

**THE EFFECT OF LIQUIDITY AND SOLVENCY ON THE
PROFITABILITY OF COMMERCIAL BANKS IN KENYA**

BY:

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DECLARATION

This research project is my original work and it has not been submitted for any academic award in any University or institution of higher learning.

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DEDICATION

I dedicate this research project to my entire family. To my dad, Simon Mburu, thank you for being my greatest mentor, my academic star and the beacon that I will always lean on, it is because of your immense support that I was able to complete my research project. Your sacrifices paid off. To my mother, Ann Wanjiku, thank you for your unending encouragement, for believing in me and for being the voice of reason in my life.

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LIST OF ABBREVIATIONS

AFS	Audited Financial Statements
ANOVA	Analysis of Variance
BCBS	Basel Committee on Banking Supervision
CAMEL	Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity
CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
COGS	Cost of Goods Sold
COMESA	Common Market for Eastern and Southern Africa
CRB	Credit Reference Bureau
EBIT	Earnings Before Interest and Tax
GDP	Gross Domestic Product
KDIC	Kenya Deposit Insurance Corporation
MFB	Micro-Finance Bank
MFC	Mortgage Finance Company
MFI	Micro-Finance Institutions
NPM	Net Profit Margin
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Squares
ROA	Return on Assets
ROE	Return on Equity
SACCO	Savings and Credit Cooperatives
SCP	Structure Conduct Performance
SHIELDS	Solvency Conditions; Home Economics Conditions; Institutional Quality; Earnings Conditions; Liquidity Conditions; Default Conditions; and Systematic Loss
UK	United Kingdom
USA	United States of America

ABSTRACT

The primary function of banks is to convert liquid deposits (liabilities) to illiquid assets such as loans which make them inherently vulnerable to liquidity risk. Lack of liquidity in bank's statement of financial position is an indicator of a liquidity crisis in a banking system. On the other hand, illiquidity, unless remedied, will give rise to insolvency and eventually bankruptcy as the business's liabilities exceed its assets. The fact that it is impossible for banks to survive without making profits cannot be overemphasised. This study sought to examine the effect of liquidity and solvency on the profitability of Commercial Banks in Kenya.

The study used a descriptive research design. The population of this study comprised the entire population of all the 43 Commercial Banks in Kenya (Appendix 1) and 42 out of the 43 Commercial Banks formed the sample. Five year secondary data was collected from 2010 to 2014 for the banks from their annual reports. Data was analysed using descriptive, correlation and regression analyses.

The regression results showed that the model explained 42.4% of the variance in bank performance. The ANOVA results showed that the model was statistically significant at 1% level of significance. The study found that both liquidity and solvency had negative but insignificant effects on the performance of banks in Kenya. Further, the study found that asset quality had a negative but insignificant effect on bank performance while growth had a positive but insignificant effect on the bank performance in Kenya. The results showed that bank size had a positive and significant effect on bank performance. The study concludes that the performance of Commercial Banks in Kenya is not influenced by both liquidity and solvency.

The study recommends that the management of Commercial Banks in Kenya should take note of the fact that while the liquidity and solvency levels of banks were not found to influence bank performance, it is important to keep them at manageable levels in relation to the industry. The study also recommends that bank managers should take note of the fact that the size of the banks influences their performance. As such, Commercial Banks should strive to have higher asset base in the industry in order to record better performance in terms of profitability. The study further recommends that since growth in bank revenues may have a positive impact on the performance of banks in Kenya, banks should focus on improving their revenue sources in order to record better performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In the recent past, there has been an increased interest in the performance of Commercial Banks following the financial turmoil of 2007 that revealed the importance of liquidity and solvency for the smooth running of the global financial system. The uncertainty that was inherent in the financial crisis resulted to banks being unable to cover their obligations due to shortage in cash. As a result, in the interest of broader financial stability, substantial amounts of liquidity were provided by authorities in many countries, including Canada and the United States (Longworth, 2010; Bernanke, 2008).

There are a total of 43 Commercial Banks in Kenya at the moment. The banking sector has played a critical role in financing economic activities in the various market segments and in order to do so, they need to remain profitable (Ongera and Kusa, 2013). Additionally, the banking sector in Kenya has been characterised by stiff competition from within and from other financial institutions such as the Micro-Finance Institutions (MFIs), Savings and Credit Cooperatives (SACCOs) and Mortgage institutions. There is therefore need for Commercial Banks to remain financially stable in order to remain relevant and competitive in the financial market. The financial stability can only be achieved if the banks are profitable and this study sought to understand the effect that liquidity and solvency have on the profitability of Commercial Banks in Kenya.

1.1.1 Liquidity

In 2000, Basel Committee on Banking Supervision defined liquidity as the ability to fund increases in assets and meet obligations as they come due (BCBS, February 2000). A more general definition was introduced in 2008 defining liquidity as the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (BCBS, September 2008). Liquidity refers to the speed and certainty with which an asset can be converted back into money (cash, income) whenever the asset holder desires. Liquid assets are those that can be converted into cash quickly in order to meet maturing financial obligations. Cash, short-term marketable securities and central bank reserves are examples of liquid assets with cash being the most liquid of all. A bank must have sufficient liquid assets to meet its near term obligations such as withdrawals by depositors. A financial institution that has a higher investment in current assets has a higher liquidity level.

The key ratios used to measure liquidity are the current ratio and the quick ratio. Current ratio is calculated by dividing the total current assets by total current liabilities whereas the quick ratio is computed by deducting inventories from current assets and dividing the result by current liabilities. The higher the current ratio and the quick ratio, the better the financial position of the business. However, critics have argued that a very high current ratio might be an indicator that a company is sitting around with a lot of cash as it lacks the managerial acumen to put those resources to work.

1.1.2 Solvency

Solvency is the ability of a financial institution to meet its obligations in the event of cessation of activity or liquidation. It refers to a company's long run financial viability and its ability to cover long-term obligations. A bank is considered solvent if the total assets exceed total liabilities. If the total assets are lower than total liabilities, the bank faces an insolvency risk and is said to be 'technically insolvent'. Insolvency risk shows the probability of default of a representative bank. The solvency problem tends to be more long-term than the previously described liquidity issue and historically, banks have always held on to funds and stopped lending when there is a solvency crisis (Mason, 2009). Financial ratios that measure solvency include total debt to total capital, total debt to equity capital, long-term debt to equity capital and short-term debt to equity ratios.

Liquidity is somehow short term solvency. Mehdi and Mohammed (2014) opined that the difference between liquidity and solvency lies in the fact that a liquid bank does not imply that it is solvent while a solvent bank does not imply that it is liquid. Goodhart (2008) remarked that an illiquid bank can rapidly become insolvent, and an insolvent bank illiquid. Thus, liquidity and solvency are the heavenly twins of banking, frequently indistinguishable.

Both liquidity and solvency relate to default. A liquidity crisis will occur when a company has temporary cash flow problems but a solvency crisis is when a company has debts that it can't honor through its assets such that even if it was to sell its total assets, it would still be unable to settle its debts. Illiquidity is a sufficient but not a necessary condition for default. Following Matz (2001): "then, the bank's liquidity provides some amount of survival time during which

the crisis is resolved or not. Ultimately, capital must cover the losses. But in the meantime, sufficient liquidity can be the single most decisive factor in a bank's ability to survive a crisis.”

1.1.3 Profitability

Profitability is a measure of the net revenue and expenses. Revenue refers to increases in owners' equity resulting from sale of goods or performance of services in the ordinary course of business. It consists of cash, or a promise to receive cash in the future (accounts receivable). Expenses are decreases in owners' equity resulting from the costs incurred in order to earn revenue. They may involve immediate cash payment or promises to pay in the future. Profitability is a key measure of a successful business. A business that is not profitable may not survive while a business that is highly profitable has the ability to reward its owners with large returns on their investment (Kithii, 2008).

Profitability is the ultimate objective of all business ventures, both in the short-run and in the long-run. A business has to remain profitable in order to withstand negative shocks and survive in the long-run. Therefore, it is important to measure current and past profitability as well as project future profitability. Gross profit is the sales less direct cost of goods (or services) sold (COGS) while net profit is determined by deducting a company's selling, general and administrative expenses, depreciation costs and taxes from its revenue and any other income.

The measures of profitability include Return on Assets (ROA) which is calculated by dividing a company's net income by the average total assets, Return on Equity (ROE), determined by dividing net income by the average shareholder's equity and Net Profit Margin (NPM) computed by dividing net income by revenues.

1.1.4 Effect of Liquidity and Solvency on Profitability

According to Hirigoyen (1985) the relationship between liquidity and profitability could become positive over the medium and long run, in the sense that a low liquidity would result in a lower profitability due to greater need for loans, and low profitability would not generate sufficient cash flows, thus forming a vicious cycle. In a study done to determine the impact of liquidity and solvency on the profitability of chemical firms in Pakistan, the researchers postulated that liquidity has a positive relationship with profitability whereas solvency has an indirect relationship with the profitability of the chemical firms, Waqas and Mobeen (2014).

Konadu (2009) found no positive relationship between liquidity trend and profitability of banks in Ghana and concluded that there is a negative relationship between liquidity and profitability in the Ghana banking sector. Li (2007) found that the result for liquidity on profitability is mixed and not significant which indicates that conclusion about the impact of liquidity remains questionable and further research is needed.

Referring to the studies above, the outcomes concerning the effect of liquidity on profitability of companies have been mixed. It is however expected that there exists a positive relationship between liquidity and profitability of Commercial Banks in Kenya, at least in the long run.

1.1.5 Commercial Banks in Kenya

A Commercial Bank is a financial institution primarily engaged in deposit and lending activities to private and corporate clients in wholesale and retail banking. Banks dominate the financial sector in Kenya (Kiganda, 2014) and as such the process of financial intermediation in the country depends heavily on Commercial Banks. In Kenya, Commercial Banks are licensed and regulated pursuant to the provisions of the Banking Act and the Regulations and Prudential guidelines issued by the CBK. Commercial Banks listed at the NSE are also regulated by the Capital Markets Act 2000 cap 485A (amended 2013) and Central Depository Act 4 of 2000 (amended 2013).

As at 31 December 2014, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, 44 banking institutions (43 Commercial Banks and 1 mortgage finance company - MFC), 7 representative offices of foreign banks, 9 Microfinance Banks (MFBs), 2 CRBs and 101 forex bureaus. Out of the 44 banking institutions, 30 locally owned banks comprise 3 with public shareholding and 27 privately owned while 14 are foreign. The foreign owned financial institutions comprise of 10 locally incorporated foreign banks and 4 branches of foreign incorporated banks.

The CBK adopted the CAMEL rating system in assessing the soundness of Commercial Banks in the year 2000. The institutions rated strong, satisfactory and fair in December 2014 were 22, 16 and 5 respectively. In 2012, 2013 and 2014, the banking sector was on overall rated strong. In 2014, the CBK continued to implement the COMESA Financial System Stability Assessment Framework. The assessment framework is used to assess the financial

stability of financial institutions over time and it is a comprehensive and structured Rating System abbreviated as ‘‘SHIELDS’’ which stands for Solvency Conditions; Home Economic Conditions; Institutional Quality; Earnings Conditions; Liquidity Conditions; Default Conditions; and Systematic Loss.

The bank annual supervision annual report 2014 stated that the Kenyan banking sector recorded improved performance in 2014 with the total net assets and customer deposits rising by 18.5 per cent and 18.65 per cent respectively. The expanded asset base was driven by a higher demand for credit in 2014 as compared to 2013 while the rise in deposits resulted from increased deposit mobilization by banks as they expanded their outreach and service networks to tap unserved segments of the market. For the 12 months period ended 31 December 2014, the banking sector’s liquidity ratio stood at 37.7% (2013: 38.6%). The major contributing factor to the decline in liquidity ratio is the increased lending in 2014 as evidenced by the increase in loans to deposits ratio from 81.6% in 2013 to 83.1% over the same period. It is worth noting that the liquidity ratio in 2014 was way above the statutory minimum of 20%.

1.2. Research Problem

The basic goals of a company’s existence are to maximise shareholders’ wealth and generate profits. According to Mehdi and Mohammed (2014), the primary function of banks is to convert liquid deposits (liabilities) to illiquid assets such as loans which make them inherently vulnerable to liquidity risk. Bank of Canada (2010) in its working paper, ‘‘The impact of liquidity on bank profitability in Canada’’ observed that liquidity was an instrumental factor during the 2008-2009 financial crises. Lack of liquidity in bank’s statement of financial

position is an indicator of a liquidity crisis in a banking system. Liquidity management is therefore an important objective for all companies since illiquidity may lead to insolvency, Goodhart (2008) and poor financial performance. On the other hand, illiquidity, unless remedied, will give rise to insolvency and eventually bankruptcy as the business's liabilities exceed its assets. The fact that it is impossible for banks to survive without making profits cannot be overemphasised.

Commercial Banks are required by the CBK to maintain a minimum liquidity ratio of 20 percent. The CBK annual supervision report 2014 showed that all the banks met the 20 percent liquidity requirement. In a country where the financial sector plays an important role in the economy, a failure in the sector would have negative multiple adverse effects. Following Ongore and Kusa (2013): "any bankruptcy that could happen in the banking sector has a contagion effect that can lead to bank runs, crises and bring overall financial crisis and economic tribulations." Locally, limited studies have been done on the internal factors that affect the profitability of banks and these studies have not satisfactorily stressed the effect that liquidity and solvency has on banks' profitability.

Studies on the performance of banking industry include Ongore and Kusa (2013) who studied determinants of financial performance of Commercial Banks in Kenya; Kiganda (2014) examined the effect of macroeconomic factors on Commercial Banks profitability in Kenya: Case of Equity Bank Limited. Although Olweny and Shiphoo (2011) studied the effects of banking specific factors on the profitability of Commercial Banks in Kenya, the variables

used; capital adequacy, asset quality, liquidity, operational cost, efficiency and income diversification in the study were not exhaustive.

Both global and local studies on the relationship have found mixed results. Dang (2011) found a positive relationship between liquidity and bank's profitability while Ongore and Kusa (2013) reported insignificant relationship between liquidity and profitability of banks. To the knowledge of the researcher, no specific study has been carried out in Kenya on how liquidity and solvency affect profitability of Commercial Banks. There is therefore a gap in literature which the present study seeks to bridge. The following research question will be answered: what is the effect of liquidity and solvency on the profitability of Commercial Banks in Kenya?

1.3. Research Objective

To examine the effect of liquidity and solvency on the profitability of Commercial Banks in Kenya.

1.4. Value of the Study

The findings of this study will have various contributions to the theory and practice of finance.

The recent global financial crisis stressed on the importance of efficient liquidity management in the banking systems. Regulators have reacted to this by formulating new liquidity standards that will ensure soundness, stability and resilience in the financial systems. Bank's

management will use this report as a guide in making capital structure and investment decisions that would satisfy stakeholders' interests with regard to liquidity, solvency and profitability.

Further, this study will inform policy makers especially the Central Bank of Kenya and Treasury on how liquidity and solvency affects profitability of banks. This will guide in policy formulation in both agencies.

Financial consultants will use the results of this study as a guide in advising their clients on matters relating to liquidity, solvency and profitability. Researchers, students, and other academicians will also find this study a valuable source of information. Thus, future studies can be based on the present study especially by taking advantage of the limitations of the present study and the recommended future research directions.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of literature. The first section reviews the theoretical literature where different theories of liquidity, profitability and other relevant theories are discussed. The second section presents an empirical review where prior studies on liquidity, solvency and profitability are reviewed. The third section is the summary of the chapter.

2.2 Theoretical Review

This section describes the various theories that have been developed explaining how liquidity and solvency impacts on profitability of companies. A number of theories are reviewed here and their relevance to the present study explained. These theories are Baumol Model Theory, Miller-Orr Model Theory, Liquidity Preference Theory and the Shiftability Theory.

2.2.1 Baumol Model Theory

According to Baumol (1952), Baumol model of cash management enables companies to find out the optimum level of cash balance to hold under conditions of certainty. It relies on the trade-off between the liquidity provided by holding money and the interest foregone by holding one's assets in the form of non-interest bearing current accounts. This model is useful in determining target cash balance.

The Baumol model assumes constant outflow of cash payments and that the firm only receives cash at the end of a particular period. It also assumes that the opportunity cost of

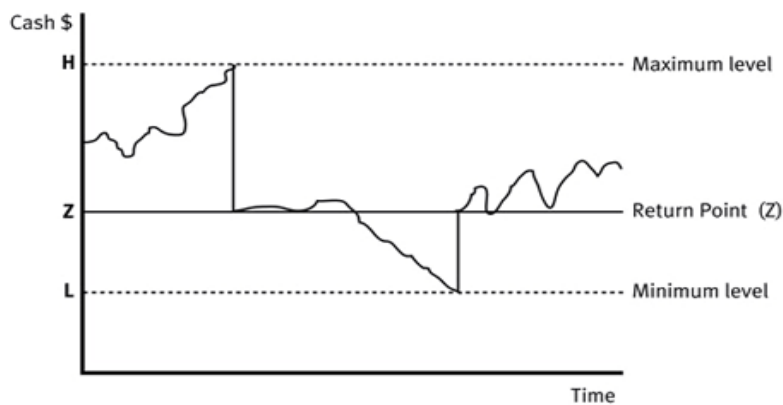
holding the cash is known and that cash is held in short-term investments. With the inflows and outflow patterns determined, then the firm is able to set average cash balance which is the target cash.

2.2.2 The Miller-Orr Model

The Miller-Orr model was developed by Miller and Orr (2006) and it is used for setting the target cash balance for a company. The model recognises the fact that cash flows are not certain and it addresses the limitation of the Baumol model which does not allow cash flows to fluctuate. To overcome this limitation, the Miller-Orr Model allows for daily cash flow variations.

The diagram below shows how the model works:

Fig 2.1: Cash movements between the two limits



Source: Brigham and Houston (2007).

The model sets higher and lower control limits, H and L respectively, as well as a target cash balance, Z. When the cash balance reaches H, then (H-Z) dollars are transferred from cash to marketable securities, i.e. the company buys a specified number of sellable securities in order to reach the desired cash level, i.e. target cash balance. Similarly, when the cash balance hits L, then (Z-L) dollars are transferred from marketable securities to cash. The factors that determine the variance between H and L are the transaction cost, the interest rate and the standard deviation. Lower limits are set by management depending on how much risk of a cash shortfall the firm is willing to accept and this in turn is dependent on access to borrowings and on the implications of the cash shortfall.

2.2.3 Liquidity Preference Theory

In macro-economic theory, liquidity preference refers to the demand for money, considered as liquidity. Keynes (1936) was the first to develop the concept of liquidity in his book *The General Theory of Employment, Interest and Money* to explain determination of the interest rate by the supply and demand for money.

Keynes (1936) identified three motives on why people demand and prefer liquidity: the transaction motive where companies and individuals hold cash in order to carry out day to day transactions; the precautionary motive where cash is held to meet unforeseen emergencies; the speculative motive which is creating the ability for a company to take advantage of special opportunities that if acted upon quickly will favour the firm.

2.2.4 Shiftability Theory

This theory was originated in the USA by Moulton (1918). This theory postulates that a bank's liquidity is maintained if it holds assets that could be shifted or sold to other lenders or investors for cash. Following Moulton: "to attain minimum reserves, relying on maturing bills is not needed but maintaining quantity of assets which can be shifted to other banks whenever necessary. It must fulfil the attributes of immediate transferability to others without loss. In case of general liquidity crisis, bank should maintain liquidity by possessing assets which can be shifted to the Central Bank". Thus this theory contends that shiftability, marketability or transferability of a bank's assets is a basis for ensuring liquidity.

This theory has some elements of truth in that Commercial Banks now accept sound assets which can be shifted to other banks. For instance, shares, debentures, treasury bills and bills of exchange of large companies are accepted as liquid assets. However, critics have argued that the theory rules out the fact that during acute depression, the shares and debentures cannot be shifted on to other lenders or investors by the banks.

2.3 Determinants of Profitability in Commercial Banks

Generally, a number of factors tend to affect profitability of Commercial Banks as several other studies have examined and determined. The factors reviewed in this study are liquidity, solvency, asset quality, size of the bank and growth.

2.3.1 Liquidity

The Economic Times, (2014) defines Liquidity as “Liquidity means how quickly you can get your hands on your cash. In simpler terms, liquidity is to get your money whenever you need it”. It refers to the ability of the bank to fulfil its obligations, mainly of depositors. As such, liquidity is a prime concern for banks and a short fall in liquidity would result into bank failure. The most common financial ratios that reflect the liquidity position of a bank are customer deposit to total asset and total loan to customer deposits. Others are cash to deposit ratio, Ongore and Kusa (2013).

Dang (2011) asserted that adequate level of liquidity is positively related with bank profitability. However, Molyneux and Thorton, (1992) and Guru, Staunton and Balashanmugam, (1999) discovered a negative relationship between the level of liquidity and profitability; in their analysis, they argued that holding liquid assets tends to reduce income due to the lower rates of return associated with liquid assets.

2.3.2 Solvency

Solvency is one of the bank specific factors that has an influence on the performance of a bank. A company whose total liabilities exceed total assets is said to be “technically insolvent.” A bank can become insolvent if it is unable honour its long term financial obligations. This means that it may be impossible for the bank to repay its depositors. This may arise when customers default on their loans for a sustained period of time, a situation which may result into a bank run. One of the key financial ratios that is used to measure the

solvency of a bank is ratio of debt to equity. The ratio indicates the degree of financial leverage being used by the bank and includes both short term and long term debt.

On 24 August 2015, the CBK approved the insolvency of Dubai Bank Kenya and ordered the closure of the Bank due its inability to pay its debts and for flouting regulations. The Bank will be liquidated on the recommendation of the KDIC that was appointed by the CBK as a receiver for Dubai Bank Kenya on 14 August 2015 in view of its serious liquidity and capital deficiencies. The recommendation was premised on KDIC's review of Dubai Bank Kenya which indicated that the magnitude of weaknesses in the bank left liquidation as the only feasible option. The CBK said that such violations and indebtedness were detrimental to the interests of its depositors, creditors and public (the CBK website).

Sufian (2011) investigated the determinants of profitability of the Korean banking sector in which bank specific and macro-economic factors were evaluated. The results revealed that solvency and liquidity level, credit risk, diversification, industry concentration and business risk have a significant effect on the profitability of banks. Omari, Warrad and Al-Nimer (2013) concluded that solvency has a significant relationship with profitability of firms in the Jordanian Industrial Sector.

2.3.3 Asset Quality

Credit portfolio is an important class of assets for a bank since loan is the major asset of Commercial Banks from which income is generated. The quality of the loan portfolio has a direct bearing on the profitability of banks. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011).

Thus, non-performing loan ratios are the best proxies for asset quality and all Commercial Banks should strive to keep the amount of non-performing loans to a low level. A study by Sangmi and Nazir (2010) confirmed that a lower ratio of non-performing loans to total loans translated to a higher level of profitability in banks. According to Kosmidou (2008), poor asset quality can have adverse impact on bank profitability, reducing interest income revenue, and by increasing the provisions cost.

2.3.4 Size of the Bank

Ordinarily, total asset is used as a measure for bank size. There is a general consensus in literature that a larger size should allow a bank to obtain economies of scale. Economies of scale will reduce the cost of gathering and processing information so that a positive effect of bank size is associated with profitability.

Berger, Akhavein and Humphrey (1997) and Smirlock (1985) found a positive and significant relationship between size of the bank and profitability. Haslem (1968), Short (1979), Bourke (1989) and Goddard, Molyneux and Wilson (2004) have all linked bank size to capital ratios, which they claim to be positively related to size. These outcomes confirm that there is a direct relationship between size and profitability and this is especially so in the case of small to medium-sized banks.

2.3.5 Growth

Bank growth indicator is given by natural logarithm of total bank assets. Boyd and Runkle (1993) established a significant inverse relationship between size and return on assets in U.S

banks from 1971 to 1990 and positive relationship between financial leverage and size of banks.

Akhavein, et al., (1997) showed that banks experience some diseconomies of scale to negatively affect performance. Goddard, et al., (2004), on five European countries, observed that the growth in bank size could positively influence bank performance. These observations suggest that the expected impact of bank size on bank profitability could be positive.

2.4 Empirical Literature Review

This section reviews various studies on liquidity, solvency and profitability. Both international and local studies have been reviewed.

2.4.1 International Evidence

Internationally, a number of studies have been carried out to examine the effect of liquidity and solvency on profitability.

Bourke (1989) carried out a study to establish the relationship between liquid assets and bank profitability for 90 banks in Europe, North America and Australia from 1972 to 1981, the study used econometric framework presented in an equation. The dependent variable, profitability, was regressed against a non-linear expression of relative liquid asset holdings, as well as a set of control variables. From the study a company with low liquidity and high profitability has to increase its borrowing leading to an increase of the financial costs. The study emphasized that profitability and solvency are necessary condition for the healthy

existence of the company and both are conditioned by the strategy adopted in the medium and long term.

Graham and Bordeleau (2010) did a study on the impact of liquidity on profitability of Banks in Canada. The study was aimed at helping to distinguish empirically, whether banks' holdings of liquid assets have a significant impact on their profitability. Since liquid assets such as cash and government securities generally have a relatively low return, holding them imposes an opportunity cost on a bank. In the model, profitability is regressed as a non-linear expression of relative liquid asset holdings as well as a set of control variables. The relationship is a function of the liquid assets ratio, a measure of short-term funding reliance and general macroeconomic conditions. While controlling for other factors, the paper found evidence, based on a panel of Canadian and American banks from 1997 to the end of 2009, that profitability is improved for banks that hold some liquid assets; however, there is a point at which holding further liquid assets diminishes a bank's profitability, all else equal.

Abera (2012) studied factors affecting profitability; an empirical Study on Ethiopian banking industry. This study examined the bank-specific, industry-specific and macro-economic factors affecting bank profitability for a total of eight Commercial Banks in Ethiopia, covering the period of 2000-2011 using a mixed methods research approach by combining documentary analysis and in-depth interviews. The study noted that despite the findings of the regression analysis that the impact of liquidity was negligible, liquidity of banks was one of the major determinants of Ethiopian banks profitability. The study concluded that the impact

of Ethiopian banks' liquidity on their performance remains ambiguous and further research is required.

Lartey, Antwi and Boadi (2013) sought to find out the relationship between the liquidity and the profitability of banks listed on the Ghana Stock Exchange. The study sought to describe the relationship between the liquidity and the profitability of banks listed on the Ghana Stock Exchange using a target population of 9 Commercial Banks listed on the Ghana Stock Exchange and a sample of 7 banks. Purposive sampling technique was used. In conclusion, both the liquidity and the profitability levels of the listed banks were decreasing within the period 2005-2010. There was a very weak positive relationship between the liquidity and the profitability of the listed banks. These findings support Munther and Omari (2013) in the case of Jordanian banks. When banks hold adequate liquid assets, their profitability would improve. Adequate liquidity helps the bank minimize liquidity risk and financial crises. The bank can absorb any possible unforeseen financial position. However, if liquid assets are held excessively, profitability could diminish because they have no or little interest generating capacity. The opportunity cost of holding low return assets would eventually outweigh the benefit of any increase in the bank's liquidity resiliency as perceived by funding markets (Mashhad, 2012).

Omari, Warrad and Al-Nimer (2013) investigated the effect of solvency among Jordanian Industrial sectors. In this study, solvency was expressed by debt ratio (Debt), and equity ratio (Equity), and the profitability was expressed by variables including earnings before interest and tax (EBIT), net profit margin (NPM), return on asset (ROA), and return on equity (ROE),

and. for the analysis the multiple regressions covered a period 2008-2011. The study found that the Mining and Extraction sector and the Glass and Ceramic Industries had the highest and lowest EBIT, NPM, ROA and ROE respectively. The study concluded that solvency has a significant relationship with profitability of firms.

2.4.2 Local Evidence

Studies in Kenya have not directly assessed the impact of liquidity and solvency on profitability but a few studies have been conducted on determinants of banks profitability coupled with impact of liquidity on profitability of Commercial Banks in Kenya.

Kamoyo (2006) carried out an empirical study on the determinants of liquidity of Commercial Banks in Kenya. The study involved 30 Commercial Banks operating in Kenya in the period 1995 to 2004. The study applied descriptive statistics, investigative questionnaires and multiple regression analysis to establish the determinants of liquidity in Commercial Banks. The results of the study indicated an insignificant negative relationship between profitability and liquidity.

Ongore and Kusa (2013) studied the determinants of financial performance of Commercial Banks in Kenya. The authors used linear multiple regression model and generalized Least Square on panel data to estimate the parameters. This explanatory study is based on secondary data obtained from published statements of accounts of all Commercial Banks in Kenya, CBK, IMF and World Bank publications for ten years from 2001 to 2010. In this study 37 Commercial Banks were considered. Out of these 13 of them are foreign owned banks and 24

are owned by locals. The findings showed that bank specific factors significantly affect the performance of Commercial Banks in Kenya, except for liquidity variable. Liquidity management was positively related to ROA, ROE and NIM but the relationship was found to be very weak.

Macharia (2013) sought to examine the relationship between the profitability and liquidity of Commercial Banks in Kenya. The population of the study was comprised all 43 Commercial Banks in Kenya operating in the years 2008 to 2012. The study involved secondary data collection of the return on assets, to measure profitability and CBK liquidity ratio and current ratio to measure liquidity during a specific year. The study used descriptive statistics and regression analysis to establish the relationship between the study variables. The study found out that there is a positive relationship between profitability and liquidity of Commercial Banks in Kenya; however, the coefficients from the study were found to be not significant.

Mwangi (2014) studied the effect of liquidity risk management on financial performance of Commercial Banks in Kenya. The study involved all the 43 Commercial Banks in Kenya analyzed for a period from 2010-2013. The results of the research showed that liquidity risk management has a significant negative relationship with financial performance of Commercial Banks. The study also concluded that holding more liquid assets as compared to total assets would lead to lower returns to Commercial Banks in Kenya whereas holding more liquid assets as compared to total deposits would lead to lower returns to Commercial Banks in Kenya.

2.5 Summary of Literature Review

The theoretical review has examined theories that explain the impact of liquidity on profitability. These theories hold certain assumptions constant and or with certainty. Baumol model does not allow for cash flow fluctuations as it assumes cash inflows are certain and regular and cash disbursements are steady and predictable. This is never the case in practice. Miller – Orr model assumes that there is a set upper and lower limit of cash in a company, and that the company reacts to restore the cash within these limits. However, conditions that are beyond the control of the company may arise and this would lead to cash flows operating beyond the aforementioned limits.

The studies have analyzed internal determinants of profitability. These factors include liquidity, solvency, asset quality, bank size and growth. The results of their effect on profitability have been mixed. For instance, Dang (2011) found out that adequate level of liquidity is positively related with bank profitability whereas Molyneux et al, (1992) and Guru et al., (1999) concluded that there was a negative relationship between the level of liquidity and profitability.

The review of empirical studies both in Kenya and internationally have had mixed conclusions as to how liquidity affects profitability. For example, Macharia (2013) found a positive relationship between liquidity and profitability of banks in Kenya, Lartey et al., (2013) concluded that there was a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana and Abera (2012) opined that the impact of

Ethiopian banks' liquidity on their performance remains ambiguous and further research is required.

It is also clear from the literature review that no exhaustive study has been undertaken in Kenya and the East Africa Region on how liquidity and solvency affect profitability of Commercial Banks. Whereas the Region was not adversely affected by the 2007 financial crisis, the banking sector experienced a liquidity crisis in 2011/2012. It would be interesting to examine how liquidity and solvency, the heavenly twins of banking, Goodhart, (2008), impact on profitability of banks.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was adopted in this study. The chapter describes the research design, the population, data collection process, and data analysis model and techniques adopted for the study.

3.2 Research Design

Cooper and Schindler (2005), observes that a design is a plan for selecting the sources and types of information used to answer the research questions. The study used a descriptive research design. According to Monsen and Van Horn, (2008), a descriptive study is one in which information is collected without changing the environment i.e., nothing is manipulated.

This design was selected because the study seeks to determine the effect of liquidity and solvency on profitability of Commercial Banks. Following Monsen and Van Horn (2008): “a descriptive research can be used to propose an association.” The present study has proposed an association between the two variables.

3.3 Population

The population of this study comprised the entire population of all the 43 Commercial Banks in Kenya (Appendix 1). Since the number of Commercial Banks in Kenya is not large, all the 43 Commercial Banks formed the sample. Thus, this was a census study of all the Commercial Banks in Kenya.

3.4 Data Collection

Data collection is gathering evidence in order to gain new insights about a situation and answer the question that necessitated study. The study used secondary data. To ensure that the study elements are complete and consistent, the researcher collected data for the Commercial Banks that were in operation from 2010 to 2014. The five (5) year period was considered adequate to provide the data that is in the analysis and this in line with past similar studies that include Wambu (2013) and Mwangi (2014) which resulted in reliable results. Liquidity data was deduced by looking at the current assets and current liabilities sections of the audited financial statements (AFS). Solvency data was gathered from the AFS by looking at the capital structure section. Liquidity and solvency ratios were then calculated as defined in Table 3.1. Profitability data was also gathered from the annual reports by looking at the net income section of the AFS of the Commercial Banks.

3.5 Data Analysis

Data analysis is a process of analysing all the information and evaluating the relevant information that can be helpful in better decision making, Sivia and Skilling (2006). To determine the effect of liquidity and solvency on profitability of the Commercial Banks two types of data analysis techniques were used, i.e., descriptive and quantitative.

3.5.1 The Analytical Model

In this study, regression technique and correlation were used to establish the effect of liquidity and solvency on profitability of Commercial Banks in Kenya.

The estimated regression model that was applied is as below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y =Profitability as measured by Return on Assets

α = Intercept

β = Coefficients of the variables

X_1 =Liquidity

X_2 =Solvency

X_3 =Asset Quality

X_4 =Bank Size

X_5 =Growth

ε = Random error term

The model also controlled for the effects of the industry and the year. These variables are defined in Table 3.1.

3.5.2 Operationalization of the Variables

The table below discusses how the aforementioned variables can be operationalized.

Table 3.1: Operationalisation of variables

Variable	Definition	Measurement Scale
Y	Profitability as measured by Return on Assets (ROA) – (Net income divided by Average total assets). Rivard and Thomas (1997) opined that bank profitability is best measured by ROA because ROA can't be distorted by high equity multiplier.	Ratio
X_1	Liquidity as measured by current ratio (current assets divided by current liabilities).	Ratio
X_2	Solvency as measured by the ratio of debt to equity.	Ratio
X_3	Asset quality as measured by non -performing loans divided by gross loans and advances.	Ratio
X_4	Bank size as measured by natural log of the bank's total assets.	Ratio
X_5	Growth as measured by percentage of increase in revenue.	Ratio

Source: Researcher

3.5.3 Tests of Significance

A correlation and a multiple regression analysis were carried out. A correlation matrix was used to show the interrelationships within the variables under study. This helped show any serial correlations. Analysis of Variance (ANOVA) and F-Test were used to show the fitness of the model under study. The coefficients show how each of the variables influence profitability.

The results of significance were interpreted at 5% level of significance. Adjusted R squared was used to determine the variation in the dependent variable due to changes in the independent variables. The p-values were interpreted.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND INTERPRETATIONS

4.1 Introduction

This chapter presents the results of the study. The chapter is organised as follows: the next section presents the findings where the descriptive results are presented followed by the correlation results and finally the regression results. The last section is the discussion of findings.

4.2 Descriptive Statistics

The descriptive results in Table 4.1 present the number of observations, the mean scores and the standard deviation. The results show that the analysis was based on data from 42 banks as one bank, Dubai Bank Kenya Ltd., was dropped for lack of data for the entire period of study. The mean ROA was 0.02, the mean of liquidity was 1.16 and that of solvency was 0.32. The asset quality had a mean of 0.07 and the mean bank size, measured as the natural logarithm of total assets, was 17.1. Finally, the growth as measured by the percentage increase in revenues was 19%.

Table 4.1: Descriptive statistics

	Mean	Std. Deviation	N
Return on Assets	.02031	.019569	42
Liquidity	1.16190	.192484	42
Solvency	.31869	.549389	42
Asset Quality	.07321	.062780	42
Bank Size	17.10593	1.231949	42
Growth	.19186	.186669	42

Source: Research findings

4.3 Inferential Statistics

Inferential statistics is concerned with making predictions or inferences about a population from observations and analyses of a sample. Thus, inferential statistics attempts to generalize the results of descriptive statistics to a larger population of interest. The study has applied correlation analysis, regression analysis and ANOVA to make inferences about the population of the Commercial Banks in Kenya.

4.3.1 Correlation Analysis

Table 4.2 shows the correlation results. As the correlation matrix shows, there were very low correlations among the independent variables used in the study. These low correlations suggest the absence of serial correlation in the dataset and, therefore, the variables can be entered in the regression model for analysis as they are.

Table 4.2: Correlation matrix

		ROA	LIQ	SOLV	ASSET	SIZE
Liquidity	Pearson Correlation	-.286	1			
	Sig. (2-tailed)	.067				
	N	42	42			
Solvency	Pearson Correlation	-.197	-.142	1		
	Sig. (2-tailed)	.210	.371			
	N	42	42	42		
Asset Quality	Pearson Correlation	-.321 [*]	.371 [*]	.067	1	
	Sig. (2-tailed)	.038	.016	.672		
	N	42	42	42	42	
Bank Size	Pearson Correlation	.574 ^{**}	-.331 [*]	.081	-.458 ^{**}	1
	Sig. (2-tailed)	.000	.032	.612	.002	
	N	42	42	42	42	42

Growth	Pearson Correlation	.018	.330*	-.074	.200	-.139
	Sig. (2-tailed)	.912	.033	.644	.204	.379
	N	42	42	42	42	42

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research findings

4.3.2 Regression Analysis

Table 4.3 presented the summary model for the regression analysis. The study found that the model explained 42.4% of the variance in bank performance as shown by the R^2 . The Durbin-Watson value of 1.675 is closer to 2 and, therefore, shows that there was very low autocorrelation in the model.

Table 4.3: Model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.651 ^a	.424	.344	.015853	1.675

a. Predictors: (Constant), Growth, Solvency, Bank Size, Liquidity, Asset Quality

b. Dependent Variable: Return on Assets

Source: Research findings

4.3.3 Analysis of Variance

Table 4.4 shows the analysis of variance results. The F value of 5.295 was significant at 1% confidence level. Thus, the regression model used in the study was significant. This suggests that at least one of the independent variables used in the study was significant.

Table 4.4: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.007	5	.001	5.295	.001 ^b
Residual	.009	36	.000		
Total	.016	41			

a. Dependent Variable: Return on Assets

b. Predictors: (Constant), Growth, Solvency, Bank Size, Liquidity, Asset Quality

Source: Research findings

Table 4.5 presents the coefficient results of the regression analysis. The results show that liquidity had a negative but insignificant effect on the performance of banks in Kenya, $p > .05$. The results also show that solvency had a negative but insignificant effect on bank performance, $p > .05$. The study found that asset quality had a negative but insignificant effect on bank performance in Kenya, $p > .05$. Bank size was found to have a positive and significant effect on bank performance, $p < .05$ while growth has a positive but insignificant effect on bank performance in Kenya, $p > .05$.

Table 4.5: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	-.107	.047		-2.292	.028
Liquidity	-.018	.015	-.181	-1.240	.223
Solvency	-.009	.005	-.256	-1.978	.056
Asset Quality	-.004	.047	-.013	-.088	.930
Bank Size	.009	.002	.548	3.760	.001
Growth	.014	.014	.137	1.021	.314

a. Dependent Variable: Return on Assets

Source: Research findings

4.4 Interpretation of the Findings

The study sought to examine the effect of liquidity and solvency on bank performance. The study found that liquidity had a negative but insignificant effect on the performance of banks in Kenya ($\beta = -0.018$, $p = 0.223$). Thus, liquidity did not affect the performance of banks in Kenya. This can be attributed to the fact that except for one Commercial Bank, most of the banks had very low liquidities (less than 2) and thus the lower liquidities could not influence the level of performance. The results are consistent with Lartey et al., (2013) who found a weak relationship between liquidity and performance of Commercial Banks. The evidence, therefore, suggests that the liquidity levels of banks in Kenya have a weak effect on the performance of banks.

The study also found that solvency had a negative but marginally insignificant effect on the performance of banks in Kenya ($\beta = -0.009$, $p = 0.056$). This shows that at 5% level of significance, there is a weak evidence that solvency of banks affect their performance. This is consistent with Kamoyo (2006) who found an insignificant relationship between solvency and profitability of banks in Kenya. There is little evidence, therefore, that solvency affects the performance of banks in Kenya.

The study also examined the effect of asset quality on the performance of banks in Kenya. The results showed that asset quality has a negative but insignificant effect on the bank performance ($\beta = -0.004$, $p = 0.93$). This is inconsistent with Sangmi and Nazir (2010) who found a negative and significant relationship between asset quality and the performance of

Commercial Banks. This confirms that in Kenya, bank performance is not influenced by the level of asset quality.

The study also examined how bank size affects the performance of banks in Kenya. The results showed a positive and significant effect of bank size on bank performance ($\beta= 0.009, p = 0.001$). This is consistent with Goddard et al., (2004) who found a positive and significant relationship between bank size and profitability of banks. This confirms that bank performance is influenced by the size of the bank in Kenya as larger banks perform better than smaller banks.

Finally, the study examined the effect of bank growth on their performance. The results showed a positive but insignificant effect of bank growth on their performance ($\beta= 0.014, p = 0.314$). This is consistent with Goddard, et al., (2004) who noted that the growth in bank size could positively influence bank performance. This shows that bank performance in Kenya is not influenced by the growth in revenues.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, the conclusions, the recommendations for policy and practice and suggestions for further research.

5.2 Summary

The study examined the effect of liquidity and solvency on the profitability of Commercial Banks in Kenya. The study used a descriptive research design. The population of this study comprised the entire population of all the 43 Commercial Banks in Kenya (Appendix 1). Since the number of Commercial Banks in Kenya is not large, all the 43 Commercial Banks formed the sample. However, one bank, the Dubai Bank Kenya Ltd., did not have the data for all the years and was, therefore, deleted from the final sample. Five year secondary data was collected from 2010 to 2014 for the banks from their annual reports. Data was analysed using descriptive, correlation and regression analyses.

The descriptive results showed that the mean of ROA was 0.02, the mean of liquidity was 1.16 and that of solvency was 0.32. The asset quality had a mean of 0.07 and the mean bank size, measured as the natural logarithm of total assets, was 17.1. The results also showed that the average growth in revenues was 19%. The correlation analysis revealed that there were low correlations among the independent variables. The regression results showed that the

model explained 42.4% of the variance in bank performance. The ANOVA results showed that the model was statistically significant at 1% level of significance.

The study found that both liquidity and solvency had negative but insignificant effects on the performance of banks in Kenya, $p > .05$. Further, the study found that asset quality had a negative but insignificant effect on bank performance while growth had a positive but insignificant effect on the bank performance in Kenya, $p > .05$. The results showed that bank size had a positive and significant effect on bank performance, $p < .05$.

5.3 Conclusion

The study sought to examine the effect of liquidity on the performance of Commercial Banks in Kenya. The study found that liquidity had a negative but insignificant effect on the financial performance of Commercial Banks ($\beta = -0.018$, $p = 0.223$). The study, therefore, concludes that the performance of Commercial Banks in Kenya is not influenced by the liquidity levels.

The study examined the effect of solvency on the performance of Commercial Banks in Kenya. The results showed that solvency had a negative but insignificant effect on the performance of banks ($\beta = -0.009$, $p = 0.056$). It is concluded that bank performance in Kenya is not influenced by the solvency levels in banks.

The study also examined the effect of asset quality on the financial performance of Commercial Banks in Kenya. The results revealed that there was a negative but insignificant

effect of asset quality on the financial performance of banks ($\beta = -0.004, p = 0.93$). This leads to the conclusion that bank performance is not influenced by the asset quality of banks.

The study further examined the effect of bank size on the performance of Commercial Banks in Kenya. The study found that bank size had a positive and significant effect on the performance of banks in Kenya ($\beta = 0.009, p = 0.001$). The study thus concludes that bank size influences the financial performance of Commercial Banks in Kenya.

The study also examined the effect of growth on the performance of Commercial Banks in Kenya. The results showed that the growth of banks had a positive but insignificant effect on the performance of banks ($\beta = 0.014, p = 0.314$). This leads to the conclusion that the performance of Commercial Banks in Kenya is not influenced by the growth of banks.

5.4 Recommendations for Policy and Practice

The study makes a number of recommendations. First, the study recommends that the management of Commercial Banks in Kenya should take note of the fact that while the liquidity and solvency levels of banks were not found to influence bank performance, it is important to keep them at manageable levels in relation to the industry.

The study also recommends that bank managers should take note of the fact that the size of the banks influences their performance. As such, Commercial Banks should strive to have higher asset base in the industry in order to record better performance in terms of profitability.

The study further recommends that since growth in bank revenues may have a positive impact on the performance of banks in Kenya, banks should focus on improving their revenue sources in order to record better performance. As such, diversification of revenue sources would be key.

5.5 Limitations of the Study

The study used OLS regression analysis on the aggregate data for the banks. This masks the individual year effects on the model. A panel analysis would have been more preferable in this case but due to certain data limitations, this was not possible. However, the OLS regression analysis still did the task as was envisaged in the methodology.

The study also used liquidity and solvency as the main determinants of bank performance. Together with other control variables, they accounted for only 42% of the variance in performance. Thus, a number of variables were not examined in this study limiting the performance determinants to two main predictor variables.

The study focused on Commercial Banks in Kenya. This means that the results are limited to Kenya and may not be applicable to other countries with different operating environments. The uniqueness of the operating environment may hinder application of these results in other countries where the environment is different. Further, this study focused on commercial banks alone. Thus, the results of this study are limited to the Commercial Banks examined in this study. Any attempt to apply the findings to other financial institutions other than commercial banks should therefore be approached with care.

The study also used annual data in performing the analysis. While this was done due to availability of annual data on most of the banks, it would have been prudent to use quarterly data in order to increase the number of observations and, therefore, the predictive ability of the model and its accuracy.

5.6 Suggestions for Further Research

There is need for more research in this area. More specifically, the study suggests that more studies should focus on how both solvency and liquidity can influence bank performance using a longer period of time, probably ten years, and using panel data methodologies to examine this relationship.

The study also recommends that more studies be done to examine the determinants of bank performance in Kenya. While this study attempted to examine this, it focused on liquidity, solvency, asset quality, size and growth which only accounted for 42% of the variance in performance. More variables, therefore, need to be examined.

This study suggests that a cross border study involving other countries should be carried out in order to determine the impact of different economic and operating factors on the effect of liquidity and solvency on the performance of Commercial Banks. In addition, future studies should also perform an analysis of the effect of these variables on the performance of financial institutions other than Commercial Banks. This will help provide results that can be generalised to all the financial institutions in Kenya.

Further studies are also required in this area using quarterly data. This way, more observations will be made and the model is more likely to provide better estimates than when the annual data is used. This is also important because commercial banks report quarterly and thus such an analysis will be more relevant to the banks.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya as at 31 December 2014

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|-------------------------------------|--|
| 1. African Banking Corporation Ltd. | 22. Fina Bank Ltd. |
| 2. Bank of Africa (K) Ltd. | 23. First Community Bank Ltd. |
| 3. Bank of Baroda (K) Ltd. | 24. Giro Commercial Bank Ltd. |
| 4. Bank of India | 25. Guardian Bank Ltd. |
| 5. Barclays Bank of Kenya Ltd. | 26. Gulf African Bank (K) Ltd. |
| 6. CFC Stanbic Bank Ltd. | 27. Habib Bank A.G Zurich |
| 7. Charterhouse Bank Ltd. | 28. Habib Bank Ltd . |
| 8. Chase Bank (K) Ltd. | 29. I&M Bank Ltd. |
| 9. Citibank N.A. | 30. Imperial Bank Ltd. |
| 10. Commercial Bank of Africa Ltd. | 31. Jamii Bora Bank Ltd. |
| 11. Consolidated Bank of Kenya Ltd. | 32. Kenya Commercial Bank Ltd. |
| 12. Co-operative Bank of Kenya Ltd. | 33. K-Rep Bank Ltd. |
| 13. Credit Bank Ltd. | 34. Middle East Bank (K) Ltd. |
| 14. Development Bank of Kenya Ltd. | 35. National Bank of Kenya Ltd. |
| 15. Diamond Trust Bank (K) Ltd. | 36. National Industrial Credit Bank Ltd. |
| 16. Dubai Bank Kenya Ltd. | 37. Oriental Commercial Bank Ltd. |
| 17. Ecobank Kenya Ltd. | 38. Paramount Universal Bank Ltd. |
| 18. Equatorial Commercial Bank Ltd. | 39. Prime Bank Ltd. |
| 19. Equity Bank Ltd. | 40. Standard Chartered Bank (K) Ltd. |
| 20. Family Bank Ltd. | 41. Trans-National Bank Ltd. |
| 21. Fidelity Commercial Bank Ltd. | 42. UBA Kenya Bank Ltd. |
| | 43. Victoria Commercial Bank Ltd. |

Source: Central Bank of Kenya

Appendix II: Final Research Data for Analysis

Bank	ROA	Liquidity	Solvency	Asset quality	Size	Growth
KCB	0.038	1.220	0.149	0.063	19.511	0.209
Barclays	0.046	1.199	0.156	0.112	19.063	-0.004
Co op	0.033	1.165	0.179	0.070	19.122	0.186
Equity	0.055	1.240	0.503	0.035	19.124	0.188
Stan Chart	0.041	1.182	0.027	0.026	19.044	0.152
CfC	0.022	1.135	0.515	0.023	18.774	0.163
Citibank	0.041	1.287	0.027	0.009	18.080	0.149
I&M	0.038	1.224	0.326	0.015	18.340	0.226
NBK	0.017	1.164	0.001	0.075	18.189	0.073
NIC	0.031	1.176	0.219	0.035	18.330	0.213
DTB	0.030	1.184	0.249	0.013	18.347	0.205
CBA	0.026	1.129	0.082	0.043	18.453	0.059
BOB	0.034	1.135	0.000	0.029	17.613	0.114
BOI	0.028	1.188	0.000	0.015	17.077	0.336
BOA	0.010	1.135	0.311	0.029	17.675	0.074
Prime	0.025	1.133	0.000	0.027	17.555	0.212
Imperial	0.043	1.162	0.000	0.049	17.325	0.184
Family	0.021	1.175	0.209	0.092	17.333	0.254
Ecobank	-0.010	1.134	2.335	0.106	17.313	0.189
Chase	0.019	1.103	0.540	0.025	17.733	0.480
Housing	0.017	1.149	1.743	0.071	17.515	0.163
Trans	0.022	1.305	0.000	0.074	15.879	0.079
ABC	0.024	1.150	0.246	0.041	16.585	0.092
Giro	0.030	1.169	0.000	0.019	16.342	-0.008
DBK	0.011	1.157	1.565	0.143	16.412	0.080
Fina	0.014	1.196	1.713	0.048	16.798	0.106
K-Rep	0.021	1.176	0.663	0.115	16.189	0.145
Gulf	0.014	1.156	0.018	0.049	16.453	0.220
Victoria	0.031	1.217	0.315	0.000	16.147	0.888
Habib AG	0.019	1.189	0.094	0.026	16.101	0.129
Oriental	0.022	1.299	0.000	0.112	15.609	0.012
Guardian	0.015	1.131	0.000	0.089	16.207	0.178
Middle	0.026	1.282	0.000	0.215	15.461	0.079
Equatorial	-0.011	1.085	0.187	0.146	16.436	0.225
Habib	0.034	1.235	0.000	0.040	15.764	0.190
Consolidated	0.002	1.114	0.929	0.141	16.516	-0.044
Paramount	0.015	1.202	0.000	0.290	15.705	0.779
Credit	0.005	1.212	0.000	0.107	15.660	0.052
Fidelity	0.018	1.113	0.000	0.076	16.276	0.123
Jamii Bora	-0.007	2.312	0.084	0.227	15.224	0.582
First	0.006	1.111	0.000	0.112	16.110	0.273
UBA	-0.063	1.427	0.000	0.043	15.059	0.053

Source: Audited Financial Statements of the Commercial Banks

Appendix III: Annual Ratios for variables I

	ROA					Liquidity					Solvency				
Bank	2014	2013	2012	2011	2010	2014	2013	2012	2011	2010	2014	2013	2012	2011	2010
KCB	0.042	0.038	0.036	0.035	0.040	1.237	1.239	1.211	1.190	1.224	0.184	0.209	0.163	0.189	0.000
Barclays	0.037	0.037	0.047	0.049	0.061	1.203	1.185	1.191	1.194	1.223	0.348	0.279	0.152	0.000	0.000
Co op	0.030	0.039	0.037	0.031	0.028	1.176	1.185	1.170	1.143	1.151	0.431	0.288	0.158	0.011	0.007
Equity	0.061	0.053	0.051	0.055	0.056	1.168	1.270	1.246	1.247	1.268	0.749	0.505	0.604	0.393	0.264
Stan Chart	0.047	0.042	0.041	0.036	0.038	1.222	1.195	1.186	1.143	1.165	0.135	0.000	0.000	0.000	0.000
CfC	0.032	0.029	0.023	0.014	0.014	1.184	1.151	1.157	1.078	1.103	0.000	0.981	0.323	0.614	0.658
Citibank	0.031	0.042	0.064	0.039	0.028	1.301	1.289	1.332	1.254	1.262	0.000	0.133	0.000	0.000	0.000
I&M	0.041	0.038	0.037	0.040	0.034	1.189	1.229	1.221	1.220	1.262	0.630	0.548	0.221	0.214	0.019
NBK	0.007	0.012	0.011	0.023	0.034	1.109	1.147	1.184	1.180	1.198	0.002	0.000	0.003	0.000	0.000
NIC	0.029	0.030	0.029	0.034	0.032	1.198	1.185	1.174	1.155	1.168	0.612	0.206	0.243	0.019	0.013
DTB	0.029	0.036	0.032	0.029	0.021	1.223	1.194	1.187	1.155	1.159	0.361	0.262	0.252	0.370	0.000
CBA	0.021	0.028	0.026	0.020	0.032	1.113	1.124	1.131	1.135	1.140	0.393	0.000	0.016	0.000	0.000
BOB	0.036	0.026	0.030	0.037	0.042	1.189	1.171	1.143	1.155	1.018	0.000	0.000	0.000	0.000	0.000
BOI	0.030	0.033	0.023	0.033	0.019	1.215	1.198	1.195	1.169	1.163	0.000	0.000	0.000	0.000	0.000
BOA	0.002	0.014	0.010	0.011	0.011	1.146	1.142	1.114	1.137	1.137	0.524	0.459	0.175	0.198	0.198
Prime	0.032	0.029	0.022	0.024	0.019	1.164	1.133	1.106	1.119	1.140	0.000	0.000	0.000	0.000	0.000
Imperial	0.036	0.043	0.041	0.047	0.046	1.152	1.153	1.152	1.168	1.185	0.000	0.000	0.000	0.000	0.000
Family	0.029	0.028	0.017	0.014	0.018	1.207	1.159	1.186	1.147	1.176	0.273	0.225	0.184	0.204	0.157
Ecobank	-0.007	-0.024	-0.033	0.007	0.005	1.205	1.101	1.067	1.068	1.229	0.662	2.302	3.929	4.781	0.000
Chase	0.022	0.021	0.018	0.016	0.017	1.115	1.108	1.116	1.089	1.085	1.401	0.785	0.458	0.056	0.000
Housing	0.014	0.017	0.017	0.021	0.013	1.116	1.138	1.145	1.176	1.170	2.708	0.000	2.316	1.676	2.015
Trans	0.012	0.016	0.024	0.028	0.030	1.230	1.240	1.263	1.314	1.478	0.000	0.000	0.000	0.000	0.000
ABC	0.012	0.022	0.023	0.030	0.033	1.139	1.143	1.125	1.158	1.188	0.591	0.277	0.360	0.000	0.000
Giro	0.026	0.028	0.018	0.025	0.050	1.191	1.181	1.169	1.154	1.151	0.000	0.000	0.000	0.000	0.000
DBK	0.013	0.012	0.005	0.009	0.015	1.195	1.132	1.139	1.157	1.162	0.947	1.313	1.871	1.992	1.701
Fina	0.016	0.013	0.017	0.015	0.009	1.277	1.312	1.171	1.117	1.105	0.027	0.034	0.078	8.110	0.316
K-Rep	0.033	0.027	0.021	0.019	0.007	1.182	1.165	1.190	1.167	1.178	0.408	0.578	0.625	0.920	0.786
Gulf	0.020	0.018	0.018	0.007	0.008	1.189	1.201	1.130	1.114	1.146	0.000	0.089	0.000	0.000	0.000
Victoria	0.027	0.032	0.034	0.030	0.035	1.200	1.227	1.246	1.196	1.216	0.482	0.586	0.279	0.226	0.000

Habib AG	0.033	0.028	0.026	0.019	-0.011	1.227	1.201	1.187	1.172	1.159	0.000	0.332	0.076	0.000	0.061
Oriental	0.009	0.020	0.015	0.030	0.034	1.255	1.278	1.286	1.345	1.333	0.000	0.000	0.000	0.000	0.000
Guardian	0.018	0.021	0.013	0.013	0.009	1.137	1.132	1.116	1.137	1.134	0.000	0.000	0.000	0.000	0.000
Middle	0.012	0.012	0.008	0.065	0.035	1.262	1.256	1.237	1.311	1.343	0.000	0.000	0.000	0.000	0.000
Equatorial	-0.020	0.004	-0.034	0.006	-0.010	1.075	1.097	1.054	1.103	1.095	0.346	0.146	0.277	0.166	0.000
Habib	0.034	0.039	0.041	0.028	0.028	1.259	1.260	1.238	1.221	1.198	0.000	0.000	0.000	0.000	0.000
Consolidated	-0.019	-0.006	0.008	0.010	0.016	1.116	1.080	1.096	1.103	1.175	1.310	1.691	1.642	0.000	0.000
Paramount	0.021	0.011	0.015	0.021	0.009	1.153	1.181	1.186	1.277	1.216	0.000	0.000	0.000	0.000	0.000
Credit	-0.010	0.007	0.011	0.009	0.007	1.149	1.204	1.225	1.216	1.264	0.000	0.000	0.000	0.000	0.000
Fidelity	0.013	0.017	0.008	0.018	0.033	1.116	1.124	1.112	1.104	1.108	0.000	0.000	0.000	0.000	0.000
Jamii Bora	0.002	0.013	0.015	-0.018	-0.045	1.310	1.473	2.510	3.812	2.456	0.130	0.053	0.057	0.052	0.128
First	0.001	0.012	0.024	0.008	-0.015	1.110	1.120	1.121	1.106	1.097	0.000	0.000	0.000	0.000	0.000
UBA	-0.059	-0.073	-0.098	-0.047	-0.038	1.315	1.400	1.715	1.294	1.410	0.000	0.000	0.000	0.000	0.000

Source: Audited Financial Statements of the Commercial Banks

Appendix IV: Annual Ratios for variables II

Bank	Asset quality					Size					Growth					roa
	2014	2013	2012	2011	2010	2014	2013	2012	2011	2010	2014	2013	2012	2011		
KCB	0.046	0.068	0.056	0.052	0.093	19.748	19.594	19.533	19.459	19.223	0.152	0.090	0.107	0.488	0.038	
Barclays	0.036	0.030	0.362	0.055	0.075	19.237	19.148	19.035	18.929	18.967	0.007	-0.021	0.065	-0.068	0.046	
Co op	0.043	0.040	0.045	0.038	0.182	19.460	19.249	19.112	18.938	18.852	0.130	0.188	0.298	0.127	0.033	
Equity	0.030	0.043	0.023	0.024	0.054	19.436	19.289	19.190	18.991	18.713	0.180	0.115	0.271	0.185	0.055	
Stan Chart	0.072	0.024	0.015	0.007	0.013	19.221	19.212	19.091	18.916	18.778	0.084	0.134	0.284	0.106	0.041	
CfC	0.034	0.026	0.016	0.013	0.026	18.959	18.956	18.709	18.758	18.490	0.041	0.132	0.314	0.166	0.022	
Citibank	0.024	0.006	0.006	0.005	0.006	18.190	18.082	18.058	18.128	17.944	-0.034	-0.202	0.396	0.437	0.041	
I&M	0.016	0.010	0.009	0.015	0.024	18.738	18.519	18.332	18.158	17.952	0.246	0.244	0.102	0.311	0.038	
NBK	0.107	0.105	0.077	0.041	0.044	18.627	18.343	18.023	18.045	17.910	0.136	0.185	-0.031	0.000	0.017	
NIC	0.034	0.041	0.031	0.032	0.036	18.736	18.542	18.438	18.114	17.819	0.149	0.213	0.259	0.229	0.031	
DTB	0.011	0.013	0.014	0.011	0.018	18.766	18.553	18.364	18.165	17.886	0.131	0.195	0.301	0.191	0.030	
CBA	0.034	0.034	0.038	0.049	0.062	18.985	18.643	18.425	18.238	17.974	0.055	0.198	0.262	-0.279	0.026	
BOB	0.033	0.022	0.023	0.031	0.034	17.942	17.768	17.647	17.418	17.292	0.438	0.003	0.090	-0.074	0.034	
BOI	0.006	0.010	0.016	0.023	0.022	17.353	17.240	17.029	16.966	16.795	0.043	0.708	-0.254	0.845	0.028	
BOA	0.055	0.039	0.021	0.016	0.011	17.946	17.780	17.706	17.472	17.472	-0.073	0.341	0.229	-0.200	0.010	
Prime	0.013	0.019	0.028	0.036	0.037	17.821	17.717	17.587	17.376	17.272	0.178	0.395	0.120	0.157	0.025	
Imperial	0.060	0.053	0.041	0.044	0.046	17.852	17.577	17.359	17.059	16.777	0.057	0.312	0.152	0.216	0.043	
Family	0.063	0.072	0.137	0.101	0.086	17.940	17.588	17.249	17.074	16.816	0.270	0.466	0.180	0.099	0.021	
Ecobank	0.087	0.078	0.051	0.089	0.223	17.643	17.424	17.274	17.119	17.107	0.697	0.866	-0.653	-0.154	-0.010	
Chase	0.042	0.026	0.016	0.018	0.024	18.489	18.154	17.709	17.413	16.900	0.428	0.525	0.538	0.430	0.019	
Housing	0.088	0.086	0.069	0.053	0.061	17.918	17.660	17.521	17.280	17.194	0.156	0.272	0.010	0.213	0.017	
Trans	0.074	0.116	0.045	0.052	0.082	16.142	16.083	15.990	15.802	15.376	0.054	-0.097	0.179	0.181	0.022	
ABC	0.052	0.044	0.034	0.029	0.045	16.881	16.793	16.764	16.342	16.147	-0.008	0.124	0.144	0.108	0.024	
Giro	0.023	0.041	0.012	0.005	0.013	16.529	16.427	16.323	16.288	16.141	0.128	0.221	-0.071	-0.308	0.030	
DBK	0.134	0.124	0.147	0.179	0.131	16.646	16.562	16.412	16.260	16.181	0.099	0.567	-0.149	-0.197	0.011	
Fina	0.022	0.025	0.038	0.062	0.093	17.312	17.060	16.658	16.499	16.463	0.223	0.202	0.085	-0.087	0.014	
K-Rep	0.067	0.077	0.118	0.114	0.201	16.575	16.396	16.072	16.048	15.853	0.197	0.257	0.069	0.058	0.021	
Gulf	0.065	0.058	0.034	0.064	0.023	16.799	16.591	16.423	16.374	16.077	0.201	0.128	0.361	0.192	0.014	
Victoria	0.000	0.000	0.000	0.000	0.000	16.663	16.429	16.150	15.850	15.643	0.076	0.203	0.372	2.901	0.031	

Habib AG	0.014	0.021	0.029	0.028	0.035	16.313	16.214	16.088	15.981	15.911	0.281	0.097	0.327	-0.189	0.019
Oriental	0.098	0.091	0.121	0.126	0.125	15.877	15.762	15.643	15.431	15.332	-0.114	0.322	-0.095	-0.065	0.022
Guardian	0.065	0.059	0.064	0.069	0.189	16.495	16.368	16.279	15.994	15.899	0.037	0.429	0.222	0.023	0.015
Middle	0.520	0.169	0.092	0.123	0.169	15.597	15.567	15.585	15.350	15.206	0.089	0.164	-0.607	0.671	0.026
Equatorial	0.251	0.119	0.074	0.072	0.216	16.624	16.560	16.462	16.375	16.157	-0.482	1.716	-0.509	0.174	-0.011
Habib	0.066	0.000	0.094	0.017	0.024	16.061	15.905	15.763	15.584	15.507	0.048	0.126	0.410	0.176	0.034
Consolidated	0.253	0.127	0.114	0.088	0.121	16.529	16.636	16.706	16.545	16.165	-0.386	0.121	-0.036	0.126	0.002
Paramount	0.066	0.103	0.300	0.374	0.607	16.158	15.899	15.797	15.369	15.302	0.633	0.047	0.042	2.393	0.015
Credit	0.082	0.058	0.093	0.109	0.194	15.998	15.805	15.673	15.501	15.326	-0.060	0.146	0.172	-0.049	0.005
Fidelity	0.062	0.081	0.103	0.040	0.093	16.620	16.363	16.281	16.194	15.921	-0.017	0.719	-0.262	0.053	0.018
Jamii Bora	0.083	0.066	0.111	0.523	0.351	16.389	15.763	15.062	14.543	14.362	0.475	0.801	1.446	-0.396	-0.007
First	0.151	0.070	0.141	0.128	0.073	16.542	16.241	16.114	15.983	15.669	0.098	-0.020	0.352	0.661	0.006
UBA	0.063	0.016	0.095	0.042	0.000	15.375	15.126	14.888	14.981	14.924	-0.078	1.029	-0.576	-0.161	-0.063

Source: Audited Financial Statements of the Commercial Banks