

**THE EFFECT OF ASSET LIABILITY MANAGEMENT ON THE
LIQUIDITY RISK OF COMMERCIAL BANKS IN KENYA**

BY

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DECLARATION

This research project is my original work and has not been submitted before any other academic institution for any award.

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This project has been submitted for examination with my approval as the research project supervisor.

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DEDICATION

With special affection and admiration, I dedicate this research project to my wife Mary and my son Dan.

ACKNOWLEDGEMENTS

I foremost give thanks to God for his grace to complete this project work. I would like to acknowledge for their contributions and support in the process.

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ABSTRACT

Liquidity is an important determinant of financial distress. The objective of liquidity management thus is to ensure that banks are able to meet in full all their financial obligations as they fall due. Banks liquidity is directly affected by asset liability management decisions in the management of the balance sheet of commercial banks. Asset liability management involves the management of the total balance sheet dynamics and it involves quantification of risks and conscious decision making with regard to asset liability structure in order to maximize the interest earnings within the framework of perceived risks. The main objective of asset liability management is not to eradicate or eliminate risk, but to manage it in a way that the volatility of net interest income is minimized in the short run and economic value of the bank is protected in the long run. The objective of the study was to investigate the effect of Asset liability management on the liquidity risk on the commercial banks in Kenya.

The study adopted a descriptive design in its methodology and the researcher chose to study on commercial banks due to availability of needed data and convenience. All the 43 commercial banks in Kenya were targeted for this study. Secondary data was obtained from annual Central bank of Kenya Banks supervision reports as well as banks annual and published financial reports while primary data was also collected by questionnaire method to supplement the secondary data. Out of the 43 questionnaires issued, 35 questionnaires were returned fully completed representing 81.3%, while 8 questionnaires were not returned representing 18.6% of the total questionnaires distributed to the respondents. SPSS version 20.0 was used for data analysis. The test for significance was t-test and computing the correlation coefficient (r), coefficient of determination and analysis of variance (ANOVA).

The results of the regression analysis shows that there is a significant positive relationship between independent variables (return on equity, capital adequacy, loan to deposit ratio, return on assets, total assets, asset liability management policies, liquidity

stress testing and contingency funding plan) and the dependent variable i.e. liquidity risk of commercial banks). The findings of the analysis conclude that independent variables have an effect on the liquidity risk of commercial banks in Kenya.

The research gives the following recommendations for policy: Commercial banks need to place greater emphasis on developing an integrated view of risks facing the banks; Asset liability committees and risk managers should implement robust and comprehensive balance sheet management approaches; management should also ensure there are effective liquidity management strategies. Lastly, this research study forms the basis for further research to be extended to other financial institutions that were relevant to the study such as Microfinance institutions (MFIs) but were not covered. A further research could also be carried out on the role of Asset liability committee with a view to coming up with recommendation to strengthen its role in the management bank risks. Lastly, a research could be carried on the factors that influence liquidity levels of commercial banks in Kenya.

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LIST OF ABBREVIATIONS

- ANOVA –Analysis of Variance
- ALM -Asset Liability Management
- ALCO -Asset Liability Committee
- BCBS -Basel Committee on Bank Supervision
- BIS -Bank for International Settlements
- CFP -Contingency Funding Plan
- CAR -Capital Adequacy Ratio
- CBK -Central Bank of Kenya
- LTD -Loan to Deposit ratio
- MFIs -Micro Finance Institutions
- ROA -Return on Assets
- ROE -Return on Equity

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Over the years, banks remained and will continue to be an important institution for any economy as they play the most fundamental role in the payments system. In most developing countries, commercial banks are the most dominant financial institutions, with the capital market institutions playing a minimal role. Of the main functions of commercial banks is the availing of funds (monetary) to its customers. For a bank to be in a position to do so, it must be in a healthy liquidity position (Litter et al, 2004).

In a traditional financial intermediation framework, banks provide liquidity to the whole economy. This is done through balance sheet intermediation by creating a duration mismatch between their assets and liabilities. This transformation exists because banks are supposed to be better at pooling, selecting and monitoring loans and borrowers than their depositors, and are therefore able to reduce the information asymmetry on credit markets. In so doing, banks intermediations ease the credit constraints affecting non-financial agents.

The market turmoil that began in mid-2007 highlighted the crucial importance of market liquidity to the banking sector. The tightening of liquidity in certain structured products and interbank markets, as well as an increased likelihood of off-balance sheet commitments coming onto banks' balance sheets led to severe funding liquidity strains for some banks and called for central bank intervention in some cases. In response to the market events, the Basel Committee original mandate was expanded and the working group on liquidity risk (management and supervisory challenges) made initial observations on the strengths and weaknesses of liquidity risk management in times of difficulty (BIS, 2008).

These observations, together with those provided by the review of national liquidity regimes, formed the basis of the report, which was submitted to the Basel Committee in

December 2007. Originally, Basel II guidelines did not focus on liquidity risk management and the spotlight was on architecting a framework for regulatory oversight of banking capital adequacy to ensure efficient usage and management of capital. Just at the onset of the crisis in 2008, the Basel Committee started focusing on liquidity risk management.

1.1.1 Asset Liability Management

Baum (1996) defines Asset Liability management (ALM) as the practice of managing a business so that decisions and actions taken with respects to assets and liabilities are coordinated in order to ensure effective utilization of company's resources to increase its profitability. ALM is conducted primarily at an overview, balance sheet level (Choundhry, 2011). Thus, ALM involves the management of the total balance sheet dynamics and it involves quantification of risks and conscious decision making with regard to asset liability structure in order to maximize the interest earnings within the framework of perceived risks. The main objective of ALM is not to eradicate or eliminate risk, but to manage it in a way that the volatility of net interest income is minimized in the short run and economic value of the bank is protected in the long run. The ALM function involves controlling the volatility of net income, net interest margin, capital adequacy, liquidity risk and ensuring an appropriate balance between growth and risk.

The whole subject of assets liabilities management is an area of banking that has undergone drastic change. Strong capital does not guarantee liquidity in all situations, there can be panics and sudden increase in the demand for liquidity (Paul, 2009). However, it is the job of the central banks to help in those circumstances. A strong capital base in the banking system and in all its components is likely to limit future liquidity shocks management, this is a provoking idea for the management of the financial institutions to think about and act. However, how and when to act are the questions which led to asset liability management; a management tool to monitor and manage various aspects of risks associated with the balance sheet management, including the management of exposure of the financial institutions.

The Asset liability management in the recent years has become a tool of integrated analysis of assets and liabilities so to value not only the interest rate risk but the liquidity risk, solvency risk, firm strategies and asset allocation as well. The landscape of asset liability management for the financial sector is ever changing and the scope of asset liability management activities has widened. Banking institutions have adopted Asset liability management strategies to address key risks such as; interest rate risks, liquidity risk and foreign exchange risk. A sound ALM process integrates strategic, profitability, and net worth planning with risk management. This process often includes an Asset Liability Committee (ALCO), which has the central purpose of attaining goals established by the short and long-term strategic plans without taking on undue risk.

Asset liability management practice is concerned with managing interest rate and liquidity risks and this is the ALM desk within the treasury department. Interest rate risk exists in two strands. The first strand is that the risk of changes in asset liability value due to changes in interest rates. Such changes impacts the cash flows of assets and liabilities, or rather their present value, because financial instruments are valued with reference to market interest rates. The second strand is associated with optionality, which arises with products such as early redeemable loans. The other type of risk managed by ALM is the liquidity risk, which refers to the liquidity of markets and the ease with which assets can be translated to cash (Choundhry, 2011).

1.1.2 Liquidity Risk

Basel Committee on Banking Supervision defines liquidity as the ability of a bank to fund increases in assets and meet obligations as they fall due, without incurring unacceptable losses. The fundamental role of banks in the maturity transformation of short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk both of an institution – specific nature and that which affects markets as a whole. Liquidity risk arises from maturity mismatches where liabilities have a shorter tenor than assets. A sudden rise in the borrowers’ demands above the expected level can lead to shortages of cash or liquid marketable assets (Oldfield and Santamero, 1997).

According to Wellink (2008), "The extreme liquidity conditions and resulting difficulties that persist today are vivid illustrations of the critical importance of market liquidity to the banking sector, these events emphasized the links between market and funding liquidity, the interrelationship between funding liquidity risk and credit risk, and the fact that liquidity is a key determinant of banking sector soundness."

The main role of banks in the financial market is to create liquidity and transform risk (Berger, & Bowman, 2009). Banks use short-term debt to invest in long-term assets (Diamond and Dybvig, 1983). This function creates liquidity risk and therefore a bank unable to roll over maturing debt can fail despite of being solvent. Majority of recent bank liquidity crises in developed economies were caused by increased uncertainty over a bank's solvency and played out primarily in wholesale funding markets (Huang & Ratnovski. 2011).

Liquidity is a significant determinant of financial distress, because without liquidity a bank cannot meet the deposit withdrawals and satisfy customer loans. The objective of liquidity management thus is to ensure that banks are able to meet in full all their financial obligations as they fall due. In December 2006, the Basel Committee on Banking Supervision established the working group on Liquidity to review liquidity supervision practices in member countries. The working group's mandate was to take stock of liquidity supervision across member countries. This included an evaluation of the type of approaches and tools used by supervisors to evaluate liquidity risk and banks' management of liquidity risks arising from financial market developments.

The new Basel III accord aims to address liquidity risk in banks through the Liquidity coverage ratio (a liquidity requirement) and the Net stable funding ratio (a restriction on maturity mismatch that limits the volume of refinancing coming due each period. (Basel Committee 2010). Basel III has introduced new banks requirement both on the capital and on the liquidity risk. These changes will have big impact on banks, because they are required to hold a level of capital and liquidity higher than in the past, this will inevitably

have also an impact on the liquidity creation function performed by banks (Horvát, et al, 2012).

1.1.3 Effect of Asset Liability Management on Liquidity Risk

Asset liability management plays a critical role in weaving together the distinct business lines in a bank. The management of both the liquidity and balance sheet are crucial to the existence of a financial institution and sustenance of its day to day operations. It is also essential for seamless growth of the balance sheet in a profitable way. Typically, the Asset liability management function seeks to generate daily gaps on short-term ladders and ensures that cumulative gaps operate within pre-set limits. However, managing liquidity gaps alone is not adequate. A well-managed liquidity function will include liquidity contingency plan, liquid asset buffers and setting liquidity policies and limits in tune with level of risk that the management believes is acceptable and manageable (Oracle White Paper, 2011).

In recent times, even large multinational financial institutions were in a deep liquidity crisis and in dire need of external intervention for survival. The practical importance of asset liability management and liquidity management had been somewhat underestimated. Even managers of large institutions, regulators, and observers glimpsed how well reputed firms and trusted institutions folded up and were not able to find a way out of the deep liquidity crisis (Oracle white paper, 2011). This resulted in regulators attributing high importance to new measures and practices needed to ensure a sound liquidity management system. Regulators have enhanced and in some geographies revamped the regulatory oversight on asset liability management and liquidity management (Oracle white paper, 2011).

Over the past couple of decades, the financial system has evolved a more effective approach of liquidity management. Due to financial innovation, commercial banks have moved from an “originate to hold” model to an “originate to distribute” model. Banks now rely more on financial markets for their funding. This has allowed the alleviating of borrowing constraints in the economy, as growth in lending could be partially

disconnected from growth in bank deposits. But financial institutions were probably overconfident in their Asset liability management techniques, which became increasingly sophisticated. In times of stress, it appears more difficult than anticipated for financial institutions to adjust their Asset liability management quickly. Therefore, there is probably a limit to the optimization of asset liability management, and this is a message for the future (Jean, 2008).

Through correct Asset liability management -liquidity, profitability and solvency of banks can be ensured and at the same time banks can manage and reduce risks such as credit risk, liquidity risk, interest rate risk, currency risk etc. The liabilities of a bank have distinct categories of varying cost, depending upon the tenor and the maturity pattern. Likewise, the assets comprise different categories with varying yield rates depending upon the maturity and risk factors. Therefore, the major aim of Asset liability management is the matching of the liabilities and assets in terms of maturity, cost and yield rates. The maturity mismatches and disproportionate changes in the levels of asset and liabilities case both liquidity risk and interest rate risk.

1.1.4 Commercial Banks in Kenya

In Kenya, there are 43 licensed Commercial banks. The regulation of banks is the responsibility of the Central Bank of Kenya. The Banking Supervision department carries out the function of supervising banks to ensure the following; liquidity, solvency, and proper functioning of a stable market based banking system. Further to this, audited performance of the banking sector is measured in terms of capital adequacy, asset quality, liquidity, and earnings based on the Central Bank internal rating system. Under section 19 of the Banking Act in Kenya, an institution shall maintain a minimum holding of liquid assets as the Central Bank may from time to time determine. Currently an institution is required to maintain a statutory minimum of 20% of its deposit liabilities with the Central Bank.

According to the Central Bank of Kenya, liquid assets comprise of notes and coins (local and foreign), balances with the Central Bank of Kenya, balances with domestic commercial banks, balances with banks abroad, balances with financial institutions, balances with mortgage finance companies, balances with building societies, treasury bills, treasury bonds, certificates of deposits or government bearer bonds, foreign currency, and bearer certificates of deposit.

Central Bank of Kenya, Liquidity Regulations Supplement (2002), state that the purpose of the regulation among others is to; ensure that each institution meets the minimum liquidity requirements, guide institutions in the formulation of liquidity risk management strategies, policies, procedures, management information systems, internal controls and contingency plans for unexpected distress situations, protect deposit funds, promote a stable and efficient banking system, and endear confidence in the financial sector. The bank's supervisory department continues to adopt and implement effective and sound supervisory methods in order to minimize the risk inherent in the banking system. The funding gap for commercial banks is managed through a stable funding base along with detailed forecasting.

According to the Bank supervision annual report (CBK, 2011), in the twelve months to December 2011, the banking sector's average liquidity ratio was above the statutory minimum requirement of 20 percent, with all banks meeting the liquidity threshold. Liquidity ratio stood at 37.0 percent as at December 2011 compared to 44.5 percent registered in 2010. The reduced liquidity ratio is attributable to increased loans and advances in 2011 as indicated by the increase in gross loans to gross deposits ratio from 74 percent in 2010 to 80 percent in 2011. The Central Bank of Kenya however, emphasizes that it is the responsibility of every board of directors of institutions to develop and document liquidity risk management strategy and relevant policies (CBK, 2002).

1.2 Research Problem

Banks liquidity is directly affected by asset liability management decisions. Managers should always analyze the impact that any ALM decision will have on the liquidity position of the bank. Liquidity risk depends on asset liability management variables such as ALM policy, contingency funding plans, maturity gap analysis, stress testing and asset liability committee activities. Liquidity is affected by ALM decisions in some ways: Any alterations in the maturity structure of the assets and liabilities can change the cash requirements and flows; Savings or borrowing promotions or change the ALM mix could have a detrimental effect on liquidity if not monitored closely while changes in interest rates could impact liquidity. If savings rates go down, customers might withdraw their capital and cause a liquidity shortfall. Higher interest rates on loans make it difficult for some clients to meet interest payments, causing a liquidity shortage.

The problem with banks liquidity is that when banks get it wrong, there can be drastic consequences for the economy. A key issue to ensure advancement has to be how to make sure banks successfully balance their liquidity risk in order to be stable and still supply the economy with adequate liquidity. Public policy makers will aim to continue strong national economic growth while keeping low unemployment and inflation. Banks themselves have a motive to ensure stability and also boost earnings. The sheer size and complexity of the modern economy increases the importance of this topic and this is all the more reason it needs to be carefully considered (Vossen 2010). Funding liquidity risk has played a key role in all historical banking crises.

Preceding studies have demonstrated the need for further research in liquidity risk. Gareth (2008) suggested a further research on liquidity risk management by concluding that asset liability committee (ALCO) is also responsible for a bank's liquidity risk management. Vossen (2010) concluded that Banks must change how to balance their liquidity risk and their role as liquidity providers, restructuring liquidity management. He further suggested future research noting that "as banks and regulators change policies there will be a need to evaluate such policies before crisis strikes in an attempt to prevent

or limit the intensity of crises. Empirical analyses of the regulators actions and their effects are future research possibilities.’’

In Kenya, empirical evidence on the application of both the traditional and contemporary techniques of assets liability management in the risk management process and in particular liquidity risks by financial institutions is scanty. However, a recent research on Kenyan banks by Citi Research (2012) suggests that “there is a concern on the widening liquidity gap due to the duration mismatch between their funding and asset risks. Kamau (2013) suggested that the findings of his study forms basis for future research extending frontiers of liquidity level in financial markets.

This research study addressed the following research question: What is the effect of Asset liability management on the liquidity risk of commercial banks in Kenya?

1.3 Objective of the Study

The objective was to determine the effect of asset liability management on the liquidity risk of commercial banks in Kenya.

1.4 Value of the Study

This research study is significant because it deals with an issue Kenyan banks are facing and will continue to confront in the future. In the present scenario, Asset liability management is important for the banking industry due to deregulation of interest rate regime. It helps to assess the risks and manage the risks by taking appropriate actions. So, to understand the Asset liability management process and various strategies that are helpful for the banks to manage the liquidity risk, this topic is selected. Therefore, it would be beneficial for me to develop my knowledge regarding the Asset liability management process, functions and its effect on the liquidity risk in Commercial banks.

Second, policy makers such as the Central Bank of Kenya and academicians recognize that liquidity is central in the dynamics of a financial crisis, and also that measurement of

liquidity is critical in evaluating and regulating systemic risk. The liquidity coverage ratio proposed Basel III, for instance, calls for banks to maintain a sufficient buffer of liquid assets to cover outflows over the next thirty days. This research study therefore, might contribute to the existing body of knowledge in the area of Asset liability management in general and its role in liquidity risk management.

Finally, and yet significantly, the research study might contribute and form the basis for further research into the application of innovative Asset liability management strategies in liquidity risks by similar industry players.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter highlights the literature relating to the research topic. This section dealt with the review of theories relating to Asset liability management and liquidity risk; general literature review; review of empirical studies and finally gave a conclusion from the literature review indicating the gaps the research is addressing and the original contribution it will make to the field in general.

2.2 Theoretical Review

Diverse ideas and theories guiding this research will be discussed below. These theories are going to be; The Redington's theory of immunization; Efficient frontiers and asset allocation theory; The Commercial Loan Theory and the Liability Management Theory. These theories are aimed to show the link between Asset liability management and liquidity risk.

2.2.1 Redington's Theory of Immunization

Redington's theory of immunization, which incredibly is now over 40 years old, is an excellent example of an asset liability management model and as a practical model to date; it has had very little competition. The notion of equating the mean term of assets with the mean term of liabilities has been used for many years by a number of insurance companies worldwide. More recently, the notion of convexity has given immunization a new lease on life.

Immunization and the process of asset liability matching have a history that dates back to the winter of 1951. One morning, Redington, an English actuary decided that it was simply too cold to get up and work in the garden so he remained in bed and created the concept immunization. His work was presented to the Institute of Actuaries in February, 1952, in London in a paper titled "*Review of the Principles of life- office valuations.*" In this paper he addressed the following question: "is the actuary's certification of the

solvency of a life insurance company dependent on a certain level of interest rates being maintained, or can the actuary give a more absolute certification of solvency?” In an effort to answer this question, Redington provided the definitions to two phrases, “matching” and “immunization.”

Matching is defined as “the distribution of the term of assets in relation to the term of the liabilities in such a way as to reduce the possibility of loss arising from a change in interest rates” (Redington, 1952). Immunization is the process of making investments in a manner which will protect the existing business from a change in the interest rates. In his paper, Redington concluded that the results of the actuary can be absolute under certain circumstances, with the primary condition being that the duration of the payments going out of the company be equal to the duration of the cash being received by the company. It was his opinion that if this criterion be met, the assets and liabilities would then be equally affected by changes in the market interest rate.

Duration was introduced by Macaulay back in 1938 and still remains a critical tool for Asset Liability Management. Despite its wide usage immunization has some very pertinent limitations. For a perfectly immunized portfolio, the following are the conditions;

Present value of Assets = Present value of Liability

Duration of Assets = Duration of Liability

Convexity of Assets > Convexity of Liabilities

According to Cain and Treussard (2007), immunization is the act of establishing a position such that the value of the position is insensitive to small changes in some specified parameter and this normally enables strategic managers to meet their target profit. The term is most commonly used to describe a liability and supporting portfolio such that the net or surplus market value of the position is immune to small changes in interest rates. This term could readily be applied to any business where its profits or values have been protected from changes in the price of an input or output.

2.2.2 Efficient Frontiers and Asset Allocation Theory

The ideas underlying some of the most advanced Asset liability management theories of today were established over 40 years ago with the concepts of risk-reward trade-offs and efficient frontiers. At the time, the financial world simply was not ready for the concept of efficient frontiers, or rather; the computer power available at the time just had not reached the stage where the ideas could be put into practice. The efficient frontier model is an example of a very broadly based asset liability model.

The work of Markowitz (1952), called “Portfolio Selection”, proposed that the investor should take into account the impact of a risky security on not only a portfolios expected return but also its variability of return. He suggested that primary function of portfolio management is to identify an asset allocation strategy that provides the highest expected (mean) return for a given level of risk that is acceptable to the investor. Markowitz paper introduced the concept of the efficient frontier, which represents the set of optimal combinations of risky assets for each level of risk. In the absence of borrowing, rational and risk-averse investors will want to select a strategy that is on the efficient frontier. Under the Markowitz model, given riskless lending and borrowing rates and all investors working with the same set of inputs, all investors will prefer a single portfolio of risky assets. This is referred to as the optimal portfolio.

2.2.3 The Commercial Loan Theory or Real Bills Doctrine

This theory originated in England during the 18th century. It is also referred to as the “real bills doctrine” and is of English origin. Historically, liquidity management focused on assets and was closely tied to credit policies. Prior to 1930, the commercial loan theory encouraged banks to make only short-term, self-liquidating loan facilities. Such loans closely matched the maturity of bank deposits and enabled banks to meet deposit withdrawals with funds from maturing loans. Logical basis of the theory Commercial bank deposits are near demand liabilities and should have short term self-liquidating obligations (Emmanuel, 1997).

Bankers long ago recognized the advantage of making self-liquidating loans (otherwise known as real bills, or claims on real resources) in order to resolve the liquidity-earnings problems. A loan was considered self-liquidating if it was secured by goods in the process of production or by finished goods in transit to their final destination for resale. The loan could be repaid after the goods were sold. Loans of this type could ensure the banks continuous liquidity and earn profits. This meant that, liquidity and earnings were simultaneously gained. However, no loan is truly automatically self-liquidating, because there may not be a ready market for the goods produced. Therefore, Banks that limit themselves to making self-liquidating loans are considered to subscribe to the commercial loan theory of bank management. This practice led to the development of commercial bills doctrine or commercial loan theory (Emmanuel, 1997).

The commercial loan theory, suffers from the fallacy of composition. Such a system can keep one bank liquid, but if all other banks follow this procedure, then the overall liquidity needs will not be met during times of financial crisis. Thus, a credit facility secured by goods cannot be repaid if the goods can't be sold off, or if the customer takes a loan to buy the goods. The banking system is no more liquid or less liquid than it was before the transaction. In the absence of central bank as lender of last resort and that stands ready to supply needed liquidity to the system as a whole, the real bills doctrine is incomplete. Although commercial loans continue to be an important component of banks asset mix, development of other uses of their funds has caused the operating methods of modern banks to change significantly (“Bank Theories”, 2009).

2.2.4 The Liability Management Theory

Since the early 1960s, the loan portfolios of commercial banks have been affected by the emergence of a new theory, which became known as the liability-management theory. This is one of the important liquidity management theories and says that there is no need to follow old liquidity norms like maintaining liquid assets, liquid investments etc. Lately, banks have focused on liabilities side of the balance sheet. According to this theory, banks can satisfy liquidity needs by borrowing in the money and capital markets.

The fundamental contribution of this theory was to consider both sides of a bank's balance sheet as sources of liquidity (Emmanuel, 1997).

Today, banks use both assets and liabilities to meet liquidity needs. Available sources of liquidity are identified and compared to expected needs by a bank's Asset and liability management committee (ALCO). Key considerations include maintaining high asset quality and a strong capital base that both reduces liquidity needs and improves a bank's access to funds at low cost. There is a short-run trade-off between liquidity and profitability. In the long-run, if management is successful in managing liquidity, then, long-term earnings will exceed other banks earnings, as will the capital and overall liquidity (Koch and McDonald, 2003).

2.3 Asset Liability Management Core Functions

Banks are a vital part of the economy and the essence of banking is asset liability management (Choudhry, 2011). Broadly, Asset liability management essentially comprises of managing the liquidity risk and market risks in an effective and efficient manner. The Asset liability management function commonly derives its charter from the Asset liability committee (ALCO) framework, which sets out the scope of the Asset liability management function, the risk kinds that come under its purview and the acceptable levels of risk appetite. Though the primary aim of Asset liability management is managing balance sheet risks, the Asset liability management function progressively tends to aim on balancing profitability while managing risks. This in the process proactively seeks to guard the bottom-line and even maximize profitability.

According to Oracle White Paper (2011), the core functions of Asset liability management consists of managing maturity gaps and mismatches while managing interest rate risk within the overall mandate prescribed by ALCO. The five key responsibilities and some usual activities initiated by the Asset liability management team are highlighted below.

First, is managing structural gaps. In a financial institution with a mature Asset Liability management function, this is arguably the most critically and continuously monitored aspect, since the Asset Liability management Managers seeks to manage the structural gaps in the Balance Sheet. While liquidity management focuses typically on short-term time ladders, the structural gap management shifts the focus on time ladders more than a year. This aspect of Asset Liability management stresses the importance of balancing maturities as well as cash flows on each side of balance sheet (i.e. deposits and loans) It strategizes dynamically on balancing the gaps, issuing timely guidelines to adjust focus on ‘right’ product types and tenors, and actively involve Asset liability committee in this process (Oracle White Paper, 2011),

Second is management of static gap. Asset Liability management function takes into consideration assets maturing in short, medium and long time ladders and seeks to balance it vis-à-vis liabilities maturing across short, medium and long term ladders. The gaps reports typically point to funding gaps and excess funds at different points in time. The challenge with the Asset Liability management function is that the gaps are dynamically evolving and need continuous monitoring as the balance sheet changes every day (Oracle White Paper, 2011).

Third is the Duration. Duration is considered as a measure of interest rate sensitivity. The Macaulay’s duration is traditionally accepted as a good measure of ‘length’ of portfolio or a measure of center of gravity of discounted cash-flows over life of an asset or liability. It is a common practice to measure duration of portfolio for different product types as well as on an overall portfolio level and useful to simulate how duration of portfolio will be affected by future events (Oracle White Paper, 2011). According to Fabozzi (2003), Macaulay duration measures the “weighted average time-to-maturity of the bond’s cash flow.” The weightings are the present values of cash flow.

Fourth is the dynamic gap management. It is normal practice to rely on dynamic gap reports to simulate future gap positions for assumed business volumes and exercise of

options (e.g., prepayments). In addition to proposed new volumes, prepayment transactions and assumed deposit roll-overs, the ALM manager would like to include a proposed hedge transaction (Oracle White Paper, 2011).

The second last function is long-term assets / long-term liabilities ratio management. Asset liability management practitioners prefer to focus on the ratio of assets and liabilities exceeding one year and often want to set acceptable limits around this. Where there are operational limits, the ALCO meetings will usually monitor the ratio. The institution constantly endeavors to stay within a comfortable level around this set limit. This along with liquidity gaps help to bring in any imbalances and help maintain a structurally sound balance sheet by focusing on both sides (Oracle White Paper, 2011).

Lastly is the function of managing liquidity. Typically, the asset liability management function seeks to generate daily gaps on short-term maturity ladders and ensures that cumulative gaps operate within the already pre-set limits. However, managing liquidity gaps alone is not adequate. A well-managed liquidity function will include a contingency plan, capital and liquid asset buffers and setting of liquidity policies in tune with level of risk that the management believes is acceptable and manageable (Oracle White Paper, 2011).

2.4 Asset Liability Committee Composition and Roles

The CBK prudential guideline on liquidity risk management stipulates that, in order to effectively monitor its liquidity risk, an institution is supposed to establish an Asset Liability Committee (ALCO) with the following four key roles: First, management of the overall liquidity of the institution; Second, ALCO must report directly to the Board and in the case of a foreign incorporated bank, report to the senior management of the institution in the country; Third, ALCO must facilitate, coordinate, communicate and control balance sheet planning with regards to risks inherent in managing liquidity and convergences in interest rates; and; Fourth, ALCO is responsible for ensuring that a bank's operations lies within the parameters set by its Board of Directors.

In determining the composition, size and various roles of the ALCO, the Board is required to consider the size of the institution, the risks inherent in the institution's operations and the organizational complexity. However, the ALCO is not responsible for formulating the in-house liquidity risk management policy.

In most banks, ALCO meets at pre-determined intervals and the agenda is usually pre-determined and for reporting purposes. In order to ensure that ALCO meetings are effective, the ALCO pack (comprehensive in many cases) is distributed in advance and reviewed during the meeting. The ALCO function is critical to Asset Liability management function and serves as the reviewing and approving authority for several key decisions including balance sheet structure, gap analysis, liquidity and capital adequacy ratios and above all pro-active management of Balance Sheet (Oracle White Paper, 2011).

2.5 Review of Empirical Studies

Odhiambo (2006) did a survey of liability management practices in commercial banks in Kenya and found that regular and systematic appraisal of asset liability management policies was a common practice among most banks. Most banks also indicated that their Asset liability management systems were governed by guidelines set by the management board which is a cross functional outfit covering all the major functions in the bank this showed that Asset liability management is a highly strategic issue in most banks, regardless of their size, extensively utilized most of the conventional hedging instruments.

Muhammed (2007) did a survey of liquidity management approaches and their effect on profitability of commercial banks in Kenya. The researcher findings reveal that the most popular theory with bankers is Commercial loan theory; the next is Asset liability management theory. The evidence of use of shiftability and anticipated income theory is weak. However, there was one bank that employed a hybrid strategy i.e. anticipated and commercial loan theory.

Gareth (2008) in a case study of GBS Mutual Bank on interest rate management concludes his thesis by summarizing the practicality of the various interest rate risk hedging alternatives available to the GBS Mutual Bank. He noted that, implementing a particular strategy or instrument depends, on its asset and liability committee's (ALCO) decision. He suggested a further research on liquidity risk management by concluding that since the Asset liability committee is also responsible for a bank's liquidity risk management. The study could be extended to include this risk-type. Thus the lack of liquidity can become a restraint on its profitability which is often referred to as the 'tension' between profitability and liquidity.

Rauch et al. (2010) study the determinants of liquidity risk and attempt to identify the determinants of liquidity creation. Their results highlight that the most important determinants are macroeconomic variables and monetary policy, while not showing a significant relationship between liquidity creation and bank specific variables such as size and performance.

Vossen, (2010), in a study on Bank liquidity management noted that banks face two central issues concerning liquidity. Banks are responsible for managing liquidity creation and liquidity risk. He concluded that banks must change how to balance their liquidity risk and their role as liquidity providers by restructuring their liquidity management strategies. Liquidity risk exposes banks to financial challenges. Banks attempt to control liquidity risk factors by balancing cash inflows and outflows and some even hold liquidity cushions for strategic purposes. Being exposed to too much liquidity risk expose banks to challenges such as; run away investors, runs by depositors, ratings downgrades, and tougher financing. These consequences are what banks wish to avoid and why they implement policies to protect themselves from liquidity risk.

Bonfim & Kim (2011) in a study on European and North American banks in the 2002-2009 period illustrate how banks manage liquidity risk. The authors also identify the determinants of liquidity risk. The results highlight that the type of relationship between

liquidity risk and size, performance and the ratio between loans and deposits depends on the type of liquidity risk measure used. Bank size generally has a positive impact on bank liquidity, while the performance measure has an ambiguous relationship with liquidity risk.

Horvath et al. (2012) in a study on Czech banks, show how capital impact on bank liquidity creation. Authors highlight that, for smaller banks, Basel III might lead to banks' reduced liquidity creation by introducing tighter capital requirements and symmetrically greater liquidity creation might hamper banks solvency. This means that, enhanced liquidity creation can have some detrimental consequences. The results underline that there is a trade-off between the benefits of financial stability introduced by the capital requirements and those of greater liquidity creation. Accordingly, they sustained that banks that create less liquidity on the market have also a lower exposure to liquidity risk.

Kamau (2013), study on factors influencing liquidity level of Commercial Banks in Kisumu City, Kenya concludes that variations in liquidity level are caused by both internal and external factors. Internal factors found significant in determining liquidity level of commercial banks in Kisumu are contingency planning, profitability, banks major obligations and management policies. The author suggested that the findings of his study forms basis for future research extending frontiers of liquidity level in financial markets.

2.6 Summary of Literature Review

From the literature review a research gap was identified in the empirical studies. The importance of this research study was attempting to answer the research question ‘‘what is the effect of Asset liability management on the liquidity risk of commercial banks in Kenya.’’ The landscape of the financial services industry is becoming increasingly competitive, coupled with rising costs of intermediation due to higher capital requirements and deposit insurance, financial institutions face loss of spread income. In

the last few years, papers by the Basel Committee on Banking supervision and the International Institute of Finance have set high hurdles in terms of principles and recommendations. Instead of waiting to be told what to do by the regulators, banks should be ready to demonstrate that their senior management has a clear understanding of and a genuine involvement with their firm's liquidity risk management. Regulators are very likely to place greater emphasis on local liquidity risk positions.

Liquidity risk management is entering a new and much more demanding era. Banks should review their liquidity risk policies, contingency funding plan and their mismatch guidelines. To achieve this, Asset and liability committees are set to play a pivotal role. Their challenge will be to build a comprehensive, joined up perspective of their institutions' asset and liability risk. ALCOs will need to ensure that fundamental challenges are addressed. So going forward, banks will need to place greater emphasis on developing an integrated view of risk across all the risk types. The emerging economic landscape presents huge challenges for Asset and liability management. The most recent financial turmoil has placed greater emphasis on liquidity management with tighter regulations and reporting requirements. Treasury and risk managers and Asset liability committees (ALCO's) need a robust and comprehensive balance sheet management solution to meet these evolving needs (PWC, 2006).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter of the research outlines the overall research methodology that was used in the study. This includes the research design, population, data collection, data validity and reliability and data analysis.

3.2 Research Design

A research design is a plan, structure and strategy of investigation so conceived as to obtain answers to research questions or problems. A descriptive design will be used in the study. Descriptive research design is a type of research method that is used when a researcher wants to get information on the current status of a person or an object. It is used to describe what is in existence in respect to conditions or variables that are found in a given situation. In this research, descriptive research will be used to determine the statistical association between the relationship of ALM variables and liquidity risk.

3.3 Population

The population of a research applies to the collection of all possible individuals, objects or measurements of interest (Mason et al, 1999). The identification of the population of the research question helps in narrowing down to the specific objective that is the subject matter of the research. For the purpose of this research, the study population comprised all the 43 commercial banks in Kenya as at 31/12/2012 (Appendix ii). Therefore, a census was used. The justification of this population was because this is a regulatory requirement by banks and bank institutions were easily accessible.

3.4 Data Collection

The study made use of secondary sources of data obtained from published sources such as the Central Bank of Kenya annual surveys and Banks supervision reports. The secondary data was supplemented with primary data collected through a questionnaire administered on a drop and pick basis. Before the actual data is collected, the researcher

drafted a Questionnaire (appendix i) that was later sent to the banks. The researcher made an initial visit to the banks for familiarization as well as seeks consent for the study.

3.4.1 Data Validity and Reliability

To ensure validity and reliability of the data to be collected, formulated questionnaires were pre-tested to establish their validity before they are administered to the respondents. The questionnaires were structured to enhance the research objective. Further, the researcher discussed in details the contents and the structure of the questionnaire with the supervisor before going to the field to ensure validity.

3.5 Data Analysis

The data collected was analyzed using the computer software known as Statistical Package for Service Solution (SPSS) version 20.0. Descriptive, correlations and regression analysis is applied to study and compare the effect of independent variables on the dependent variable. The questionnaire data obtained was checked for accuracy and completeness of recording of the responses, coded and checked for coding errors and omissions. SPSS was used in investigating, measuring and comparing the specific issues about the effect of Asset liability management on the liquidity risk. Quantitative analysis techniques such frequencies and cross tabulations were used to analyze the data.

3.5.1 Analytical Model

Liquidity risk was the dependent variable while Asset liability management components were the independent variables of the research study. The researcher used t-test as a test of significance since the sample size is large and greater than 30. The researcher computed correlation coefficient (r), coefficient of determination (r^2) and analysis of variance (ANOVA) using the regression model below.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + e$$

Where;

Y denotes the dependent variable (Liquidity risk) – This is measured as a ratio by dividing net liquid assets to total short term liabilities.

α is the value of the intercept.

β_i is the coefficient of the explanatory x variables.

e is the error term assumed to have zero mean and independent across time period.

X_1 is the return on equity (ROE) – It is measured by dividing earnings available for common stockholders to common stock equity.

X_2 is the capital adequacy ratio (CAR) – This is a measure of the financial strength of a bank, expressed as a ratio of its capital to its assets. This is given by dividing total capital by the total risk weighted assets.

X_3 is the Loan to deposit ratio (LTD) – This ratio measures the gross loans to gross deposits ratio. It is the amount of a bank's loans divided by the amount of its deposits at any given time.

X_4 is the Return on assets (ROA) - This is the bank asset utilization ratio and is measured by dividing the operating income by the total assets.

X_5 is the size of the bank. This is measured as the natural log of total assets.

X_6 is the presence and importance of ALM and liquidity management policies.

X_7 is the presence and importance of liquidity stress testing.

X_8 is the presence and importance of contingency funding plans.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of study findings of the investigation on the effect of asset liability management on the liquidity risk of commercial banks. In the study variables which were included are; return on equity, capital adequacy, loan to deposit ratio, return on assets, total assets, ALM policies, liquidity stress testing and contingency funding plan. This chapter analyses the variables involved in the study and estimates of the model presented in the previous chapter.

4.2 Research Findings

4.5.1 Response Rate

The response rate of the respondents who participated in the survey is as shown in table 4.1 below. Out of the 43 questionnaires which were issued, 35 questionnaires were returned fully completed representing 81.4%, while 8 questionnaires were not returned representing 18.6% of the total questionnaires distributed to the respondents. It can be inferred that the response rate was good. According to Mugenda and Mugenda (2003), a response rate of 70% and over is excellent for analysis and reporting on the opinion of the entire population.

Table 4.1: Response Rate

Response Rate	Rate (n = 43)	
	F	%
Filled Questionnaires	35	81.4
Unreturned questionnaires	8	18.6
	43	100

Source: Research findings

4.2.2 Highest Level of Education

Table 4.2 below indicate that (6.0%) respondents who participated in the study were college graduates, 51.4% indicated they were undergraduates and 42.6% indicated they were post graduates. This shows that majority of the respondents were undergraduates.

Table 4.2: Level of Education

Education level	Education level (n = 35)	
	F	%
Diploma	2	6.0
Undergraduate	18	51.4
Postgraduate	15	42.6
	35	100

Source: Research findings

4.2.3 Work Experience

Results of the study indicate that 22.8% of the respondents had worked between 1-2 years 28.4%, 25.6% and 14.2% of the respondents had worked for a period between 3-5, 6-8 and 9-11 years respectively, while 9.0% of the respondents had a work experience of over 12 years as indicated on table 4.3.

Table 4.3: Work Experience of Respondents

Work Experience	Years of Service (n = 35)	
	F	%
1-2 years	8	22.8
3-5 years	10	28.4
6-8 years	9	25.6
9-11years	5	14.2

12+years	3	9.0
	35	100

Source: Research findings

4.2.4 Length of Bank operation

Majority (37.1%) of the banks have been in business for between 11-15 years, while 34.3% and 28.6% of the banks have been in operations for over 16 years and between 5 and 10 years respectively as indicated on table 4.4 below.

Table 4.4: Length of Bank Operation

Categories in Years	Length (n = 35)	
	F	%
5-10 years	10	28.6
11-15 years	13	37.1
16+ years	12	34.3
	35	100

Source: Research findings

4.2.5 Asset Liability Management

4.2.5.1 Department Responsible for Asset Liability Management Function

Most (85.7%) of the respondents indicated that treasury department is responsible for asset liability management function, while 5.7% and 8.6% of the respondents indicated finance and risk departments respectively as shown on table 4.5 below.

Table 4.5: Department Responsible for Asset Liability Management Function

Departments	Response (n = 35)	
	F	%
Treasury	30	85.7
Finance	2	5.7
Risk	3	8.6
	35	100

Source: Research findings

4.2.5.2 Asset Liability Management Function

The study shows the views of respondents on the role of asset liability management function. Majority (33.3%), (38.9%), (42.2%) and (55.6%) of the respondents strongly agreed and agreed respectively that asset liability management function involves managing both assets and liabilities, maturity gaps and mismatches, structural, static and dynamic gaps liquidity risk and market risks as shown on table 4.6 below.

Table 4.6: Asset Liability Management Function

Statements	SA %	A %	(n = 35)		
			N %	SD %	D %
Managing both assets and liabilities	33.3	26.7	10	15.1	14.9
Managing liquidity risk and market risks	38.9	24.4	16.7	4.7	5.3
Managing maturity gaps and mismatches	42.2	27.8	15	7.6	7.4
Managing structural, static and dynamic gaps	23.3	55.6	11.1	4.4	5.6

Source: Research findings

4.2.6 Asset Liability Committee

According to the study majority (40.0%), (45.6%), (34.4%), and (41.1%) of the respondents strongly agreed and agreed respectively that management of liquidity of the bank, facilitates, coordinates, communicates and control risk planning, ensures bank's risk lies within parameters set by the board and undertakes maturity analysis of assets and liabilities to identify liquidity gaps as shown in table 4.7.

Table 4.7: Asset Liability Committee Function

Statements	SA	A	(n = 35)		
			N	SD	D
	%	%	%	%	%
Management of overall liquidity of the bank	33.3	40.0	11	10.2	0.5
Facilitates, coordinates, communicates and control balance sheet risk planning	45.6	28.9	0.5	11.2	9.8
Ensures bank's risk lies within parameters set by the Board	27.8	34.4	10	0.5	16.7
Undertakes regular maturity analysis of assets and liabilities to identify liquidity gaps	16.7	41.1	22.2	16.4	3.6

Source: Research findings

Relationship between Asset Liability Management Policies, Asset Liability Committee and Liquidity Risk of Commercial Banks

Results on table 4.8 below shows the correlations between asset liability management policies and liquidity risk management of commercial banks, while holding the correlation coefficient (r) value at between plus and minus one (-1.00 and +1.0). The study used the significance level of alpha = .05 (95%), Degrees of freedom (df) of 7, and two-tailed test.

Based on the study, correlation coefficient (r) was .833 and the coefficient of determination (r²) was .693 indicating that 69% of the liquidity risk of commercial banks can be predicted by asset liability management policies. Since the correlation of .693 is positive it can be concluded that the correlation is statistically significant, hence there is a positive relationship between liquidity risks of commercial banks and asset liability management policies.

Table 4.8: ALM Correlation Model

R	R Square	df	Sig
.833 ^a	.693	7	.028

Source: Research findings

4.2.7 Liquidity Stress Testing

Table 4.9 below indicated the majority (42.8%), (36.1%), (33.3%) and (33.3%) of the respondents agreed that liquidity stress testing: involves macro variables, capital controls and withdrawal of funding; consists of prepayments obligations, bid-ask spreads and collateral demands; involves cash flow timing and magnitude, liquidity gap relative to tolerance, profitability and solvency; and provides insight in the liquidity risks of the bank under different situations.

Table 4.9: Liquidity Stress Testing

Statement	SA	A	(n = 35)		
			N	SD	D
	%	%	%	%	%
Involves macro variables, capital controls and withdrawal of funding	27.2	42.8	11	10	9
Consists of prepayments obligations, bid-ask spreads and collateral demands	30.6	36.1	11	8.3	14

Involves cash flow timing and magnitude, liquidity gap relative to tolerance, profitability and solvency	25.0	33.3	8.3	14	19
provides insight in the liquidity risks of the bank under different situations	30.5	33.3	11.1	8.3	17

Source: Research findings

Relationship between Liquidity Stress Testing and Liquidity Risk of Commercial Banks

Table 4.10 below show the study results based on correlation coefficient (r) value at between plus and minus one (-1.00 and +1.0); significance level (Alpha = .05 or 95%), Degrees of freedom (df) of 6 and two-tailed test. Results of the analysis showed: correlation coefficient (r) of .761 and the coefficient of determination (r²) of .579 indicating that 58% of the liquidity risk of commercial banks can be predicted by liquidity stress testing. Since the correlation of .579 is positive it can be concluded that the correlation is statistically significant, hence there is a positive relationship between liquidity stress testing and liquidity risk of commercial banks.

Table 4.10: Liquidity Stress Testing Correlation Model

R	R Square	df	Sig
.761 ^a	.579	6	.026

Source: Research findings

4.2.8 Contingency Funding Plans

Majority (38.3%), (53.3%), (50.0%) (47.8%), (33.7%), (43.1%) and (49.9%) of the respondents strongly agreed and agreed respectively that: CFP process provides additional insight into the bank's liquidity strengths and weaknesses; CFP scenario analysis may identify an undesirable liquidity position before a crisis begins; CFP primarily addresses low-probability and high-impact events, the severity and duration of

negative liquidity events; CFP provide a plan for responding to various and increasing levels of a bank’s liquidity stress; CFP designate management responsibilities, crisis communication methods and channel, and reporting requirements; CFP identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations; and CFP describe steps to be taken to ensure bank’s sufficiency of sources of liquidity to fund operating requirements and meet the bank’s commitments.

Table 4.11: Contingency Funding Plans

Contingency Funding Plans	SA	A	(n =35)		
			N	SD	D
	%	%	%	%	%
CFP process provides additional insight into the bank’s liquidity strengths and weaknesses	38.9	33.3	11.1	0.6	11.1
CFP scenario analysis may identify an undesirable liquidity position before a crisis begins	53.3	16.7	20	7.2	2.8
CFP primarily addresses low-probability and high-impact events, the severity and duration of negative liquidity events	50.0	27.8	0.6	0.6	11.1
CFP provide a plan for responding to various and increasing levels of a bank’s liquidity stress	12.2	47.8	17.8	11.2	10.0
CFP designate management responsibilities, crisis communication methods and channel, and reporting requirements	33.7	21.1	18.2	13.6	13.4
CFP identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations	43.1	19.8	17.6	11.5	8.0

CFP describe steps to be taken to ensure bank's 49.9 30.0 11.0 7.0 1.1
sufficiency of sources of liquidity to fund
operating requirements and meet the bank's
commitments

Source: Research findings

Relationship between Contingency Funding Plans and Liquidity Risk

Table 4.12 below show results of study analysis based on correlation coefficient (r) value at between plus and minus one (-1.00 and +1.0); significance level = .05. (95%), degrees of freedom (df) of 6, and two-tailed test. The results of the study showed, correlation coefficient (r) = .684 and the coefficient of determination (r²) = .467 indicating that .47% of the liquidity risk of commercial can be predicted by contingency funding plans. Since the correlation of .467 is positive it can be concluded that the there is a positive relationship between contingency funding plans and liquidity risk of commercial banks.

Table 4.12: Contingency Funding Plans Correlation Model

	R	R Square	df	sig
1	.684 ^a	.467	6	.041

Source: Research findings

4.2.9 Secondary Data Results

Relationship between Return on Equity, Capital Adequacy Ratio, Return on Assets, Loan to Deposit Ratio, Total Assets and Liquidity Risk

The findings of the analysis is based on the significance level (alpha) of 0.05 (95%), degrees of freedom (df) of 5, and two-tailed test indicated: Return on Equity (r² = 0.401; t=2.011); Capital Adequacy Ratio (r²=.346; t=2.009); Loans to Deposits Ratio (r²=.577; t=2.006); Return on Assets (r²=.452; t=2.004) and Total Assets (r²=.769; t=2.008).

The result on table 4.13 below show a positive coefficient of determination (r^2) indicating that: liquidity risk is influenced by return on equity, capital adequacy ratio, loans to deposits ratio, return on assets and total assets. In addition, the computed t-values: Return on Equity (t=2.011); Capital Adequacy Ratio (t=2.009); Loans to Deposits, Ratio (t=2.006); Return on Assets (t=2.004); Total Assets (t=2.008) are smaller than the critical t-value of (2.057) and higher than the significance threshold of 1.96 (0.05). This then indicate that there is a significant relationship between liquidity risk and return on equity, capital adequacy ratio, loans to deposits ratio, return on assets and total assets.

Table 4.13: Secondary Data Correlation Model

Model	r	r²	df	t	Sig
Return on Equity	.634 ^a	.401 ^a	5	2.011	.013
Capital Adequacy Ratio	.589 ^a	.346 ^a	5	2.009	.010
Loans to Deposits Ratio	.760 ^a	.577 ^a	5	2.006	.039
Return on Assets	.673 ^a	.452 ^a	5	2.004	.027
Total Assets	.877 ^a	.769	5	2.008	.048

Source: Research findings

Regression between Independent and Dependent Variables

Results of the study on table 4.14 and 4.15 based on the significance level (alpha) of 0.05 (95%), degrees of freedom (df) of 5, and two-tailed test, shows the degree of the relationship between the effect of asset liability management on the liquidity risk of commercial banks as per the regression model, $Y = \alpha + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \beta_5X_5+ \beta_6X_6+ \beta_7X_7+ \beta_8X_8 + e$

The results of the study indicate: correlation coefficient (r), =.761; (r^2) =.579; computed t-value (t=2.06) which is smaller than the critical (t-value = 2.57) and greater than the (alpha=0.05 or 1.965); while the p-value = 0.129 is larger than the significance level of 0.05. From the results it can be concluded that there is a significant relationship between

independent variables (return on equity, capital adequacy, loan to deposit ratio, return on assets, total assets, ALM policies, liquidity stress testing and contingency funding plan) and the dependent variable (liquidity risk of commercial banks). Hence return on equity, capital adequacy, loan to deposit ratio return on assets total assets, ALM policies, liquidity stress testing and contingency funding plans affect liquidity risk of commercial banks.

Table 4.14: Variables Regression Model

Model	R	R Square	df	P-Value	Sig.
1	.761 ^a	.579	5	.129 ^a	.049 ^a

Source: Research findings

Table 4.15: Variables Coefficients

Variables	B	Beta	t	Sig.
(Constant)	1.640		7.752	.000
Return on Equity	0.129	0.074	0.440	0.062
Capital Adequacy	0.164	0.155	0.902	0.72
Loan to Deposit ratio	0.086	0.209	1.213	0.003
Return on Assets	0.051	0.127	0.696	0.040
Total Assets	0.346	-0.015	0.088	0.031
ALM policies	0.051	0.127	0.696	0.040
Liquidity Stress Testing	0.346	-0.015	-0.068	0.031
Contingency Funding Plans	1.237	0.082	0.494	0.024

Source: Research findings

4.3 Interpretation of Findings

4.3.1 Asset Liability Management

The results of the analysis shows that majority (33.3%), (38.9%), (42.2%) and (55.6%) of the respondents strongly agreed and agreed respectively that asset liability management function involves managing both assets and liabilities, maturity gaps and mismatches, structural ,static and dynamic gaps liquidity risk and market risks. While most (40.0%), (45.6%), (34.4%) , (41.1%) of the respondents strongly agreed and agreed respectively that asset liability management consists of facilitating, coordinating, communicating and controlling risk planning undertakes maturity analysis of assets and liabilities to identify liquidity gaps and ensures that the bank's risk lies within parameters set by the board.

On the relationship between asset liability management policies and liquidity risk of commercial banks, the results showed that there is a positive relationship between liquidity risks of commercial banks and asset liability management policies as evidenced by positive correlation coefficient (r) of .833 and the coefficient of determination (r^2) of .693 indicating that 69% of the liquidity risk of commercial banks can be predicted by asset liability management policies. The study is in line with the views of Choudhry (2011) who observed that Asset liability management essentially comprises of managing the liquidity risk and market risks in an effective and efficient manner.

4.3.2 Liquidity Stress Testing

Majority (42.8%), (36.1%), (33.3%) and (33.3%) of the respondents agreed that liquidity stress testing involves macro variables, capital controls and withdrawal of funding; consists of prepayments obligations, bid-ask spreads and collateral demands; involves cash flow timing and magnitude, liquidity gap relative to tolerance, profitability and solvency; and provides insight in the liquidity risks of the bank under different situations.

On the other hand the results of the correlation analysis showed a positive relationship between liquidity stress testing and liquidity risk of commercial banks as shown by

correlation coefficient (r) of .761 and the coefficient of determination (r^2) of .579 indicating that 58% of the liquidity risk of commercial banks can be predicted by liquidity stress testing. The findings of the study concurs with Vossen (2010) finding in which the author observes that banks must change how to balance their liquidity risk and their role as liquidity providers by restructuring their liquidity management strategies which include liquidity stress testing which is an important instrument of asset liquidity risk management.

4.3.3 Contingency Funding Plans

The findings of the study showed that majority (38.3%), (53.3%), (50.0%), (47.8%), (33.7%), (43.1%) and (49.9%) of the respondents strongly agreed and agreed respectively that: CFP process provides additional insight into the bank's liquidity strengths and weaknesses; identify undesirable liquidity position before a crisis begins; addresses low-probability and high-impact events, the severity and duration of negative liquidity events; provide a plan for responding to various and increasing levels of a bank's liquidity stress; designate management responsibilities, crisis communication methods and channel, and reporting requirements; identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations and describe steps to be taken to ensure bank's sufficiency of sources of liquidity to fund operating requirements and meet the bank's commitments.

The correlation analysis results also showed that there is a positive relationship between contingency funding plans and liquidity risk of commercial as indicated by the results of ($r = .684$); ($r^2 = .467$) indicating that .47% of the liquidity risk of commercial can be predicted by contingency funding plans. The study confirms the findings of Kamau (2013), who established that variations in liquidity level are caused by both internal and external factors which include the absence or presence of contingency planning necessary for managing liquidity risk.

4.3.4 Relationship between Return on Equity, Capital Adequacy Ratio, Return on Assets, Loan to Deposit Ratio, Total Assets and Liquidity Risk

The result of the regression analysis indicated that there is a significant positive relationship between liquidity risk and return on equity, capital adequacy ratio, loans to deposits ratio, return on assets and total assets. This is evidenced by positive coefficient of determination ($r^2 = 0.401$); Capital Adequacy Ratio ($r^2=.346$); Loans to Deposits Ratio ($r^2=.577$); Return on Assets ($r^2=.452$); Total Assets ($r^2=.769$). In addition, the computed t-values: Return on Equity ($t=2.011$); Capital Adequacy Ratio ($t=2.009$); Loans to Deposits Ratio ($t=2.006$); Return on Assets ($t=2.004$); Total Assets ($t=2.008$) are smaller than the critical t-value of (2.057) and higher than the significance threshold of 1.96 (0.05). The findings are in line with the views of Bonfim and Kim (2011) who noted that the type of relationship between liquidity risk and size, performance and the ratio between loans and deposits depends on the type of liquidity risk measure used, however this study did not focus on the specific measures that banks use in the management of liquidity risk.

4.3.5 Relationship between Independent and Dependent Variables

The results of the regression analysis shows that there is a significant relationship between independent variables (return on equity, capital adequacy, loan to deposit ratio return on assets total assets, ALM policies, liquidity stress testing and contingency funding plan) and the dependent variable (liquidity risk of commercial banks), hence return on equity, capital adequacy, loan to deposit ratio return on assets total assets, ALM policies, liquidity stress testing and contingency funding plans affect liquidity risk of commercial banks. This is derived from of the analysis which indicated that: correlation coefficient (r), $=.761$; (r^2) $=.579$; computed t-value ($t=2.06$) which is smaller than the critical (t -value $= 2.57$) and greater than the ($\alpha=0.05$ or 1.965); while the p-value $= 0.129$ is larger than the significance level of 0.05. The findings of this study confirms the findings of Kamau (2013) who established that variations in liquidity level are caused by

both internal and external factors which include contingency planning, profitability, banks obligations and management policies.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter introduces the summary from the data analysis; conclusion and recommendations for the policy. It also highlights limitations of the study and finally gives suggestions for future research studies.

5.2 Summary

The study established the existence of a positive relationship between liquidity risks of commercial banks and asset liability management policies since most banks have asset liability management committee who undertake regular and systematic appraisal of asset liability management policies across the banks operational areas. Asset liability management committee involves managing assets and liabilities, maturity gaps and mismatches, structural, static and dynamic gaps liquidity risk and market risks. In addition asset liability management consists of facilitating; coordinating, communicating and controlling risk planning undertakes maturity analysis of assets and liabilities to identify liquidity gaps and ensures that the bank's risk lies within parameters set by the board

The study found out that there is a positive relationship between liquidity stress testing and liquidity risk of commercial banks as liquidity stress testing involves macro variables, capital controls and withdrawal of funding; consists of prepayments obligations, bid-ask spreads and collateral demands; involves cash flow timing and magnitude, liquidity gap relative to tolerance, profitability and solvency; and provides insight in the liquidity risks of the bank under different situations.

It was established from the results that there is a positive relationship between contingency funding plans and liquidity risk of commercial as the CFP process provides insight into the bank's liquidity strengths and weaknesses; identify undesirable

liquidity position before a crisis begins; addresses low-probability and high-impact events, the severity and duration of negative liquidity events; provide a plan for responding to various and increasing levels of a bank's liquidity stress; designate management responsibilities, crisis communication methods and channel, and reporting requirements; identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations and describe steps to be taken to ensure bank's sufficiency of sources of liquidity to fund operating requirements and meet the bank's commitments.

The study established that liquidity risk can result into experiencing adverse operational and financial problems such as decline in investor confidence, panic withdrawals and daily operation problems hence banks attempt to control liquidity risk factors such as return on equity, capital adequacy ratio, loans to deposits ratio, return on assets and total assets of commercial banks by balancing cash inflows and outflows hence the existence of positive relationship between liquidity and liquidity risk factors. It also found out that there is a significant positive relationship between -return on equity, capital adequacy, loan to deposit ratio, return on assets total assets, ALM policies, liquidity stress testing and contingency funding plan and liquidity risk of commercial banks. Hence -return on equity, capital adequacy, loan to deposit ratio, return on assets, total assets, ALM policies, liquidity stress testing and contingency funding plans affect liquidity risk.

5.3 Conclusion

Asset liability management function has a key role in managing asset liquidity risk and among other consists of facilitating; coordinating, communicating and controlling risk planning undertakes maturity analysis of assets and liabilities to identify liquidity gaps and ensures that the bank's risk lies within parameters set by the board. Liquidity stress testing involves macro variables, capital controls and withdrawal of funding; consists of prepayments obligations, bid-ask spreads and collateral demands; involves cash flow timing and magnitude, liquidity gap relative to tolerance, profitability and solvency; and provides insight in the liquidity risks of the bank under different situations.

Contingency funding plans process provides insight into the bank's liquidity strengths and weaknesses; identify undesirable liquidity position before a crisis begins; addresses low-probability and high-impact events, the severity and duration of negative liquidity events; provide a plan for responding to various and increasing levels of a bank's liquidity stress; designate management responsibilities, crisis communication methods and channel, and reporting requirements; identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations and describe steps to be taken to ensure bank's sufficiency of sources of liquidity to fund operating requirements and meet the bank's commitments.

Banks' liquidity needs depend significantly on the balance sheet structure, product mix, and cash flow profiles of both on and off balance-sheet obligations which without efficient management can result into banks experiencing adverse operational and financial problems such as decline in investor confidence, panic withdrawals and daily operation problems. Hence, banks attempt to control liquidity risk factors such as return on equity, capital adequacy ratio, loans to deposits ratio, return on assets and total assets of commercial banks by balancing cash inflows and outflows hence the existence of positive relationship between liquidity risk and liquidity risk factors.

5.4 Recommendations for Policy

There is need for commercial banks to place greater emphasis on developing an integrated view of risk across all the risk types and the banks operational areas while ensuring that the Asset management committee introduces and implements tighter regulations and reporting requirements with tighter capital requirements and symmetrically greater liquidity creation.

There is need for bank treasuries, risk managers and asset liability committees (ALCO's) to implement a robust and comprehensive balance sheet management solution to meet the evolving financial needs of the bank while taking into consideration the emerging liquidity risks arising from the banks business expansion and technology.

There is need for the bank management and staff to take cognizance of the fact that management of liquidity risks must not be left to the Asset liquidity management committee but is for all the participants in the organization. However, the management and board of directors must take the lead and continuously develop proactive policies and communicate the same consistently so as to ensure that every employee and manager buys into the process of asset liquidity management.

There is need for the bank to regularly train its employees on the various balance sheet risks and how they can be managed especially in the changing business environment in which the organization strives to be competitive in the marketplace and at the same ensure that its profitable from its business operations. Employee training must be laced with efficient planning and monitoring process so as to ensure that both the risk management objectives and those of the overall organization are met.

Management needs to continuously develop, implement proactive, efficient and effective liquidity management strategy that allows the institution to monitor and measure expected daily gross liquidity inflows and outflows, manage and mobilize collateral when necessary to obtain intraday credit, identify and prioritize time-specific and other critical obligations in order to meet them when expected; settle other less critical obligations as soon as possible and control credit to customers when necessary.

5.5 Limitations of the Study

There was some reluctance was experienced from some bank staff in the provision of documents containing bank statement and other relevant information with regards to the study for fear of being reprimanded by their superiors in the organizations who are responsible for issues related to the bank risk management. However, the researcher assured the respondents of the confidentiality of the documents that they provide and sought authority from management to undertake research in the bank.

Due to finance and time constraints, the research was limited to only commercial banks in Kenya. Therefore, to generalize the results for a larger group, the study should have involved a larger area of study, may be in other sectors of the economy or in other areas of the country.

Lastly, there was the challenge of accessing past bank record due to poor record keeping hence there was scant information that could be accessed in terms of published financial statements, however the researcher used other relevant documentation to collect the required information despite the fact that it took longer than anticipated.

5.6 Suggestions for Future Research

This research study was limited to data collected from banks, however there are many other financial institutions and providers who were relevant to the study such as Microfinance institutions (MFIs) but were not covered. Since the study tested only the banking institutions, other financial institutions should be studied in order to compare the results.

The role of Asset liability committees has grown in importance in the management of balance sheet, liquidity risks and in the implementation of liquidity risk management strategies. Hence, there is need for further research on the role of this important committee with a view to coming up with recommendation to strengthen the committee's role in the bank institutions.

Further research study can be conducted on the factors that influence the liquidity levels of commercial banks in Kenya. Future research should be conducted based on categories of demographic characteristics such as bank ownership (public, private and foreign) and/or size of the bank among others.

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APPENDICES

Appendix i Questionnaire

PART I: Background Information

1. Name of the bank

2. What is your highest level of education?
 Diploma [] Undergraduate []
 Post Graduate []
3. How long have you been working in the banking industry?
 1-2 Years [] 3-5 Years [] 6-8 Years [] 9-11 Years []
 12 and above []
4. How long has your bank been operating in Kenya
 5- 10 years [] 11 -15 years [] 15+ years []

PART 2: Asset Liability Management (ALM)

5. Which department is responsible for the Asset liability management in your bank?
 Treasury Finance Risk
6. Please tick the numeric value corresponding to your personal opinion for each statement

Statement	Strongly agree	Agree	Neutral	disagree	Strongly disagree
	⑤	④	③	②	①
Asset liability management comprises of managing effectively both the assets and liabilities sides of the bank balance sheet					

Asset liability management comprises of managing liquidity risk and market risks in an effective manner					
Asset liability management consists of managing maturity gaps and mismatches					
Asset liability management involves managing structural , static and dynamic gap					

PART 3: Asset Liability Committee (ALCO)

7. Please tick the numeric value corresponding to your personal opinion for each statement

Statement	Strongly agree	Agree	Neutral	disagree	Strongly disagree
ALCO is responsible for the management of the overall liquidity of the bank	⑤	④	③	②	①
ALCO facilitates, coordinates, communicates and control balance sheet planning with regards to risks inherent in managing liquidity and convergences in interest rates					
ALCO is responsible for ensuring that the bank's operations risk lies within the parameters set by its Board of Directors.					
ALCO regularly undertakes maturity analysis of Assets and Liabilities to identify liquidity gaps					

PART 4: Liquidity Stress Testing

8. Please tick the numeric value corresponding to your personal opinion for each statement

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Stressed testing inputs involve macro variables, capital controls and withdrawal of funding					
Stress testing include prepayments obligations, bid-ask spreads and collateral demands					
Stress testing final metric include Cash flow timing and magnitude, Liquidity gap relative to tolerance, Profitability and Solvency					
Liquidity stress test provides insight in the liquidity risks of the bank under different situations					

PART 5: Contingency Funding Plans (CFP)

9. Please tick the numeric value corresponding to your personal opinion for each statement

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
CFP process provides additional insight into the bank's liquidity strengths and weaknesses					
CFP scenario analysis may identify an undesirable liquidity position before a crisis begins					
CFP primarily addresses low-probability and high-impact events, the severity and duration of negative liquidity events					
CFP provide a plan for responding to various and increasing levels of a bank's liquidity stress					

CFP designate management responsibilities, crisis communication methods and channels, and reporting requirements					
CFP identifies a menu of contingent liquidity sources that a bank can use under various liquidity adverse situations					
CFP describe steps that should be taken to ensure that the bank's sources of liquidity are sufficient to fund scheduled operating requirements and meet the bank's commitments with minimal costs and disruption					

Thank you for your cooperation

Appendix ii List of Commercial Banks in Kenya as at 31/12/2012

1	ABC Bank (Kenya)
2	Bank of Africa
3	Bank of India
4	Bank of Baroda
5	Barclays Bank
6	CFCStanbic Bank
7	Chase Bank (Kenya)
8	Charterhouse Bank ltd
9	Citibank N.A.
10	Commercial Bank of Africa
11	Consolidated Bank of Kenya
12	Cooperative Bank of Kenya
13	Credit Bank
14	Development Bank of Kenya
15	Diamond Trust Bank
16	Dubai Bank Kenya
17	Eco Bank
18	Equatorial Commercial Bank
19	Equity Bank
20	Family Bank
21	Fidelity Bank
22	Fina Bank (Kenya)
23	First Community Bank
24	Giro Commercial Bank
25	Guardian Bank
26	Gulf African Bank
27	Habib Bank AG Zurich
28	Habib Bank

29	Imperial Bank Kenya
30	Investment & Mortgages Bank
31	Jamii Bora Bank
32	Kenya Commercial Bank
33	K-Rep Bank
34	Middle East Bank Kenya
35	National Bank of Kenya
36	National Industrial Credit Bank
37	Oriental Commercial Bank
38	Paramount Universal Bank
39	Prime Bank (Kenya)
40	Standard Chartered Bank
41	Trans National Bank Kenya
42	United Bank for Africa
43	Victoria Commercial Bank

Source: Central Bank of Kenya

Appendix iii YEAR 2012 Secondary Data Variables

		X1	X2	X3	X4	X5
No.	Name of the Bank	Return on Equity (ROE)	Capital Adequacy Ratio (CAR)	Loan to Deposit ratio (LTD)	Return on Assets (ROA)	Total assets (m)
1	Kenya Commercial Bank Ltd	29.80%	21.30%	83.68%	5.20%	304,112
2	Equity Bank Ltd	37.60%	19.90%	87.26%	7.40%	215,829
3	Cooperative Bank of Kenya Ltd	33.10%	20.30%	73.39%	4.80%	199,663
4	Barclays Bank of Kenya Ltd	44.00%	22.70%	75.56%	7.00%	185,102
5	Standard Chartered Bank (K) Ltd.	37.60%	16.30%	80.20%	5.90%	195,493
6	CFC Stanbic Bank Ltd	26.00%	20.50%	87.46%	3.50%	133,378
7	Citibank N.A.	41.70%	41.10%	53.01%	10.40%	69,580
8	NIC Bank Ltd	28.60%	15.60%	85.69%	4.20%	101,772
9	Diamond Trust Bank Ltd	31.40%	17.70%	82.66%	4.90%	94,512
10	I&M Bank Ltd	28.50%	17.00%	84.36%	5.20%	91,520
11	Commercial Bank of Africa Ltd	34.30%	15.50%	53.13%	4.00%	100,456
12	National Bank of Kenya Ltd	11.00%	27.30%	50.45%	1.70%	67,155
13	Bank of Baroda Ltd	28.90%	22.60%	66.75%	3.60%	46,138
14	Chase Bank Ltd	25.80%	12.30%	80.22%	2.70%	49,105
15	Family Bank Ltd	17.40%	21.90%	72.55%	2.70%	30,985
16	Ecobank Kenya Ltd	-76.70%	22.70%	65.04%	-4.80%	31,771
17	Bank of India	14.90%	39.50%	54.78%	2.40%	24,877
18	Prime Bank Ltd	27.80%	17.00%	57.61%	2.70%	43,463
19	Imperial Bank Ltd	42.00%	18.20%	73.84%	5.50%	34,590
20	Bank of Africa (K) Ltd	12.70%	10.30%	85.14%	1.30%	48,958
21	Victoria Commercial Bank Ltd	24.10%	24.50%	69.98%	4.80%	10,323
22	Trans-National Bank Ltd	17.60%	37.90%	64.87%	3.70%	8,801
23	Giro Commercial Bank Ltd	11.70%	28.20%	52.97%	1.70%	12,280

24	African Banking Corporation Ltd	26.40%	13.60%	64.18%	2.90%	19,071
25	Fina Bank Ltd	13.90%	14.70%	63.59%	2.00%	17,150
26	Gulf African Bank (K) Ltd	23.90%	13.80%	80.45%	2.80%	13,562
27	Habib AG Zurich	26.90%	55.70%	0.00%	4.20%	9,702
28	K-Rep Bank Ltd	20.10%	20.50%	104.59%	3.20%	9,546
29	Development Bank of Kenya Ltd	6.30%	20.90%	99.70%	0.80%	13,417
30	Jamii Bora Bank Ltd	2.50%	82.80%	107.91%	1.50%	3,480
31	Habib Bank Ltd	33.80%	41.00%	0.00%	6.50%	7,014
32	Guardian Commercial Bank Ltd	18.30%	17.30%	0.00%	1.90%	11,745
33	UBA Bank (K) Ltd	-32.60%	72.40%	0.00%	-13.60%	2,924
34	Credit Bank Ltd	6.90%	30.30%	0.00%	1.30%	6,407
35	Consolidated Bank of Kenya Ltd	11.20%	11.40%	75.62%	1.00%	18,001
36	Oriental Commercial Bank	8.20%	28.90%	71.85%	1.80%	6,220
37	Fidelity Commercial Bank Ltd	8.60%	17.50%	63.07%	0.90%	11,772
38	Paramount Universal Bank Ltd	7.90%	46.30%	0.00%	1.20%	7,255
39	Middle East Bank (K) Ltd	4.20%	39.40%	80.50%	0.80%	5,870
40	First Community Bank Ltd	27.30%	15.80%	0.00%	290.00%	9,959
41	Dubai Bank Ltd	-3.30%	45.20%	0.00%	-1.20%	2,584
42	Equatorial Commercial Bank Ltd	-90.80%	45.20%	58.15%	-4.60%	14,109
43	Charterhouse Bank Ltd	0.00%	5.70%	-	0.00%	-

Source: Central Bank of Kenya

Appendix iv YEAR 2011 Secondary Data Variables

		X1	X2	X3	X4	X5
No.	Name of the Bank	Return on Equity (ROE)	Capital Adequacy Ratio (CAR)	Loan to Deposit ratio (LTD)	Return on Assets (ROA)	Total assets (m)
1	Kenya Commercial Bank Ltd	31.18%	19.90%	85.57%	4.98%	282,494
2	Equity Bank Ltd	34.53%	15.36%	87.45%	6.84%	176,911
3	Cooperative Bank of Kenya Ltd	29.41%	16.04%	76.67%	3.68%	167,305
4	Barclays Bank of Kenya Ltd	41.11%	24.10%	79.76%	7.18%	167,305
5	Standard Chartered Bank (K) Ltd	40.11%	12.31%	78.56%	5.03%	164,182
6	CFC Stanbic Bank Ltd	30.82%	12.59%	86.44%	2.23%	140,087
7	Citibank N.A.	31.77%	30.87%	61.14%	6.43%	74,646
8	NIC Bank Ltd	33.95%	14.98%	83.90%	4.57%	73,581
9	Diamond Trust Bank Ltd	31.34%	14.21%	85.23%	4.19%	77,453
10	I&M Bank Ltd	32.17%	18.12%	82.15%	5.80%	76,903
11	Commercial Bank of Africa Ltd	30.04%	13.86%	58.85%	3.58%	83,283
12	National Bank of Kenya Ltd	23.37%	27.93%	49.48%	3.56%	68,665
13	Bank of Baroda Ltd	33.96%	20.47%	63.26%	4.57%	36,701
14	Chase Bank Ltd	28.62%	11.35%	73.08%	2.33%	36,513
15	Family Bank Ltd	15.72%	16.18%	76.16%	2.01%	26,002
16	Ecobank Kenya Ltd	7.03%	14.86%	68.70%	0.45%	27,210
17	Bank of India	28.87%	45.42%	39.13%	4.18%	23,352
18	Prime Bank Ltd	28.88%	16.51%	63.71%	3.07%	35,185
19	Imperial Bank Ltd	44.28%	20.14%	83.59%	6.37%	25,618
20	Bank of Africa (K) Ltd	11.87%	12.68%	90.22%	1.43%	38,734
21	Victoria Commercial Bank Ltd	26.32%	21.39%	69.58%	4.31%	7,645
22	Trans-National Bank Ltd	16.92%	46.16%	62.62%	4.05%	7,287
23	Giro Commercial Bank Ltd	20.90%	22.53%	63.16%	2.79%	11,846

24	African Banking Corporation Ltd	30.28%	16.85%	67.56%	4.12%	12,507
25	Fina Bank Ltd	20.22%	16.29%	58.71%	2.12%	14,630
26	Gulf African Bank (K) Ltd	11.78%	13.53%	68.48%	1.20%	12,915
27	Habib AG Zurich	19.82%	36.23%	0.00%	2.91%	8,722
28	K-Rep Bank Ltd	19.23%	19.18%	104.78%	2.75%	9,319
29	Development Bank of Kenya Ltd	10.08%	24.68%	141.50%	1.37%	11,523
30	Jamii Bora Bank Ltd	-2.43%	110.19%	76.84%	-1.79%	2,070
31	Habib Bank Ltd	25.51%	33.01%	0.00%	4.62%	5,861
32	Guardian Commercial Bank Ltd	15.94%	18.23%	0.00%	1.92%	8,836
33	UBA Bank (K) Ltd	-25.19%	69.49%	0.00%	-5.72%	3,206
34	Credit Bank Ltd	5.35%	29.40%	0.00%	0.95%	5,394
35	Consolidated Bank of Kenya Ltd	17.18%	10.93%	76.58%	1.61%	15,318
36	Oriental Commercial Bank	14.93%	34.03%	75.77%	3.83%	5,030
37	Fidelity Commercial Bank Ltd	29.64%	13.95%	68.98%	2.79%	10,789
38	Paramount Universal Bank Ltd	11.00%	52.80%	0.00%	2.39%	4,727
39	Middle East Bank (K) Ltd	8.40%	42.76%	94.86%	1.99%	4,639
40	First Community Bank Ltd	13.34%	14.19%	0.00%	1.28%	8,740
41	Dubai Bank Ltd	2.92%	35.65%	0.00%	0.90%	2,316
42	Equatorial Commercial Bank Ltd	5.91%	13.02%	67.47%	0.55%	12,927
43	Charterhouse Bank Ltd	0.00%	0.00%	-	0.00%	-

Source: Central Bank of Kenya