macroeconomic variables are used: annual gross domestic product (GDP) growth rate, annual inflation rate and interest rate.

Measures of profitability

The profit or net income is the firm's income available for distribution to the shareholders. The assessment of profitability usually is the Return on Assets (ROA) and Return on Equity (ROE). ROA and ROE ratios express profit or net

income as a percentage of the total assets or equity employed to generate it i.e., they compare the profit or net income to the total assets or equity respectively.

Also, profit margin is a measure of the firm's ability to use its top line (revenue, sales or interest income) to generate profits.

Theories of the relationship between liquidity and profitability

A number of theories underlying the relationship between liquidity and profitability of banks seek to provide insight into how liquidity affects profitability in banking. Osborn, Fuertes, & Milne (2012) postulated that higher liquidity reduces profitability because of the cost of liquidity to banks. However, trade-off theory posits that higher liquidity has risk reduction effects and hence lower costs of capital and bankruptcy. Conventional corporate finance theories expect banks in equilibrium to hold optimal levels of liquidity that trades off costs and benefits but regulatory liquidity and capital requirements usually make banks hold excess liquidity above their internal optimal liquidity level (Bassey & Moses, 2015).

The relationship between liquidity and profitability may be positive or negative in the short-run depending on whether a bank is above or below its optimal liquidity level. Thus, the expected average relationship between liquidity and profitability across banks will be cyclical because bank's optimal liquidity level varies over the business cycles. The optimal liquidity level of banks is higher with higher expected costs of distress. During the periods of distress as banks increase their liquidity, profitability improves (Osborn, et al (2012).

Osborn, et al (2012) further opined that banks' optimal liquidity level rises during periods of banking sector distress, since in such conditions the

expected cost of bankruptcy rises. Banks in distressed environment tend to be below their optimal liquidity level. During normal conditions, banks may meet their optimal liquidity level such that no relationship exists between liquidity and profitability. In normal conditions, banks that have above optimal liquidity levels can increase profitability by reducing the liquidity level

Flannery and Regan (2008) assert that no short-run relationship exists if banks attain their optimal liquidity level since any change in liquidity has no impact on profitability. However, due to regulatory requirements or unexpected shock, higher liquidity above the optimal liquidity level reduces profitability in the long run.

Relationship between Liquidity and Bank Profitability

A number of empirical works abound on the relationship between liquidity and profitability across industries and sectors of the economy. However, for the sake of this research, the review of the empirical evidence is devoted to the relationship between liquidity and profitability in banking. There have been many researches on the relationship between bank liquidity and profitability. Studies on the determinants of bank profitability almost always highlight liquidity as a determinant of profitability in banks (Bourke, 1989; Bashir, 2000; Karasulu, 2001; Guru, Staunton, & Balashanmugam, 2002; Staikouras & Wood, 2003; Naceur, 2003; Njihia, 2003).

Heibati, Nourani, & Dadkhah (2009) found empirical results from regression analysis of cross-country panel data of private banks in Iran and Arabic countries of Persian Gulf area showing statistically significant relationship between liquidity and profitability especially during their initial years. They examined and compared the performance in four groups of

profitability, liquidity, efficiency and capital. The relationship between the profitability of banks and their liquidity level with a balanced panel data set for ten Jordanian banks over the period 2001 to 2010 was investigated by Imad, Kilani, & Kaddumi (2011). The results showed that bank liquidity explains a significant part of the variation in banks' profitability: the rate of return on assets (ROA) and the rate of return on equity (ROE).

The impact of liquidity management (proxied by cash and short-term fund, bank balances and treasury bills and certificates) on the profit after tax of 3 banks in Nigeria was investigated by Ibe, (2013). The Elliot Rosenberg Stock (ERS) stationary test model was used to test the association of the variables, while regression analysis was used to test the hypothesis and the result showed a statistically significant relationship between the variables of liquidity management and profitability. Meanwhile, no consensus exits on the nature of the relationship between bank liquidity and profitability. Some empirical work evidence a positive relationship between bank liquidity and profitability and argue that banks with more liquid assets holdings have lower financing costs, leading to higher profitability.

Bourke (1989) studied 90 banks in Europe, North America and Australia over the period 1972-1981 by regressing profitability against a non-linear expression of relative liquid asset holdings, as well as a set of control variables and observed a positive relationship between liquid assets and bank profitability. Obiakor & Okwu (2011) investigated the nature and extent of the relationship between liquidity (current assets- liabilities ratio) and profitability (operating profit turnover ratio) in 15 selected quoted companies in Nigeria and also to determine whether any cause and effect relationship existed. They employed

correlation and regression analysis and found a trade-off existed between liquidity and profitability with a negative but insignificant impact and a positive correlation. Uremadu, (2012) studied the effect of capital structure and liquidity on the profitability of selected Nigerians banks for the 1980 to 2006 period. Using descriptive statistics and regressive distributed lag (ARDL) model, the empirical results indicated a positive and significant relationship between cash reserve ratio, liquidity ratio, and banks' profitability.

A study by Kehinde (2013) examining the relationship between credit management, liquidity position and profitability of selected Nigerian banks over the period of 2006 to 2010 found evidence from ordinary least squares estimate found that liquidity has significant positive effect on Return on Asset (ROA). On the other hand, other studies argue a negative effect of liquidity on profitability of banks. They further argue that holding liquid assets has opportunity costs and relatively low return, thereby reducing bank interest income and thus a negative effect on profitability.

Molyneux and Thornton (1992) studied European banks in the late 1980s whilst Goddard, Molyneux, and Wilson, (2004) studied European banks in the late 1980s mid-1990s. They both found a negative relationship between bank liquidity on profitability. Other empirical works present evidence of both positive and negative relationships at turning points or thresholds and depending on the choice of profitability proxy.

Bordeleau and Graham, (2010) investigated the effect of liquid asset holdings on the profitability of 55 US banks and 10 Canadian banks between the period of 1997 and 2009. The empirical results from ordinary least squares regression analysis of panel data of the banks suggested/ suggests a nonlinear

relationship whereby profitability is improved for banks that hold some liquid assets till at a point beyond which holding-further liquid assets minimizes a bank's profitability, all else equal. Furthermore, the empirical results from the study also indicated that this relationship varies depending on a bank's business model and the state of the economy.

Bassey and Moses, (2015) examined the liquidity-profitability trade off of 15 deposit money banks in Nigeria over panel data of 2010 to 2012 and revealed the empirical results that there is a statistically significant relationship between bank liquidity measures-current ratio, liquid ratio, cash ratio, loans to deposit ratio, loans to asset ratio- and return on equity but statistically insignificant relationship with return on asset.

In Ghana, the relationship between liquidity and the profitability of banks listed on the Ghana Stock Exchange was studied by Lartey, Antwi, & Boadi, (2013) by adopting the longitudinal time dimension model. They found a very weak positive relationship between the liquidity and the profitability of seven of the nine listed banks. The use of time series analysis revealed a downward trend in both liquidity and profitability for the period 2005 to 2010.

Chapter Summary

The chapter looked at the concepts in liquidity and profitability, measures of liquidity in commercial Banking, other non-liquidity variables and theories of relationship between liquidity and profitability.

CHAPTER THREE

RESEARCH METHODS

Introduction

The study is about the relationship that exists between liquidity and bank profitability. This chapter describes the data, its source and the empirical methods used in the data analysis, model specification and estimation. The data and the variables are described and then the effect of liquidity on bank profitability as well as other determinants of bank profitability examined.

Research Design

Other researchers had studied on the topic but the scope and period of this study necessitated an extensive data collection which justified the strategy used in arriving at conclusions from the research objectives. Data was available for the period of the study but scope was restricted to only listed banks.

Study Area

The study is focused on liquidity and bank profitability of licensed Banks in Ghana.

Population

The data used for this study is sourced from the financial statements of banks in Ghana.

Sampling Procedure

The entire population was worked with therefore there was no sampling.

Data Collection Instruments

Data was pooled from the financial statements of licensed banks in Ghana. To make it meaningful and to serve the purpose of the study, data was used to derive indicators for the analysis including Profit after tax (PAT), Return on assets (RoA), Return on equity (RoE)

Data Collection Procedures

The study will build models to fit pooled data of 23 licensed banks in operation over the period 2009 to 2018. The Ghanaian banking sector has seen transformation as a result of the 2017-2018 clean up; leading to revocation and reclassification of licenses as well as mergers. This coupled with the different entry dates, an unbalanced panel data is used in order to increase the data observations.

Data Processing and Analysis

The study employs correlation analysis, trend analysis and multiple regression analysis to the data.

Model Specification

The study specifies a panel regression model to examine the effect of liquidity on profitability of banks in Ghana by using panel data, consisting of both the cross sectional and time-series dimensions.

The panel regression model estimates the following equations:

Pooled OLS

$$y_{i,} = \alpha + \sum_{i=1}^{n} \beta X_{i,} +$$

Fixed effects model

$$y_{i,t} = (\alpha + \mu_i) + X_{i,t}\beta + v_{i,t}$$

with varying intercepts across groups and/or times and constant error variances.

Random effects model

$$yi,t = \alpha + Xi,t\beta + (\mu i + vi,t)$$

with constant intercepts and varying error variances across groups and/or times

where $y_{i,t}$ is the dependent variable, profit of bank, i at time t

α is the constant term

β is the coefficient of the independent variables

X_i is the set of independent/explanatory variables

ε is the error term

The pooled OLS, Fixed Effects and Random Effects models will be estimated and evaluated with the Haussmann, fixed effects, and random effects tests to determine the best fit to the data.

Variables

Dependent variable: profitability

Bank profitability is proxied by Return on Assets (RoA) and Return on Equity (RoE) such that two different models are estimated with these two different proxies. The Return on Assets (RoA) is the ratio of net income to total assets whilst the Return on Equity (RoE) is the ratio of net income to total equity.

Liquidity independent variables

From the variety of bank liquidity ratios, two most commonly used ratios were used in the study, namely the loan-to-deposit ratio and the cash-to-deposit ratio.

Bank-specific independent variables

Non-liquidity bank-specific variables such as bank size and cost to-income ratio were used in the analysis and estimations. The natural logarithm of assets (ln Assets) of a bank was used as a proxy for bank size.

The expected signs of these variables are presented in Table 1

Table 1: Expected signs of variables in the estimations

Variable	Measurement	Expected sign
ROA	Profit after tax/Total Assets	--
ROE	Profit after tax/Total Equity	--
Loans To Deposit (LDR)	Loan and advances/ Customer Deposits	(- /+)
Cash To Deposit (CDR)	Cash / Customer Deposits	(- /+)
Ln Assets	Natural Logarithm of Total Assets	(+)
Cost To Income	Operating cost/Operating income	(-)

Source: Field data (2019)

Chapter Summary

Bank liquidity ratios as well as bank profitability ratios were key in examining the relationship that exists between liquidity and bank profitability. Other non-liquidity variables were considered in the estimation.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter deals with the analysis of the data used for the study and the interpretation of results and presentation of the findings of the study. It analyses and discusses the results and the main findings from the study.

Summary of Descriptive Statistics

The data used for the study was from the financial statements of 23 licensed banks over the ten-year period 2009-2018. A summary of descriptive statistics for the study are reported in Table 2.

Table 2: Descriptive statistics of variables in the estimations

Variable	Obs	Mean	Std. Dev.	Min	Max	Range
ROA	212	0.0256	0.0260	-0.1023	0.0856	0.1879
ROE	212	0.1431	0.3665	-4.5249	0.8535	5.3784
Loans To Deposit (LDR)	212	0.5907	0.2459	0.0005	1.8534	1.8528
Cash To Deposit (CDR)	212	0.3991	1.6524	0.0485	23.9003	23.8517
LnAssets	212	9.0471	0.5152	7.0194	9.9804	2.9609
Cost To Income	212	0.7103	0.2921	0.1173	1.8277	1.7105

Source: Field data (2019)

The ROA of the 23 licensed banks over the period 2009-2018 averaged 2.56%, dispersing marginally at 0.0260. The ratio of profit after tax to assets ranged 18.79% from a minimum return of -10.23% recorded by FNB Ghana in 2017 to a maximum of 8.56% by Bank of Baroda in 2013.

Return on Equity (ROE) – the ability of banks to generate profits from their equity is more dispersed than the Return on Assets (ROA) over the same

period largely as a result of variations in bank liabilities. The ROE for the period varied with the standard deviation 0.3665 around the mean 14.31%. Bank ROE ranged from Universal Merchant Bank's 2011 return-on equity of -57.19% (Bank of Africa recorded an outlier of -452.49 in 2010) to 85.35% by Bank of Baroda in 2017.

Banks' average ratio of value of their loans outstanding to the value of their deposits (LDR) was 59.07%, ranging from 0.056% (United Bank of Africa, 2017) of to 185.34% (Access Bank, 2009).

The median cash-to-deposits ratio (CDR) of the average bank over 2008-2019 was 20.51%. The distribution is influenced by some extreme values (122.53% of Bank of Africa in 2016; 392.49% of Access Bank in 2009; 2,390% of FNB Bank in 2015). The 2,390% recorded by FNB Bank is not unusual in their first year of operations in Ghana. The LDR and CDR of the banks is dispersed 0.2459 and 1.6524 round their mean values respectively.

Exploratory data analysis

This section presents a preliminary but detailed exploratory data analysis of the median of the profitability and the liquidity measures of banks for each year. Figures 1 and 2 display the exploratory analysis of the median of the profitability ratios.
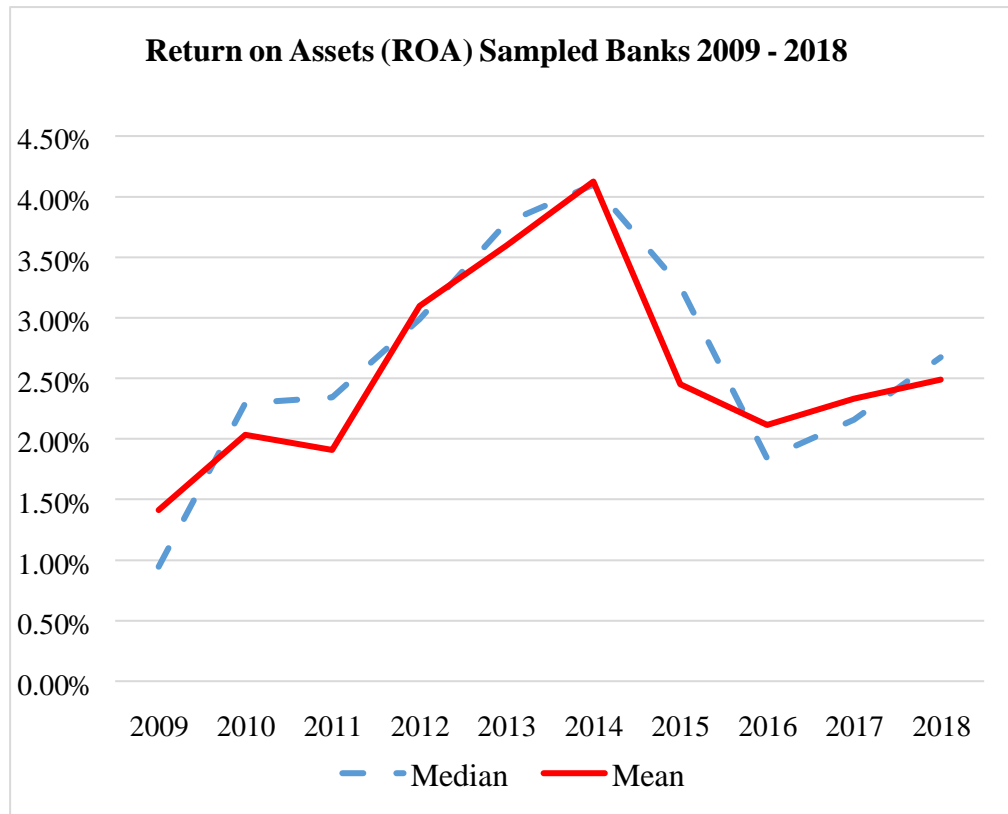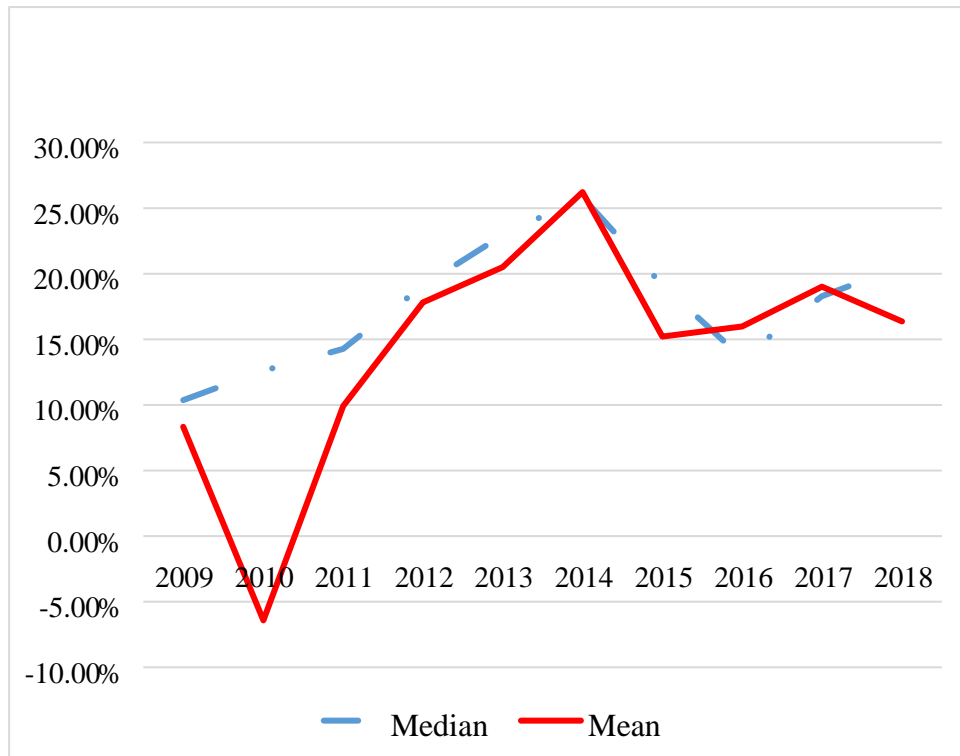
Return on Assets (ROA) Sampled Banks 2009 - 2018

Figure 1: Explorative data analysis of Return on Assets (ROA)
Source: Field data (2019)

The median return on assets of the sampled banks ranges from 0.95% in 2009 to

peak of 4.10% in 2014 with a standard deviation of 0.009 with mean of 2.64%.

On the other hand, the mean return on assets of the sampled banks ranges from

1.41% from 2009 to 4.12% in 2014 and standard deviation of 0.008 with mean

of 2.39%.

Return on Equity (ROE) - Sampled Banks 2009-2018

Figure 2: Explorative data analysis of Return on Equity (ROE)
Source: Field data (2019)

The median return on equity of the sampled banks ranges from 10.36% in 2009 to peak of 25.82% in 2014 with a standard deviation of 0.047 with mean on 17.66% and median of 18.69%. On the other hand, the mean return on assets of the sampled banks ranges from -6.42% from 2010 to 26.22% in 2014 and deviation of 0.087 with mean of 14.29% and median of 16.18%.

The use of the median is more desirable because extreme values and outliers affect the mean. The Bank of Africa recorded an extreme return on equity in 2010.

The exploratory analysis of the median values of the share of loans of deposits (LDR) and the share of cash of deposits (CDR), for all banks in the sample are presented in Figures 3.

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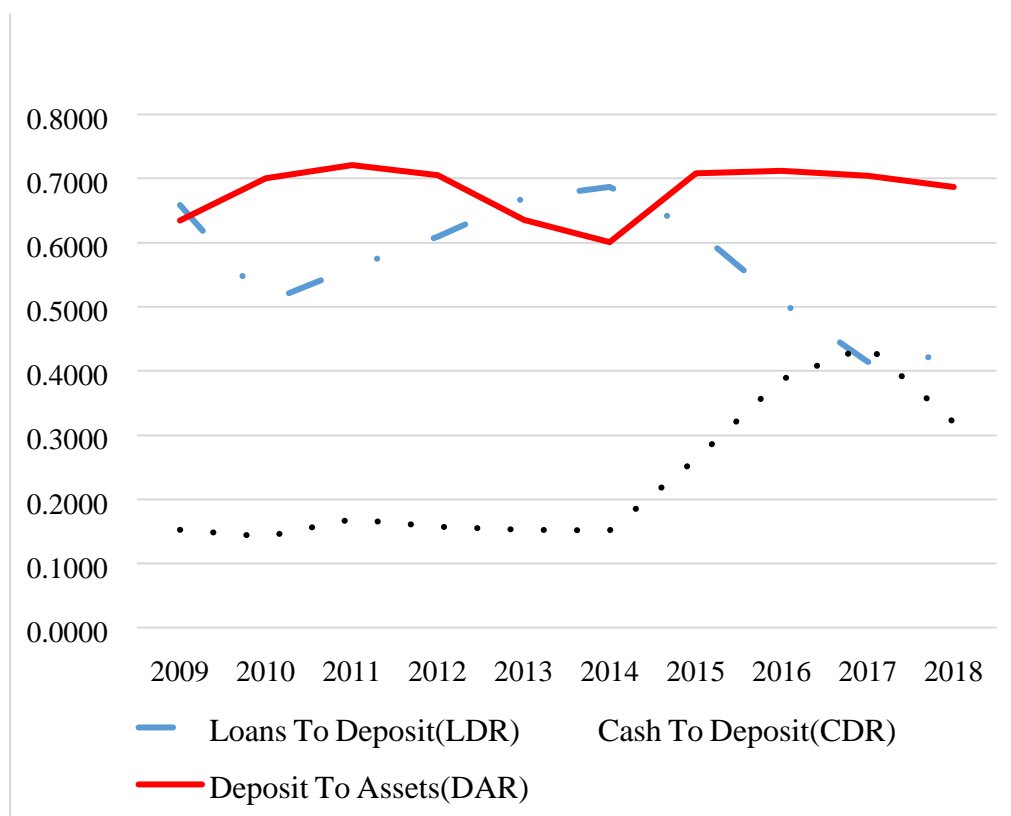
Liquidity ratios - Sampled Banks 2009-2018

Figure 3: Explorative data analysis of Liquidity ratios
Source: Field data (2019**)**

Banks' median LDR of the value of their loans outstanding to the value of their

deposits, averaging 56.58% has ranged from 41.41% to 72.35% with a standard

deviation of 0.095 and median 58.53%.

On the average banks had 23.30% of their deposits as cash as their CDR

ranged from 14.18 to 46.16% with a standard deviation of 0.108 and median

16.28 %.

Correlation analysis

To identify the relationship between profitability and liquidity of banks

in Ghana as required by the objective of the study, a pairwise correlation of

variables was conducted and analysed.

Table 3 reports the pairwise correlations among the key variables in the model.

Table 3: Correlation analysis of variables in the estimations

VARIABLES	ROA	ROE	LDR	CDR	Ln (Assets)	Cost To Income
ROA	1					
ROE	0.55***	1				
Loans To Deposit Ratio	0.04	0.02	1			
Cash To Deposit Ratio	-0.16**	-0.02	0.12	1		
LnAssets	0.20***	0.19***	-0.13	-0.13	1	
Cost To Income	-0.90**	-0.53**	-0.02	0.12	-0.14**	1

*** significant at 0.01, ** significant at 0.05, * significant at 0.1
Source: Field data (2019)

Table 3 shows that there is weak negative statistically significant correlation between ROA and CDR. However; there is a weak statistically insignificant positive correlation between ROA and LDR. A negative relationship therefore exits between ROA and liquidity.

With respect to ROE, there exist no statistically significant relationship between ROE and the liquidity ratios. Table reveals that ROE is weak-positively correlated with LDR and weak-negatively correlated with CDR, showing that ROE and liquidity are weakly and negatively correlated. There is no evidence of a significant relationship between ROE and liquidity. The observed relationship may be attributed to chance and not any fundamental association.

Trend analysis

Trends in profitability and the liquidity ratios and the relationship between them are analysed to examine the effects of changes in liquidity levels on profitability of banks in Ghana for the second objective. Focus is on the one

to one relationship between average bank liquidity and profitability over the period of study.

Median values of the profitability and the liquidity measures of banks for each year are analysed with line graphs.

Figure 4 and Figure 5 display line graphs representing trends in ROA and the liquidity ratios LDR and CDR respectively.
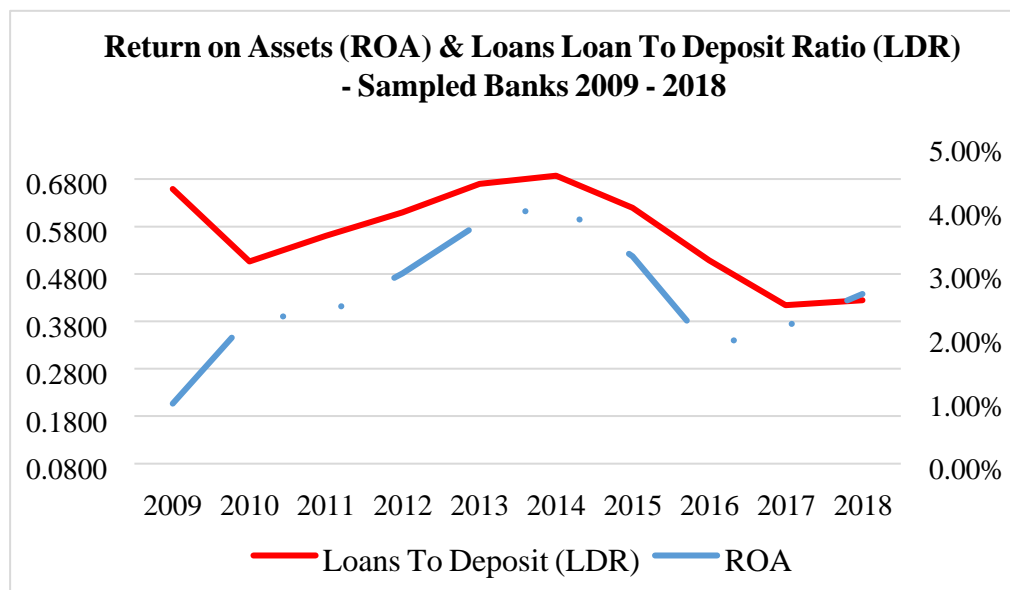

Figure 4: Line graphs of trend analysis of Return on Assets (ROA) & Loans to Deposit Ratio (LDR)
Source: Field data (2019)

The above graph generally shows a positive relationship between return on assets (ROA) and loan-to-deposit ratio (LDR). From the graph, ROA and LDR move in the same direction over 2010 to 2016. Therefore, ROA and liquidity are positively related because LDR and liquidity have a direct relationship.
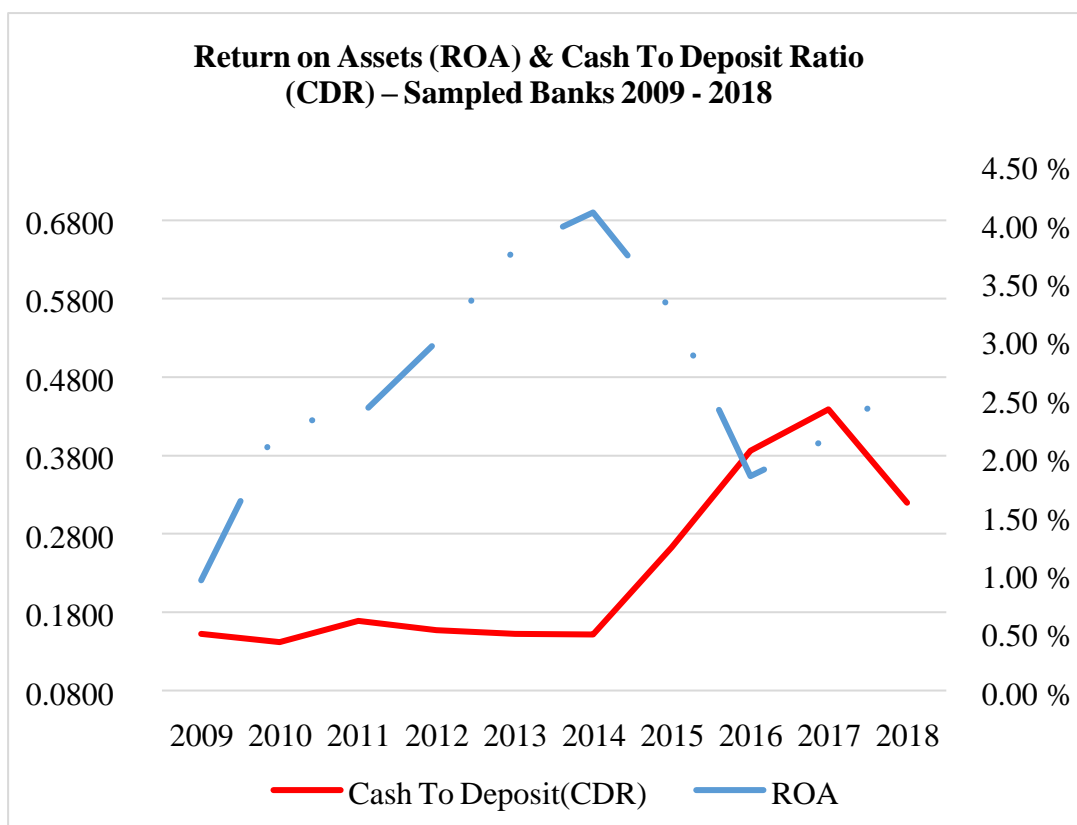
Figure 5: Line graphs of trend analysis of Return on Assets (ROA) & Cash To
Deposit Ratio (CDR)
Source: Field data (2019)

From the graph in Figure 5, return on assets (ROA) and cash to-deposit ratio
(CDR) largely trend in opposite directions, showing a negative relationship.
Thus, ROA and liquidity are negatively related because high CDR depicts
increasing liquidity.

Generally, from the trend analysis (line graph) of the ROA and the
liquidity measures LDR and CDR, a negative relationship is observed between
profitability and liquidity. ROA has a positive relationship with LDR (a direct
liquidity ratio) and a negative relationship with CDR (a positive liquidity ratio).

Figure 6 and Figure 7 present an analysis of trends in RoE and the
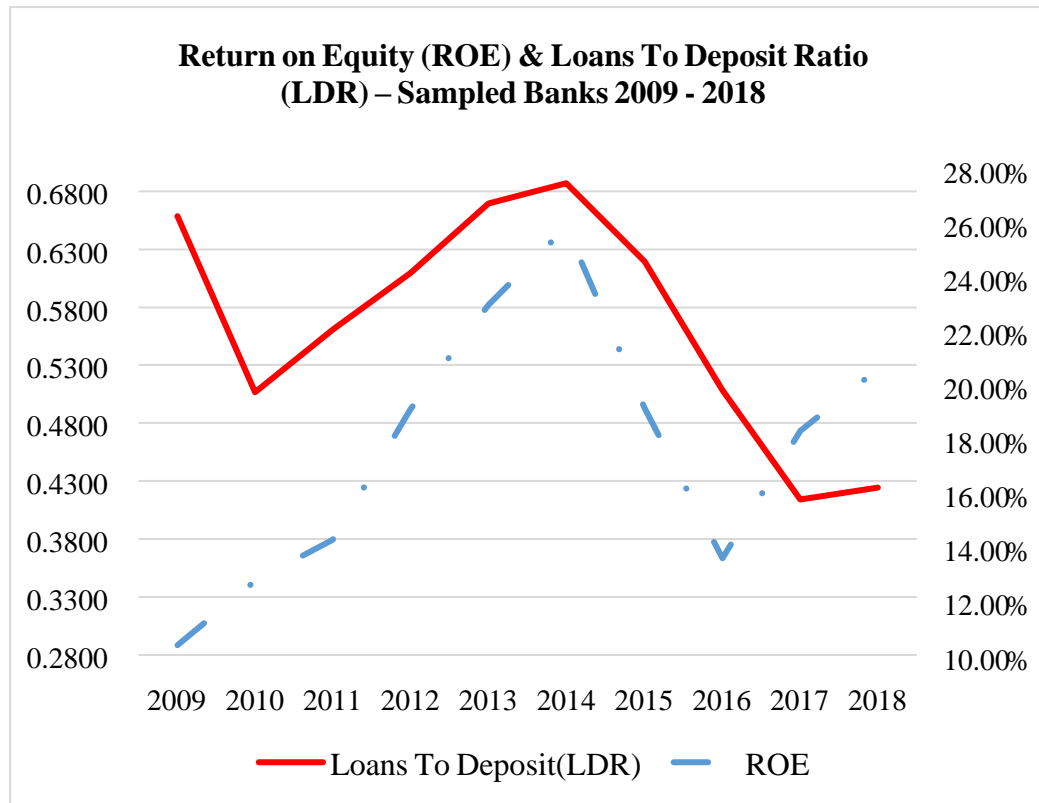liquidity measures RoA and LDR and CDR respectively.

Figure 6: Line graphs of trend analysis of on Equity (ROE) & Loans To Depost
 Ratio (LDR)
Source: Field data (2019**)**

 The graph depicts that ROE mostly moves in the same direction as the loans-to

deposits ratio (LDR). However, LDR has negative relationship with liquidity

implying that liquidity has a negative relationship with ROE.
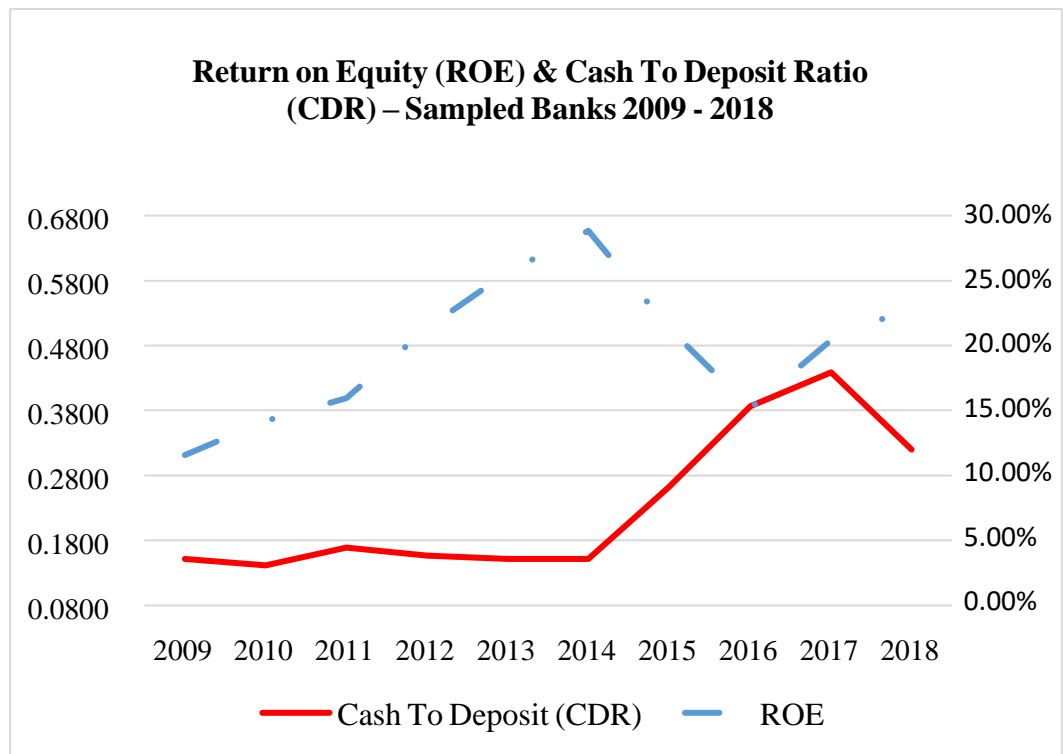
Figure 7: Line graphs of trend analysis of on Equity (ROE) & & Cash To
Deposit Ratio (CDR)
Source: Field data (2019)

The ROE has a negative relationship with CDR as observed in the line
graph above. CDR and liquidity are positively related, thus, ROE displays a
negative relationship with liquidity.

Similarly, from the trend analysis (line graph), ROE has a positive
relationship with LDR (an inverse liquidity ratio) and a negative relationship
with CDR (a positive liquidity ratio). Thus, a negative relationship is observed
between profitability and liquidity.

Table 4: Regression analysis of variables in the estimations

VARIABLES	(1) OLS1 ROA	(2) OLS2 ROA	(3) OLS1 ROE	(4) OLS2 ROE
Loans To Deposit (LDR)	0.0014		0.0332	
	(0.0042)		(0.0548)	
Cash To Deposit (CDR)		-0.0007***		0.0097**
		(0.0002)		(0.0047)
LnAssets	0.0042**	0.0037*	0.0654**	0.0714**
	(0.0021)	(0.0020)	(0.0309)	(0.0318)
Cost To Income	-0.0779***	-0.0775***	-0.6410***	-0.6461***
	(0.0047)	(0.0047)	(0.1847)	(0.1868)
Constant	0.0392**	0.0445**	0.0055	-0.0211
	(0.0186)			
		(0.0171)	(0.3092)	(0.3139)
Observations	212	212	212	212
R-squared	0.8359	0.8375	0.3146	0.3159
F(12, 199)	60.87	173.78	11.29	15.15
Prob > F	0.0000	0.0000	0.0000	0.0000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$ **Robust standard errors in parentheses**
Source: Field data (2019)

Table 4 presents model results for the regression models 1 to 4.

The cash-to-deposit ratio (CDR) has a negative significant relationship with return on assets (ROA). Thus, liquidity as measured by the CDR significantly affects the profitability as measured by the ROA of the commercial banks in Ghana over 2009 - 2018 as CDR has positive relationship with liquidity. Therefore, there is a very significant negative relationship between bank liquidity and profitability (ROA). This result is consistent with expected theory as high CDR is associated with high liquidity. Banks face opportunity costs when they invest in low earning liquid assets instead of investing in high earning loan portfolio, leading to lower profit potential.

However, the loans-to-deposit ratio (LDR) is not significantly related to the return on assets. According to the R-squared of the ROA models 1 and 2, the predictor variables explain 83% of the variation in the ROA. The analysis of variance, F test, depicts that the models is jointly significant.

On the other hand, the cash-to-deposit ratio (CDR) is positively significant in determining the return on equity (ROE). Thus, liquidity of the commercial banks in Ghana over 2009-2018 as measured by the CDR significantly affects the profitability as measured by the ROE. A high CDR is indicative of high liquidity thus, liquidity and the profitability ratio ROA have a very significant positive relationship. Although this result is contrary to expected theory, the liability structure of banks may provide further insight.

Similarly, there is no evidence of any statistically significant relation between ROE and LDR. The R-squared of the ROE model of about 32% implies that the independent variables explain only 32% of the variation in the dependent variable. An analysis of variance with the F test shows that the variables in the ROE models are jointly significant. Bwacha & Xi, (2018) in using three liquidity ratios, (Loan-to-Deposit Ratio, Deposit-to-Asset Ratio and Cash-to-Deposit Ratio) and three location dummy variables fitted in the regression model found only the Deposit-to-Asset Ratio to be statistically significant in explaining bank profitability.

The bank specific variables, LnAssets (size proxy) and cost-to-income ratio had strong positive and negative significance on the profitability measures respectively. To capture business cycle effects observed over time, time dummies were used in the estimations (not shown in the results) instead of the macroeconomic variables because of the presence of multicollinearity in

CPI/inflation, GDP (growth) and interest rates. Preliminary estimations, the Hausman test to decide between fixed or random effects, the fixed effect test and the Breusch-Pagan Lagrange multiplier test for (LM) random effects favoured the choice of pooled LOS regression.

Chapter Summary

A summary of descriptive statistics was used in deriving measures and ratios based on the data for the study-financial statements of 23 licensed banks over a ten-year period, from 2009 to 2018.Tabutar and graphical representations were produced, showing liquidity ratios, correlation analysis, trend analysis and regression analysis.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This part manages the summary of the study, reaching inferences on the study and lastly making proposals. This study tried to concentrate how liquidity and profitability are interrelated in the financial business by dissecting the likelihood measures (returns on assets and returns on equity), and the bank liquidity ratios (loan-to-deposits ratio and cash-to deposit ratio) of twenty-three (23) banks over the period 2009-2018.

Summary of Findings

Results from the regression analysis on the effects revealed a negative link between liquidity and bank profitability. If a bank increases liquidity (too much liquidity), it presupposes that returns on assets for shareholders would decrease. Reducing liquidity also goes with liquidity risk.

Conclusions

Liquidity management and profitability in Banks are two delicate issues in the activities of Commercial banks and of which data on them are genuinely amassed. The significant worry of this study was to accommodate the clashing requirements of bank liquidity and bank profitability emerging from the clashing wants of the two significant suppliers of the bank resources, in particular the investors and the contributors. The investors desire extreme profitability as an arrival on their capital, while the contributors decide on a greatest liquidity as an assurance for security and capacity to pay their cash on request.

Considering the findings of the study, the accompanying ends can be drawn:

1. For the achievement of tasks and endurance, commercial banks ought not bargain proficient and compelling liquidity the board. They are required to keep up ideal liquidity level so as to fulfill their money related commitments to clients or contributors and amplify benefits for the investors.

2. The ideal liquidity level is reached if the commercial banks strictly kept up the base liquidity required as expressed capital by the Bank of Ghana. This endeavor assists with diminishing instances of bank trouble.

3. From the examination, we can properly reason that both illiquidity and overabundance liquidity are "budgetary illnesses" that can without much of a stretch disintegrate the benefit base of a bank as they influence bank's endeavor to accomplish high gainfulness level. The quest for high benefit without thought to the liquidity level can cause extraordinary illiquidity, which lessens the clients' support and dependability. In this manner, any bank that has the point of amplifying its benefit level must embrace compelling liquidity the executives.

4. Effective Liquidity the board additionally requires satisfactory liquidity level which will assist business saves money with estimating the extent of contributor's subsidizes that will be requested at any period and mastermind on the best way to satisfy the need.

5. It can at last be reasoned that liquidity is conversely identified with benefit. This implies as liquidity expands, productivity diminishes and the other way around.

6.   Bank liquidity and productivity are of exceptionally incredible worry to partners – investors, borrowers, open, obligation holders, investors, bank administrators and controllers in light of its basic effect on the certainty, dissolvability and endurance of money related segment of any economy.

Any endeavors to meet the targets of partners through a proficient and successful ideal exchange off require an away from of the relationship liquidity and gainfulness in banking.

Recommendation

In view of the basic assessment of the above discoveries, I thusly make the accompanying suggestions with the earnest conviction that they will decrease if not thoroughly kill the issues related with liquidity the executives and gainfulness in business Banks.

1.   Since the endurance of business banks rely upon liquidity the executives and benefit, they ought not exclusively focus on the benefit amplification idea however ought to likewise receive measures that will guarantee successful liquidity the board.

2.   Instead of saving extreme liquidity as an arrangement for startling withdrawal requests of the clients, the business banks should think that its sensible to receive different proportions of meeting such necessities, which can incorporate acquiring and limiting bills. What's more, the excess assets of the business banks ought to be occasionally put resources into transient instruments of the currency advertise.

3. For the way that the money related arrangements of Bank of Ghana horribly influence liquidity the board of the business banks, Bank of Ghana should take the enthusiasm of the later into thought while setting up and executing these fiscal strategies when all is said in done and the liquidity proportion specifically. To accomplish this accomplishment, Bank of Ghana is relied upon to make a discussion whereby its approach producers and the administration of business banks connect and exchange for worthy money related arrangements.

4. Commercial banks should plan the development times of their auxiliary save resources for relate to the period in which the assets will be required.

Recommendations for Further Studies

1. Further research is prescribed on the most proficient method to accomplish the ideal liquidity level in business banks. The outcome will assist with taking care of the issue of abundance liquidity and its decreasing consequences for benefits, and self-assertive high productivity with its ensuing decrease of liquidity position.

2. It is at long last suggested that intrigued analysts ought to harp on a similar region of this examination broadly utilizing a more extensive information and region of inclusion.

REFERENCES

Bashir, A. (2000). *Determinants of Profitability and Rates of Return Margins in Islamic Banks: Some Evidence from the Middle East.* Grambling State University, Mimeo.

Bassey, G. E., & Moses, C. E. (2015). Bank Profitability and Liquidity Management: A Case Study of Selected Nigerian Deposit Money Banks. *International Journal of Economics, Commerce and Management, (3.) 4*.

Bordeleau, E., & Graham, C. (2010). The Impact of Liquidity on Bank Profitability. *Bank of Canada. Working Paper/Document No. 38*.

Bourke, P. (1989). Concentration and other Determinants of Bank Profitability in Europe. *Journal of Banking and Finance, pp65-80*.

Bwacha, C. R., & Xi, J. (2018). The Impact of Liquidity on Profitability An explanatory study of the banking sector between 2008 and 2017. *Unpublished Master's Thesis*.

Coopers, P. H. (2018). *Banking reforms so far: topmost issues on the minds of bank CEOs,* Accra: PricewaterhouseCoopers (Ghana) Limited.

Flannery, M. J., & Regan, P. (2008). What Caused the Bank Capital Build-up of the 1990s? *Review of Finance, 12*.

Goddard, J., Molyneux, P., & Wilson, J. O. (2004). Dynamics of Growth and Profitability in Banking. *Journal of Money, Credit and Banking 36, 10691090*.

Guru, B., Staunton, J., & Balashanmugam, B. (2002). *Determinants of Commercial Bank Profitability in Malaysia.* University Multimedia Working Papers.

Heibati, F., Nourani, S., & Dadkhah, S. (2009). Evaluation of the Performance of Private banks of Iran in Comparison to the banks of Arabic countries, Persian Gulf area (domain). *Economic Research Letter, 6*.

Ibe, S. O. (2013). The Impact of Liquidity Management on the Profitability of Banks in Nigeria. *Journal of Finance and Bank Management 1(1)*.

Imad, R., Kilani, Z. Q., & Kaddumi, T. (2011). Determinants of Bank Profitability: Evidence from Jordan. *Int. J. Acad. Res. 3(4)*.

Karasulu, M. (2001). *The Profitability of the Banking Sector in Korea.* IMF Country Report.

Kehinde, O. P. (2013). An Empirical Investigation of the Liquidity-Profitability Relationship in Nigerian Commercial Banks. *Journal of Economics and Sustainable Development, (4) 6*.

King, R. G., & Levine, R. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics, Vol. 108(No. 3), 717-737*.

Lartey, V. C., Antwi, S., & Boadi, E. K. (2013). The Relationship between Liquidity and Profitability of Listed Banks in Ghana. *International Journal of Business and Social Science, (4.) 3*.

Molyneux, P., & Thornton, J. (1992). Determinants of European Bank Profitability: A Note. *Journal of Banking and Finance, Vol. 16, No. 6, 1173-8*.

Naceur, S. (2003). The Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. *Paper Presented at the Proceedings of the Economic Research Forum (ERF) 10th Annual Conference,* Marrakesh Marocco.

Njihia, J. K. (2003). Determinants of Banks profitability: the case of Commercial Banks in Kenya. *Unpublished MBA research project, University of Nairobi*.

Obiakor, R. T., & Okwu, A. T. (2011). Investigating Liquidity – Profitability Relationship in Business rganisation: A Study of Selected Quoted Companies in Nigeria. *British Journal of Economics, Finance and Management Sciences, (1) 2*.

Osborn, M., Fuertes, A., & Milne, A. (2012). *Capital and Profitability in Banking: Evidence from US Banks bank profitability.* Miller.

OpenStax Economics, Principles of Economics, OpenStax CNX. May18, 2016

Rehman, M., Khan, M., & Khokhar, I. (2015). Investigating Liquidity-Profitability Relationship: Evidence from Companies Listed in Saudi Stock Exchange (Tadawul). *Journal of Applied Finance & Banking, 5*(3), 159-173.

Schumpter, J. (1911). *The Theory of Economic Development.* Cambridge,MA: Harvard University Press.

Shin, H. H., & Soenen, L. (1998). Efficiency of Working Capital and Corporate Profitability. *Financial Practice and Education, 8(1),37-45.*

Staikouras, C., & Wood, G. (2003). The Interest-Elasticity of Transactions Demand for Cash. *Review of Economics and Statistics*.

Uremadu, S. (2012). Bank Capital Structure, Liquidity and Profitability Evidence from the Nigerian Banking System. *International Journal of Academic Research in Accounting, Finance and Management Sciences, (20 1.).*

Van-Horne, J. C., & Wachowicz, J. M. (2004). Fundamentals of Financial Management (12th ed). *New York: Prentice Hall Publishers*.

Zumanu, G. A. (2016). Financial inclusion in sub-Saharan Africa: A determinant analysis. *Unpublished Master of Philosophy (MPhil) Finance thesis.*

APPENDIX

List of Banks used in the study

Access Bank (Ghana) Plc

ADB Bank Limited

Bank of Africa Ghana Limited

Bank of Baroda Ghana Limited

Barclays Bank of Ghana Limited

CAL Bank Limited

Ecobank Ghana Limited

Energy Commercial Bank Ghana Limited

FBN Bank (Ghana) Limited

Fidelity Bank Limited

First Atlantic Bank Limited

First National Bank (Ghana) Limited

GCB Bank Limited

Guaranty Trust Bank (Ghana) Limited

National Investment Bank Limited

Prudential Bank Limited

Republic Bank (Ghana) Limited

Societe General (Ghana) Limited

Stanbic Bank Ghana Limited

Standard Chartered Bank (Ghana) Limited

United Bank for Africa (Ghana) Limited

Universal Merchant Bank Limited

Zenith Bank (Ghana) Limited