EFFECT OF LIQUIDITY MANAGEMENT ON PROFITABILITY OF COMMERCIAL BANKS IN RWANDA.

Case study: Bank of Kigali

Period: 2011-2022

BY

Jean Claude MASERA

Research thesis submitted in partial fulfillment of the requirements for Master's Degree in Business Administration

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DECLARATION

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Jean Claude MASERA

Reg. No: 202110378

Signature _____ Date _____

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I certify that this research was carried out by the candidate under my supervision and guidance.

Signature _____ Date _____

Lecturer at University of Kigali Independent University

Dr RUBERWA Alexis

DEDICATION

This Research thesis is dedicated to my family and friends for their devotion and support towards my academic accomplishment.

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I am gratefully indebted to all those who have contributed to the success of this research thesis. First and foremost, I recognize and uphold my Almighty Lord whose power has made me come this far. May His name be praised and adored. My sincere gratitude goes to my supervisor, for tirelessly and willingly sharing his scholarly experience and for making this dissertation a successful undertaking. He has been available for consultation, his professional guidance and supervision added value to this work. My thanks go also to my family and friends for their devotion and support towards my academic success.

LIST OF ACRONYMS, ABBREVIATIONS AND SYMBOLS

BK: Bank of Kigali

GDP: Gross Domestic Product

NBR: National Bank of Rwanda

ROA: Return on Assets

ROE: Return on Equity

SPSS: Statistical Package for Social Science

ADR: Advanced Loans to Deposit Ratio

CDR: Cash to Deposits Ratio

DAR: Deposit to Assets Ratio

%: Percentage

ABSTRACT

Many organizations rely on liquidity and profitability as crucial elements to determine their performance and survival. Profitability and liquidity should go hand in hand to ensure the long-term survival and expansion of any business enterprise. Long-term investments outperform cash in terms of profitability. Financial managers' primary issue is whether to invest in more profitable long-term assets to limit liquidity or in less profitable short-term assets to reduce capital margins.. The general objective of this study was to assess the impact of liquidity management on financial performance of commercial banks. While specific objectives of the study were to establish the effect of advanced loans to deposit ratio on the profitability, to examine the effect of cash to deposit ratio on profitability and to analyze the effect of deposit assets ratio on the profitability of commercial banks in Rwanda. Secondary data were collected through annual financial reports and data were analyzed through E-views. Validity of research data were conducted and the data were normally distributed and free from multicollinearity whereby the calculated VIF were below 10. To establish the relationship between research variables, the econometrics were constructed and regression analysis were used. The regression results revealed that there is a significant positive relationship between Deposit to assets ratio and Return on Assets whereby the calculated coefficient is 0.6 and prob value is 0.053, this implies that an increase in deposit to assets by 1% will result in an increase of 6% in return on assets and vice versa. The research results also indicate a significant negative relationship between cash deposit to assets and return on assets where the calculated coefficient is -0.11 and prob value is 0.19, it implies also that an increase in cash to deposits by 1% will result in a decrease of 0.1% in return on assets and vice versa.

Based on the results, there is long run relationship between liquidity management practices and the profitability of commercial banks in Rwanda. The higher the manager's ability to raise deposits the more deposits and the more profit. From this perspective, bank should encourage voluntary deposits which will enables them to hinder liquidity constraints by analyzing their potential customers for special treatments and by raising their deposits rate to motivate customers to deposit more.

Keyword: Liquidity management, advanced to deposit ratio, Cash to deposits ratio & deposits to assets ratio

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CHAPTER ONE: GENERAL INTRODUCTION

The first chapter, entitled "General Introduction", describes the background of the study, the explanation of the problem, the purpose of the study, the questions of the study, the hypothesis of the study, the importance of the study, and the scope of the study.

1.1. Background to the study

Globally, financial institutions all over the world have undergone significant changes. As a resultof this major transformation, the banking industry as a financial center faces a variety of challenges, including advanced technology and increased competitiveness in the market. As a result, maintaining a balance between liquidity and profitability has become an important issue for banks seeking to remain competitive in the stock market. Today, banks face multiple pressures to regulate liquidity and increase monetization due to excessive competition in money and financial markets. In addition, technological advances, telecommunications networks, and ultra-fast data processing systems will enable us to increase productivity and provide a wide range of services through electronic means.

Therefore, to balance the efficiency and risk of a bank, shareholders and depositors need to be content with increasing returns and ensuring a rate of return on their investment. Liquidity refers to cash or cash equivalents used in day-to-day operations to accommodate short-term business activities. Analysts believe that liquidity is important in short-term commitments and daily investments and expenditures to pay off debt. Bunia (2010).

According to Bagh et al. (2017), "The banking sector acts as the backbone of the economy and plays an important role in the development and expansion of the country's economy." Banks somehow act as an intermediary for all industries, including textiles, cotton and agriculture. It works, SMEs, manufacturing, construction, seed finance, etc., directly contribute to the

income,growth and development of the country. It served as the core of the seamless operation of domestic and global economic activity, and the subsequent reconstruction and innovation of this sector has improved living standards.

According to Eljelly (2004), the concept of liquidity management has been carefully studied around the world, primarily due to the current financial situation. In addition, Panday (2005) argues that liquidity management is surrounded by four key decision areas: corporate financial management, which require thorough management, planning, and management for an organization's success.

According to Kashyap et al. (2002) prolonging the growth period of the banking sector leads to a liquidity bottleneck. According to Rehman et al. (2015) Liquidity and profitability are two of the most confusing issues in corporate finance, making it difficult to define the concept of liquidity. Based on these facts, cushions are suitable for studying liquidity management strategies.

Nwaezeaku (2008) defines liquidity as convertibility to cash, that is, the ease with which assets can be redeemed or converted to cash. He also explained that assets must be sold at fair market prices. According to Nahum et al. (2013) Liquidity management is about achieving the right trade-offs between profitability and liquidity.

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Ibe (2013) insists that ease with which benefits can be converted into money is called liquidity. Bank liquidity means that you have enough money to meet your obligations. This refers to the ability of banks to quickly fulfill their money, checks, and other payment obligations**.**

According to Akter and Mahmud (2014), liquidity is the availability of funds to satisfy day-to- day business activities. Money can be easily converted from liquid resources.

According to Arif and Anees (2012), liquidity issues can negatively impact a bank's profitability and capital. In high-risk situations, this can otherwise lead to solvent bank collapse. Meeting the needs of depositors can be another challenge. Appropriate consideration of liquidity issues is a top priority in bank management. These issues need to be addressed as soon as possible, and preventative and corrective actions need to be taken promptly to avoid the consequences of illiquidity.

This study focuses on the impact of liquidity on the profitability of Rwandan commercial banking sector. Liquidity occurs when a bank has sufficient funds to handle its day- to-day operations. Bank liquidity means that you have enough money to meet your obligations.

According to the National Bank of Rwanda (2014), most Rwandan financial institutions saw a decline in lending from the fourth quarter of 2012 to the first quarter of 2013, a significant decline related to the inability to apply for proper credit. It is thought that it is risk management method. National banks use a rating system of capital adequacy ratios, asset quality, management quality, earnings and liquidity (CAMEL) when analyzing the health of commercial banks. According to the 2016 BNR survey, the sector's profitability and sustainability have dropped dramatically, with ROE and ROA at only 8% and 1%, respectively. It is emphasized that banking i s a dangerous business and liquidity risk is important for the continued operation of banks.

1.2. Statement of the problem

According to, Bug et al. Wrote. (2017). Stated that “Banks are currently developing rapidly," As a result, many Rwandan commercial banks customers’ begun to apply for loans as a source of funding. Banks, on the other hand, must always be ready to lend money. If a bank cannot meet all of these requirements, an unexpected situation will occur. Customers lose confidence in such institutions and lead to fierce competition as borrowers switch to other banks. For this reason, with sufficient liquidity, all banks need to optimize their profits to balance their financial needs with their profits. This is because liquidity and profit levels have different consequences. If a bank seeks to maximize profits, it can lead to technical and financial problems.

According to Rehman et al. (2015) Liquidity and profitability are the most pressing corporate finance challenges and it is difficult to define liquidity. From this perspective, cushions are now available for research on liquidity management strategies.

Cash management is recognized as a major concern of business leaders and owners around the world as several solutions have been created for corporate cash management. Liquidity is very important because lack of liquidity can create uncertainty among investors. To provide security to investors, regulatory agencies have set some minimum liquidity levels for banks. Previous studies on liquidity management and its impact on profitability have been conducted in developed countries, but less often in developing countries such as Rwanda. The problem with this research is "the impact of liquidity management on the profitability of commercial banks in Rwanda."

1.3. Objectives of the study

This study has two main objectives which are general objective and specific objectives.

1.3.1. General objective

The general objective of the study is to examine the effect of liquidity management on the profitability of commercial banks in Rwanda.

1.3.2. Specific objectives

i. To examine the effect of cash to deposits ratio on profitability of commercial banks in Rwanda

ii. To establish the effect of advanced loans to deposit ratio on the profitability of commercial banks in Rwanda

iii. To analyze the effect of deposit assets ratio on the profitability of commercial banks in Rwanda

1.4. Research hypothesis

H_o1: Cash to deposits ratio has statistically significant effect on profitability of commercial banks in Rwanda

H_o2: Advanced loans to deposit ratio has statistically significant effect on profitability of commercial banks in Rwanda

H_o3: Deposit to assets ratio has significant statistical effect on profitability of commercial banks in Rwanda

1.6. Significance of the study

This work will be significant at different levels; academic, personal, and country.

1.6.1. Personal significance

The study will help the researcher to acquire more knowledge on the financial management of commercial banks. Apart from the knowledge it serves to partially fulfill the master' degree.

1.6.2. Academicians

This study will be helpful to academia for the findings will be of great beneficial to future students of MBA, finance and management of banks in the field of effect of liquidity management on profitability by providing relevant literature to build the better insight of that area.

1.6.3. To the policy makers

The key conclusions of this study benefit policymakers and executives at banks and businesses at risk of collapsing due to mismanagement of liquidity. The proposed survey is beneficial to the banking sector as it emphasizes its services while ignoring the need for liquidity management. This study highlights the importance of liquidity management for a bank's financial performance. Upon completion of this research, further research opportunities will be explored.

1.7. Scope of the study

The scientific regulation requires that the angle in which this topic is treated be precisely defined; it means content, time scope and geographical scope.

1.7.1. Time scope

This research covered 2011 up to 2022 in bank of Kigali which was selected as a case study.

1.7.2. Content scope

According to domain, this study will reflect in finance in general, specifically it evaluates the practice of liquidity risks management and financial performance of bank of Kigali. Last it assesses the effect of liquidity management on profitability of commercial banks in Rwanda.

1.7.3. Geographical scope

This research focused on the financial operation of bank of Kigali, whereby the research used the consolidated financial statement of bank of Kigali in Rwanda.

1.8. Structure of the thesis

The study is organized into five chapters; where the first one is concerning with the background to the study, statement of the problem, research question, objectives of the study, significance of the study, scope of the study, conceptual framework and lastly how the whole study is organized. Chapter two dealt with the literature review, where this chapter examines the views of other theorists and authors as well as theoretical framework, empirical and critical review and research gap identification. Chapter three is research methodology which outlined the research techniques and methods that the researcher employed in carrying out the data collection; the chapter also dealt with the study area, population and the sample size selection of the study as well as methods of data analysis. Chapter four presents the analysis and presentation of data in this study. Chapter five as the final chapter of this study presents the summary, conclusion and the necessary recommendations.

CHAPTER TWO: LITERATURE REVIEW

This chapter focuses on conceptual review, theoretical review, empirical review, conceptual framework, and research gap.

2.1. Conceptual Review

Various concepts have been discussed presenting the arguments that guide this study. These theories include anticipated income theory and shiftability theory.

2.1.1. Profitability of commercial banks

The profitability of a commercial bank is determined by its return on assets, return on equity, interest spread, interest margin, other operating income to total assets, intermediation margin, net income per staff, net income staff cost. The results show that well-capitalized banks have the greatest impact on their performance, as well-capitalized banks are less risky and this advantage leads to higher profitability. (Waqas, 2014).

Profitability maximization is the goal for banks because of their for-profit essence, through previous definition; two aspects are concerned with profitability, the revenues generated and the cost. Thus, the way of improving profitability includes enhancing revenues and managing cost. In general, there is several ways of improving profitability, like breakeven analysis, cost control, ratio analysis. (Ibe, 2013).

Although profitability maximization is the common goal for all the commercial banks, it is not easily being achieved since so many variables are concerned. Tsomocos (2003), points out survival of companies should be taken as priority before concentrating on its profitability, which connects the concepts of liquidity and profitability. If one company expects to improve profitability by increasing revenues, then it should manage liquidity at first to seize the proper investment opportunities and make most use of available funds; If cost control is the approach

one company use to achieve wealth maximization, then liquidity management is equally important to avoid extra cost generation caused by lack of profitability.

2.1.1.1. Measurement of profitability

Banks' performance can be measured by stability and profitability, while stability is related to risk exposure and profitability concerns with banks' financial return. Bowman (1980), proposed risk and return theory, which led to the use of accounting ratios to quantitatively measure profitability. Banks' profitability is usually measured by ROE, ROA, and Net profit margin. (Nickel & Rodriguez, 2002; Miller & Bromiley, 1990).

ROA measures the efficiency of using total assets to produce profit, it was calculated as net income divided by total assets, the higher ROA indicates higher profitability of banks.

ROA=Net Income/ Total Assets

Another similar ratio for measuring profitability is ROE, unlike ROA, ROE measures the efficiency of using shareholder's equity to produce profit, which is the most concerned indicator for shareholders, banks with high ROE is normally viewed as profitable and promising by shareholders.

ROE=Net Income/Shareholder's Equity

NPM (Net Profit Margin) measures the efficiency of translating revenue into profit, which indicates bank's management ability of cost control, higher NPM is viewed as a favorable signal for good capability of cost management of banks.

Net Profit Margin=Net Profit/ Revenue

Another ratio for measuring profitability is NIM, which measures how much net interest earnings gained from bank's business operations, it was calculated as the interest income minus expenses, then divided by average interest- bearing assets.

Higher NIM represents higher profitability of bank operations.

NIM = Interest Income-Expenses / average interest-bearing assets

While profitability is the most concerned consideration of financial managers, the importance of profitability varies depends on the role of stakeholders. The depositors would take stability of deposits as priority, while shareholders would view profitability as the most important indicator, and debt holders may consider in-time repayment of financial obligation at first.

2.1.2. Concept of Liquidity

This thesis discusses the impact of liquidity on bank profitability. As we mentioned before, liquidity is significantly important for the sustainable work of banks. Researchers have given different definition about liquidity. Shim et Siegel define Accounting liquidity as "company's capacity to liquidate maturing short-term debt (within 1 year)" (Shim et Siegel, 2000, p. 46-47). Maness & Zietlow (2005, p. 31) summarizes 3 components to define liquidity, which is amount, time and cost. Amount means how many resources the company has to fulfil its financial obligations; time means how long the company takes to transfer assets into cash; cost means if the company can transfer assets into cash without much costs. While Campbell et al., defines liquidity as "the ability of a firm to augment its future cash flows to cover any unforeseen needs or to take advantage of any unexpected opportunities" (cited by Maness & Zietlow 2005, p. 32). For bank industry, liquidity is defined as "the capability to secure the necessary funding through attracting deposits, cash, or pledging encumbered assets" (Aldo, 2015, p. 3). Crockett (2008), indicates liquidity is much easier to be recognized than be

defined, and the researcher also summarizes 3 concepts of understanding liquidity. Financial Instrument liquidity refers to the availability of change them into cash without value loss. Market liquidity refers to the capability to trade certain securities or assets without influencing their price. The third concept of liquidity deals with monetary liquidity concerned with quantity of fully liquid assets in the financial world. Compared to liquidity, there is a relevant concept called solvency, which measures the extent of how much companies' assets excess its liabilities, ratios like current ratios, quick ratios and the concept called net working capital which measure solvency are also used to measure liquidity. (Maness & Zietlow, 2005, p. 25). It's vital for companies to meet liquidity needs, the concept of liquidity is accompanied with one company's financial strength, which means the capability to finance for the investment activities. High liquidity tends to improve the efficiency of the financial operation and performance of financial management (Chandra, 2001, p. 72). While profitability influences the quality of the future development of one company, liquidity decides directly the survival and sustainability of this company, one company usually becomes default or go to bankruptcy due to lack of liquidity rather than lack of profitability. For commercial banks, Adalsteinsson (2014, p. 25) points out the liquidity can be achieved through 3 different ways, the first one is the sales of assets, the second way is to borrow money from creditors in financial markets, and the third way is relied on the repayment of debts from debtors

2.1.2.1. Importance of Liquidity

A bank and financial institution cannot be run with liquidity. The commercial banks and other financial institutions should keep the stock of liquid assets in the ratio of their deposit liability as fixed by the National Reserve Bureau (NRB). If commercial banks and financial institution maintain the stock of liquid properly as per the law and policy of the central bank then there

is no dispute that liquidity is the most important thing for a bank. The Commercial bank and financial institutions should maintain the balance of cash fund in required amount that the monetary policy fixes. The importance of liquidity is considered very sensitive because if it can't maintain the liquidity, it has to pay fine. So, they have to maintain certain amount determined by the NRB. People deposit their savings into bank to safeguard them, earn interest, and get back whenever they need liquidity is the life blood of bank, without which a bank cannot survive for long. Banking transactions are more dependent upon the mutual faith between bankers and customers. It is essential to maintain sufficient cash reserve in bank to maintain the customer faith. Banks and financial institution should maintain some liquidity to refund the deposit when account holders withdraw deposit. Hence, liquidity is the life blood of bank. Since importance of liquid assets are as follows:

- To run the daily operating expenses.
- To meet the customer demand of fund.
- Liquidity is necessary for the efficient and healthy competition among banks.
- To control the economic fluctuation.
- To gain trust from public and including other stakeholders.
- It is important to maintain statutory liquidity ratio in banks.
- It is essential for the payment of all sorts of deposits such as current, saving and fixed account of its customers.

2.1.2.2. Motive for Holding Liquidity by Commercial Bank

Liquidity generally related with cash and cash equivalent items and it is the most liquid and least productive current assets. Cash, if it remains idle, earns nothing but involves cost on terms

of interest payable to finance it. If cash is the least productive current assets, why should a firm hold the cash and keep in liquid form?

There are four motives for holding liquid assets:

1. **Transaction Motive**

The motive for holding liquidity is to satisfy ongoing operation of firm. It refers the need to hold liquid assets to satisfy normal disbursement collection activities associated with a firm's ongoing operation. In its ordinary course of action, a firm frequently involves in purchases and sales of goods or services. A firm should make payment of wages, salary, interest, commission, brokerage, rent, taxes, and insurance dividend and so on. Individual and business firms keep some amount in liquid form for daily expenditure and transaction. So, keeping some amount in ready cash (money) will help them in carrying out the daily transactions. Keynes has divided the demand form money in transaction motive into two parts. They are income motive and business motive (Subedi, 2015).

2. **Precautionary Motive**

Precautionary motive refers to holding cash as a safety margin to act as a financial reserve. A firm should also hold some cash for the payment of unpredictable or unanticipated events.

A firm may have to face emergencies such as strikes and luck- ups form employees increase in cost of raw material, funds and labor fall in market demand and so on. People desire to keep some ready money with them to solve the unforeseen incidents that may occur in the future. This type of demand for money is known as the demand for precautionary motive. People will be fully unaware of illness, accidents, etc. that may occur in the future (Subedi, 2015).

3. Speculative Motive

People desire to hold their resources in liquid form in order to take advantage of market movements regarding the future changes in the interest rate. So, this type of demand for money is known as the demand for money for speculative motive. It refers to the need to hold liquidity to take advantage of bargain purchases, attractive interest rates, and favorable exchange rate fluctuations. Speculative need for holding liquidity requires that a firm possibly may have some profitable opportunities to exploit which are out of the normal course of business. These opportunities a rise in conditions, when price of raw material is expected to decline and purchase of inventory occurs at reduced price on immediate cash payment (Subedi, 2015).

4. Compensating Balance

The firm should maintain the minimum cash balance with central bank for operating the daily operation of bank. The cash balance that a firm must have to maintain with a bank, to compensate that bank for services rendered or for granting a loan. Firm often maintains bank balance in excess of transaction needs as means of compensating for the various services. Bank provides various services to the firm like payment of check, and information of credit, loan etc. (Subedi, 2015)

2.1.2.3. Liquidity risk

As we mentioned, liquidity plays crucial roles in the stability of financial systems, lack of liquidity may cause bank's default in fulfilling its financial obligations in normal conditions. More seriously, when it comes to unexpected emergency situation like financial crisis or economic shock, liquidity problems may result the bankruptcy of banks and the instability of whole financial system, 2008 global financial crisis proved that the risk of lack of liquidity.

For commercial banks, liquidity risk means the incapability of meeting payment needs by using cash or cash equivalent instruments. Another definition of liquidity risk is from market point of view which is "the failure of offsetting or unwinding one position without affecting its price". (Aldo, 2015, p.5)

For banks, the liquidity risk doesn't exist solely but are interconnected with several risk factors. Aldo (2015) points out credit risk, reputation risk, market risk and concentration all have certain influence on the generation of liquidity risk (Aldo, 2015, p. 7). For example, reputation risk tends to increase the funding cost and trigger liquidity risk of banks accordingly. For the source of liquidity risk, Adalsteinsson (2014, p. 43) points out all liquidity risks come from 3 main resources, the first one is systematic source which produces external avoid less liquidity risks, market disruption is an example of this source; Another is called individual source, which generates liquidity risk due to bank specific factors, like bank reputation damage and bank loss; the third source is called technical source (timing source), which generates liquidity risk due to time mismatching of liquidity assets inflow and outflow.

2.1.2.4. Liquidity regulation

Liquidity plays a significant role in the sustainable development of banks and the stability of financial system, strict liquidity regulations are supposed to be put forward to guard against problems due to lack of liquidity, Rochet (2008) indicates 2 reasons for liquidity regulation, from micro point of view, liquidity regulations prevent bank's bankruptcy and damage of depositors' interest by regulating liquidity buffer of banks; from macro point of view, liquidity regulation help maintenance of financial system stability. The 2008 global financial crisis reminded financial institutions of the threat of liquidity risk on financial systems. This prompted the BCBS (Basel Committee on Banking Supervision) to reach a consensus on the

main items of Basel Accord III; compared with previous Basel Accords (1998 and 2004) which mainly focus on capital management, Basel III took liquidity regulation into consideration and put forward global rules for liquidity regulation, which aims to improve bank's ability against financial crisis and other unexpected economic shocks.

BCBS	• Sep 2008 Principles for Sound Liquidity Risk Management and Supervision. • May 2009 Principles for Sound Stress Testing Practices and Supervision. • Dec 2010 Basel III: A Global Regulatory Framework for more Resilient Banks and Banking Systems, and Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring. • January 2013 Basel III: The Liquidity Coverage Ratio and Liquidity Monitoring Tools.
CEBS	December 2009 Guidelines on Liquidity Buffers & Survival Periods.
SFA	October 2009 Strengthening liquidity standard PS
CBI	October 2011 Review of the requirements for the management of liquidity risk

Source: Adalsteinsson, The Liquidity Management Guide: From Policy to Pitfalls (2014, p. 175)

Basel III focused on liquidity by introducing liquidity coverage ratio (LCR) and net stable funding ratio (NSFR), and the principles for liquidity risk management and supervision. LCR (Liquidity Coverage Ratio) was put forward to enforce banks have more HQLA (high quality

liquidity assets) in case of extreme situations. The formula of calculating LCR is high quality assets divided by 30 days net cash outflows, and it is required that banks need to have LCR above 100%, or else its exposure of liquidity risk is high, to address this the bank needs to increase its HQLA (Basel Accord 3, 2010). LCR = (High Quality Asset) / (30 days net cash outflows) NSFR (Net Stable Funding Ratio) measures the bank's ability to get access to stable funding, this ratio comes out to make sure banks have available stable funding within 1- year period. It can be calculated as available stable funding divided by required stable funding, normally banks with NSFR above 1 is seen as standard. NSFR = (Available Stable Funding) / (Required Stable Funding)

Basel III regulations and their possible impact on banks

Apart from the maturity mismatch noted above, several researchers have pointed that liquidity risk can arise due to recessionary economic conditions (Arif & Nauman Anees, 2012). Downsizing in the economy may create a possible "bank run" in which depositors rush to withdraw their funds because they believe that a bank failure is possible. Furthermore, sudden withdrawals may force the bank to liquidate its assets at a loss, leading eventually to bankruptcy (Diamond & Dybvig, 1983). Heavy reliance of banks on short-term borrowings to finance long-term loans accompanied by a "bank run" were witnessed during the financial crisis of 2007-2009 (Hartlage, 2012). Shortcomings in the funding and liquidity management at financial institutions motivated the creation of new rules under the Basel III regulatory framework for banks (BIS, 2010; Acharya, et al., 2011). Specifically, they cover additional capital, liquidity and debt requirements compared with Basel I and II (BIS, 2010). Furthermore, due to some inefficiencies concerning banking regulation during the 2007-2009 financial crisis, Basel III also addresses issues regarding business cycles and systematic risk.

In particular, banks are required to maintain capital buffers during economic growth cycles to cover potential losses which arise from periods of economic distress (BIS, 2010). Since the introduction of new capital and liquidity restrictions, a few studies which attempt to analyse the impact of the Basel III rules on banks have appeared, with mixed results being reported by scholars (Berger & Bouwman, 2009; Allen et al., 2012; Dietrich et al., 2014; Roulet, 2018). While the purpose of introducing the Basel III rules was to enhance more efficient and stable capital and liquidity structures in banking, these rules may potentially lead to the emergence of new problems. Härle et al. (2010) foresee that banks will have to increase their base of stable funding via optimised deposit gathering, secured funding instruments and stronger investor coverage to help them place long-term unsecured debt. On the asset side, the definition of eligible liquid assets is likely to mean that banking liquidity will be heavily concentrated in government securities and other liabilities of the public sector, such as deposits in the central banks. Liquidity in the government securities market could deteriorate rapidly due to inelastic demand from banks locking up eligible liquid assets in the banks' portfolios (Allen et al., 2012). If a certain government nevertheless were to default, then its securities would suddenly become ineligible liquid assets on banks' balance sheets. Hempel and Simonson (1999) established that one of the most significant external risks that banks face is legislative risk, which refers to the risk of changes in laws that affect the operations of banks. Complying with Basel III new standards could also have negative impacts on bank performance such as reduced profitability and a squeeze on lending margins; implications of the introduction of Basel III framework undoubtedly warrant further exploration.

2.1.2.5. Liquidity management models

This part discusses on different management models

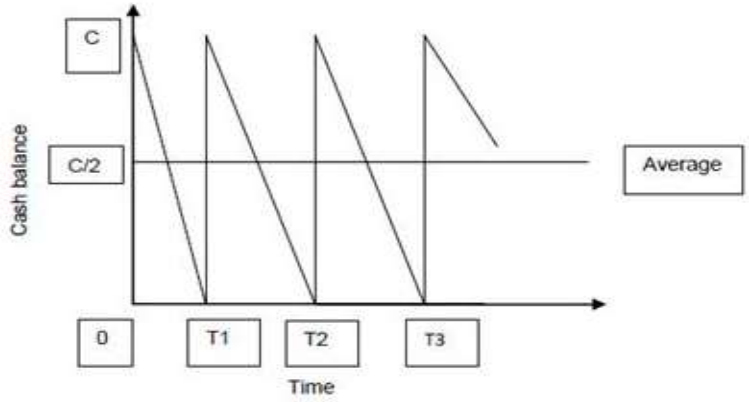
2.1.2.5.1. Baumol model

The Baumol model helps in determining the minimum amount of cash that a manager can obtain by converting securities into cash. Baumol model is an approach to establish a firm's optimum cash balance under certainty. As such, firms attempt to minimize the sum of the cost of holding cash and the cost of converting marketable securities to cash. Baumol model of cash management trades off between opportunity cost or carrying cost or holding cost and the transaction cost.

The Baumol model is based on the following assumptions:

- The firm is able to forecast its cash requirements in an accurate way.
- The firm's payouts are uniform over a period of time.
- The opportunity cost of holding cash is known and does not change with time.
- The firm will incur the same transaction cost for all conversions of securities into cash.

Cash balances are refilled and brought back to normal levels by the sale of securities. The average cash balance is C/2. The firm buys securities as and when it has above-normal cash balances. This pattern is explained in figure below.



2.1.2.5.2. Miller-Orr Model

Miller-Orr's model was proposed in 1966, and it is based on the proposition that cash flow is stochastic. It means that different cash amounts are paid at different times. The Millers-Orr model signifies random payments of cash within a business entity.

The cash management model emphasizes that any amount of cash inflows and outflows should result in a predetermined balance of normal points. If the outer or inner limits of cash are exploited by a transaction, it should be adjusted back.

Management chooses the lower limit whereas, the upper limits are calculated by the formula. The working of Miller-Orr model goes in the following way:

- The cash movement should remain within the upper and lower limit and most favorably at the normal point. When the cash balance increases and touches the upper limit, market securities are bought to reach the new balance. The amount spent for buying securities is a difference of the upper limit and the cash balance.
- When the cash balance reaches a lower limit point, the management sells securities to raise cash levels to the normal point.
- The new cash balance in both scenarios is represented by z.

h = upper limit representing the maximum point to the extent a company can hold cash

o =lower limit representing minimum cash requirement that a company should hold at a given point in time

z = normal balance or return point for cash

The Miller-Orr model works on the basic assumption that cash movements do not work on defined patterns but move randomly.

2.1.2.6. Determinants of commercial banks liquidity

The liquidity of a bank depends on the both internal and external factors as well, for example, the level of development of market relations in different segments of the economy, the activities of the Central Bank. Also, the rational allocation of resources in terms of profitability has a positive impact on the financial stability of banks, in particular on liquidity. While, the low quality of loans issued by banks, the increase in the volume of problem loans have been impacting on bank liquidity negatively. Tojiev Rakhmatilla (2021)

Sheefeni and Nyambe (2015) Investigated on macroeconomic determinants of commercial banks liquidity in Namibia. The result shows real GDP is the main determinants of commercial banks liquidity. And monetary policy rate is positively related to bank even though statistically insignificant. In other side, inflation and commercial banks liquidity has negative relationship in this study.

Diep and Nguyen conducted on determinants of liquidity of commercial banks in Vietnam in the period 2000-2016. The study concluded that three determinant of commercial bank liquidity in this period. Those are: size of bank (positively affect), ratio of total loans to total deposits and capital to asset proportion are negative and significantly affect the liquidity.

josephat and Justus assessment on determinants of liquidity on Tanzanian banks result shows that capital adequacy, bank size, and interest rate margin had a negative and statistically significant effect on liquidity. Other hand revealed that, non-performing loans and inflation had positive and significant effect on liquidity. However, profitability and GDP growth rate had insignificant effect on bank liquidity.

Shah investigates factor affecting liquidity of banks operating in Pakistan [8]. They concluded that internal factor that affect liquidity capital adequacy, cost of fund, and bank size are

statistically significant and negatively related to liquid asset to total asset ratio. From macro-economic factor GDP and unemployment are statistically and negatively affect banks liquidity. In addition, their finding shows the relationship between deposits and bank liquidity is negative and statistically significant.

Abdu investigated on firms-specific and macroeconomic determinants of banks liquidity on Ethiopian private banks. His findings shows that bank specific factor like size of bank, loan growth, and deposit are determinant of the bank liquidity. And macroeconomic determinants like interest rate margin, national banks bill purchase, GDP and annual inflation have significant factor influence on bank liquidity. Norazwa study show that bank capitalization and interest rate are significant determinant of liquidity.

El-Chaarani conducted on determinants of bank liquidity in the Middle East Region by using 183 banks from eight countries for the period of three years (2014-2016). Its study revealed that economic growth, asset quality, capital level, and bank size are significant determinants of bank liquidity. He concluded that Lebanese banks have highest level of liquidity whereas Omani banks have lowest level of liquidity.

Gjorgij and Goran investigated on determinants of liquidity and its relationship with profitability in case of Macedonian banking sector. The study includes important and potential factor banks internally related like lagged value of liquidity, bank profitability, size of banks, capital adequacy, and non-performing loan. While macroeconomic factors are GDP growth rate and Central bank reference interest rate. Their result shows that profitability, lagged value of liquidity, and central bank interest rate has positive effect on liquidity

Puja investigated on bank specific determinants of liquidity of public and private sector banks. The result shows determinants of liquidity for both public and private banks are varying. Public

sector banks increase in their size, increase the amount of liquid asset adequately to manage liquidity risk. But, private banks rely more on financial market with their increase size holds less liquidity

Zelalem investigated on determinants of bank liquidity and its impact on bank Profitability in Ethiopia findings shows that bank profitability, foreign exchange availability, and real GDP growth have positive significant effect on bank liquidity but net loan and advance has an undesirable significant effect on bank liquidity

Tojiev investigated on factors affecting the liquidity of commercial banks. His findings revealed level of development of market relation in different segments of the economy, activities of central bank, and rational allocation of resources in terms of profitability has a positive impact on liquidity. However, low quality of loan issued, increase in the volume of loan had negative impact on liquidity.

Mekonnen investigation which is on firm-specific and macroeconomic determinants of commercial banks liquidity in Ethiopia revealed that lagged value of liquidity and deposit has a positive and statistically significant effect. On other side capital adequacy, bank size, interest rate margin, and GDP have a negative and statistically significant effect on commercial bank's liquidity.

Donjeta and Albert investigated on factors that affecting bank liquidity in Kosovo They concluded that non-performing loan, capital adequacy, and credit interest rate are grand and important factors on the liquidity banking position

According to the reviewed article so many determinant factors of commercial banks liquidity. Basically, these factors categorized as firm/ bank specific factor and macroeconomic factor. The bank related and important factor which is depicted by different author are: asset quality,

capitalization ratio, bank size, lagged value of liquidity, bank profitability, non-performing loan, capital adequacy, credit interest rate, loan growth, low quality of loan issued, capital level, increase volume of loan and interest rate margin. The second determinant factor which is macroeconomic are according to various author's findings the following. Those are: interest rate margin, national bill purchase, gross domestic product (GDP), inflation, Foreign exchange availability, unemployment, activities of national bank, real GDP, level of development of market relation, and rational allocation of resource.

2.1.2.7. Measurement of liquidity

Shim et Siege (2014) define accounting liquidity as "company's capacity to liquidate maturing short-term debt (within 1 year)" (Shim et Siegel, 2000, p. 46-47). Maness & Zietlow (2005) summarizes 3 components to define liquidity, which is amount, time and cost. Amount means how many resources the company has to fulfil its financial obligations; time means how long the company takes to transfer assets into cash; cost means if the company can transfer assets into cash without much costs. While Campbell et al., defines liquidity as "the ability of a firm to augment its future cash flows to cover any unforeseen needs or to take advantage of any unexpected opportunities" (cited by Maness & Zietlow 2005). For bank industry, liquidity is defined as "the capability to secure the necessary funding through attracting deposits, cash, or pledging encumbered assets" (Aldo, 2015).

Crockett (2008) indicates liquidity is much easier to be recognized than be defined, and the researcher also summarizes 3 concepts of understanding liquidity. Financial Instrument liquidity refers to the availability of change them into cash without value loss. Market liquidity refers to the capability to trade certain securities or assets without influencing their

price. The third concept of liquidity deals with monetary liquidity concerned with quantity of fully liquid assetsin the financial world.

Compared to liquidity, there is a relevant concept called solvency, which measures the extent of how much companies' assets excess its liabilities, ratios like current ratios, quick ratios and the concept called net working capital which measure solvency are also used to measure liquidity. (Maness & Zietlow, 2005)

It's vital for companies to meet liquidity needs, the concept of liquidity is accompanied with one company's financial strength, which means the capability to finance for the investment activities. High liquidity tends to improve the efficiency of the financial operation and performance of financial management (Chandra, 2001). While profitability influences the quality of the future development of one company, liquidity decides directly the survival and sustainability of this company, one company usually becomes default or go to bankruptcy due to lack of liquidity rather than lack of profitability.

For commercial banks, Adalsteinsson (2014) points out the liquidity can be achieved through 3 different ways, the first one is the sales of assets, the second way is to borrow money from creditors in financial markets, and the third way is relied on the repayment of debts from debtors.

2.1.3. Current ratio

According to Wikipedia, the current ratio measures a company's liquidity. In many cases, the acceptable power level will vary from industry to industry. Creditors will prefer a high quick ratio to a low quick ratio. This is because a high quick ratio indicates that the company is likelyto repay the creditor. High electricity prices are not always a positive indicator for

investors. If your company's working capital ratio is too high, it may indicate that you are not making the most of your working capital or short-term funding arrangements.

$$\text{Current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

2.1.4. Advanced loans to deposit ratio

According to sputulsian .com, Credit-to deposits ratio, is a ratio that indicates how much a bank lends out of the deposits it has mobilized. A very low ratio indicates that banks are not making use of the full of the resources. Alternatively, the high ratio indicates more reliance on deposits for lending and likely pressure on the resources.

2.1.5. Cash to deposits ratio

According to Alasthi (2014), the quick ratio of a bank is equal to (total cash in hands) / (total assets). Banks need to remain liquid in order to function and have a certain amount of cash on hand to accommodate net withdrawals from customers.

2.1.6. Deposit to assets ratio

Helms (2006), defines the ratio of deposits to assets as the amount of assets supported by public deposits. He further stated that the deposit-to-asset ratio determines whether banks with high deposits bear more operating costs to attract deposits.

2.2. Theoretical review

This part discusses different theories related on liquidity management in banking sector

2.2.1. Anticipated Income Theory

The Anticipated Income theory - The Anticipated Income theory holds that liquidity can be guaranteed whenever secured advance instalments are made on future salary of the borrower. This hypothesis relates advance reimbursement to pay than depend on guarantee. This theory

additionally holds that a banks liability can be impacted by the development example of advances and speculation portfolios. The hypothesis perceived that specific sort of credits have more liquidity than others. Based on this theory, bank executives received stepping stool impact in the venture portfolio. Banks guaranteed a specific measure of protections developing every year and on occasion when assets may be requested for loaning or withdrawal. Anyway, there was no sign about the future pay of the borrower. The huge currency markets began the training which later spread all through U.S. The underlying foundations of the theory can be followed to the restoration of federal fund markets in the 1980's and improvement of negotiable time deposits as a significant currency advertise instrument. Banks in U.S depend for liquidity on government finances advertise, Euro dollar market or offer of advance participation certificates. Such obtaining came to be called to be known as liquidity management. This theory was proposed by H.V. Prochanow in 1944 based on the act of expanding term credits by the US commercial banks. This theory expresses that independent of the nature and highlight of a borrower's the same old thing, the bank designs the liquidation of the term-credit from the expected normal income of the borrower. A term-credit is for a period exceeding one year and reaching out to a period of less than five years.

It is admitted against the hypothecation (vow as security) of hardware, stock and even immovable property. The bank puts confinements on the money related exercises of the borrower while loaning this credit. While loaning an advance, the bank considers security alongside the foreseen profit of the borrower. So, a credit by the bank gets reimbursed by the future profit of the borrower in portions, rather giving a singular amount at the maturity of the loan.

Using the anticipated income theory, these loans are typically paid off by the borrower in a series of instalments. Viewed in this way, the bank's loan portfolio provides the bank with continuous flow of funds that adds to the bank's liquidity. Moreover, even though the loans are long term, in a liquidity crisis the bank can sell the loans to obtain needed cash in secondary markets. The anticipated income theory was developed by H.V. Prochanow in 1944 on the basis of the practice of extending term loans by the US commercial banks. According to this theory, regardless of the nature and character of a borrower's business, the bank plans the liquidation of the term-loan from the anticipated income of the borrower. A term-loan is for a period exceeding one year and extending to less than five years.

It is granted against the hypothecation of machinery, stock and even immovable property. The bank puts restrictions on the financial activities of the borrower while granting this loan. At the time of granting a loan, the bank takes into consideration not only the security but the anticipated earnings of the borrower.

The Anticipated Income theory holds that liquidity can be ensured if scheduled loan payments are made on future income of the borrower This theory relates loan repayment to income than rely on collateral. This theory also holds that a banks liability can be influenced by the maturity pattern of loans and investment portfolios. The theory recognized that certain types of loans have more liquidity than others. On the basis of this theory, bank management adopted ladder effect in the investment portfolio. Banks ensured a certain amount of securities maturing annually and at times when funds might be demanded for lending or withdrawal. However, there was no clue about the future income of the borrower.

Thus, a loan by the bank gets repaid out of the future income of the borrower in instalments, instead of in a lump sum at the maturity of the loan.

Advantages of the Anticipated Income theory

This hypothesis commands the business credit theory and the shiftability hypothesis as it fulfils the three significant destinations of liquidity, security and productivity. Liquidity is settled to the bank when the borrower spares and reimburses the credit normally after certain timeframe in portions. It satisfies the wellbeing guideline as the bank allows a relying on good security as well as the ability of the borrower to repay the loan. The bank can utilize its excess reserves in loaning term-advance and is persuaded of a normal pay. In conclusion, the term-advance is exceptionally beneficial for the business network which gathers assets for medium-terms

This theory fulfils the three objectives of liquidity, safety and profitability.

1. Liquidity is assured to the bank when the borrower saves and repays the loan regularly in instalments.

2. It satisfies the safety principle because the bank grants a loan not only on the basis of a good security but also on the ability of the borrower to repay the loan.

3. The bank can utilize its excess reserves in granting term-loan and is assured of a regular income. Lastly, the term-loan is highly beneficial for the business community which gets funds for medium-terms.

Disadvantages of the Anticipated Income theory

The theory of foreseen pay isn't liberated from demerits. This hypothesis is a technique to analyze a borrower's reliability. It gives the bank conditions for looking at the capability of a borrower to well reimburse a credit on schedule. It likewise neglects to meet crisis money prerequisites.

1. Analyses Creditworthiness:

It is not a theory but simply a method to analyze a borrower's creditworthiness. It gives the bank criteria for evaluating the potential of a borrower to successfully repay a loan on time.

2. Fails to Meet Emergency Cash Needs:

Repayment of loans in instalments to the bank no doubt provides a regular stream of liquidity, but they fail to meet emergency cash needs of the lender bank.

2.2.2. Shiftability theory

The Shiftability theory, liquidity replaced the commercial loan theory and was supplemented by the doctrine of anticipated income. Formally developed by Harold G, Moulton in 1915, the Shiftability theory held that banks could most effectively protect themselves against massive deposit withdrawals by holding, as a form of liquidity reserve, credit instruments for which there existed a ready secondary market. Included in this liquidity reserve were commercial paper, prime bankers' acceptances and most importantly as it turned out, treasury bills. Under normal conditions all these instruments met the tests of marketability and because of their short terms to maturity, capital certainty.

A major defect in the Shiftability theory was discovered similar to the one that led to the abandonment of the commercial loan theory of credit, namely that in times of general crisis the effectiveness of secondary reserve assets as a source of liquidity vanishes for lack of a market (Casu et al, 2016). The role of the central bank as lender of last resort gained new prominence, and ultimately liquidity was perceived to rest outside the banking system. Furthermore, the soundness of the banking system came to be identified more closely with the state of health of the rest of the economy, since business conditions had a direct influence on the cash flows, and thus the re-payment capabilities of bank borrowers. The shiftability theory

survived these realizations under a modified form that included the idea of ultimate liquidity in bank loans resting with shiftability to the Federal Reserve Banks. Under this institutional scheme, the liquidity concerns of banks were partially returned to the loan portfolio, where maintenance of quality assets that could meet the test of intrinsic soundness was paramount (Allen and Gale, 2014).

2.3. Empirical Review

An empirical review can be described as the review of many aspects of an empirical study that hold some levels of significance to the study being conducted this study will assess the differentrelated that has been conducted with different researchers.

2.3.1. Current ratio and Profitability of commercial banks

Victor and Ehiedu (2014) The overall results of this study are (1) a significant positive correlation between current ratio and profitability, and (2) a clear significance between durability test ratio and profitability. It shows that there is no significant correlation. (3) Return on capital used has no significant positive relationship with profitability. According to the survey, corporateorganizations should not pursue excessive liquidity strategies at the expense of profitability, but should balance the two key performance indicators (liquidity and profitability).

Ali Sulieman (2014) investigated the impact of liquidity management on the profitability of Jordanian commercial banks from 2005 to 2012. Thirteen institutions representing the entire Jordanian commercial bank were selected. Liquidity indicators include investment ratio, quick ratio, capital ratio, net lending facility / total asset ratio, and liquidity ratio, and profitability indicators include return on equity (ROE) and return on total assets (ROA). The Augmented Dickey Fuller (ADF) stationary test model was used to test the unit roots in a time series of

study variables, followed by regression analysis to evaluate the hypothesis. Empirical evidence shows that faster ratios of available money and higher investment ratios lead to higher profitability.

Murekatete and Patrick Mulyungi (2018) found that the liquidity ratio (0.739) had the greatest impact on a bank's profitability, followed by the cash reserve ratio (0.48 8) and finally the loan ratio (0.166). I did. This suggests that implementing either variable will improve the profitability of the bank. The Pearson correlation value was 0.969. This is noteworthy and proves a very strong and positive correlation between liquidity management strategies and profitability.The results show that banks need to effectively manage the supply and demand of liquidity in order toincrease profitability and productivity.

Nyaga (2014) used data from 2001 to 2010 to investigate the impact of liquidity on the profitability of Ukrainian companies. The results of the regression analysis show that the current situation has a positive and significant impact on profitability.

Rasul (2013) assessed the impact of liquidity on Islamic banks' profitability from 2001 to 2011. Five Islamic banks in Bangladesh were used for the sample size. He found that bank funds and liabilities to total assets had little impact on ROA. Ajanthan (2013) studied the relationship between PF liquidity and profitability of Sri Lankan trading companies. From 2008 to 2012, the survey focused on eight public companies. Regression and correlation analysis were used and the results show that there is a significant relationship between the liquidity and profitability of listedtrading companies in Sri Lanka. Based on the results of the study, investigators concluded that liquidity management affected the profitability of Jordanian commercial banks when assessed using ROE or ROA.

2.3.2. Advanced loans to deposits and profitability of commercial banks

According to Jaya jukkla (2017), her research topic was entitled "The Impact of Deposit Management on the Profitability of Commercial Banks in Rwanda." Studies show that if liquidity decisions, cash management, non-core investments, and loan repayments are all set to zero, the financial performance will be 0.347. A 1 unit increase in liquidity decisions will increase the financial performance by 0.162, a 1 unit increase in liquidity will increase the financial performance by 0.282, and a 1 unit increase in non-core investment will increase the financial performance by 1. It is 0.194, and increasing the loan repayment by 1 unit will increase the financial performance by 0.211.

Valverde & Fernandez (2007) researches the determinants of bank profitability in Europe, the positive impact of LDR (loan to deposits ratio) on bank profit supports the theory that liquidity positively influences profitability. Dietrich & Wanzenried. (2011), chose 372 commercial banks in Switzerland from the period 1999 to 2009 to investigate the determinants of bank profitability, the findings of positive relationship between loan rate and NIM suggests the positive relationship between liquidity and profitability. Neto (2003), indicates the disadvantage of holding liquidity on the profitability, compared with fixed assets, the current assets are proved to be less profitable, over focus on the holding of liquidity may cause the accumulation of idle resources, incapability of maximizing investment returns and inefficiency of financial management.

This statement can be supported by a series of researches. Smith and Begemann（1997), discusses the negative relationship between liquidity and profitability by choosing industry firms listed in JSE (Johannesburg Stock Exchange), liquidity is represented by ratios concerned with working capital and profitability is measured by ROI (Return on Assets).

Lyroudi et al. (1999) chose companies listed in LSE (London Stock Exchange) from 1993 to 1997 to analyse the relationship between liquidity and profitability, liquidity is measured by Current Ratio, Cash conversion Cycle and Liquidity Ratio, and profitability is measured by ROA, ROE and NPM. The research shows a negative relationship between liquidity and profitability. This research is in line with the research conducted by Eljelly (2004), who studies the same issue by choosing Saudi Arabia's companies from 1996 to 2000, similar to Lyroudi et al (1999), the researcher uses CCC and CR to measure liquidity, finds out the negative relationship between liquidity and profitability. Garcia-Teruel and Martinez-Solano (2007) chooses both small and medium size companies of Spain to investigate the impact of working capital on profitability and finds out the negative relationship between them. Similar research conducted by Uyar (2009) also support the negative relationship between the 2 factors. Other research conducted by Marques and Braga (1995) and Blatt (2001) also shows the inverse correlation between liquidity and profitability.

Vintila (2016) focused on the relationship between market's liquidity and the real economy, and also on the effects that the banking system could generate, as the basis of the entire financial system. This study started from the assumption that liquidity and profitability are issues of significant impact on companies' stability and development. The analysis was conducted on companies listed on the Bucharest Stock Exchange. In order to observe the changes recorded before the crisis and the subsequent evolution, data were collected for a period of 10 years, from 2005 to 2014. In this paper, it did not focus on testing a certain model, but analyzed the correlations between the studied variables. In the first part of the study, a graphical analysis was conducted regarding the trend of current liquidity and leverage ratios. Also, the effective tax rate was analyzed in order to monitor the impact of tax pressure and

changes recorded during the financial crisis. The empirical study was conducted by econometric analysis, using multivariate regression models for unbalanced panel data. Financial performance was approached through accounting measures using return on assets and return on equity. Factors that could influence firm's performance were focused on liquidity and solvency indicators. The results confirmed the statistically significant relationship between the analyzed variables and revealed a negative correlation between liquidity and corporate financial performance.

Rasul (2013) analyses the relationship between liquidity and profitability by choosing 2 Islamic banks in Bangladesh during the period from 2001 to 2011. The ratio of calculating liquidity is CDTA (cash & due from banks to total assets), INVSTA (investment to total assets), CDDEP (cash & due from banks to total deposits), and INVSDEP (Investment to total deposits). The ratio to calculate profitability is ROE (Return on Equity), ROA (Return on Assets) and ROD (Return on Deposits). The research confirms the strong impact of liquidity on profitability. The ISEF (Indicator de Saúde Economico-Fianceira das Empresas) model which adapted by Marques et al. (2004) gives researchers assess to investigate liquidity, profitability and the relationship between them.

This study shows that liquidity risk management has a significant negative link to the financial performance of commercial banks. The study also suggests that storing more liquid assets than total assets will reduce the returns of commercial banks in Rwanda, but the impact is only 5%. Holding more liquid assets than total deposits will reduce the returns of Rwandan commercial banks, with a significant impact of 5%. Buhangu (2021) This study found that the use of prudent credit management practices in bank of Kigali has a strong positive link to bank performance.

2.3.3. Cash to deposits ratio and profitability

This section contains empirical studies on the impact of cash management on profitability. Through research in many countries, including the United Kingdom, India and the United States, researchers in Pakistan, Canada and other countries have obtained varying results. However, some of the most important major research papers will be discussed in the next discussion. Hakimi and Zaghdoudi (2017) studied the impact of liquidity on Nigerian banking performance from 2004 to 2012 using current generalized methods, and the results are the cash-to-deposit ratio and Nigeria's. It shows a positive relationship with the profitability of bank performance. They recommend increasing the liquidity of banks in order to improve their performance. In addition, liquidity, smoothing past performance, debt structure, and board size are important sources of revenue for banks.

In addition, Ismail (2016) used correlation and regression methods to analyze the impact of cash management on the profitability of 64 Pakistani non-financial companies from 2006 to 2011. Theresults of the study show that liquidity variables, current ratios, and cash conversion cycles havea significant positive impact on return on assets (ROA).

Agarwal (2012), Bhunia et al. It is quoted in. (2012) assessed the relationship between cash and profitability using current rapid indicators and concluded that additional liquidity would have a beneficial impact on a company's profitability. According to Niresh (2012: 35), "liquidity refers to the ability of a company to meet its short-term obligations." Liquidity is important to the effective operation of a company.

According to Akter and Mahmud, Malaysia's manufacturing liquidity and profitability are statistically significant and reasonably positive (2014). The correlation coefficient shows a fairly good relationship. The results show that liquid companies are making more money.

Akinleye andOgunleye (2019) also concluded that financial liquidity supports the financial efficiency of selected Nigerian manufacturers. In addition, the current ratio has a positive impact on the profitability of some Nigerian industrial companies.

Aliraza (2016) concluded that profitability plays very important role in every organization. In banking sector tells about how much we have earned against its expenses and how much we have to bear within a year or more than one year. And this research paper showed the impact of liquidity management on profitability. Liquidity means that easily convertible to cash in other words those assets which are can be converted into cash in short term period. And profitability means revenues more than its total expense is called profitability. And the banking sector of Pakistan is choosing as sector and country is Pakistan and there was a significant relationship between liquidity and profitability eight 8 banks financial reports were taken and 8 years data were taken from 2004 to 2015 for this research paper and the banks were selected bank of Punjab, allied bank, united bank, askari bank, alfalah bank, meezan bank, Jahangir saddiqui bank and Muslim commercial bank limited were selected. Pooled analysis was used to summarize the data of correlation and regression. There was a short time to collect data more than eight banks and 8 years data and further it is suggested that new researcher can take more than eight 8 banks and can take more than 8 years data from financial reports and also can take other formulas in profitability and liquidity like quick ratio, return on equity, return on investment and net profit margin as for further research and also can take other ratios as dependent and independent variable in different sectors.

Maqsood et al. (2016) explained that there is significant impact of liquidity on bank profitability in the banking sector. The data that is used in this is taken from financial statement of 8 different banks from 2004 to 2015. The regression and correlation technique were used in

this study. To look the liquidity, it used the current and cash ratio as independent variable and to measure the profitability uses the return on assets as dependent variable. It suggested using scientific tools and more variable to measure the impact of liquidity on profitability.

Nabeel and Hussain (2017) examined the effect of liquidity management on profitability in the banking sector of Pakistan. Liquidity management is independent and profitability is dependent variable. The secondary data used for this study and taking from publish annual report of ten banks (2006-2015). The data was analyzed by using correlation, descriptive statistics and regression techniques. The quick, current, cash, interest coverage and capital adequacy ratios were taken as dimension of liquidity and return on assets, return on equity, and earnings per share as dimension of profitability. The research findings showed that interest coverage, capital adequacy and quick ratio had a positive whereas the cash and current ratio had negative relationship with bank's profitability. The data was taken from annual reports of ten banks from 2006-2015. The results showed that most liquidity ratios had positive and some liquidity ratios had negative relationship with the bank's profitability. The findings of such study clarify that interest coverage ratio had positive and significant relationship with banks profitability when it analyzed with return on assets and return on equity. The capital adequacy ratio had positive and significant relationship with return on equity and earning per share. The quick ratio had positive relationship with profitability. The current ratio suggested the positive but insignificant relationship when look the relationship with return on assets. And current ratio suggested the negative and significant relationship with return on assets and negative and insignificant with earning per share. Therefore, the overall results explained that liquidity management has positive related with banks profitability.

2.3.4. Deposit to assets ratio and Profitability

According to the different studies, banks need to focus on holding high levels of deposits to improve performance. To make their performance smooth, they need to borrow a decent amount of debt. Khan and Ali (2016) investigated the relationship between profitability and liquidity in Pakistan's commercial banking environment from 2008 to 2014, using secondary data extracted from annual reports over the last five years. did. After one hell of statistical research, it was shown that there is a significant positive relationship between deposit-to-asset ratios and bank profitability. The results suggest that banks have a significant amount of liquid funds to increase their profits.

In addition, Maqsoodetal. (2016) used data from 2004 to 2015 to investigate the impact of deposit management on the profitability of Pakistan's banking sector. The results of the survey show that there is an important link between liquidity and profitability.

Bassey and Moses (2015) examine the relationship between profitability and liquidity of Nigerian banks from 2010 to 2012. This study used the usual least squares approach and showed that there was a substantive relationship between liquidity indicators.

From 2015 to 2012, Alashatti (2015) focused on the impact of liquidity on the profitability of Jordanian commercial banks. Using a sample of 13 banks, researchers found that the ratio of speed to investment had a positive effect on profitability, and the ratio of capital to liquidity hada negative impact on the profitability of Jordanian banks. Did. As a result, investigators suggest adesire to harness the liquidity of banks. Many aspects of investing are to increase the profitabilityof banks and harness the time value of their money. Banks need to take a systematic approach to identify the strengths and weaknesses of liquidity and to consider only the swift circumstances that banks can see.

According to Mushtaq et al. (2015), the study focused on the trade-offs between liquidity and profitability in the five Pakistani sectors. Quantitative research was used as part of the research. Correlation analysis and panel regression analysis were used in this study. The result of the panelregression is analyzed. This result suggests that there is a positive relationship between a company's liquidity and profitability. Ehiedv (2014) investigated the relationship between liquidity and profitability. In this study, we used a quantitative approach. Probability-free sampling and simple correlation tests were used to evaluate the hypothesis. The results show thatthere is a significant positive association between the current ratio and profitability, but there is no significant association between the pace ratio and profitability.

Similarly, Bareikaite and Martinkut-Kaulien (2014) investigated the liquidity risk and favorable liquidity positions of Lithuanian banks and the impact of liquidity on the profitability of the Lithuanian banking sector.

In addition, Ibe (2013) investigated the relationship between liquidity and profitability in Nigerian banks. Regression was used in the study and three banks were randomly selected as the sample size. The results show that liquidity is an important concern of Nigeria's banking system. Niresh (2012) investigated the relationship between liquidity and profitability of 31 listed manufacturing companies in Sri Lanka. They studied from 2007 to 2011 using descriptive statistics and correlation. The results show that there is no significant relationship between the liquidity and profitability of Sri Lankan listed companies. Siame (2012) conducted a survey on the impact of liquidity on the profitability of South African listed companies from 2000 to 2009. This result suggests that there is a negative correlation between liquidity and good liquidity management, which can increase shareholder income.

Vodova (2011) examines the liquidity determinants of Hungarian commercial banks from 2001 to 2010. The regression results of the panel data show that the liquidity of the bank is the capital ratio of the bank, the profit margin of the loan of the bank, the size of the bank, the interest rate margin, the monetary policy interest rate and the interest rate of the interbank exchange. Arif andAnees (2012) examines the liquidity effects and benefits of the banking system of 22 Pakistani banks from 2004 to 2009. The results of the multiple regression show that liquidity has a significant impact on bank productivity.

Akhtar et al. (2011) conducted a study on the management of liquidity effects in traditional and Islamic banks in Pakistan. In this study, secondary data were used to find positive but negligible associations. In addition, Chenetal. (2009) evaluated the relationship between bank performance, liquidity and influence of 12 commercial banks in developed financial countries from 1994 to 2006. According to research, liquidity is an endogenous determinant of a bank's success and is measured by net margin, return on assets, and return on equity.

In addition, Haron and Azmi (2004) conducted a survey of Islamic bank output variables in several countries and found that aspects of liquidity risk have a significant impact on bank output. Studies show that liquidity gaps and the provision of non-performing loans negatively impact profitability. Some scholars have attempted to study the impact of liquidity on the profitability of commercial banks in different countries. The results of previous studies vary. In the banking industry, there is a trade-off between liquidity and profitability.

According to Daviri et al. Much research has been done on this subject over the years. (2017). Appropriate liquidity is defined as the ability of a financial institution to fulfill its creditor's obligations (in the short term). Profitability is defined as the ability of a company to generate profits. To maintain liquidity, you need to keep it at a balanced level. The rate of return affects

the profitability of a company. All businesses strive to maximize profitability. So, the important answer is that every organization needs to be profitable**.**

In contrast, Niresh (2012) conducted a survey based on five-year data from 31 Sri Lankan manufacturers from 2007 to 2011. According to the results of a survey using correlation analysis and descriptive statistics, there is no relationship between the profitability and liquidity of listed manufacturers in Sri Lanka.

Mwizarubi et al. (2015) when an econometric analysis was performed and all elements of Tanzania's banking system were included, no significant relationship was found between bank profitability and liquidity. In another context, Ali and Jameel (2019) investigated the role of liquidity management in the profitability of selected Iraqi banks, and the findings show a slight negative relationship between liquidity and profitability. It shows that there is, and suggests that an increase in the liquidity ratio leads to a consequent decrease. Measuring profitability using both ROA and ROE improves profitability.

Adebayo et al. (2011) conducted an empirical study to find out how commercial banks can improve liquidity and profitability and to what extent good liquidity management affects profitability. Cash management has become an important factor in the success of any business organization. An organization cannot survive without liquidity, as evidenced by its views on liquidity management requirements that are relevant to the financial performance of the Bank of Kigali. The relationship is important ($p = 0.225$, p0.5; $p = 0.000$). From multiple regression analysis. The study showed that credit management tactics have a significant impact on financial performance. This is supported by the high mean and standard deviation of the uniformity of the variables, and the positive p-values obtained from the multiple regression analysis.

A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Stressing the importance of profitability, Dietrich and Wanzenried (2011) suggested applying this concept as a measure of how well a bank is run. At the same time, a bank with good assets quality, strong earnings and sufficient capital may yet fail if it is not maintaining adequate liquidity (Arif & Nauman Anees, 2012). The relationship between the roles of liquidity and profitability in banking business has been at the centre of a vast body of research. Nevertheless, little consensus has been reached so far and the empirical evidence is mixed. One group of scholars (Arif & Nauman Anees, 2012; Chen et al., 2018, Nguyen et al., 2017) suggests that increased liquidity holdings are negatively associated with financial development. This is because banks with high liquidity risk commonly lack stable and cheap funding, and therefore may be forced to borrow from the capital markets at a higher interest rate. A second group of researchers argues that higher liquidity risk (i.e. larger portion of illiquidity) has the opposite effect since liquid assets have lower returns compared to illiquid ones (Trujillo- Ponce, 2013). Indeed, several scholars point out that those liquidity holdings, imposed by the regulatory authorities, represent an opportunity cost to the banks (Molyneux & Thornton, 1992). Bordeleau and Graham (2010) have further suggested that liquid assets may have a nonlinear relationship with bank profitability. Scholars argue that it seems to be a tradeoff between short-term profitability gains of lower liquidity holdings and longer-term performance benefits of insurance against liquidity shocks. Ehiedu (2014) stresses the importance of balancing profit maximisation and sufficient liquidity holdings. Moreover, Olagunju et al. (2012) argue that both illiquidity and excess liquidity are fatal to the profits of any bank: pursuing high profitability without considering liquidity level can cause great illiquidity, which may in turn reduce the loyalty of

customers. On the other hand, unnecessarily excessive liquidity can reduce bank profitability. Literature focusing on bank liquidity also suggests that by reducing profits which normally act as a "buffer" against external and internal shocks, competition precludes the creation of bank liquidity by limiting the volumes of both the loans granted and the deposits accepted (Berger & Bouwman, 2009).

2.4. Conceptual framework

Conceptual framework is graphical representation of variables, which are being studied in research. It is important research tool planned to help the researcher to extend understanding of situation.

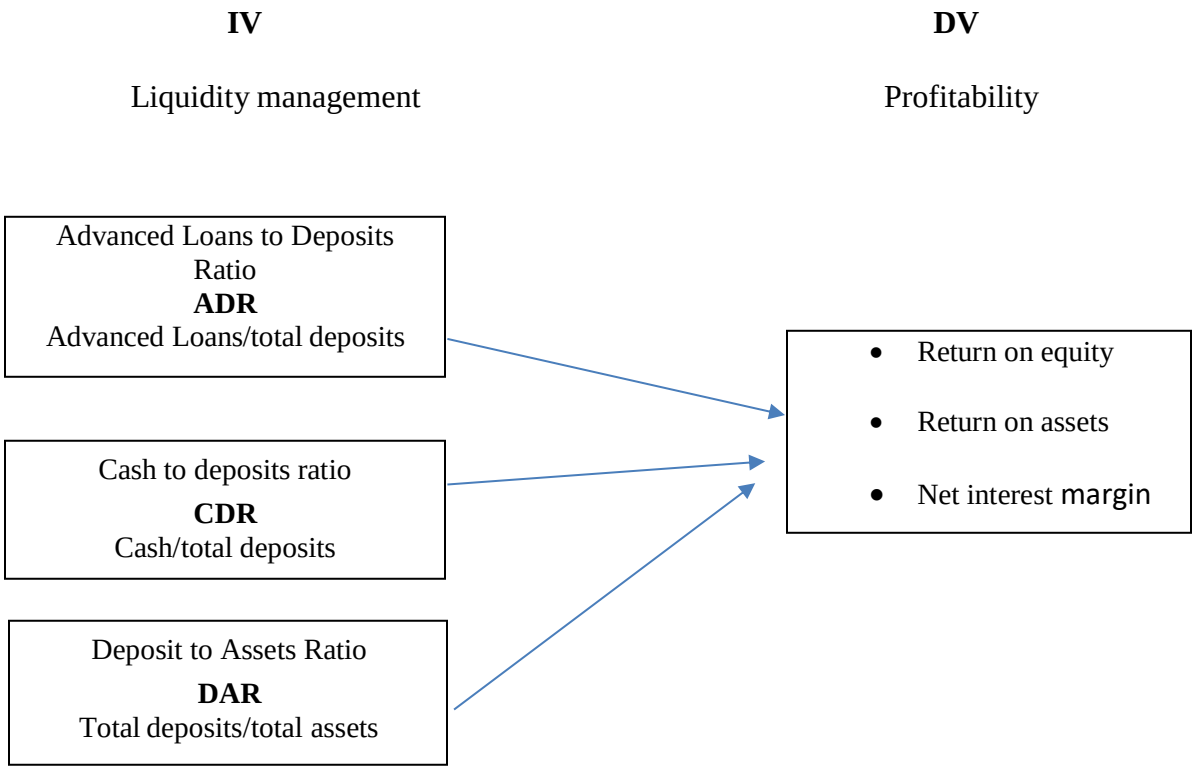


Figure 1: Conceptual framework

2.5.Research gap

The literature review shows that liquidity management is likely to expose a firm to great financial losses in a situation where the firm fails to take precautionary measures such as maintaining a proper match between assets and liabilities. Therefore, firms should balance between liquidity management through implementing proper financial management practices in investing and risk management. The empirical evidence has also demonstrated a direct relationship exists between liquidity management and financial performance. Hence, there is need for all financial institutions to practice prudent risks management to protect the interests of investors. Therefore, this study aimed establishing the effect of liquidity management on performance of banks in Rwanda.

According to Jaya jukkla (2017) in their research topic 'The impact of caption liquidity management on the profitability of Rwandan Commercial Banks' if liquidity decisions, cash management, non-core investments and loan repayments are all set to zero, the financial performance will be 0.347. A 1 unit increase in liquidity decisions will increase the financial performance by 0.162, a 1 unit increase in liquidity will increase the financial performance by 0.282, and a 1 unit increase in non-core investment will increase the financial performance by 1 and increasing the loan repayment by 1 unit will increase the financial performance by 0.211. This study shows that liquidity risk management has a significant negative link to the financial performance of commercial banks. The study also suggests that storing more liquid assets than total assets will reduce the returns of commercial banks in Rwanda, but the impact is only 5%. Holding more liquid assets than total deposits will reduce the returns of Rwandan commercial banks, with a significant impact of 5%. A study by Buhangu (2021) found that the application of prudent credit management practices was significantly positively associated with bank

performance in Kigali. Despite the fact that some studies have attempted to demonstrate a link between liquidity risk management and the profitability of commercial banks in Rwanda. Thereis no recent study that has conducted especially during this period of covid 19, whereby the liquidity of banks has been affected mostly.

CHAPTER THREE: RESEARCH METHODOLOGY

The chapter outlines the research design and methodology that was applied in conducting this study. It describes the research design, population of the study, sample size, sample frame, data collection methods and data analysis and presentation of the research findings. The chapter has covered the research design, on the target population and sample frame, and data collection methodology and instruments sections.

3.1. Research Design

The research employed panel data, sometimes referred to as longitudinal data, is data that contains observations about different cross sections across time. The panel data series can include groups such as country, company, people, and demographic categories. Panel data includes observations recorded regularly and in time series, as well as time series data. Panel data, such as section data, includes observations from groups of people.

3.2. Study of population

A population is defined as an entire group of individual or objects having common observable characteristic. A complete group of people, objects, or interests from which a researcher wishes to study and samples are taken and tested. Scientific questions often focus on a wide group of people and things. Research is done for the benefit of the general public. However, due to the large population, it is often too expensive and time consuming for researchers to study every individual in the community (Mugenda & Mugenda, 2008). The target population of this study is 79 branches of bank of Kigali.

Data used for this study were obtained from the audited annual reports sample banks for the year 2011 to 2022 as it is indicated in appendix.

3.3. Data Collection

Data collection refers to how information is obtained from the selected subjects of an investigation or a study. It refers to the techniques applied in extracting the required study data for analysis (Mugenda & Mugenda, 2008). The data required for the study were obtained from secondary sources that were used to assess the relationship between liquidity management and profitability of commercial banks in Rwanda. In the study, twelve years data 2011 to 2022 were collected.

3.4. Data processing

Data analysis is the act of analyzing, cleaning, manipulating, and modeling data to identify useful information, draw conclusions, and support decision making. Data analysis includes multiple dimensions and methods, including a wide range of techniques under many titles in various disciplines of economics, science, and social sciences (Kothari, 2008). Quantitative approaches were used in the study to determine the correlation from the collected data. This analytical approach examined the simultaneous effects of independent factors on the dependent variable.

Step1. The research starts by unit square roots testing, to test the stationary of data, the unit square roots must be tested. Stationary testing is essential in panel data analysis.

Step2. Establishing correlation analysis by using least square method, the aim of this research is to assess if there is significant relationship (correlation) between liquidity management and the profitability of commercial bank. To test the relationship, least square method was applied.

Step3. The last test involves testing the diagnostic tests, normality test, heteroskedasticity testing,and residual serial correlation test.

3.5. Data analysis

This study used both descriptive and inferentialstatistics in data analysis

3.5.1. Descriptive statistics

A descriptive analysis technique was used to analyze data. This included the use of table, charts, graphs, percentages, and frequencies (Mugenda & Mugenda, 2008). Multiple regressions and linear regressions were used to determine the relationship between profitability and liquidity management using statistical software of E-views.

3.5.2. Inferential statistics

According to Kuhar (2010) Inferential statistics are often used to compare the differences between the treatment groups. Inferential statistics use measurements from the sample of subjects in the experiment to compare the treatment groups and generalize about the larger population of subjects. During this research both correlation and linear regression analysis have been used to analyze the relationship between research variables.

3.5.3. Econometrics model specification

To identify the effect of liquidity management on profitability of commercial banks in Rwanda, the following mathematical model will used:

$$\mathbf{Y_t = B_0 + B_1 X_1 it + B_2 X_2 it + B_3 X_3 it + e}$$

Whereby:

Y_t: Profitability

B_0: Constant

B_1-B_3: Coefficient estimates

X_1: ADR

X_2: CDR

X_3: DAR

e: Error

i: Time

3.6. Anticipated limitation of the study

This research includes data on Rwanda commercial banks for the period 2011 to 2022 which is 12 years financial period. The time frame includes the data on banks performance after the implementation of policies that is geared towards the improvement of the standard of Rwandan commercial banks.

3.7. Ethical consideration

This research aims to obtain the information from the reports provided by the selected commercial bank on its websites. The researcher will analyze collected data from the secondary source, and information is expected to be used only academically and information provided will be well maintained.

3.8. Test of reliability & validity

After selecting the research design, the researcher checked on its validity and reliability. According to Kothari (2000), validity and reliability in research design refer to the need to ensure that concepts used in the study measure what they are actually intended to, and that this measurement is consistent and stable for all respondents. Saunder, et al., (1999), Mugenda (2008) argue further that it is essential that validity and reliability checks are recognized and incorporated in the study using different approaches in order to have results that adequately address the objectives of the study.

Table 1:Variable Centered VIF

Variables	**Centered VIF**
CDR	1.112771
DAR	1.477618
ADR	1.349296

Source: researcher, 2023

None of the centered VIFs of the regressors is greater than 10. Thus, this confirms the absence of multicollinearity in the model.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

This chapter focused on the analysis of the results from the data collection in relation to the research objectives. These data are presented in descriptive statistical table and percentages. Basing on the adjectives of study and research questions, information was gathered from 12 years secondary data source of Bank of Kigali.

4.1. Presentation of research Variables

This part presents detailed related research data that were used to test research hypothesis, such as profitability, total loan, and total assets, cash position and total deposits. To reach to our research objectives the following steps were made:

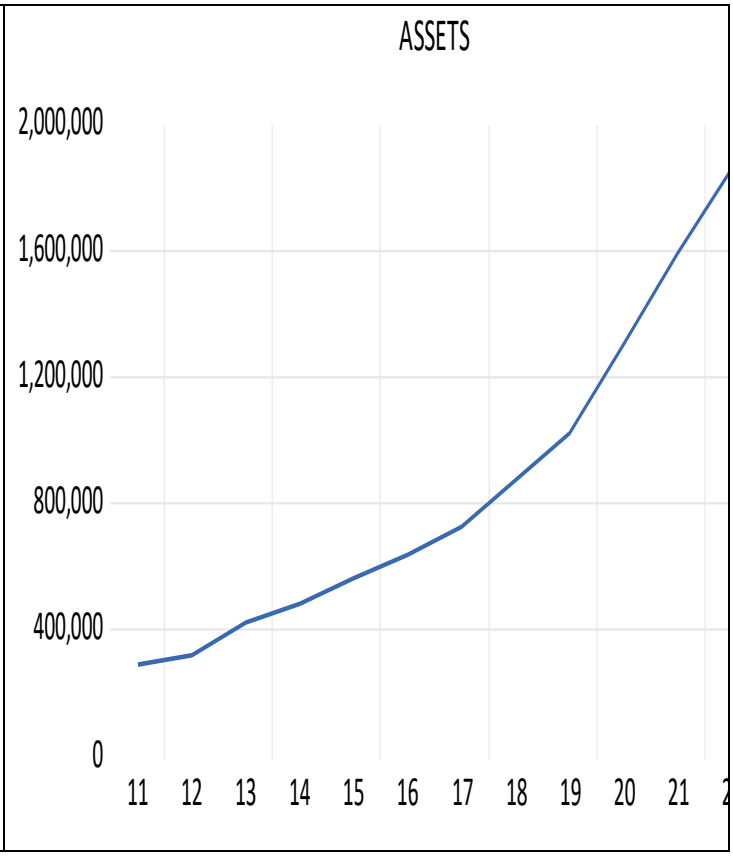
Step1. The research starts by unit square roots testing, to test the stationary of data, the unit square roots must be tested. Stationary testing is essential to assess whether there is a trend within the series

Step2. Establishing correlation analysis by using least square method, the aim of this research is to assess if there is significant relationship (correlation) between liquidity management and the profitability of commercial bank. To test the relationship, least square method was applied.

Step3. The last test involves testing the diagnostic tests, normality test, heteroskedasticity testing,and residual serial correlation test

Figure 1: total assets

	ASSETS
Mean	840668.0
Median	683139.0
Maximum	1853994.
Minimum	287899.9
Std. Dev.	508587.7
Skewness	0.800256
Kurtosis	2.427471
Jarque-Bera	1.444712
Probability	0.485607
Sum	10088015
Sum Sq. Dev.	2.85E+12
Observations	12

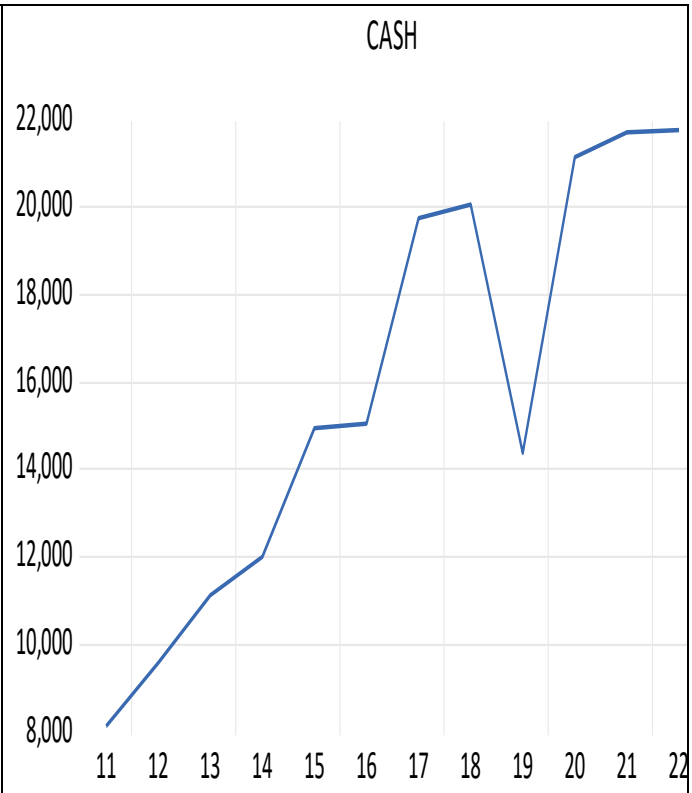


Source: research findings, 2023

The table above presents the total assets realized by bank of Kigali. An asset is a resource with economic value that an individual, corporation, or country owns or controls with the expectation that it will provide a future return. The main assets of commercials banks are loans. According to results the assets of a selected commercial bank (BK), the mean of total assets over the past 12 years was 840,660,000,000 Rwf, Kurtosis 2.42 which is almost near 3 this indicates that data are well distributed around its tail. While the skewness is 0.82, which indicates the normal skewness.

Figure 2: cash

	CASH
Mean	15805.92
Median	14992.17
Maximum	21757.32
Minimum	8123.088
Std. Dev.	4953.426
Skewness	-0.113805
Kurtosis	1.570540
Jarque-Bera	1.047582
Probability	0.592271
Sum	189671.0
Sum Sq. Dev.	2.70E+08
Observations	12

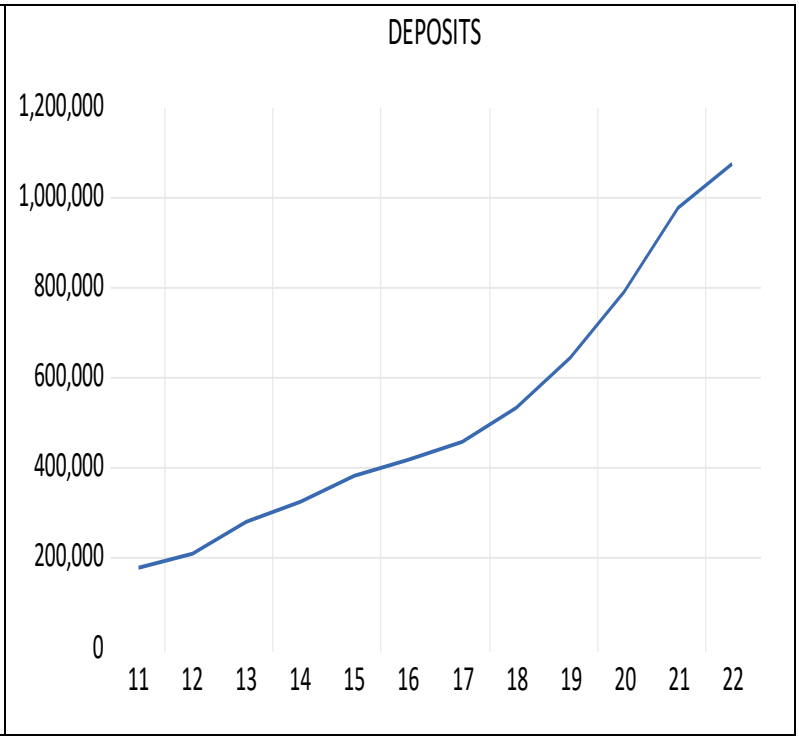


Source: designed by research from secondary data

The above graph presents the cash status of bank of Kigali over the past 12 years, the cash is the most liquid asset and can be used immediately to perform economic actions like buying, selling, or paying debt, and meeting immediate wants and needs. The results indicate that the mean is 15,805,920,000 Rwf, the kurtosis is 1.5 almost of 1.6, it indicates the flatness of the distribution series this indicates that data are normally distributed. Negative skew indicates that data have longer or flatter tail on the left side of the distribution.

Figure 3: Total deposits

	DEPOSITS
Mean	522704.7
Median	439027.4
Maximum	1075189.
Minimum	181019.7
Std. Dev.	292774.5
Skewness	0.699831
Kurtosis	2.282010
Jarque-Bera	1.237282
Probability	0.538676
Sum	6272456.
Sum Sq. Dev.	9.43E+11
Observations	12

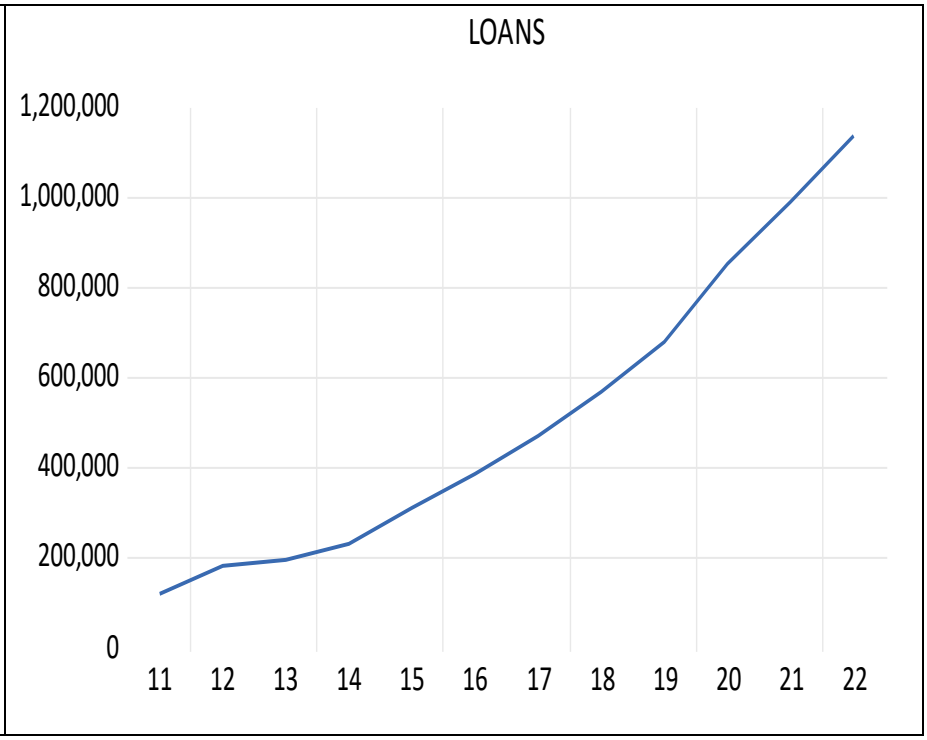


Source: Designed by research from secondary data

The table above presents the evolution of deposits of bank of Kigali over the past 12 years. Bank deposits are savings products that customers can use to hold an amount of money at a bank for specified period. According to the results the mean distribution is 522,704.7 billion Rwf, Kurtosis of 2.28 which is positive kurtosis, a positive kurtosis (flattered curve) this means that the distribution has a lighter tail than normal distribution. While the skewness is 0.69, which indicates the normal skewness.

Figure 4: Total loans

	LOANS
Mean	511175.6
Median	428764.4
Maximum	1134512.
Minimum	123130.7
Std. Dev.	337420.5
Skewness	0.597178
Kurtosis	2.057936
Jarque-Bera	1.156985
Probability	0.560743
Sum	6134107.
Sum Sq. Dev.	1.25E+12
Observations	12



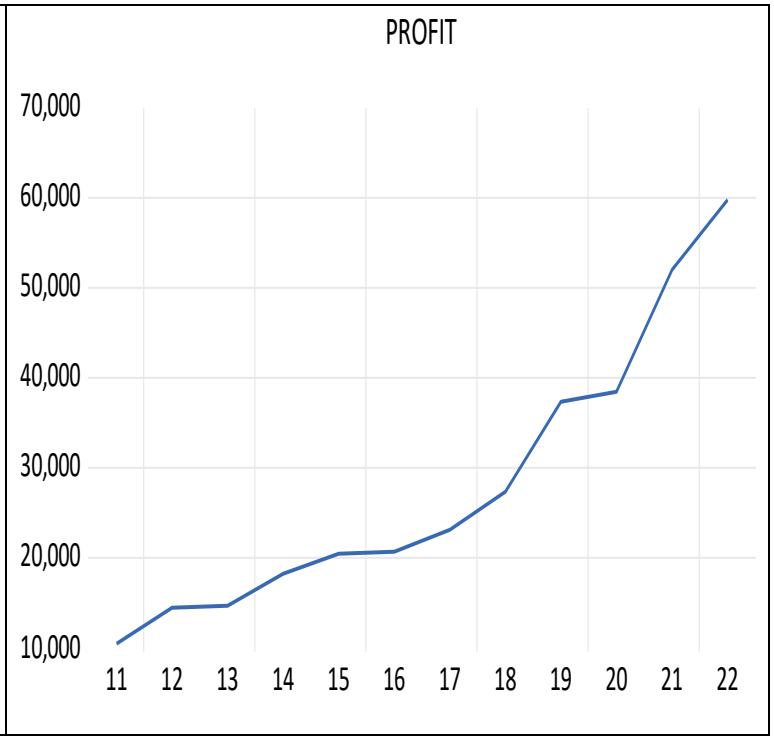
Source: Designed by research from secondary data

The table above presents the volume of loans granted by bank of Kigali from 2011 to 2022, loan receivable is the amount of money owed by bank' customers. Loan is recorded as assets on the side of bank' balance sheets. The results indicate that the loans from commercials banks had a growth trend. By overall mean of total loan of the selected commercial were 511,175.6 billion Rwf.

The kurtosis is 2.05 which is positive kurtosis this mean that the distribution has a peaked and possess a thick tail. The skewness is 0.59. The skewness measures the degree of asymmetric of a series, 0.59 skewness mean a normal distribution of values around tails.

Figure 5: profit

	PROFIT
Mean	28121.44
Median	21988.90
Maximum	59724.31
Minimum	10653.91
Std. Dev.	15539.64
Skewness	0.879040
Kurtosis	2.569105
Jarque-Bera	1.638256
Probability	0.440816
Sum	337457.3
Sum Sq. Dev.	2.66E+09
Observations	12



Source: Designed by research from secondary data

The table above presents the net profit of selected Rwandan commercial banks; the net profit in commercial is calculated deducting interested expenses and operating expenses from bank's interest income. According to the results the mean of net profit of banks of Kigali was 28,121.44 billion Rwf which indicates a positive growth trend. The kurtosis is 2.569, the kurtosis which is -2 & +2 are considered accepted according (George and Mallery, 2010) this indicates that data are normally distributed. (Mesokurtics). The skewness is 0.87, the skewness measures the degree of asymmetric of a series, 0.87 indicates the normal skewness, and the distribution is symmetric around the mean.

4.2. Liquidity ratio analysis

In order to assess the effectiveness of liquidity management of selected commercial banks, liquidity management was used. Liquidity ratio is analyzed to determine the short-term ability of the bank to meet its obligations. Banks are a leveraged business and hence their ability in both short term and long term should be carefully analyzed, this part aim to analyze the effectiveness of liquidity management of selected commercial banks.

Table 2: Advanced loan to total deposits

Period	Loan	Deposits	ADR	Comments
2011	123,130,687	181,019,654	68.0%	*
2012	185,066,752	208,424,579	88.8%	*
2013	199,025,241	280,489,463	71.0%	*
2014	233,439,509	324,601,160	71.9%	*
2015	313,925,535	384,713,700	81.6%	*
2016	385,824,570	420,465,054	91.8%	*
2017	471,704,315	457,589,724	103.1%	**
2018	568,104,724	531,959,345	106.8%	**
2019	678,005,885	642,698,799	105.5%	**
2020	851,099,810	790,811,261	107.6%	**
2021	990,267,321	974,494,626	101.6%	**
2022	1,134,512,318	1,075,188,572	105.5%	**

- Denotes whereby honored regulatory rule

** where bank gave more credit than its recorded deposits

The table above indicates ratio of advanced loan to total deposits, the loan to deposits ratio is used to assess a bank' liquidity by comparing a bank' total loans to its total deposits from the same period. Typically, the ideal loan to deposits ratio is 80% to 90%. The results from the above table indicate that total loan to deposits ratio of selected commercial bank was fluctuating from 68% to 91% from the year 2011 to 2016. The year 2017 to 2022, the loan to deposits ratio exceeds 100%. This implies that there is mismatch in credit creation process.

Table 3: Cash to deposits ratio

Period	Cash	Deposits	CDR
2011	8,123,088	181,019,654	4.5%
2012	9,595,769	208,424,579	4.6%
2013	11,110,210	280,489,463	4.0%
2014	12,020,669	324,601,160	3.7%
2015	14,951,617	384,713,700	3.9%
2016	15,032,721	420,465,054	3.6%
2017	19,731,699	457,589,724	4.3%
2018	20,071,592	531,959,345	3.8%
2019	14,400,534	642,698,799	2.2%
2020	21,152,662	790,811,261	2.7%
2021	21,723,165	974,494,626	2.2%
2022	21,757,316	1,075,188,572	2.0%

Source: Research findings, 2023

The table above indicates ratio of cash to deposits. The cash to deposits ratio is equal to total cash divided total deposits. Bank must maintain some liquidity to operate that's why cash management is crucial to services withdraws from customers. According to central banks law directive no 01/2018 of 15/02/ 2018 on the computation of the liquidity ratios, law states that banks should maintain 20% of cash. The results from the above table indicate that cash to deposits ratio of selected commercial bank is below benchmark of 20%. This implies that studies commercial bank should be prudent.

Table 4: Deposits to total assets ratio

Period	**Deposits**	**Assets**	**DAR**
2011	181,019,654	287,899,874	62.9%
2012	208,424,579	322,794,214	64.6%
2013	280,489,463	422,360,073	66.4%
2014	324,601.160	482,607,964	67.3%
2015	384,713,700	561,226,400	68.5%
2016	420,465,054	639,117,735	65.8%
2017	457,589,724	727,160,327	62.9%
2018	531,959,345	877,401,364	60.6%
2019	642,698,799	1,019,075,587	63.1%
2020	790,811,261	1,304,004,486	60.6%
2021	974,494.626	1,590,372,983	61.3%
2022	1,075,188.572	1,853,994,433	58.0%

Source: research findings, 2023

The table above indicates total deposits to total assets ratio. This ratio estimates the range that assets are backed by the part of constant deposits. Indicative benchmark prescribed by RBI is minimum of 50%. The higher the ratio indicates sound liquidity position of banks. The results from the above table indicate deposits to assets ratio was above 50% over the period of the study. This implies that the chance of facing liquidity risk by bank of Kigali is very remote.

4.3. Analysis of profitability of selected commercial bank

Profitability of commercial banks is found out by either return on assets or return on equity, this part presents the return on assets of selected commercial bank.

4.3.1. Return on assets

Table 5: Return on assets

Period	Profit	Assets	ROA
2011	10,653,908	287,899,874	3.7%
2012	14,466,909	322,794,214	4.5%
2013	14,830,235	422,360,073	3.5%
2014	18,316,825	482,607,964	3.8%
2015	20,484,058	561,226,400	3.6%
2016	20,730,879	639,117,735	3.2%
2017	23,246,922	727,160,327	3.2%
2018	27,366,616	877,401,364	3.1%
2019	37,308,336	1,019,075,587	3.7%
2020	38,433,289	1,304,004,486	2.9%
2021	51,894,970	1,590,372,983	3.3%

2022	59,724,310	1,853,994,433	3.2%

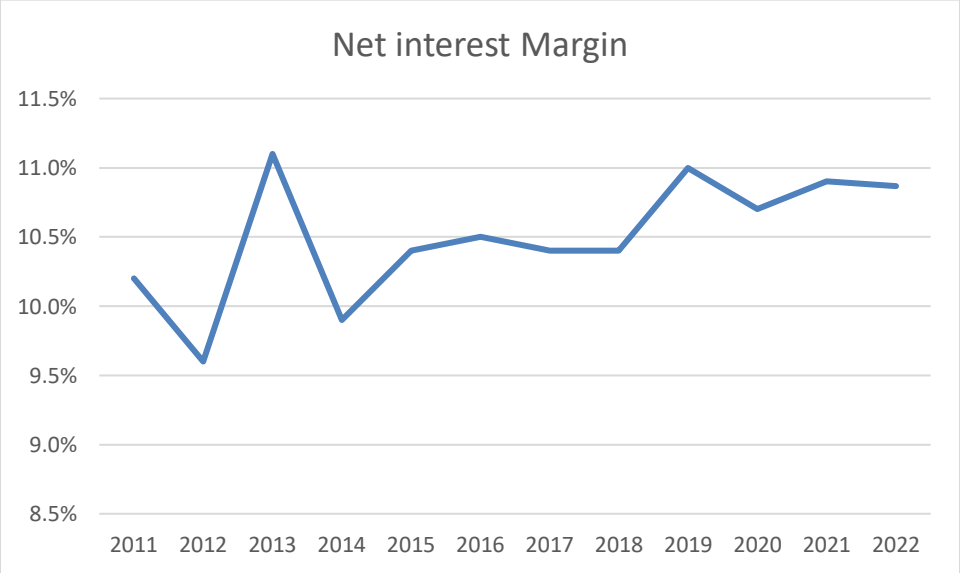
Source: research findings, 2023

The table above presents return on assets ratio. Return on assets ratio indicates how well a bank' investments generate value, making it an important measure of productivity for a bank. The results indicate that return assets were positive.

However, during Covid 19 the return on assets decreased significantly. According to https://www.theglobaleconomy.com/Rwanda/bank_return_assets/, the average bank's return in Rwanda is 2.73%. This implies that the performance of this selected commercial bank (BK) was good.

4.3.2. Net interest margin

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin (or gross profit margin) of non-financial companies



Source: research findings, 2023

The graph above presents the net interest margin of bank of Kigali over the past 12 years. According to the research findings the net interest margin of bank of Kigali. 10.2%,9,6%, 11, %, 9.9%, 10.4%, 10.4%, 10.4%, 11% 10.7%, 10.9% and 10.9%. in 2011, 2012, 2013,2014,2015, 2016,2017,2018,2019,2020,2021, and 2022 respectively. This implies besides in 2013 whereby the net interest margin was quietly higher compared to other period of time the net interest margin remained almost constant.

4.3.3. Return on equity

Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity. Because shareholders' equity is equal to a company's assets minus its debt, ROE is considered the return on net assets

Table 6: Return on equity

Period	Net income	Equity	ROE
2011	10,653,908	54,167,291.00	19.7%
2012	14,466,909	63,107,293.00	22.9%
2013	14,830,235	70,763,684.00	21.0%
2014	18,316,825	89,547,734.00	20.5%
2015	20,484,058	99,245,545.00	20.6%
2016	20,730,879	108,485,600.00	19.1%
2017	23,246,922	151,595,340.50	15.3%
2018	27,366,616	194,705,081.00	14.1%
2019	37,308,336	122,750,132.00	30.4%
2020	38,433,289	204,225,123.00	18.8%

2021	51,894,970	285,700,114.00	18.2%
2022	59,724,310	319,076,357.00	18.7%

Source: research findings, 2023

The above table presents the return on equity of bank of Kigali over the 12 years period, according to the research results the return on equity of equity of bank of Kigali over the 12 years period were positive. whereby the highest or maximum return on equity earned by bank of Kigali was 30% whereas the minimum return on equity were 14%

4.4. Impact of liquidity management on profitability

This part analyses the effect of regressors on explanatory variables DAR, CDR and ADR were used as regressors while ROA was used as a dependent variable.

4.4.2. Stationary test

Stationary (Unit root) is very important to examine whether the variables are either stationary at level I (0) or stationary at first difference I (1) before proceeding to the co-integration tests. This is because most of the finance and economics variables are non-stationary in their original form. To check the stationary of variables separately in the log forms, Augmented Dicky-Fuller test (ADF) test has been used.

Table 7: Stationary test at level (0)

Variables	**T statistics**	**Prob**	**1%level**	**5%level**	**10%level**	**Comment**
Logadr	-1.579970	0.4806	-3.661661	-2.960	-2.6191	Non stationary

Logcdr	-1.80619	0.3408	-2.9389	-2.6079	-2.6074	Non stationary
Logdar	0.091504	0.9615	-3.6104	-2.9389	-2.6079	Non stationary
Logroa	-0.19756	0.9304	-3.6104	-2.9382	-2.60709	Non stationary
Logroe	-1.80619	-2.331662	-2.766	-2.6191	-3.552551	Non stationary
LogNim	-1.579970	0.4615	-2.7304	-2.8182	-2.33332	Non stationary

At level (0) all variables (Logadr, Logcdr Logdar, Logroa, log Roe, and log nim) are non-stationary. ADF calculated is superior to ADF critical and p value is greater than 0.05. This indicates that there is unit root. Whereas the model requires that all residuals to be stationary distributed. Therefore, researcher proceeded with the stationary test at the first difference.

Table 8: Stationary test at level (1)

Variables	**T statistics**	**Prob**	**1%level**	**5%level**	**10%level**	**Comment**
Logadr	-6.668	0.0000	-3.666	-2.9604	-2.619160	Stationary
Logcdr	-4.594	0.0008	-3.632	-2.948	-2.612	Stationary
Logdar	-6.188	0.0000	-3.615	-2.941	-2.609	Stationary
Logroa	-6.150	0.0000	-3.615	-2.941	-2.609	Stationary

Logroe	-4.754	0.0000	-2.331662	-2.766	-2.6191	
LogNim	-4.999	0.0000	0.4615	-2.7304	-2.8182	

From the results of the stationary test at the first difference, series that were not stationary at level (0) become stationary after the first difference, they are integrated of order one I (1). ADF calculated is inferior to ADF critical at 1%, 5% and 10% level margin of error. Therefore, the regression has a sense.

4.4.3. Regression Analysis

The following equation as presented in chapter three related to the research methodology are regressed using **Eviews7** to assess the liquidity management on profitability of commercial banks, whereby profitability was used as dependent variables that presents the profitability, while Deposit to assets ratio, cash to deposits ratio, advanced loan deposits ratio, were used as independents variables. **Equation**: $\mathbf{B_0+B_1X_1it+B_2X_2it+ B_3X_3it+e}$

4.4.3.1. Impact of liquidity management on return on assets

Return on assets is a profitability ratio that provides how much profit a company can generate from its assets. In other words, return on assets (ROA) measures how efficient a company's management is in earning a profit from their economic resources.

Dependent Variable: ROA

Method: Least Squares

Date: 11/10/23 Time: 17:31

Sample: 2011 2022

Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAR	0.666156	0.058635	0.446082	0.0543
	_-			
CDR	0.115512	0.172526	0.437656	0.6732
ADR	-0.214703	0.012555	-0.613646	0.5565
C	0.022612	0.044768	0.505108	0.6271
R-squared	0.896381	Mean dependent var		0.034750
Adjusted R-squared	0.046273	S.D. dependent var		0.004267
S.E. of regression	0.004167	Akaike info criterion		-7.862139
Sum squared resid	0.000139	Schwarz criterion		-7.700503

The table above is regression table tables presents the relationship between liquidity management on profitability of banks. ROA was used as dependent variables whereas DAR, CDR, & ADR were used as explaining variables.

R SQUARE = 0.89 ~ 90%. There is goodness of the model and the model fitted. It means that independent variables (DAR, CDR, and ADR) explain the dependent variable ROA at the level of 90%.

Cash to deposits ratio has statistically significant effect on profitability of commercial banks in Rwanda.'' According to the research the results indicate that there is significant relationship between liquidity to assets and return on assets. The calculated coefficient is -0.11 and prob value is 0.01 which is less 5%. This implies that an increase in liquidity to assets by 1% will results in decrease in return in assets by 0.1%

Advanced to deposit ratio has no statistically significant effect on profitability of selected commercial bank. According to the research findings. The research results revealed that there no significant relationship between advanced to deposits ratio and return on assets where P value is greater than significant level of both 5% and 10%.

Deposit to assets ratio has statistically significant effect on profitability of selected commercial banks in Rwanda. Research findings revealed that there is significant effect of deposits to assets ratio whereby the calculated coefficient is 0.63 and prob value is 0.05. This implies that deposits to assets and return on assets varies in same direction, an increase in deposits to assets by 1% will results in increase in return on assets by 6% vice versa.

4.4.3.2. Impact of liquidity management of net interest margin

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks or other financial institutions and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their (interest-earning) assets. It is similar to the gross margin (or gross profit margin) of non-financial companies.

Dependent Variable: Net profit Margin

Method: Least Squares

Date: 11/09/23 Time: 19:46

Sample: 2011 2022

Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAR	0.000378	0.054483	0.006940	0.9946
CDR	-0.353166	0.160307	-2.203066	0.0587
ADR	-0.002714	0.011666	-0.232631	0.8219
C	0.119441	0.041597	2.871375	0.0208

R-squared	0.763291	Mean dependent var	0.104972
Adjusted R-squared	0.262026	S.D. dependent var	0.004507
S.E. of regression	0.003872	Akaike info criterion	-8.009053
Sum squared resid	0.000120	Schwarz criterion	-7.847418

Source: research findings, 2023

The table above present the relationship between, liquidity management and net interest margin of bank of Kigali over the past 10 years. according to the research findings, the findings revealed that there is significant relationship between cash to deposits ratio and Net profit margin. Whereas the findings reveled that the relationship between Deposits to assets ratio and advanced loan to loan ratio and net profit margin are insignificant.

The calculated coefficient is -0.355. with Prob value ~ 0.05 which is significant level of 10%. This result implies that the direction of two variables varies in the different direction, the increase of one variable will results in the decrease in another variable. The increase in 1% of cash to deposits ratio will results in decrease by 0.35% in net profit margin. A bank with a higher liquidity will have a competitive advantage because they won't need external financing. such as interbank short financing decisions.

4.4.3.3. Impact of liquidity management on Return on equity

Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity. Because shareholders' equity is equal to a company's assets minus its debt, ROE is considered the return on net assets.

Dependent Variable: Return on Equity

Method: Least Squares

Date: 11/09/23 Time: 19:50

Sample: 2011 2022

Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAR	0.222188	0.243872	-0.090982	0.0597
CDR	0.507227	0.717558	0.706880	0.4997
ADR	-0.058347	0.052219	-1.117356	0.2963
C	0.275910	0.186195	1.481837	0.1767

R-squared	0.394000	Mean dependent var	0.225722
Adjusted R-squared	0.166750	S.D. dependent var	0.018985

S.E. of regression	0.017330	Akaike info criterion	-5.011525
Sum squared resid	0.002403	Schwarz criterion	-4.849889

Source: research findings, 2023

The above table present the relationship between, return on equity and liquidity management and return on equity of bank of Kigali. According to the research findings the results reveled that there is a positive and significant relationship between return on equity and deposits to assets ratio. This implies that deposits to assets and return on equity varies in same direction, an increase in deposits to assets by 1% will results in increase in return on assets by 0.222 %. this implies that the profitability of bank also depends to its capacity to generate deposits from customer and transform those deposits into loans.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATION

This chapter presents the summary of findings, conclusion, recommendation and suggestions for further research. The conclusion of the study was drowned from the findings under the study. In addition, the objective of the study was based on guiding principle in data analysis which leads to the conclusion, recommendation as well as suggestion for further studies.

5.1. Summary of findings

The researcher had summarized this study based on 3 specific objectives:

- To establish the effect of advanced to deposit ratio on profitability of commercial banks in Rwanda,
- To examine the effect of cash to deposit ratio on profitability of commercial banks in Rwanda
- To establish the effect of deposit assets ratio on the profitability of commercial banks in Rwanda.

Effectiveness of liquidity management of Rwandan commercial banks

The table above indicates ratio of advanced loan to total deposits, the loan to deposits ratio is used to assess a bank' liquidity by comparing a bank' total loans to its total deposits from the same period. Typically, the ideal loan to deposits ratio is 80% to 90%. The results from the above table indicate that total loan to deposits ratio of selected commercial bank fluctuated from 68% to 91% from the year 2011 to 2016. And the year 2017 to 2022, the loan to deposits ratio exceeds 100%. This implies that there is mismatch in credit creation process.

The table above indicates ratio of cash to deposits. The cash to deposits ratio is equal to total cash divided total deposits. Bank must maintain some liquidity to operate that's why cash management is crucial to services withdraws from customers. According to central bank's

law directive no 01/2018 of 15/02/ 2018 on the computation of the liquidity ratios, law states that banks should maintain 20% of cash. The results from the above table indicate that cash to deposits ratio of selected commercial bank is below benchmark of 20%. This implies that studied commercial bank should be prudent.

The table above indicates total deposits to total assets ratio. This ratio estimates the range that assets are backed by the part of constant deposits. Indicative benchmark prescribed by RBI is minimum of 50%. The higher the ratio indicates sound liquidity position of banks. The results from the above table indicate deposits to assets ratio was above 50% over the period of the study. This implies that the chance of facing liquidity risk for this selected commercial bank is very remote.

Relationship between liquidity management (DAR, CDR, ADR) and profitability

1st objective: The first research objective assesses the effect of advanced loans to deposit ratio on profitability of commercial banks in Rwanda. According to the research findings. The research results revealed that there is no significant relationship between advanced loans to deposits ratio and return on assets where P value of 0.47 is greater than significant level of both 5% and 10%.

2nd Objective: The second research objective was examining the effect of liquidity to assets t ratio on profitability of commercial banks in Rwanda. Research findings indicate that there is a significant negative relationship between Cash to deposit ratio and Return on Assets, whereby P value is 0.01 while the calculated coefficient is -0.11. An increase by 1% in LAR, the return on assets decreases by 0.1%, which indicates a significant negative correlation. And the Whereas the findings reveled that the relationship between Deposits to assets ratio and advanced loan to loan ratio and net profit margin are insignificant.

The calculated coefficient is -0.355. with Prob value ~ 0.05 which is significant level of 10%. This result implies that the direction of two variables varies in the different direction, the increase of one variable will results in the decrease in another variable. The increase in 1% of cash to deposits ratio will results in decrease by 0.35% in net profit margin. A bank with a higher liquidity will have a competitive advantage because they won't need external financing. such as interbank short financing decisions.

3rd Objective: The third research objective was to establish the effect of deposit assets ratio on the profitability of commercial banks in Rwanda. Research findings indicates that there is a significant positive relationship between Deposit to asset ratio and return on assets whereby prob value is 0.05, and 0.63 as DAR coefficient. An increase by 1% in DAR, the Return on assets increases by 6%, which indicates a positive strong correlation. And research findings the results reveled that there is a appositive and significant relationship between return on equity and deposits to assets ratio. This implies that deposits to assets and return on equity varies in same direction, an increase in deposits to assets by 1% will results in increase in return on assets by 0.222 %. This implies that the profitability of bank also depends to its capacity to generate deposits from customer and transform those deposits into loans.

5.2. Conclusion

In summary, the main objective of this research was to establish the relationship between liquidity management and profitability of commercial banks. Based on literature review, the results confirmed that there is significant relationship between deposit to assets ratio and profitability. This implies that a proportionally higher deposits as a percentage of total assets is associated with an improved financial sustainability, assuming that the deposits cost efficient.

5.3. Recommendation

Based on the research findings commercial banks should encourage voluntary deposits which will enable them to hinder liquidity constraints by:

i. Analyzing their best or potential customers for special treatments
ii. By raising their deposits rate to motivate customers to deposits more
iii. By increasing adverting so that they attract new customers
iv. By increasing and investing heavily in digital banking

5.3. Area for further research

This study aims to assess the contribution of liquidity management of on the profitability of commercial banks in Rwanda. The research findings are based on the sample of one commercial bank (BK). The sample may not be sufficient to make a solid conclusion. Hence the further studies should be undertaken to expand the sample. By increasing the sample size, the reliability of the study will increase.

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BNR Annually report, 2016

Bk annually reports from 2012- 2022

Appendix

	Note	31 December 2020 FRw'000	31 December 2019 FRw'000
Interest income	7	145,491,017	116,517,161
Interest expense	8	(32,697,702)	(21,743,716)
Net interest income		**112,793,315**	**94,773,445**
Net fees and commission income	9	12,796,749	14,470,680
Foreign exchange related income	10	9,924,689	8,783,166
Gross insurance premiums	11	8,460,697	6,671,948
Other operating income	12	251,793	155,409
Operating income before impairment losses and claims		**144,227,243**	**124,854,648**
Credit impairment losses – loans and investments	13	(37,128,906)	(17,886,085)
Premium ceded to reinsurance	11	(1,647,235)	(1,515,824)
Insurance benefits and claims paid	14	(2,982,619)	(2,368,177)
Net operating income		**102,468,483**	**103,084,562**
Employee benefits expense	15(i)	(23,232,754)	(24,640,029)
Depreciation and amortisation	15(ii)	(3,699,376)	(6,331,565)
Administration and general expenses	15(iii)	(18,241,423)	(19,738,007)
Total operating expenses		**(45,173,553)**	**(50,709,601)**
Operating profit		**57,294,930**	**52,374,961**
Finance costs		(228,644)	(282,355)
Profit before income tax		**57,066,286**	**52,092,606**
Income tax expense	16	(18,632,997)	(14,784,270)
Profit for the year		**38,433,289**	**37,308,336**
Other comprehensive income:			
Items that will not be subsequently reclassified to profit or loss			
- Revaluation surplus		99,845	-
Total comprehensive income for the year		**38,533,134**	**37,308,336**
Attributable to:			
Equity holders of the parent		38,011,181	36,924,658
Non-controlling interests		**521,953**	**383,678**
Basic and diluted earnings per share in FRw	18	42.6	41.2

Consolidated statement of financial position

As at 31 December 2020

Assets	Note	31 December 2020 FRw'000	31 December 2019 FRw'000
Cash in hand	19 (a)	21,152,662	14,400,534
Balances with the National Bank of Rwanda	19 (b)	101,621,779	68,351,345
Due from banks	20	107,102,581	77,286,457
Investment securities at amortized cost	21 (a)	142,021,914	124,797,114
Investment in corporate bond	21 (b)	12,166,178	-
Investment in specialized fund	21 (c)	1,216,854	-
Investments in equity instruments	21 (d)	-	-
Loans and advances to customers	22	851,099,810	678,005,885
Insurance receivables	23	2,742,765	2,923,995
Other assets	24	17,605,631	9,943,427
Deferred income tax	25	6,102,616	5,261,914
Right of use assets	26	2,489,038	3,309,375
Assets classified as held for sale	27	734,678	1,634,510
Property and equipment	28(i)	29,483,594	26,389,977
Intangible assets	28(ii)	8,464,386	6,771,054
Total assets		**1,304,004,486**	**1,019,075,587**
Liabilities			
Due to banks	29	130,557,930	54,160,261
Deposits and balances from customers	30	790,811,261	642,698,799
Current income tax	17	3,276,474	7,441,556
Dividends payable	31	13,286,327	13,291,112
Insurance liabilities	32	6,713,188	5,079,081
Other liabilities	33	32,404,493	26,189,778
Lease liabilities	34	2,669,914	3,426,696
Long-term finance	35	64,940,879	45,977,418
Total liabilities		**1,044,660,466**	**798,264,701**
Capital and reserves			
Share capital	36 (i)	9,045,474	9,045,474
Share premium	36 (ii)	76,573,491	76,573,491
Revaluation reserves	36(iii)	13,099,994	13,000,149
Statutory reserves	36(iv)	2,279,052	-
Retained earnings	36(iv)	156,494,803	120,862,519
Equity attributable to the owners of the parent		**257,492,814**	**219,481,633**
Non-controlling interests		1,851,206	1,329,253
Total equity		**259,344,020**	**220,810,886**
Total liabilities and equity		**1,304,004,486**	**1,019,075,587**

Consolidated statement of profit or loss and other comprehensive income

For the year ended 31 December 2022

	Note	31 December 2022 FRw'000	31 December 2021 FRw'000
Interest revenue calculated using the effective interest	7	187,448,813	176,572,535
Interest expense calculated using the effective interest method	8	(49,673,037)	(40,301,177)
Net interest income		**137,775,776**	**136,271,358**
Fee and commission income	9	29,167,427	21,824,949
Fee and commission expense	9	(2,894,123)	(1,965,524)
Foreign exchange related income	10	13,529,522	11,779,561
Gross insurance premiums	11	11,581,822	10,140,525
Other operating income	12	2,087,671	2,170,394
Operating income before impairment losses and claims		**191,248,095**	**180,221,263**
Credit impairment losses	13	(10,006,879)	(34,068,752)
Premium ceded to reinsurance	11	(3,744,871)	(2,694,984)
Insurance benefits and claims paid	14	(3,247,645)	(3,359,441)
Net operating income		**174,248,700**	**140,098,086**
Employee benefits expense	15(i)	(35,039,416)	(31,333,019)
Depreciation and amortisation	15(ii)	(8,538,536)	(6,543,090)
Administration and general expenses	15(iii)	(41,994,760)	(25,153,532)
Total operating expenses		**(85,572,712)**	**(63,029,641)**
Operating profit		**88,675,988**	**77,068,445**
Interest on lease liabilities	15(iv)	(221,212)	(187,777)
Profit before income tax		**88,454,776**	**76,880,668**
Income tax expense	16	(28,730,466)	(24,985,698)
Profit for the year		**59,724,310**	**51,894,970**
Comprehensive income			
Other comprehensive income		-	-
Total comprehensive income for the year		**59,724,310**	**51,894,970**
Attributable to:			
Equity holders of the parent		**58,894,419**	**51,077,753**
Non-controlling interests		**829,891**	**817,217**
Basic and diluted earnings per share in FRw	**18**	**65.0**	**57.4**

Consolidated statement of financial position

As at 31 December 2022

		31 December 2022 FRw'000	31 December 2021 FRw'000
Cash in hand	19 (a)	21,757,316	21,723,165
Balances with the National Bank of Rwanda	19 (b)	328,750,207	231,758,146
Due from banks	20	48,979,707	77,839,613
Held to maturity investments	21 (a)	216,899,036	164,115,134
Investment in corporate bond	21 (b)	12,069,536	12,703,795
Investment in specialized fund	21 (c)	12,605,141	7,814,784
Loans and advances to customers	22	1,134,512,318	990,267,321
Insurance-related assets	23	5,518,539	6,517,668
Other assets	24	19,374,250	25,810,132
Deferred income tax	25	10,649,558	9,546,653
Right of use assets	26	1,760,557	1,659,359
Assets held for sale	27	566,145	734,678
Property and equipment	28(i)	30,057,613	29,608,750
Intangible assets	28(ii)	10,494,510	10,273,785
Total assets		**1,853,994,433**	**1,590,372,983**
Liabilities			
Due to banks	29	280,588,198	190,223,687
Deposits and balances from customers	30	1,075,188,572	974,494,626
Income tax payable	17	5,920,034	10,013,864
Dividends payable	31	30,704,511	26,928,781
Insurance liabilities	32	8,162,379	9,445,233
Other liabilities	33	29,848,038	35,470,426
Lease liabilities	34	1,787,992	2,069,256
Long-term finance	35	102,718,352	56,026,996
Total liabilities		**1,534,918,076**	**1,304,672,869**
Capital and reserves			
Share capital	36 (i)	9,185,147	9,045,474
Share premium	36 (ii)	79,953,617	76,573,491
Revaluation reserves	36(iii)	13,099,994	13,099,994
Statutory reserves	36(v)	2,321,973	2,321,973
Retained earnings	36(iv)	211,017,312	181,990,759
Equity attributable to the owners of the parent		315,578,043	283,031,691
Non-controlling interests		3,498,314	2,668,423
Total equity		**319,076,357**	**285,700,114**
Total liabilities and equity		**1,853,994,433**	**1,590,372,983**

BK GROUP PLC
CONSOLIDATED STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME
FOR THE YEAR ENDED 31 DECEMBER 2018

	Note	2018 FRw'000	2017 FRw'000
Interest income	8	93,997,805	84,707,152
Interest expense	9	(18,199,106)	(18,315,980)
Net interest income		**75,798,699**	**66,391,172**
Net fees and commission income	10	16,523,167	15,857,994
Foreign exchange related income	11	9,188,503	7,786,502
Net premium income	12	3,932,651	2,104,762
Other operating income	13	392,387	1,231,111
Operating income before impairment losses		**105,835,407**	**93,371,541**
Credit impairment losses	14	(11,409,582)	(16,489,292)
Net claims	15	(1,785,522)	(909,363)
Net operating income		**92,640,303**	**75,972,886**
Employee benefits expense	16(i)	(22,818,679)	(21,127,700)
Depreciation and amortisation	16(ii)	(4,866,655)	(4,501,210)
Administration and general expenses	16(iii)	(22,353,344)	(16,171,942)
Total operating expenses		**(50,038,678)**	**(41,800,852)**
Profit before income tax		**42,601,625**	**34,172,034**
Income tax expense	17(a)	(15,235,009)	(10,823,154)
Profit for the year		**27,366,616**	**23,348,880**
Other comprehensive income:			
Items that may be subsequently reclassified to profit or loss		-	-
Items that will not be subsequently reclassified to profit or loss		-	-
Total comprehensive income for the year		**27,366,616**	**23,348,880**
Attributable to:			

ASSETS	Note	2018	2017
		FRw'000	FRw'000
Cash in hand	20 (a)	20,071,592	19,731,699
Balances with the National Bank of Rwanda	20 (b)	64,914,684	42,583,327
Due from banks	21	105,210,355	53,055,021
Investment securities	22 (a)	73,594,798	94,248,923
Loans and advances to customers	23	568,104,724	471,704,315
Insurance receivables	24	2,877,789	882,660
Deferred income tax	30	672,030	-
Current income tax	17(b)	551,644	-
Other assets	25	9,502,119	10,569,349
Equity investments	22 (b)	-	221,425
Property and equipment	26	28,226,576	33,529,626
Intangible assets	27	3,675,053	678,355
TOTAL ASSETS		**877,401,364**	**727,204,700**
LIABILITIES			
Due to banks	28	61,312,934	42,377,460
Deposits and balances from customers	29	531,959,345	455,213,393
Current income tax	18	4,095,815	6,900,698
Dividends payable	31	11,078,029	9,378,311
Insurance liabilities	32	3,909,011	1,902,366
Other liabilities	33	19,457,343	15,488,363
Deferred income tax	30	-	2,351,802
Long-term finance	34	50,883,806	70,842,175
TOTAL LIABILITIES		**682,696,283**	**604,454,568**
CAPITAL AND RESERVES			
Share capital	35 (i)	8,967,592	6,745,370
Share premium	35 (ii)	74,795,986	18,936,176
Revaluation reserves	35(iii)	13,000,149	13,000,149
Retained earnings	35(iv)	96,995,779	84,068,437
Equity attributable to the owners of the parent		193,759,506	122,750,132
Non-controlling interests		945,575	-
TOTAL EQUITY		**194,705,081**	**122,750,132**
TOTAL LIABILITIES AND EQUITY		**877,401,364**	**727,204,700**

The notes set out on pages 74 to137 form an integral part of these financial statements.

	Note	2016 FRw'000	2015 FRw'000
Interest income	7	72,254,385	59,966,855
Interest expense	8	(16,556,236)	(13,727,086)
Net interest income		**55,698,149**	**46,239,769**
Net Fees and commission income	9	14,160,293	11,884,277
Foreign exchange related income	10	6,583,450	5,301,247
Other operating income	11	305,974	292,651
Net premium earned	12	159,418	-
Operating income before impairment losses		**76,907,284**	**63,717,944**
Net impairment on loans and advances	13	(10,448,958)	(7,547,662)
Account maintenance fees	14	(6,634,811)	(1,816,787)
Net operating income		**59,823,515**	**54,353,495**
Personnel costs	15(i)	(14,075,178)	(15,029,991)
Depreciation and amortisation	15(ii)	(3,955,171)	(3,807,120)
Administration and General expenses	15(iii)	(11,812,051)	(9,779,152)
Total operating expenses		**(29,842,400)**	**(28,616,263)**
Profit before income tax		**29,981,115**	**25,737,232**
Income tax expense	16(a)	(9,225,248)	(5,253,174)
Net profit for the year		**20,755,867**	**20,484,058**
Other comprehensive income not to be reclassified to profit and loss in subsequent periods			
Revaluation of Building net of tax		5,458,582	-
Total comprehensive income for the year		**26,214,449**	**20,484,058**

	Note	2016 FRw'000	2015 FRw'000
Assets			
Cash in hand	18 (a)	15,032,721	14,951,617
Balances with the National Bank of Rwanda	18 (b)	31,832,058	44,572,594
Due from banks	19	84,634,868	62,568,118
Held to maturity investments	20(a)	77,962,606	93,503,198
Loans and advances to customers	21(a)	385,824,570	313,925,535
Other assets	22	8,877,766	8,255,500
Equity Investments	20(b)	221,425	221,425
Property and equipment	23	33,435,701	22,846,884
Intangible assets	24	514,883	381,529
Total Assets		**638,336,598**	**561,226,400**
Liabilities			
Due to banks	25	28,105,184	22,609,724
Deposits and balances from customers	26	419,017,263	384,713,700
Tax Payable	16(b)	4,165,830	808,141
Deferred tax liability	27	6,795,553	1,682,520
Dividends Payable	28	8,343,104	34,230
Other liabilities	29	6,286,996	9,656,897
Long-term finance	30	57,137,068	42,475,643
Total Liabilities		**529,850,998**	**461,980,855**
Capital and Reserves			
Share Capital	31(i)	6,724,428	6,721,842
Share Premium	31(ii)	18,695,343	18,665,604
Revaluation Reserves	31(iii)	13,630,625	6,129,035
Other Reserves	31(iv)	-	11,918,110
Retained earnings	31(v)	69,435,204	55,810,954
Total Equity		**108,485,600**	**99,245,545**
Total Liabilities and Equity		**638,336,598**	**561,226,400**

	Note	2014 FRw'000	2013 FRw'000
Interest income	7	51,909,827	45,210,752
Interest expense	8	(12,654,600)	(10,015,908)
Net interest income		**39,255,227**	**35,194,844**
Net Fees and commission income	9	10,899,154	10,801,253
Foreign exchange related income	10	7,724,325	7,476,135
Other operating income	11	301,838	281,008
Operating income before impairment losses		**58,180,544**	**53,753,240**
Net impairment on loans and advances	12	(7,542,957)	(8,993,999)
Net operating income		**50,637,587**	**44,759,241**
Personnel costs	13(a)	(14,427,737)	(11,707,238)
Depreciation and amortisation	13(b)	(3,663,534)	(4,639,637)
Administration and General expenses	13(c)	(9,787,611)	(9,656,130)
Total operating expenses		**(27,878,882)**	**(26,003,005)**
Profit before income tax		**22,758,705**	**18,756,236**
Income tax expense	14(a)	(4,441,880)	(3,926,001)
Net profit for the year		**18,316,825**	**14,830,235**

	Note	FRw'000	FRw'000
Assets			
Cash in hand	16 (a)	12,020,669	11,110,210
Balances with the National Bank of Rwanda	16 (b)	46,938,373	24,855,050
Due from banks	17	102,988,217	107,377,523
Held to maturity investments	18(a)	58,596,907	50,820,690
Loans and advances to customers	19(a)	233,439,509	199,025,241
Equity Investments	18(b)	221,425	218,455
Other assets	20	7,665,385	7,695,005
Property and equipment	21	20,503,423	21,018,894
Intangible assets	22	234,056	239,005
Total Assets		**482,607,964**	**422,360,073**
Liabilities			
Due to banks	23	15,214,461	17,345,024
Deposits and balances from customers	24	324,601,160	280,489,463
Tax Payable	14(b)	692,518	1,828,573
Deferred tax liability	25	1,431,391	1,620,650
Dividends Payable	26	5,469	7,416,579
Other liabilities	27	11,185,264	8,705,581
Long-term finance	28	39,929,967	34,190,519
Total Liabilities		**393,060,230**	**351,596,389**
Capital and Reserves			
Share Capital (page 43)	29(a)	6,713,706	6,684,500
Share Premium (page 43)	29(b)	18,572,040	18,236,171
Revaluation Reserves (page 43)	29(c)	6,537,638	6,946,241
Other Reserves (page 43)	29(d)	37,364,514	29,949,395
Retained earnings (page 43)	29(e)	20,359,836	8,947,377
Total Equity		**89,547,734**	**70,763,684**
Total Liabilities and Equity		**482,607,964**	**422,360,073**

The financial statements were approved by the Board of Directors on ..10.....March 2015 and were signed on its behalf by:

	Note	2013 RwF'000	2012 RwF'000
Interest income	7	45,210,752	32,069,789
Interest expense	8	(10,015,908)	(8,338,615)
Net interest income		**35,194,844**	**23,731,174**
Net Fees and commission income	9	10,272,081	6,797,680
Foreign exchange related income	10	7,476,135	7,031,504
Other operating income	11	810,180	715,722
Operating income before impairment losses		**53,753,240**	**38,276,080**
Net impairment on loans and advances	12	(8,993,999)	(3,647,289)
Net operating income		**44,759,241**	**34,628,791**
Personnel costs	13(i)	(11,707,238)	(9,615,156)
Depreciation and amortisation	13(ii)	(4,639,637)	(3,678,098)
Administration and General expenses	13(iii)	(9,656,130)	(6,868,628)
Total operating expenses		**(26,003,005)**	**(20,161,882)**
Profit before tax		**18,756,236**	**14,466,909**
Income tax expense	14(a)	(3,926,001)	(2,685,573)
Net profit for the year		**14,830,235**	**11,781,336**
Comprehensive income			
Other comprehensive income net of taxes:		-	-
Total comprehensive income for the year		**14,830,235**	**11,781,336**
Basic earnings per share in RwF	15	**22.20**	**17.65**

	Note	2013 RwF'000	2012 RwF'000
Assets			
Cash on hand	29 (a)	11,110,210	9,595,769
Balances with the National Bank of Rwanda	29 (b)	24,855,050	54,304,202
Due from banks	16	107,377,523	25,898,920
Held to maturity investments	17(a)	50,820,690	13,119,325
Loans and advances to customers	18(a)	199,025,241	185,066,752
Equity Investments	17(b)	218,455	218,455
Other assets	19	7,695,005	12,624,707
Property and equipment	21	21,018,894	21,627,964
Intangible assets	22	239,005	338,120
Total Assets		**422,360,073**	**322,794,214**
Liabilities			
Due to banks	23	17,345,024	18,418,926
Deposits and balances from customers	24	280,489,463	211,865,068
Tax Payable	14(b)	1,828,573	320,745
Deferred tax liability	25	1,620,650	2,454,218
Dividends Payable	20	7,416,579	5, 894,345
Other liabilities	26	8,705,581	14,788,641
Long-term finance	27	34,190,519	5,944,978
Total Liabilities		**351,596,389**	**259,686,921**
Capital and Reserves			
Share Capital (page 41)	28(i)	6,684,500	6,673,370
Share Premium (page 41)	28(ii)	18,236,171	18,108,176
Revaluation Reserves (page 41)	28(iii)	6,946,241	7,354,844
Statutory Credit Risk Reserves (page 41)	28(iv)	-	19,100
Other Reserves (page 41)	28(v)	29,949,395	24,058,727
Retained earnings (page 41)	28(vi)	8,947,377	6,893,076
TOTAL EQUITY		**70,763,684**	**63, 107,293**