EFFECTS OF SHORT TERM INTEREST RATES ON LIQUIDITY OF COMMERCIAL BANKS IN KENYA

BY

NZULA, CRISPUS MAITHYA

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DEDICATION

This project has been dedicated to my beloved wife, Caroline Maithya, My Children Maggy, Mark & Martin for their continued support and encouragement while taking this course.

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ABBREVIATIONS AND ACRONYMS USED IN THIS STUDY

ALCO   Asset Liability Committee

ANOVA   Analysis Of Variance

CBK   Central Bank of Kenya

CBR   Central Bank Rate

CITI   Collaborative Institute Training Initiative

D/E   Debt to Equity

IMF   International Monetary Fund

KES   Kenya Shilling

NBE   National Bank of Ethiopia

SPSS   Statistical Package for Social Sciences

SVAR   Structural Vector Auto-Regression

TB   Treasury Bills

TL/TA   Total Liabilities / Total Assets

TVAR   Threshold Vector Auto-Regression

US   United States

USD   United States Dollar

WB   World Bank

ABSTRACT

The role of Banks remain central in financing economic activity and its effectiveness could exert positive impact on overall economy as a sound and profitable Banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Banks play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Liquidity is the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Hence, liquidity risk arises from the fundamental role of banks in the maturity transformation of short -term deposits into long-term loans. Objective of the Study was to examine the effects of short term interest rates on liquidity of commercial banks in Kenya. The theories used in this study included: Liquidity Preference Theory, The Real Theory (Model) of Interest Rate and Fisher's Theory of Interest. The current study employed the use of both descriptive survey and historical research designs. The target population for this study was all the 44 listed commercial banks in Kenya as at December 2015. The study employed the use of document analysis of secondary data. The study extracted reports on various variables for the last five financial years (2011 to 2015). Secondary data on the short term interest rates data was collected from financial institutions through their quarterly reports and CBK and this was the individual weighted lending rates in proportion to the market share of the firms. The data on Debt to Equity ratio was collected from the firm's quarterly financial reports and emphasis put on total liabilities and total assets. The operating expense ratio was similarly collected from the firms quarterly financial reports of the firms specifically the operating expenses and the revenue. Secondary data on bank liquidity was collected from banks basically through quarterly reports on cash and cash equivalents balances and the value of the total assets. The data collected was sorted, organized and captured in SPSS analysis tool. The study used one way ANOVA to test the level of significant of the independent variables on the dependent variable at 95% level of significance, the one way ANOVA was used to test whether there exist any significant difference between the study variable. In addition, the study conducted a multiple regression analysis. Inferential statistics was analyzed using regression analysis to establish the relationship among study variables and to test the hypothesized relationships. Inferential statistics was carried out using multiple regression models. The regression model was used to test the strength of the predictor variables. The study found a weak positive correlation between banks liquidity of commercial banks and short term interest rates. The study also found weak positive correlation between banks liquidity of commercial banks and debt to equity ratio. A negative correlation between banks liquidity of commercial banks and Operating Expense / Revenue was established. The study therefore concludes that short term interest rates, debt to equity ratio and Operating Expense / Revenue are not major determinants of bank liquidity in Kenya. Based on the findings on average, commercial banks in Kenya will register liquidity of negative - 0.422 units if the independent variables were excluded in the estimation model. This implies there are other control variables that affect liquidity of banks which were not considered in the study.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The role of Banks remain central in financing economic activity and its effectiveness could exert positive impact on overall economy as a sound and profitable Banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Rajan, 2011). According to Diamond and Rajan (2005) banks play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Crowe (2009) defines liquidity as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. Hence, liquidity risk arises from the fundamental role of banks in the maturity transformation of short -term deposits into long-term loans (Rajan, 2011). Therefore, Strahan (2013) indicates that banks have to hold optimal level of liquidity that can maximize their profit and enable them to meet their obligation.

Over the past years, the subject of bank liquidity creation has become more and more in focus of research in financial intermediation. The widely accepted view today is that banks create liquidity on both the asset and liability side of their balance sheets by transforming maturities of balance sheet items. This process allows banks to hold liquid monetary items for the non-bank public and give out liquid monetary items to both depositors and borrowers. Strahan (2013) in addition says that the idea of bank liquidity is therefore an extension of the classic maturity transformation, as the bank creates liquidity on both sides of the balance sheet by offering access to long-term loans and contemporaneous access to short -term deposits. According to Wilson, (2009) one of the key reasons why banks are fragile, is their role in transforming maturity and providing insurance as regards depositors potential liquidity needs. Almost no/little effort has to date been devoted to an analysis of one of the key ingredients that make banks safer institutions: their own holdings of liquid assets.

1.1.1 Short Term Interest Rates

Goodhart (2008) defines interest as the price paid by the borrower for the use of funds saved by the lender and the compensation to the lender for deferring expenditures. According to Goodhart (2008) this compensation comprises two elements, namely a payment equal to the loss of

purchasing power of the principal during the term of the loan and a balance that represents the real interest accruing to the lender. However this simplicity does not extend into the area of rate determination since rates vary not only because of inflation, as implied above, but also because of a number of other influences, including: the amount, purpose and period of the transaction; the credit-worthiness of the borrower; the collateral offered and/or other guarantees/guarantors available; the competition for the transaction; government policy. Interest rates are shown as short-term, generally 3 months, and long-term, generally 10 years, with forecast data available for both. For short and long term interest rates, annual and quarterly data are normally averages of monthly figures (Akhtar, 2007).

According to International Financial Statistics Yearbook (2000), short-term interest rates are the rates at which short-term borrowings are affected between financial institutions, or the rate at which short-term government paper is issued or traded in the market. These rates are sometimes referred to as money market rates and Treasury bill rates (Homer, 2006). Similar views are shared by Harvey (2012) who defines short term interest rates as interest rates on loan contracts or debt instruments such as Treasury bills, bank certificates of deposit or commercial paper that have maturities of less than one year.

Tirole (2010) states that short term interest rates are a vital tool of monetary policy, and are measured using variables like investment, inflation and unemployment. The author further adds that the central banks of countries generally tend to reduce interest rates when they wish to increase investment and consumption in the country's economy. However, Svensson (2007) warns that a low interest rate as a macro-economic policy, over a prolonged period of time, can be risky and may lead to the creation of an 'economic bubble' in which large amounts of investments are poured into the real-estate market and stock market. In developed economies, interest-rate adjustments are thus made to keep inflation within a target range for the health of economic activities or cap the interest rate concurrently with economic growth to safeguard economic momentum (Braun and Larrain, 2005; Holmstrom and Tirole, 2011).

1.1.2 Banks Liquidity

Liquidity is the term used to describe how easy it is to convert assets to cash (Jenkinson, 2008). According to Stein (2012) the most liquid asset, and what everything else is compared to, is cash. This is because it can always be used easily and immediately. Liquid assets are important

to have in times of crisis or emergency because they are so easily converted into cash. Without liquidity, money can become tied up in systems that are difficult to cash out of and even more difficult to assess for actual cash value (Kimari, 2013). During times of emergency, large commercial banks shut down, making it difficult for people to access the cash they need to buy essentials like food, gasoline and other emergency supplies (Chaplin, Emblow & Michael, 2000). Liquidity is also used to determine the financial health of a business or personal investment portfolio. Three liquidity ratios are used for this purpose, including the current ratio, the quick ratio and the capital ratio. According to Maaka (2013) liquidity not only helps ensure that a person or business always has a reliable supply of cash close at hand, but it is a powerful tool when it comes to determining the financial health of future investments as well.

Guglielmo (2008) posits that when analyzing the financial health of a firm there is four different groups of ratios that the analyst will consider. The groups are liquidity ratios, financial leverage ratios, efficiency ratios, and profitability ratios. The most used liquidity ratios are: ratios concerning receivables, inventory, working capital, current ratio, and acid test ratio (Hayden, 2006). Other ratios related to the liquidity of a firm deal with the liquidity of its receivables and inventory. The ratios indicating the liquidity of a firm's receivables are days' sales in receivables, accounts receivable turnover, and account receivable turnover in days (Chaplin et al., 2000).

1.1.3 Short Term Interest Rates and Banks Liquidity

Interest rate is the price that has to be paid by a borrower of money to a lender of money in return for the use of the funds. Short term/money market interest rate is the rate paid on money market instruments (Svensson, 2007). According to Jenkinson (2008) money market instruments are securities that when issued have a year or less to maturity, which includes Treasury bills, commercial papers, bankers acceptances, certificates of deposit, repurchase agreements and Eurocurrency deposits. Treasury bills are the most important since they provide the basis for all other domestic short term interest rates. The money market is important because many of these instruments are held by banks as part of their eligible reserves, that is, they may be used (are eligible) as collateral if bank wishes to raise funds from central bank because they are short maturing and have less default risk (Stein, 2012). Therefore, the

higher short term interest rate induces banks to invest more in the short term instruments and enhance their liquidity position (Pilbeam 2005). According to the NBE investments in the Treasury bill are considered as liquid assets to the banks.

Short term interest rates and banks liquidity are closely intertwined and, to a large extent, directly related. This relationship between the two variables (i.e., short term interest rates and banks liquidity) implies that an increase in one variable is likely to have a similar effect on the other variable, and vice versa. For instance, according to Kimari (2013) an increase in the supply of a banks 's liquidity, or an open-market sale of bonds (in the case of government), is likely to increase the interest rate in general, at least in the short term, and vice versa, while holding other market forces of demand and supply constant. Conversely, an increase in the inflation rate is likely to reduce the real interest rate of a banks (Krishnamurthy and Vissing-Jorgensen, 2013). The Theory of Banks Finance by Tirole (2006) also suggests that there is a relationship between short term interest rates and banks liquidity. According to this theory, an increase in the banks 's liquid (money) supply is usually expected to increase short-term interest rates, a phenomenon he calls the liquidity effect.

1.1.4. Commercial Banks in Kenya

In Kenya, there are 44 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

Government deficit affects banks liquidity of the firm in that an expected increase in government deficit signals a decline in gross domestic product, which may lead to decrease in banks liquidity of the firm due to the income effect (Panico, 2008). Similarly, an increase in the level of inflation is likely to affect a banks's liquidity negatively. Interest rates affect a financial institution's banks liquidity, both in the short and long terms. For instance, when the management of the firm expects the interest rates to go high or increase in the near future, then such a management might decide to hold less cash and opt to do more investment in order take advantage of the expected higher returns. If the firm incurs a deficit, this may signal a change in

interest rates in the future; and when the interest rates are very high, the borrowers are likely to default as a result of an increase in the cost of borrowing (Brunnermeier, 2009).

Globally, a study by Michael (2010) discovered that high levels of banks liquidity make it easy for a financial institution to diversify its portfolios and invest in profitable ventures as a way of mitigating its risks of financial losses and monitoring its interest rates. Another study by Winton (2010) found out that maintaining high levels of banks liquidity enables the firm to meet its short term and long-term obligation as they fall due. 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. Pasiouras (2015) concluded that Banks must change how to balance their liquidity risk and their role as liquidity providers, restructuring liquidity management. 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 commercial banks 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. According to Maaka (2013) there is a positive correlation between proper short term interest monitoring or management and a firm's performance. Ngugi (2012) findings established that information sharing, especially on changes in interest rates or loan facilities by financial institutions, has a desirable effect on the general institutional performance, since it helps to boost customer confidence and trust, hence increasing a firm's client share. Muasya (2013) concluded that there is a significant negative relationship between poor short term interest rate management practices and the financial institutions' performance in Kenya.

The gap with the above studies is that none of them has tried to research on the relationship between short term interest rates and commercial banks liquidity in Kenya. Thus, there is need to examine on the effect of short term interest rates on banks liquidity, and hence answer the research question: What is the effect of short term interest rates on banks liquidity in commercial banks in Kenya?

1.3 Objective of the Study

To examine the effects of short term interest rates on liquidity of commercial banks in Kenya.

1.4 Value of the Study

The findings of this study will be resourceful to commercial banks since they will understand the effect of short term interest rates and its effect on liquidity of the firm. From these findings commercial banks can determine the proper match between assets and liabilities to maintain proper levels of liquidity. This study could be used as an initiation for those who are interested to conduct a detailed and comprehensive study in relation to short term interest rates and liquidity of the firm or other related topics.

The findings will also assist various law and policy makers especially those charged with the responsibility of planning, monitoring and controlling the banks liquidity ratio in developing and ensuring proper implementation of a policy framework that will help in promoting good lending and saving practices in the service-based financial industry. This is crucial in growing SMEs and upcoming entrepreneurs, especially in our country (Kenya) where there has been a negative culture on credit borrowing from banks by the general public due to perceived high interest rates charges by these institutions. This will also help such institutions to grow their capital base in the long term and, ultimately growing the national economy.

Lastly, findings from this study will be of importance to future scholars, academicians and financial theorists who may want to use conclusions and recommendations of this study as the basis for further research on the same topic or other related topics. This is key in adding to the already existing literature on the subject, as well as in bringing forth new insights and ideas that have not been there before. This is crucial in growing the corpus of knowledge, both now and in the future.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers the theoretical framework of the study, the determinants of short term interest rates and banks liquidity, empirical studies and a summary of the literature review.

2.2 Theoretical Framework

This section presents theories that that will be applied in this study. The independent variable is: measures of short term interest rates while dependent variable is commercial banks liquidity. The first theory is underpinned on the dependent variable (commercial bank liquidity) whereas the last two theories touch on the first variable (short term interest rates). The theories include: Liquidity Preference Theory, The Real Theory (Model) of Interest Rate and Fisher's Theory of Interest.

2.2.1 Liquidity Preference Theory

Liquidity Preference Theory, also known as Liquidity Preference Hypothesis, was first expressed by John Maynard Keynes, and it is contained in 'The Collected Writings of John Maynard Keynes' (1989). This theory is based on the idea that investors demand a premium for securities with longer maturities, which entail greater risk, because they would prefer to hold cash, which entails less risk; hence, the more liquid an investment is, the easier it is to sell quickly for its full value (Wessels, 2000). The theory further holds that since interest rates are more volatile in the short term, the premium on short-term versus medium-term securities will be greater than the premium on medium-term versus long-term securities (Blinder, 2012). According to Keynes, people value money for both the transaction of current business and its use as a store of wealth. Thus, they will sacrifice the ability to earn interest on money that they want to spend in the present, and that they want to have it on hand as a precaution; on the other hand, when interest rates increase, they become willing to hold less money for these purposes in order to secure a profit (McConnell and Brue, 2005).

According to Keynes (1989), the rate of interest is determined by the demand for, and supply of, money; and demand for money (or liquidity preference) means the desire of the public to hold liquid cash for the following three motives: The transactions motive, which relates to the demand for money or the need of cash for the current transactions of individual and business exchanges;

The precautionary motive, which refers to the desire to hold cash balances for unforeseen contingencies (such as illness, accident and unemployment); and The speculative motive, which relates to the desire to hold one's resources in liquid form to take advantage of future changes in the rate of interest or bond prices. The higher the rate of interest, the lower the speculative demand for money, while the lower the rate of interest, the higher the speculative demand for money (Bolton *et al.*, 2011). According to this theory, a firm needs to hold more cash for investment; hence, the rate at which a financial institution charges interest on loans borrowed, especially in the short term, is key in promoting the investment agenda for such a firm; hence the relevance of this theory to the current study.

2.2.2 The Real Theory of Interest Rate

This theory which is attributed to the economic writings of Harris (1985) came about as a way of countering the Classical Economic Theory, which had dominated economic thought of the time. According to the Classical Economic Theory, saving and investment out of a full employment level of income are regarded as functions of the interest rate alone, and interest is the primary force of an economic system (Zagst, 2002). However, in the Real Theory of Interest Rate, investment and savings are the real forces or determinants (and not just functions as in the case of Classical Economic Theory) of interest rate (Steele, 2001). According to Schmid (2002), the Real Theory of Interest Rate is framed in terms of the market for loanable funds, and the forces of demand and supply of new bonds are functions of planned savings and planned investment alone. Since the interest rate of bonds is inversely related to their price, the forces determining are analyzed in the bond market.

The Real Theory of Interest Rate has two specific features (Harris, 1985). These are: the supply of bonds being related to the firm's desire to invest, where the supply of bonds is equal to the planned level of investment; as the demand for such bonds is being attributed to the consumer's desire to save, planned demand for bonds is thus equal to planned savings; and the second feature of this model is concerned with the demand for, and supply of, new bonds rather than the existing stock of bonds; implying that we are dealing with flow of investment and savings concept. From these two features, we can therefore deduce that demand and supply function, and the equilibrium interest rate, can be determined by their equality (Cairns, 2004). This theory is important to this study since it underscores the fact that equilibrium interest rate is determined

solely by equality of planned savings and planned investment which, together, make banks liquidity.

2.2.3 Fisher's Theory of Interest

Fisher's Theory of Interest (or 'The Fisher Effect') is an economic theory proposed by economist Irving Fisher that describes the relationship between inflation and both real and nominal interest rates. Irving Fisher (1867-1947) was born in Saugerties, New York, in 1867.Fisher made important contributions in the fields of statistics, econometrics and index number theory; a significant amount of his work contributed to the development of modern monetary theories, including the quantity-theory-of-money equation and the theory regarding interest rates and inflation (Barro, 2007; Fisher, 1930/1977).

Fisher's Theory of Interest states that an increase in the growth rate of the money supply will result in an increase in inflation and an increase in the nominal interest rate, which will match the increase in the inflation rate. Hence, according to this theory, the real interest rate equals the nominal interest rate minus the expected inflation rate. Therefore, real interest rates fall as inflation increases, unless nominal rates increase at the same rate as inflation. Inflation is a rise in the general price level of an economy (Brigo and Mercurio, 2001). The real interest rate is the rate of interest adjusted for inflation, while the nominal interest rate is the rate of interest that is not adjusted for inflation (it's basically the rate reported on loan statements and investment statements). You can determine the nominal interest rate by taking the real interest rate and adding the inflation rate to it, and you can calculate the real interest rate by subtracting the inflation rate from the nominal interest rate (Cairns, 2004).

This theory is important to the current study since it helps to explain why we should not see inflation affecting the real interest rate in the long-run. Thus, in order for real interest rates not to be effected by inflation, the nominal interest rate must mimic the changes in the inflation rate (James and Webber, 2000). For instance, if inflation increases by 2%, nominal interest rates must increase by 2%. This keeps the real interest rate unchanged because the increase in the nominal rate and the increase in the inflation rate cancel out any effect on the real interest rate.

2.3 Determinants of Banks Liquidity

Over the past years, the subject of bank liquidity creation has become more and more in focus of research in financial intermediation. The widely accepted view today is that banks create liquidity on both the asset and liability side of their balance sheets by transforming maturities of balance sheet items (Akhtar, 2007). This process allows banks to hold illiquid monetary items for the non-bank public and give out liquid monetary items to both depositors and borrowers. The idea of bank liquidity is therefore an extension of the classic maturity transformation, as the bank creates liquidity on both sides of the balance sheet by offering access to long-term loans and contemporaneous access to short -term deposits (Homer, 2006).

2.3.1 Short term interest rate and bank liquidity

According to Berríos, (2013) short term interest rate or Money market interest rates include the Treasury bill rate. As short term interest rate increases and since it has less default risk, banks tend to invest more in Treasury bill and other short term instruments and enhance their liquidity position. Treasury bill is considered as liquid asset according to the NBE. A Treasury Bill (TB) is a short- term money market instrument which is issued by the government. The TB rate is the discount at which the Treasury bill is issued (Michael, 2010). The TB rate is not stated on the bill itself, but like interest rates on bonds, has an inverse relationship to its price. TBs serve as a benchmark indicator of money market conditions and act as a reference rate for the calculation of interest rates on many other money market asset s (Clementi, 2011). Treasury bill market is the only regular primary market where securities are transacted on a fortnightly basis. Therefore, the proxy for short term/money market interest rate in this study will be the weighted average yield on all types of Treasury bills annually (28 days, 91 days and 182 days). The annual rate will be used due to the form of data used in this study (i.e. annual base).

Rajan (2011) says that interest rate is the price that has to be paid by a borrower of money to a lender of money in return for the use of the funds. Short term/money market interest rate is the rate paid on money market instruments. Money market instruments are securities that when issued have a year or less to maturity, which includes Treasury bills, commercial papers, bankers acceptances, certificates of deposit, repurchase agreements and Eurocurrency

deposits (Diamond and Rajan, 2005). Treasury bills are the most important since they provide the basis for all other domestic short term interest rates. The money market is important because many of these instruments are held by banks as part of their eligible reserves, that is, they may be used (are eligible) as collateral if bank wishes to raise funds from central bank because they are short maturing and have less default risk. Therefore, the higher short term interest rate induces banks to invest more in the short term instruments and enhance their liquidity position According to the Falconer. (2011) investments in the Treasury bill are considered as liquid assets to the banks.

2.3.2 Debt to Equity Ratio and bank liquidity

Debt to Equity Ratio which is to be measured using Total Liabilities / Total Assets is a debt ratio used to measure a company's financial leverage, calculated by dividing a company's total liabilities by its stockholders' equity (Strahan, 2013). The D/E ratio indicates how much debt a company is using to finance its assets relative to the amount of value represented in shareholders' equity.

As stated Wilson (2009) the debt to equity ratio is also defined as financial, liquidity ratio that compares a company's total debt to total equity. The debt to equity ratio shows the percentage of company financing that comes from creditors and investors. A higher debt to equity ratio indicates that more creditor financing (bank loans) is used than investor financing (shareholders). Given that the debt/equity ratio measures a company's debt relative to the total value of its stock, it is most often used to gauge the extent to which a company is taking on debts as a means of leveraging (attempting to increase its value by using borrowed money to fund various projects). As posited by Goodhart (2008) a high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. Aggressive leveraging practices are often associated with high levels of risk. This may result in volatile earnings as a result of the additional interest expense.

Guglielmo (2008) explains that if a lot of debt is used to finance increased operations (high debt to equity), the company could potentially generate more earnings than it would have without this outside financing. If this were to increase earnings by a greater amount than the debt cost (interest), then the shareholders benefit as more earnings are being spread among the same amount of shareholders. However, if the cost of this debt financing ends up outweighing the returns that the company generates on the debt through investment and business activities,

stakeholders' share values may take a hit. If the cost of debt becomes too much for the company to handle, it can even lead to bankruptcy, which would leave shareholders with nothing (Tirole, 2010).

Debt-to-equity ratio is the key financial ratio and is used as a standard for judging a company's financial standing. It is also a measure of a company's ability to repay its obligations. When examining the health of a company, it is critical to pay attention to the debt/equity ratio. If the ratio is increasing, the company is being financed by creditors rather than from its own financial sources which may be a dangerous trend (Svensson, 2007). Lenders and investors usually prefer low debt-to-equity ratios because their interests are better protected in the event of a business decline. Thus, companies with high debt-to-equity ratios may not be able to attract additional lending capital.

According to Jenkinson (2008) each industry has different debt to equity ratio benchmarks, as some industries tend to use more debt financing than others. According to Jenkinson a debt ratio of .5 means that there are half as many liabilities as there is equity. In other words, the assets of the company are funded 2-to-1 by investors to creditors. This means that investors own 66.6 cents of every dollar of company assets while creditors only own 33.3 cents on the dollar (Jenkinson, 2008).

A debt to equity ratio of 1 would mean that investors and creditors have an equal stake in the business assets. A lower debt to equity ratio usually implies a more financially stable business. Companies with a higher debt to equity ratio are considered more risky to creditors and investors than companies with a lower ratio. Unlike equity financing, debt must be repaid to the lender. Since debt financing also requires debt servicing or regular interest payments, debt can be a far more expensive form of financing than equity financing. Companies leveraging large amounts of debt might not be able to make the payments (Stein, 2012). According to Kimari (2013) creditors view a higher debt to equity ratio as risky because it shows that the investors haven't funded the operations as much as creditors have. In other words, investors don't have as much skin in the game as the creditors do. This could mean that investors don't want to fund the business operations because the company isn't performing well. Lack of performance might also be the reason why the company is seeking out extra debt financing.

2.3.3 Operating Expense Ratio and bank liquidity

Operating-Expense ratio is a measurement of financial efficiency and is determined based on information derived from a business or farm operation's financial statements specifically using the financials that determine gross farm income (Steele, 2011). Financial efficiency refers to how effectively a business or farm is able to generate income. Looking at the financial efficiency of a business or farm assists the owner(s) in determining how the various aspects of the business such as production, financing, marketing, etc. effects the gross income of the business. Deep and Schaefer (2014) argue that operating-Expense ratio is measured as a percentage, the lower the percentage the better the situation is for the business or farm. The Operating-Expense ratio shows the proportion of income that is being used to cover operating expenses not including the principal and interest of loans.

Operating expense ratio can be explained as a way of quantifying the cost of operating a piece of property compared to the income brought in by that property. The operating expense ratio (OER) is a helpful tool in carrying out the comparisons between the expenses of analogous properties. If a particular property piece features a high OER, an investor should take it as a warning signal and look into the matter for why is the OER high (Shortland, 2015). The investors using this ratio can further compare any type of expense including insurance, utilities, taxes and maintenance, to the gross income, and the sum of all expenses to the gross income.

According to Winton (2010) operating Expense Ratio is to be measured using Operating Expense / Revenue. A lower operating expense ratio indicates a greater profit for the investors. The lower the percentages the better position a farm or business is. A number less than 60% means the business or farm is on strong footing while anything higher than 80% means the farm or business is going to be more easily vulnerable to changes in markets. In simple words, the operating expense ratio reflects the percentage of a property's income which is being utilized to pay operational and maintenance expenses. Moreover, the operating expense ratio also represents individual operating expenses items in the form of a percentage of the effective gross income and is also helpful in identifying potential problems (Kashyap, 2012).

2.4 Empirical review

Studies on bank liquidity have been done both internationally and locally. Vossen (2010) in a study on Bank liquidity management noted that banks face two central issues concerning liquidity. Vossen (2010) used descriptive design and probabilistic sampling to select banks. Vossen (2010) found that 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. However the study did not investigate the causes of liquidity risk.

In another study, Berger and Bouwman (2009) utilizing TVAR (threshold vector auto-regression) Model showed that there is a switching rezime from low liquidity to excess liquidity in Indonesia in 2005. Excess liquidity has made monetary policy ineffective in restraining inflation. The study proved that monetary policy influences liquidity only on the small banks. Yet, there is no difference in liquidity creation by monetary policy during normal or crisis situation.

Saxegaard (2006) studied the pattern of excess liquidity in commercial banks in Sub-Sahara African countries using SVAR (structural vector auto-regression) Model. The result indicated that excess liquidity impairs monetary policy transmission so that monetary authority could not control money demand. A similar study by Fielding and Shortland (2005) revealed that liquidity absorption by monetary authority inclines to utilize monetary instrument tools such as central bank securities with high interest. This has made monetary policy transmission ineffective. The study concluded that in the long run, the implication of this policy is likely to increase the cost of monetary operation and therefore eventually make most commercial banks bankrupt.

Ericsson and Renault (2006) used three measures of liquidity, including the bid-ask spread and liquidity based estimates from a model extension of the limited dependent variable model and a unique data set of emerging market bonds spanning 16 countries and eight years, to demonstrate the importance of modeling liquidity as a component of yield spreads. From this study, it was found out that liquidity is highly significant in explaining cross-sectional variation in yield levels and changes across rated and unrated categories for both banks and sovereign issuers. Liquidity

risk also appeared to dominate credit risk in explaining cross-sectional variations in yield spreads for both banks and sovereign debt instruments across all of the emerging markets examined.

Locally, Kamau (2013) did a 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.

Kimari (2013) studied the effect of credit risk management on financial performance of Deposit Taking Savings and Credit Cooperative Societies in Kenya. The study used census method of sampling. Kimari (2013) found that Kenyan banks attempt to control liquidity risk factors by balancing cash inflows and outflows and some even hold liquidity cushions for strategic purposes. The study did not look into the determinants of bank liquidity. According to Kassim (2011) 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.

Ngugi (2001) studied factors determining interest rate spread in the Kenya's banking sector for pre-liberalization period and post-liberalization period. She found out that interest rate spread increases due to yet to be gained efficiency and high intermediation costs. Both implicit and explicit taxes widen the interest spread as they increase the intermediation costs hence affecting the bank liquidity (Ngugi, 2001).

Mwendwa (2012) did a study on relationship between profitability and liquidity of banks in Kenya. His study used secondary and primary data. Mwendwa opined that liquidity is of major importance to both the internal and external analysts' because of its close relationship with day to day operations of a business. A weak liquidity position poses a threat to the solvency as well as profitability of a firm and makes it unsafe and unsound.

However none of these studies have investigated how short-term interest rates affect the liquidity of banks especial commercial banks of Kenya.

2.5 Conceptual framework

The conceptual framework represents short-term interest rates and liquidity of commercial banks in Kenya. The three independent variables will be investigated to determine their relationship with liquidity of commercial banks in Kenya.

Figure 2.1 Conceptual frameworks on short-term interest rates and liquidity
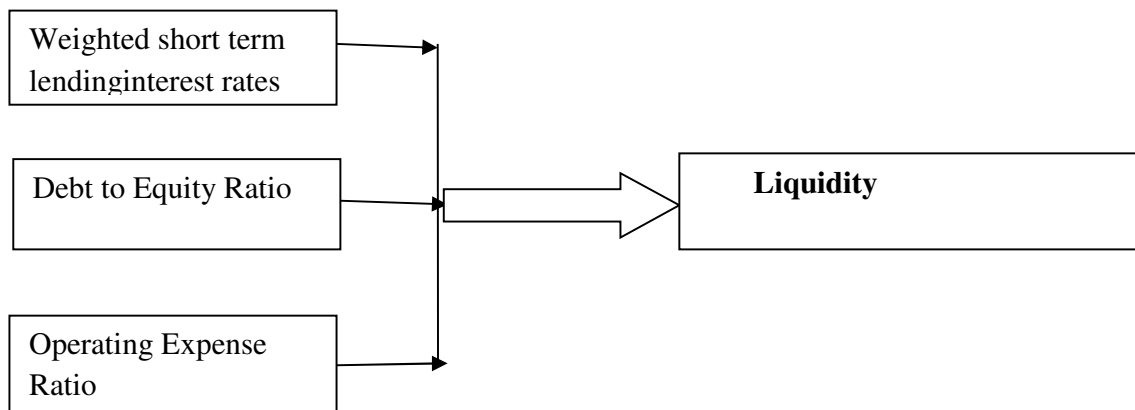
Independent Variables   **Dependent variable**

2.6 Summary of Literature Review

In line with the above theoretical as well as empirical review, liquidity is important to all business specially for banking industry since their function is creation of liquidity both on the asset and liability side of their balance sheet. It also revealed that banks liquidity can be affected by different factors such as bank specific, macroeconomic a nd regulatory factors. While this study focused on some of the bank specific factors affecting liquidity and the impact of bank liquidity on financial performance. Theory on bank liquidity is well documented unlike empirical studies. According to the review, most of the empirical studies done on the area of bank liquidity and its impact on financial performance were done following the U.S. subprime mortgage crisis. Although liquidity problems of some banks during global financial crisis re -emphasized the fact that liquidity is very important for functioning of financial markets and the banking sector, an important gap still exists in the empirical literature about liquidity and its Measurement. Only few studies aimed to identify determinants of

liquidity. Studies reviewed suggest that commercial banks" liquidity is determined both by bank specific factors (such as size of the bank, profitability, capital adequacy and factors describing risk position of the bank), macroeconomic factors (such as different types of interest rates and indicators of economic environment) as well as the central bank decisions.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents an overview of the research methodology in terms of research design, study population, data collection, data analysis, analytical model and the tests of significance.

3.2 Research Design

The current study employed the use of both descriptive survey and descriptive research designs. A descriptive survey is usually concerned with describing a population with respect to important variables with major emphasis being on establishing the relationship between the variables (Morgan, 2007). A descriptive survey is also concerned with determining the frequency with which something occurs or the relationship between variables (Kothari, 2008). Furthermore, it is also useful for clarifying variables and shaping hypothetical constructs (Kothari, 2008). The choice of this design is informed by the fact that the study involved an in-depth analysis of secondary data, which was obtained from secondary sources of the selected commercial banks – i.e., the financial reports, books of accounts and documents for a period of five consecutive years (i.e., between 2011-2015).

According to (Mugenda, 2009), descriptive design explains the relationship between two or more variables. Thus the research design establishes whether there is a relationship existing between interest rates and liquidity.

3.3 Population

The target population for this study was all the 44 listed commercial banks in Kenya as at December 2015 including the one that was put under receivership during that financial year.

3.4 Data Collection

The study employed the use of document analysis of secondary data. Secondary analysis involves the use of existing data, collected for the purposes of a prior study. The study used secondary data since the nature of the data collected was quantitative. Thus, the nature of the data collected was quantitative, and helped the researcher to draw conclusions and give policy recommendations on the effects of short term interest rates on banks' liquidity.

Secondary data on the short term interest rates data was collected from commercial banks through their quarterly reports and CBK and this was the individual weighted lending rates in proportion to the market share of the firms. The data on Debt to Equity ratio was collected from the firm's quarterly financial reports and emphasis put on total liabilities and total assets. The operating expense ratio was similarly collected from the firms quarterly financial reports of the firms specifically the operating expenses and the revenue. Secondary data on bank liquidity was collected from banks basically through quarterly reports on cash and cash equivalents balances and the value of the total assets.

The data to be collected covered the year 2011 to 2015.

3.5 Data Analysis

Secondary data (i.e., financial documents, reports and relevant library material) from CBK were reviewed for completeness and reliability in order to carry out statistical analysis. According to Mugenda (2003), data must be cleaned, coded and properly analyzed in order to obtain a meaningful report. The data to be collected was sorted and organized before capturing it in SPSS analysis tool.

3.2.1 Tests of Significance

The study used one way ANOVA to test the level of significant of the independent variables on the dependent variable at 95% level of significance, the one way ANOVA was used to test whether there exist any significant difference between the study variable. The hypotheses was tested at 0.05 level of significance ($\alpha = 0.05$). At 5% level of significance the null hypothesis was rejected for tests with probability estimates lower than 5% ($p \leq 0.05$) and concluded if was significant. Otherwise, it was accepted (when probability estimates were above 0.05) and concluded that there is no overall significance.

3.2.2 Multiple regression model

In addition, the study conducted a multiple regression analysis. Inferential statistics was analyzed using regression analysis to establish the relationship among study variables and to test the hypothesized relationships. Inferential statistics was carried out using multiple regression models as suggested by Mugenda (2003). The regression model was used to test the strength of the predictor variables. Once the strength of the predictors are determined, the variables that determined the model best were used in the step by step method to run the multiple regression to

determine the predictors that best predict the dependent variable as recommended by Gall *et al* (2003).

The multiple regression equation was: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

Where the measurement of the variables were as follows:

Y is the dependent variable which is banks liquidity. This was measured using cash and cash equivalents divided by the total assets held by the financial institutions,

β_0 is the regression constant,

β_1, β_2, β_3, and β_4 are the coefficients of independent variables,

X_1 = Short term interest rates = individual weighted short term lending interest rates of the commercial banks

X_2 = Debt to Equity Ratio = Total Liabilities / Total Assets

X_3 = Operating Expense Ratio measured = Operating Expense / Revenue

ε = Error term within a confidence interval of 5% was used.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the findings and discussion from data collected from commercial banks through their quarterly reports and CBK. This is in line with the objectives of this study. The objective of this study was establish the effects of short term interest rates on banks liquidity of commercial banks in Kenya, the study period was between 2011-2015. The data was analyzed using Statistical Package for Social Sciences computer software. Research findings were presented in tables as below;

4.2 Descriptive Statistics

Table 4.1: Descriptive statistics

	Median	Minimum	Maximum	Mean	Std deviation
Bank Liquidity	.47	.22	.440	.176760	.075512
Short Term Interest Rates	11.33	8.90	15.6	10.4160	1.42444
Debt To Equity Ratio	5.21	.37	14.6	5.28744	2.44947
Operating Expense / Revenue	23.11	18.43	53.1	5.38465	2.24488

Source: Research findings (2016)

Banks liquidity had a mean of 0.176760 with standard deviation of 0.075512. This illustrates that for one shilling of total asset invested by the 44 commercial banks generates a cash flow of Ksh 0.176760. Short term interest rates for the 44 commercial banks in Kenya had a mean of 10.4160 with standard deviation of 1.42444. Debt to equity ratio reported a mean of 5.28744 with standard deviation of 2.44947. This depicts that the ratio of debt to equity was 5 is to one

implying that the total debt of commercial banks was less than their equity. On average, the operating expenses of commercial banks in Kenya recorded a mean of 5.38465 with standard deviation of 2.24488 which indicates that the operating expenses of commercial banks in Kenya was higher than the revenue collected during the study period.

4.3 Inferential Statistics

4.3.1 Pearson Correlation Analysis

Correlation is a way to index the degree to which two or more variables are associated with or related to each other. The most widely used bi-variant correlation statistics is the Pearson product-movement coefficient, commonly called the Pearson correlation which was used in this study. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship).

Pearson correlation analysis was also conducted to show a linear relationship between the predictor variable and explanatory variables. It, thus, help in determining the strengths of association in the model, that is, which variable best explained the relationship between short term interest rates and banks liquidity of commercial banks in Kenya.

Table 4. 2: Correlations table

		Bank liquidity	Short term interest rates	Debt to Equity Ratio	Operating Expense / Revenue
Bank liquidity	Pearson Correlation	1	.302*	.288**	-.172**
	Sig. (2-tailed)		.001	.012	.004
Short term interest rates	Pearson Correlation	.302*	1	-.340**	-.312*
	Sig. (2-tailed)	.001		.003	.028
Debt to equity ratio	Pearson Correlation	.288**	-.340**	1	.389**
	Sig. (2-tailed)	.011	.003		.007
Operating Expense / Revenue	Pearson Correlation	-.172**	-.312*	.389**	1
	Sig. (2-tailed)	.004	.028	.007	

Source: Research findings (2016)

Based on the finding from the table above, the study found a weak positive correlation between banks liquidity of commercial banks and short term interest rates as shown by correlation factor of 0.302, this weak relationship was found to be statistically significant as the significant value was 0.001 which is less than 0.05, the study also found weak positive correlation between banks liquidity of commercial banks and debt to equity ratio as shown by correlation coefficient of 0.288, this too was also found to be significant at 0.011 level. The study also found negative correlation between banks liquidity of commercial banks and Operating Expense / Revenue as shown by correlation coefficient of -.172 at 0.004 level of confidence.

4.3.2 Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter

and compute the measurements of the multiple regressions. The model summary are presented in the table below;

4.3.2.1 Model Summary

Table 4.3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.718[a]	.515	.5134	.32344

Source: Research data, (2016)

R is the correlation coefficient which shows the relationship between the study variables, from the findings shown in the table above there was a strong positive relationship between the study variables as shown by 0.718. Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the above table the value of adjusted R squared was 0.5134 indications that there was only a variation of 51.34 percent on liquidity of commercial banks of Kenya are due to changes in Short term interest rates, Debt to equity ratio and Operating Expense / Revenue at 95 percent confidence interval. This shows that 51.34 percent changes in on liquidity of commercial banks of Kenya could be accounted to changes in Short term interest rates, Debt to equity ratio and Operating Expense / Revenue.

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4.3.2.3 ANOVAᵃ

Table 4.4: ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.78	3	2.26	6.91593	.002ᵇ
	Residual	625.2	40	15.63		
	Total	631.98	43			

Source: Research findings (2016)

F critical = 2.66

From the ANOVA statics, the study established the regression model had a significance level of .002 which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. On the F test the calculated value was greater than the critical value (6.91593>2.66) an indication that Short term interest rates, Debt to equity ratio and Operating Expense / Revenue all have a significant effects on level of liquidity of commercial banks in Kenya. The significance value was less than 0.05 indicating that the model was significant.

4.3.2.3 Coefficients

The following tables gives the coefficients which helps in establishing the regression line

Table 4.5: Table of Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.422	0.1388		-0.32891	0

Short term interest rates	0.0288	0.0041	0.02655	0.14236	0.015
Debt to Equity Ratio	0.0489	0.0097555	0.03968	0.19918	0.01
Operating Expense Ratio	-0.0405	0.005634	-0.0030176	-0.13904	0.001

Source: Research findings (2016)

The established regression equation was

$$Y = - 0.422 + 0.0288 X_1 + 0.0489 X_2 - 0.0405 X_3$$

From the regression model obtained above, on average, commercial banks in Kenya will register liquidity of negative - 0.422 units if the independent variables were excluded in the estimation model. In addition, a unit change in Short term interest rates cause an increase in commercial banks liquidity by a factor of 0.0288, a unit change in Debt to Equity Ratio cause an increase in commercial banks liquidity by a factor of 0.0489, also a unit change in Operating Expense Ratio cause a decrease in commercial banks liquidity by a factor of 0.0405. The analysis was undertaken at 5% significance level. The criteria for comparing whether the predictor variables were significant in the model was through comparing the obtained probability value and $\alpha = 0.05$. If the probability value was less than α, then the predictor variable was significant otherwise it wasn't. In this study, all the predictor variables were significant in the model as their probability values were less than $\alpha = 0.05$

4.4 Interpretation of the Findings

The purpose of this paper was to investigate how short term interest rates affect banks liquidity of commercial banks in Kenya. The study established that Short term interest rates for the 44 commercial banks in Kenya had a mean of 10.4160 with standard deviation of 1.42444.

From the findings in the value of adjusted R squared was 0.5134. This shows that only 51.34 percent changes on liquidity of commercial banks of Kenya could be accounted to changes in Short term interest rates, Debt to equity ratio and Operating Expense / Revenue.

The study found a weak positive correlation between liquidity of commercial banks and short term interest rates (correlation factor = 0.302). The findings further revealed that that Short term interest rates had a positive coefficient with banks liquidity (0.0288) implying that unit change in Short term interest rates cause an increase of 0.0288 in banks liquidity. Further the study established that the level of short-term interest affects bank risk-taking and the 'amount of credit risk in the system', Banks remain at the core of the financial system and credit risk is the most important risk banks face. When short-term interest rates are too low and there is excessive liquidity in the financial markets. The study also revealed that short-term interest rates affect risk-taking and credit risk. In particular, low interest rates encourage ex-ante risk-taking.

The research found a weak positive correlation between debt to equity ratio and banks liquidity (Pearson correlation coefficient = 0.288, significant value =0.012), the study also found a positive coefficient of variation between banks liquidity and debt to equity ratio this implies that a unit change in Debt to Equity Ratio would cause an increase in banks liquidity by 0.0489. The study also revealed that Debt-to-equity ratio is the key financial ratio and is used as a standard for judging a organizational liquidity standing. It is also a measure of a company's ability to repay its obligations. When examining the health of a financial institution, it is critical to pay attention to the debt/equity ratio.

Further the research revealed that higher debt to equity ratio is risky, higher debt to equity ratio shows that the investors haven't funded the operations as much as creditors have. In other words,

investors don't have as much share in the trade as the creditors do. This could mean that investors may have failed to fund the business operations because the organization poor performance.

The study also found a weak negative correlation between operating expense ratio and banks liquidity (correlation coefficient = -0.172, P value = 0.001), the coefficient value established was found to be negative implying that, a unit change in operating expense ratio led to a decrease in banks liquidity by a factor 0.0405. The study further reveled that very high operational expenses may have a long term effect on the earnings or capital of a firm and thus adversely affecting the liquidity position. A lower operating expense ratio indicates a greater profit for the investors

Based on the findings all the independent variables were statistically significant (P < 0.05) at 5% in causing the variation on the dependent variable. On average, commercial banks in Kenya will register liquidity of negative - 0.422 units if the independent variables were excluded in the estimation model. This implies there are other control variables that affect liquidity of banks which were not considered in the study.

The findings are in line with literature by Kamau (2009) that interest rate is the price that has to be paid by a borrower of money to a lender of money in return for the use of the funds. Short term/money market interest rate is the rate paid on money market instruments. Money market instruments are securities that when issued have a year or less to maturity, which includes Treasury bills, commercial papers, bankers" acceptances, certificates of deposit, repurchase agreements and Eurocurrency deposits. Treasury bills are the most important since they provide the basis for all other domestic short term interest rates. The money market is important because many of these instruments are held by banks as part of their eligible reserves, that is, they may be used (are eligible) as collateral if bank wishes to raise funds from central bank because they are

short maturing and have less default risk. Therefore, the higher short term interest rate induces banks to invest more in the short term instruments and enhance their liquidity position (Pilbeam 2005). According to the NBE investments in the Treasury bill are considered as liquid assets to the banks. Thus, companies with high debt-to-equity ratios may not be able to attract additional lending capital.

A lower debt to equity ratio usually implies a more financially stable business. According to Berger and Bouwman (2009) Banks with a higher debt to equity ratio are considered more risky to creditors and investors than companies with a lower ratio. Unlike equity financing, debt must be repaid to the lender. Since debt financing also requires debt servicing or regular interest payments, debt can be a far more expensive form of financing than equity financing. Companies leveraging large amounts of debt might not be able to make the payments. The findings supports the findings by Brunnermeier, (2009) Lack of performance might also be the reason why the company is seeking out extra debt financing. According to Harris, (1985) the operating expense ratio reflects the percentage of entity's income which is being utilized to pay operational and maintenance expenses. Besides, the operating expense ratio also represents individual operating expenses items in the form of a percentage of the effective gross income and is also helpful in identifying potential problems. The findings supports the theory by Schmid (2002), that operating expense ratio provides a dimension of insight into the bank's core profitability because it measures profit margins based on the total cost of the business, not just the gross margin per unit sold and that an operating expense ratio that is decreasing over time while other important metrics remain strong is an indicator of a company that is growing more efficient and successful.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study findings, conclusion and recommendations. The objective of this study is to establish the effects of short term interest rates on liquidity of commercial banks in Kenya. The study specifically investigated the effects of Short term interest rates, Debt to equity ratio and Operating Expense / Revenue on liquidity of commercial banks in Kenya. It was based on the following theories: Liquidity Preference Theory, The Real Theory (Model) of Interest Rate and Fisher's Theory of Interest.

5.2 Summary

Based on the descriptive statistics findings, Banks liquidity had a mean of 0.176760 with standard deviation of 0.075512. This illustrates that for one shilling of total asset invested by the 44 commercial banks generates a cash flow of Ksh 0.176760. Short term interest rates for the 44 commercial banks in Kenya had a mean of 10.4160 with standard deviation of 1.42444. Debt to equity ratio reported a mean of 5.28744 with standard deviation of 2.44947. This depicts that the ratio of debt to equity was 5 is to one implying that the total debt of commercial banks was less than their equity. On average, the operating expenses of commercial banks in Kenya recorded a mean of 5.38465 with standard deviation of 2.24488 which indicates that the operating expenses of commercial banks in Kenya was higher than the revenue collected during the study period.

On the correlation the study found a weak positive correlation between banks liquidity of commercial banks and short term interest rates as shown by correlation factor of 0.302, this weak relationship was found to be statistically significant as the significant value was 0.001 which is less than 0.05. This is consistent with the NBE report (2010), stating that „the dominancy of

commercial banks especially in the Treasury bills market continued to diminish owing to enhanced participation of non-bank institutions. At the end of 2009/10 the non-bank institutions held 62% of the total outstanding T-bills". Therefore, we fail to reject the hypothesis stating STIR has positive and significant impact on liquidity.

The study also found weak positive correlation between banks liquidity of commercial banks and debt to equity ratio as shown by correlation coefficient of 0.288, this too was also found to be significant at 0.011. The study also found negative correlation between banks liquidity of commercial banks and Operating Expense / Revenue as shown by correlation coefficient of -0.172 at 0.004 level of confidence.

Further the findings revealed that the value of adjusted R squared was 0.5134 indications that there was variation of 51.34 percent on liquidity of commercial banks of Kenya due to changes in the study independent variables (Short term interest rates, Debt to equity ratio and Operating Expense / Revenue) at 95 percent confidence interval. This shows that 51.34percent changes in on liquidity of commercial banks of Kenya could be accounted to changes in Short term interest rates, Debt to equity ratio and Operating Expense / Revenue.

From the findings on average, commercial banks in Kenya will register liquidity of negative -0.422 units if the independent variables were excluded in the estimation model. In this study, all the predictor variables were significant in the model as their probability values were less than $\alpha=0.05$.

5.3 Conclusions

Liquidity creation is the primary reason why commercial banks exist as it is stated in the literature part. The balanced correlation and regression analysis for two liquidity ratios and financial performance was conducted. Before performing regression the models were tested for

the classical linear regression model assumptions. All explanatory variables were proved to be statistically significant.

On the three major independent variables investigated, the study found a weak positive correlation between banks liquidity of commercial banks and short term interest rates. The study also found weak positive correlation between banks liquidity of commercial banks and debt to equity ratio. However, a negative correlation between banks liquidity of commercial banks and Operating Expense / Revenue was established. The study therefore concludes that short term interest rates, debt to equity ratio and Operating Expense / Revenue are not major determinants of bank liquidity in Kenya.

On average, commercial banks in Kenya will register liquidity of negative - 0.422 units if the independent variables were excluded in the estimation model. The study concludes that there are other control variables that affect liquidity of banks which were not considered in the study.

Further the findings revealed that the value of adjusted R squared was 0.5134 indications that there was variation of 51.34 percent on liquidity of commercial banks of Kenya due to changes in the study independent variables (Short term interest rates, Debt to equity ratio and Operating Expense / Revenue) at 95 percent confidence interval. This shows that only 51.34 percent changes in on liquidity of commercial banks of Kenya could be accounted to changes in Short term interest rates, Debt to equity ratio and Operating Expense / Revenue. The study concludes that short term interest rates, Debt to equity ratio in commercial banks should be increased in order to increase liquidity. The study also concludes that commercial banks should work towards decreasing operation expense ratio since it negatively affects liquidity. A lower operating expense ratio indicates a greater profit for the investors. The lower the percentages the better position a firm or business.

The study also concludes that the high interest rates charged by many commercial banks have attracted the attention of policy makers throughout the world. The commercial banks lending interest rates is a key indicator of the marginal cost of short-term and long-term external funding in an economy and provides useful information about developments in the average cost of borrowing.

5.4 Recommendations

Based on the findings of the research the following recommendations were given:

Since adjusting their liquidity position for managing credit risk has negative impact on financial performance, commercial banks in Kenya have to adopt other ways of managing credit risk. For instance, minimizing adverse selection during the time of credit approval and strict follow up of borrowers to minimize the problem of moral hazards after the provision of credit.

There has to be further research on the area of factors affecting banks liquidity in Kenya by incorporating regulatory factors and other bank specific and macroeconomic factors.

In addition to this the impact of banks liquidity on financial performance of banks has to be seen by grouping banks as highly liquid, liquid and less liquid. Gaining further insight into the liquidity made available to a market by banks is crucial. Liquidity is not only of importance for banks but also for the health and functioning of the real economy.

5.5 Study Limitations

The research encountered several limitations including that the secondary data used in this research was obtained from the sources and the researcher had no means of verifying for the validity of the data which were assumed to be accurate for the purpose of this study.

In addition the descriptive and correlation analysis relied on secondary data which had already been compiled by banks. The study results are therefore subject to the validity of the data used, the study used the ordinary least square regression method of analysis which may have its own weaknesses compared to other methods which may limit the general applicability of the study results.

5.6 Recommendations for Further Research

The study sought to determine the effect of short term interest rates on corporate liquidity of commercial banks in Kenya. Based on the findings on average, commercial banks in Kenya will register liquidity of negative - 0.422 units if the independent variables were excluded in the estimation model. This implies there are other control variables that affect liquidity of banks which were not considered in the study. The study therefore recommends that a similar research should be conducted this time involving other factors like, Capital adequacy (CAP), Bank size (SIZE), Loan growth (LG), Nonperforming loans (NPL, Real GDP growth (GDP), Inflation rate (INF) Interest rate margin (IRM) among others

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APPENDIX I: LISTOF COMMERCIAL BANKS as at 31st DEC 2015

S.No	NAME
1.	ABC Bank (Kenya)
2.	Bank of Africa
3.	Bank of Baroda
4.	Bank of India
5.	Barclays Bank Kenya
6.	CfC Stanbic Holdings
7.	Chase Bank Kenya
8.	Citibank
9.	Commercial Bank of Africa
10.	Consolidated Bank of Kenya
11.	Cooperative Bank of Kenya
12.	Credit Bank
13.	Development Bank of Kenya
14.	Diamond Trust Bank
15.	Dubai Bank Kenya Ltd
16.	Ecobank Kenya
17.	Equatorial Commercial Bank
18.	Equity Bank
19.	Family Bank
20.	Fidelity Commercial Bank Limited
21.	First Community Bank
22.	Giro Commercial Bank
23.	Guaranty Trust Bank Kenya
24.	Guardian Bank
25.	Gulf African Bank
26.	Habib Bank
27.	Habib Bank AG Zurich
28.	Housing Finance Company of Kenya
29.	I&M Bank
30.	Imperial Bank Kenya
31.	Jamii Bora Bank
32.	Kenya Commercial Bank
33.	K-Rep Bank
34.	Middle East Bank Kenya
35.	National Bank of Kenya
37.	NIC Bank

38.	Oriental Commercial Bank	
39.	Paramount Universal Bank	
40.	Prime Bank (Kenya)	
41.	Standard Chartered Kenya	
42.	Trans National Bank Kenya	
43.	United Bank for Africa	
44.	Victoria Commercial Bank	

Source: (CBK, 2016)