

**A SURVEY OF THE APPLICATION OF TERM STRUCTURE
OF INTEREST RATE BY COMMERCIAL BANKS IN KENYA**

BY

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D61/75457/2009

**A RESEARCH PROJECT PRESENTED IN FULFILLMENT OF
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION
(MBA).**

School Of Business, University Of Nairobi.

2012

DECLARATION

This management research project is my original work and has not been presented for award of a degree in any other university.

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ACKNOWLEDGEMENT

I would like to acknowledge and appreciate the assistance accorded to me by lecturers in the school of business Kisumu campus but more so Mr. Luther Otieno whose assistance and patience during the development of this document was above board.

My classmate and friends, Miss Linet Okioma, Miss Sophia Ogeisia, Miss Judith Maloba. To this group i remain indebted for encouragement and support throughout the course. I would also wish to appreciate the support of my friend for his tireless effort in helping me at every stage of the course.

Finally, I would wish to thank my family members Mrs. Imelda Chemonges, Mr. Michael Nawari, Mrs Collete Chemonges and Mr. Oliver Mamati. Their patience, financial assistance and playing a bigger part in coming up with the research topic.

God bless you all.

DEDICATION

I dedicate this project work to my family Mrs. Imelda Chemonges, Michael Nawari, Collete Chemonges and Oliver Mamati for the moral and financial support they gave me. May God bless them abundantly.

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ABBREVIATIONS

CBK	Central Bank of Kenya
IMF	International Monetary Fund
CAPM	Capital asset pricing model
T-BILLS	Treasury bills
SACCO	Savings and credit co-operative society

ABSTRACT

Interest rates charged by commercial banks in Kenya are highly unpredictable and volatile. These has elicited sharp reactions most of which is need to place ceiling on the maximum rate of interest that commercial banks will be allowed to charge. There are competing theories of interest rate that tries to explain the behavior or shape of interest curve. My objective was to identify which of the competing theories of structure interest rate mostly used by commercial banks in Kenya.

Primary data was collected using likert scale questionnaire and send though emails to respondents. The responses were then analyzed using mean and standard deviation.

According to the data analyzed, expectation theory had the least standard deviation thus portrayed consistency across the respondents as a widely used theory to determine the rate of interest by Kenyan commercial banks.

Kenyan parliament are continually focusing on setting the ceiling on the rate of interest rate on the basis that they are arbitrary figures arrived at by banks to attain maximum profit on their landings. My project proves the contra, that the rate of interest are arrived at on careful analysis of economic trends, business cycles and other forecast variables of term structure of interest rate. Thus the forecast should be on the commercial banks to best use the term structure of interest rate especially the expectation theory to forecast future rates thus reducing volatility and interest rate risk and advice their clients on the implication of this forecast on their repayment schedule.

CHAPTER ONE: INTRODUCTION.

1.0 Background to the Study

There were attempts for institutional reforms in the financial sector during the post liberalization period. During the same period, economy experienced volatile inflation being a signal of the conflicting policy by the regulatory body on its use of fiscal and monetary policies, this diminished policy credibility.

Financial institutions experience a wide range of financial risk; these risks include credit risks, which are risk that a borrower will default on any type of debt by failing to make payments, which it is obligated to do. The risk is that of a lender and includes loss of principal and interest, disruption of cash flows, and increased collection costs. I chose this topic as my research topic because I had a particular interest towards time series. It is really fascinating to be able to understand and forecast a time series ex ante and to predict future behavior. The term structure of interest rates was chosen since it is a determinant variable within Finance and Economics. The riskless rate of interest is a factor applied in all asset pricing models and a determinant factor in any fiscal and monetary policies

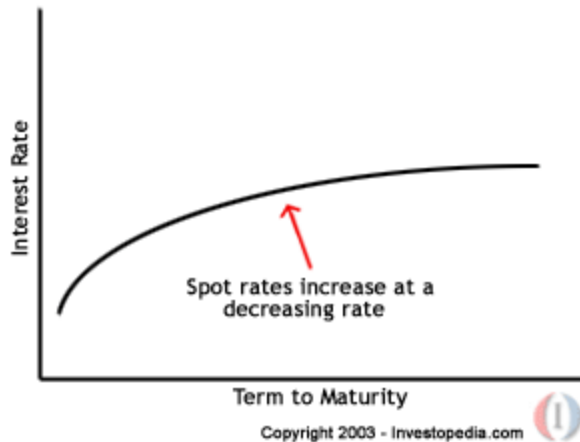
During the period of high inflation, financial institutions increase both deposits and the lending rates, and later post high interest income from loans. Interest rate is the annualized cost of credit or debit-capital computed as the percentage ratio of interest to the capital (business dictionary). Interest is also defined as charges levied by commercial banks on its lending's basing on 91-day

Treasury bill published by federal bank (central bank) plus a market risk premium (Brealey, 2003). Interest rate is a rate of return paid by a borrower of funds to a lender of them, or a price paid by a borrower for a service, the right to make use of funds for a specified period (Vinci, 2010). Interest rate varies depending on the borrowing or lending decision. Institutional constraints, market structures and policy actions explain substantial variations in interest rates spread. This is because of their impact on the transaction costs with risk and uncertainty in the market.

Kenya has experienced high and persistent interest rates fluctuation. Interest rates are the most important factor when determining the pricing of contingent claims, the cost of capital and managing financial risk. If we are able to determine the cost of capital ex ante; we can determine the most appropriate moment for lending or taking a loan. We could determine the best moment for obtaining the least expensive loan and the most appropriate moment for investing, best hedge strategy in order to minimize any possible risk.

1.1.1 Term Structure Theories

This study attempts to survey the term structure of interest rates, in order to explain differences on the interest rate charged by commercial banks in Kenya. The term structure of interest rate is the relationship between the term to maturity of a bond and its yield to maturity (Haugen, 2005). Interest rate structure is the relationship between the various rates of interest in an economy on financial instruments of different lengths (terms) or of different degrees of risk (Vinci, 2010). It is a yield curve displaying the relationship between spot rates of zero-coupon securities and their term to maturity



Graph 1: Term Structure of Interest Rates

The interest term structure yield curve is explained by the following theories. Liquidity preference theory predicts that investors are risk averse and prefer short-term securities (Gibson, 2001) Market segmentation theory asserts that interest rates for different maturities are determined independent of each other (Hull, 2005). Pure expectation theory holds that forward rate represents the average opinion of what the expected future spot rate for that period will be (Sharpe, 2008), while preferred habitat theory purports that investors can move between segments if there sufficient incentives exist (Sharpe, 2008).

1.1.2 Interest Rates

The interest rates charged by commercial banks on loans are exorbitantly high compared to the risk free rate charged by the Central bank of Kenya on its money; on the same interest rates on customer deposits are much lower. In the period November 1993 – December 1995, a tight monetary policy was adopted with increased reserve requirements and restrictions set on the use

of a discount window. As the Treasury bill rate increased, other short-term interest rates increased at an even faster rate, however the lending rate increased faster than the deposit rate.

These variations have led to proposal for monitoring and probable controls by the Central bank of Kenya, through monetary and fiscal policies. There is a continued debate before the parliament on a need to place ceilings on the interest rates charged by commercial banks in Kenya on its lending at a few percentages above the base rate to cushion borrowers. There are theories of the structure of interest rates which tries to explain the variations in interest rates. I will try to explain if the theories of the structure of interest rates influence the rate of interest rates in Kenya.

1.1.3 Commercial Banks.

An institution which accepts deposits, makes business loans, and offers related services. Commercial banks also allow for a variety of deposit accounts, such as checking, savings, and time deposit. These institutions are run to make a profit and owned by a group. While commercial banks offer services to individuals, they are primarily concerned with receiving deposits and lending to businesses.

1.2 Statement of the Problem

Interest risk management is not purely about managing the interest line in the profit and loss account. It also includes the management of the whole debt profile of the business, including maturity of the debt, the currency of the debt, and the fixed-floating mixture of the debt and expectations of future interest rates. It is a major cost of doing business in Kenya. Not surprisingly interest rates in Kenya have elicited continued debate with a continued champion for

the control of the lending rates. Through the Gazette Notice No. 4939 of 1989, provided the following maximum interest rates, though there were subsequent later reviews on the maximum rates until 17th April 1997, interest rates in Kenya had ceilings. The Donde act of 2001 provided that the maximum interest rate chargeable on all loans and advances from 1st January 2001 is “the 91-day Treasury-Bill rate published by the Central Bank of Kenya on the last Friday of each month, or the latest published 91-day Treasury Bill rate, plus 4 per centum”. Donde Act was repealed through *The Central Bank of Kenya (Amendment) Act 2004*, Act No. 8 of 2004, after a continued lobbying by IMF and the World Bank

There have been studies done on the structure of interest rates across the world, among these include; Telser (1966) analyzes the importance of empirical research on the term structure of interest rates when choosing between different theories with respect to the determinants of the term structure. Two interesting theories are analyzed: the expectations theory and the liquidity preference theory. In addition; modified versions of both theories are introduced in order to incorporate the effects of other variables that could affect expectations in addition to the forecast error. It is concluded that both theories have advantages and limitations. As a result; no consensus can be achieved when determining the most accurate theory for describing the term structure of interest rates.

Nelson (1972) concluded that the existence of term premiums appear from a more complex set of maturity preferences than those postulated by the liquidity preference theory. Cox, Ingersoll and Ross (1985) model consider anticipation of future events, risk preferences, investment alternatives and preferences about the timing of consumption as factors that explain the term structure of interest rates. Chan, Karolyi, Longstaff and Sanders (1992) models that allow the conditional volatility of interest rate changes best describe the interest rates dynamics.

The Kenyan interest rate charges has been at a center of debate for quite a while, the discussion majorly focused on liberalization and controls of interest rates in Kenyan commercial banks. Njuguna, (2000) and Phiri(2011) studied the factors affecting interest rate spread in Kenya. They tried to explain the main factors that determine the levels of interest rates in Kenyan commercial banks. Ngingi, (1998) studies financial sector reforms and interest rate liberalization.

Since there are competing theories that explain term structure of interest rates, there is need to establish the theory that explain the term structure of interest rate. Therefore, this study will seek to answer the question: Which of the competing theories of term structure interest rate do bank managers apply?

1.3 Objectives of this Study

The objective of this study is to determine which of the competing theories of interest rates are mostly used by commercial banks in Kenya on setting the rate of interest.

1.4 Value of the Study

Bank managers and credit officers when issuing new debt, there is need to decide about the availability of savings and the maturity of the debts. Banks need to manage the risk of paying short-term interest rates on deposits while receiving long-term interest rates on loans. Understanding on the best derivative pricing and hedging provide a major role of controlling and managing the risk involved with interest rate risk to maximize banks profits at leaser risk exposure. To compute these strategies, banks need to know how the price of these derivative securities depends on the state of the economy.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter examines the significant theories of interest rates, the factors influencing interest rates charged by commercial banks, pointing out common factors across the industry. Interest rate is a rate of return paid by a borrower of funds to a lender of them, or a price paid by a borrower for a service, the right to make use of funds for a specified period.

2.2 Term Structure of Interest Rates

The term structure of interest rate is the relationship between the term to maturity of a bond and its yield to maturity. Yield to maturity is the average rate of return of return you would earn on a bond investment if you held the bond from the current time until its maturity date and if there was no default on any of the promised payments. The term to maturity is the number of years until the last promised payments (Haugen, 2005).

Interest rates vary because of differences in the time period, the degree of risk, and the transactions costs associated with different financial instruments. The greater the risk of default associated with an asset, the higher must be the interest rate paid upon it as compensation for the risk. This explains why some borrowers pay higher rates of interest than others (Vinci, 2010). The relationship between the yields on comparable securities but different maturities is called the term structure of interest rates. The primary focus here is the Treasury market.

The degree of risk associated with a request for a loan may be determined based upon a company's size, profitability or past performance; or, it may be determined more formally by credit rating agencies. Borrowers with high credit ratings will find it easy to borrow directly from banks at a lower rate of interest. The graphic that depicts the relationship between the yields on Treasury securities with different maturities is known as the yield curve.

Term structures of interest rates is determined mainly by two different theories, which are the liquidity preference theory and the preferred habitat theory (Nelson, 1972); Gibson, Lhabitant and Talay (2001) agree that the term structure of interest rates is mainly explained by three theories which analyze the relationship between interest rates of various maturities and the value of the term premium. These theories include the expectation hypothesis, the liquidity preference theory and the preferred habitat theory. However; Cox, Ingersoll and Ross (1985) these include expectation hypothesis, liquidity preference theory, market segmentation theory and preferred habitat theory. These theories will be described below.

2.2.1 Keynes' Liquidity Preference Theory

The theory predicts that a term premium may be obtained by capital invested in long term bonds because bond holders will require compensation for exposure to capital fluctuations (Nelson, 1972). According to the liquidity preference theory, investors are risk averse, prefer short term maturities and will require a premium in order to commit in long term securities (Gibson, 2001).

Liquidity preference theory assumes that investors prefer to preserve their liquidity and invest funds for short periods. Borrowers on the other hand, usually prefer to borrow at fixed rates for long periods of time (Hull, 2005). In the absence of any incentive to do otherwise, investors

would tend to deposit their funds for short time periods and borrowers would tend to choose to borrow for long times. Financial intermediaries would then find themselves financing substantial amounts of long-term fixed rate loans with short-term deposits. This would involve excessive interest rate risk in order to match depositors with borrowers and avoid interest rate risk.

Financial intermediaries raise long-term interest rates relative to expected future short-term interest rates; this reduces the demand for long term fixed-rate borrowing and encourages investors to deposit their funds for long terms. The term premium is the increment given to investors in order to hold longer-term securities since those imply higher risk (Cox, 1985). Though long-term securities may be liquidated prior to maturity, their prices are more sensitive to interest rate movements. Short-term securities are usually considered to be more liquid because they are more likely to be converted to cash without a loss in value. Thus there is a liquidity premium for less liquid securities which changes over time.

2.2.2 Market Segmentation Theory

This conjectures that interest rates for different maturities are determined independently of one another, there is no relationship between short, medium and long-term interest rate (Hull, 2005). The short-term interest rate is determined by supply and demand in the short-term money market, the medium – term rate is determined by supply and demand in the medium- term money market and the long – term in rate is determined by supply and demand in the long – term money market.

According to market segmentation theory, investors and borrowers do not consider their short-term investments or borrowings as substitutes for long-term ones. This lack of substitutability

keeps interest rates of different maturities independent of one another. If investors or borrowers considered alternative maturities as substitutes, they may switch between maturities. However if investors switch between maturities in response to interest rate changes, interest rates for different maturities would no longer be independent of each other. An interest rate change for one maturity would affect demand and supply, and hence interest rates, for other maturities.

2.2.3 Pure Expectation Theory

This theory holds that the forward rate represents the average opinion of what the expected future spot rate for the period in question will be (Sharpe, 2008). According to this theory, longer-term rates are determined by investor expectations of future short-term rates. The pure expectations theory assumes that investors are indifferent between investing for a long period on the one hand and investing for a shorter period with a view to reinvesting the principal plus interest on the other hand (Vinci, 2010). For example an investor would have no preference between making a 12-month deposit and making a 6 - month deposit with a view to reinvesting the proceeds for a further six months so long as the expected interest receipts are the same. This is equivalent to saying that the pure expectations theory assumes that investors treat alternative maturities as perfect substitutes for one another.

The pure expectation theory assumes that investors are risk-neutral. A risk-neutral investor is not concerned about the possibility that interest rate expectations will prove to be incorrect, so long as potential favorable deviations from expectations are as likely as unfavourable ones. Risk is not regarded negatively (Vinci, 2010). However most investors are risk- averse i.e they prefer to forgo some investment return in order to achieve greater certainty about return and value of their

investments. Attitudes to risk may generate preferences for either short or long maturities. If such is the case, the term structure of interest rates (yield curve) would reflect risk premiums.

If an investment is close to maturity, there is little risk of capital loss arising from interest rate changes. Loan with a distant maturity (long duration) would suffer considerable capital loss in the event of a large rise in interest rates. The risk of such losses is known as capital risk (Leornado, 2010). To compensate for the risk that capital loss might be realized on long-term investment, investors may require a risk premium on such investments.

Some investors may prefer long maturity investments because they provide greater certainty of income flows. This uncertainty is income risk. If investors have a preference for predictability of interest receipts, they may require a higher rate of interest on short term interest rates. If money market participants expect short-term interest rate to rise, the yield curve would tend to be upward sloping. If the effect of capital risk were greater than the effect of income risk, the upward slope would be steeper. If market expectations were that short-term interest rates would fall in the future, the yield curve would tend to be downward sloping. A dominance of capital-risk aversion over income-risk aversion would render the downward slope less steep (or possibly turn a downward slope into an upward slope)

2.2.4 Preferred Habitat Theory

According to this theory, investors and borrowers have segments of the market in which they prefer to operate, similar to the market segmentation theory. However, they are willing to leave their desired maturity segments if there are significant differences in yields between various

segments. These yield differences are determined by the supply and demand for funds within the segments (Sharpe, 2008).

The preferred habitat theory allows for some substitutability between maturities. However the preferred habitat theory views that interest premiums are needed to entice investors from their preferred maturities to other maturities. According to preferred habitat, government can have a direct impact on the yield curve. Government borrow by selling bills and bonds, it will push up long-term interest rates (by pushing down long-term bond prices) and cause the yield curve to be more upward sloping (or less downward sloping). If the borrowing were at the short-term interest rates would be pushed up (Leornado,2010).

2.3 Theories on Interest Rates

There is interest rate at which banks are lending (the offer rate) and interest rate they are paying for deposits (the bid rate). The difference between them is called a spread. The spread between offer and bid rates provides a cover for administrative costs of the financial intermediaries and includes their profit. The spread is influenced by the degree of competition among financial institutions. In the short-term international money markets the spread is lower if there is considerable competition. Conversely, the spread between banks borrowing and lending rates to their retail customers is larger in general due to considerably larger degree of loan default risk. Thus the lending rate (offer or ask rate) always includes a risk premium. Risk premiums are addition to the interest rate demanded by a lender to take into account the risk that the borrower might default on the loan entirely or may not repay on time (default risk).Borrowers and lenders

think mostly in terms of real interest rates. There are two economic theories explaining the level of real interest rates in an economy:

2.3.1 Loanable Funds Theory

In an economy, there is a supply loanable fund (i.e., credit) in the capital market by households, business, and governments. The higher the level of interest rates, the more such entities are willing to supply loan funds; the lower the level of interest, the less they are willing to supply. These same entities demand loanable funds, demanding more when the level of interest rates is low and less when interest rates are higher. The extent to which people are willing to postpone consumption depends upon their time preference. Time preference describes the extent to which a person is willing to give up the satisfaction obtained from present consumption in return for increased consumption in the future.

The term ‘loanable funds’ simply refers to the sums of money offered for lending and demanded by consumers and investors during a given period. The interest rate in the model is determined by the interaction between potential borrowers and potential savers.

The loanable funds theory was formulated by the Swedish economist Knut Wicksell in the 1900s (Haugen, 2005). According to him, the level of interest rates is determined by the supply and demand of loanable funds available in an economy’s credit market (i.e., the sector of the capital markets for long-term debt instruments). This theory suggests that investment and savings in the economy determine the level of long-term interest rates. Short-term interest rates, however, are

determined by an economy's financial and monetary conditions. According to the loanable funds theory for the economy as a whole:

Given the importance of loanable funds and that the major suppliers of loanable funds are commercial banks; the key role of this financial intermediary in the determination of interest rates is vivid. The central bank is implementing specific monetary policy; therefore it influences the supply of loanable funds from commercial banks. As central bank increases (decreases) the supply of credit available from commercial banks, it decreases (increases) the level of interest rates.

2.3.2 Liquidity Preference Theory

Saving and investment of market participants under economic uncertainty is influenced by expectation and by exogenous shocks than by underlying real forces. A possible response of risk-averse savers is to vary the form in which they hold their financial wealth depending on their expectation about asset prices. Since they are concerned about the risk of loss in the value of assets, they are likely to vary the average liquidity of their portfolio.

Interest rates are determined based on the preferences of households to hold money balances rather than spending or investing those funds (Sharpe, 2008). Money balances can be held in the form of currency or checking accounts, however it does earn a very low interest rate or no interest at all. A key element in the theory is the motivation for individuals to hold money balance despite the loss of interest income. The quantity of money held by individuals depends on their level of income and, consequently, for an economy the demand for money is directly

related to an economy's income. There is a trade-off between holding money balance for purposes of maintaining liquidity and investing or lending funds in less liquid debt instruments in order to earn a competitive market interest rate. The difference in the interest rate that can be earned by investing in interest-bearing debt instruments and money balances represents an opportunity cost for maintaining liquidity. The lower the opportunity cost, the greater the demand for money balances; the higher the opportunity cost, the lower the demand for money balance. Liquidity preference is preference for holding financial wealth in the form of short-term, highly liquid assets rather than long-term illiquid assets, based principally on the fear that long-term assets will lose capital value over time.

According to the liquidity preference theory, the level of interest rates is determined by the supply and demand for money balances. The money supply is controlled by the policy tools available to the country's Central Bank.

2.4 Determinants of Interest Rates

Several factors determine the rate of interest charged by commercial banks in Kenya include;

2.4.1 Legal and Regulatory framework

The regulatory framework incorporates regulations by the monetary authority aimed at achieving financial stability. The major goal of financial liberalization is to achieve financial stability by creating a strong regulatory framework. Financial instability with unsound and improper supervised lending practices may results in high interest on loans and widening the spread because of information asymmetry problem. With adequate supervision an increase in interest

results in banks rationing out credit instead of taking on new borrowers (Ndung'u and Ngugi, 2000). Imposing various regulations to banks results in financial sector instability by diverting intermediation into informal, less regulated and less taxed part of the financial system.

The legal framework incorporates the adequacy of commercial law and the efficiency with which the judicial system makes and enforces legal decisions. Weaknesses in enforcement of financial contracts will create credit management problems so that the premium charged on credit increases. This is because banks face a credit risk associated with their inability to make agreements that restrict the inability of the borrowers to divert away funds from the intended purpose, disclose accurate information on borrowers or make legal contracts. A weak legal system without clearly spelt out property right hinder diversity of institutions thus denying them the opportunity to diversity risk. Efficient legal system and better contract enforcement are associated with lower realized interest rates (Demirguc-kunt and Huizinga, 1997).

2.4.2 Money Supply

The money supply is crucial determinant of the level of interest rates in the economy. The equilibrium interest rate is determined when the quantity of money demanded is equal to the quantity of money supplied (Haugen, 2005). The supply of money is determined by the Central bank of Kenya through monetary policies. According to the loanable funds theory, interest rate determination in financial market is as a result from factors that affect the supply and demand for loanable funds (Saunders and Cornett, 2008) the aggregate quantity of funds supplied is positively related to interest rates as long as competitive forces are allowed to operate freely in a financial system (Saunders and Cornett, 2008). Changes in underlying factors that determine the demand and supply of loanable funds can cause continuous shifts in the supply and/or demand

curve for loanable funds. Market forces will react to the resulting disequilibrium with a change in the equilibrium interest rate and quantity of funds traded in that market.

2.4.2.1 Open Market Operation

The Central bank of Kenya achieves market equilibrium on interest rate through open market operation, when the demand for money is less than the supply, and the rate of interest are high, there is surplus liquidity (Haugen, 2005), individuals will “attempt” to get rid of it by buying government bills in securities market, thus lowering real rate of interest. This will continue until interest rate has reached its equilibrium level. In the same sense, if the rate of interest were below its equilibrium level, the supply of money would be less than the demand. There will be shortage in liquidity; people would attempt to increase liquidity by selling T- bills in security market. This will drive the real rate of interest up to equilibrium level. I say “attempt” because only Central bank can really get rid of money in the economy.

2.4.2.2 Capital Requirements

Commercial banks in Kenya are required to hold a certain percentage of their assets as capital, a rate which may be established by the Central bank of Kenya or the banking supervisor. The Basel capital accords sets the threshold at 8% of risk – adjusted assets whereby certain assets such as government bonds are considered to have a lower risk and are either partially or fully excluded from total assets for the purposes of calculating capital adequacy, when at the threshold, a bank cannot extend another loan without acquiring further capital on its balance sheet.

2.4.3 Taxation

Reserve and liquidity requirements and mandatory investment and interest controls are categorized as implicit taxes. A reserve requirement with no interest payment tends to have a high opportunity cost as it squeezes the excess reserve available for banks to advance credit, reducing the scope of the banks' income-earning assets. Similarly, mandatory investment implies inefficient allocation of resources where banks continue giving funds to prioritized sectors despite a non-optimal rate of return, while interest rate controls limit the banks' effort to capture high-yielding investments.

Explicit taxes may provide a negative effective protection to the domestic financial system and encourage financial intermediation abroad, especially if there is tax discrimination. Discriminatory taxation reduces the flexibility of the system by significantly reducing the funds available for discretionary lending. Tax discrimination also leads to financial sector instability by driving intermediation into the informal, less regulated and less taxed part of the market. The presence of explicit and implicit taxes also discourages the development of an interbank market level; all financial transactions make short-term overnight borrowing uneconomical and increase the reliance on Central Bank discount facilities that provide inexpensive and unlimited loans to banks in need of funds. Restrictive discount facility results liquidity problems on banks thus resort to offering attractive deposit rates to attract more deposits. There is a positive relationship between high interest rate spread and high levels of taxation of the intermediation process (Demirguc-kunt, 1997)

2.4.4 Risk Factor

A risk is a variable, price or quantity that affects cash flow or return and can change unexpectedly for reasons beyond one's control (Stulz, 2003). The interest rates charged by commercial banks in Kenya encompass a risk factor. Risk includes financial and operational risks (Haugen, 2005). Financial risks are risks commercial bank interacts with on its business. These risks include credit risks, which are risk of defaults by borrowers on the loan amount on both interest and principle; liquidity risk is the inability to meet current cash obligations and market risks that include interest rate risk, foreign exchange and investment portfolio risk. Banks are exposed to risk because of uncertainty, information asymmetry and the policy environment. When banks hold deposits and loans with unmatched maturities they are exposed to interest rate risk as they adjust to the available assets and liabilities at the end of the period by engaging in money and secondary- market operations or roll over the deposits. A decline in market interest rate lowers the present value of the outstanding amount of loan even if the credit risk is low, especially when banks raise funds through short-term deposits to finance loans or purchase security with a longer maturity period, and thus leads to a significant increase in the volatility of market interest rate. This is because short- term interest rates are highly volatile and affected by nominal shocks.

Banks are exposed to risk in the credit market as they do not know in advance the proportion of loans that will perform. To cover this credit risk, banks charge a premium whose magnitude depends on the credit policy, the interest rate on alternative assets, amounts borrowed and types of clients. This increases the effective rate to borrowers and may reduce the demand for loans. If lending interest is high, investors find it costly to finance their loans, thus increases credit risk and the level of non-performing loans for banks, thus widening the spread.

According to Capital Asset Pricing model (CAPM), tries to construct efficient portfolio. The expected return over the risk free rate is called the risk premium. Risk premium is the reward commercial banks expect to receive for bearing the risk associated with lending to the public (Stulz, 2003). Over a period of 75 years the market risk premium ($r_m - r_f$) has averaged about 9 percent a year (Brealey and Meyers, 2003). In a competitive market, the expected risk premium varies in direct proportion to beta.

According to arbitrage pricing theory, assumes that returns depends partly on pervasive macroeconomic influences or “factors” and partly on “noise” – events that are unique to that market (Brealey and Meyers, 2003). Moreover, the returns are assumed to obey the following simple relationship:

Some commercial banks will be more sensitive to a particular factor than other banks. An efficient financial market exists when interest rates reflect all available public information about the economy, financial markets, and the specific customer involved (Van horne, 2002). The implication is that interest rates on loans adjust very rapidly to new information.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses on how data will be collected, processed, analyzed and interpreted to achieve the research objectives. Highlight research design, variables and population.

3.2 Research Design

The research uses a descriptive survey design. Descriptive survey is a method that is used to collect data from the population and help the researcher to get the descriptive existing phenomenon survey method is useful when there's need to collect data on a phenomenon whose data cannot be obtained through direct observation. The survey is necessary to establish whether managers rely on any of these theories in their understanding of term structure of interest rates.

3.3 Population of study

A population is a group of individuals, objects or items from which samples are taken for measurement (Combo and Tromp, 2006). The populations will comprise of all the 43 licenced (see appendix 1) commercial banks in Kenya. The choice of the bank managers or loans officer is because is because they are the one responsible for coming up with the interest rate after consultation and comparison. Given that some decisions on interest rates are made at the branch level, data could be collected from any of the branches except in cases where they do not make such decisions. The entities that the study will try to focus on effects of information shocks,

inflation, competitiveness of other banks products, past variables that predicts future events, banks liquidity, investments options available and future financial expectations.

3.4 Data Collection

The study will use structured likert scale questionnaires to collect primary data. The questionnaire will be administered on specific variables to the branch managers or credit officers to determine which theory they believe in, the questionnaire to be used will contain similar, closed ended question which will help to get specific answers (see appendix 2).

3.5 Data Analysis

Data will be analyzed using descriptive statistics from likert items to test for the significance of the relationship between theories of structure and interest rates.

Forecasting estimation will be done using tools such as: correlation coefficient measures the extent to which pairs of data are related, or change in the same manner, coefficient of determination, trends, cyclical variations, seasonal variations and random variations.

Banks liquidity, it will be important to establish what an adequate measure of liquidity is, in terms of: availability of funds to lend, liquid assets and liabilities, and liquidity trap.

Data will be subjected to confidence tests to gauge the degree of accuracy in the study. Furthermore, the economic and business climate would be assessed to evaluate the impact they exert on lending decisions. These assessments would, therefore, require measurement through metrics such as: Present Situation index, Confidence interval and business cycle indicators.

Investors are, normally interested in growth of their investments, as well as less risk. So metrics such as: interest income, efficient portfolio and net returns volatility of returns and time weighted rate of return would be a good indicators of whether there are, or would be any economic benefits to banks to lend.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Response Rate

The response rate was 13 out of 40 loan officers of commercial banks that were targeted for this study. This gives 32.5% response rate.

4.2 Demographic Data

Table 1: Distribution of the respondents by bank size

Commercial bank capital base	Frequency	Percentage
Tier 1	3	23.1
Tier 2	4	30.7
Tier 3	6	46.2
TOTAL	13	100

From the findings of the study, 3 out of 13 respondents were from large banks which represent 23.1% of the sample. The medium size banks respondents constituted 30.7% and small size banks respondents constituted 46.2%. From these findings, we can conclude all categories of banks were represented with a negligible difference. This represents a wide span of capital which is a factor that forms a variable that may influences interest rate.

4.3 Data Analysis

Table 2: showing pure expectation theory

	forecasting		Use trends & cyclical records		Indifferent between two maturities		Effects of deposit on interest	
	frequency	percentage	Freq.	%	Freq.	%	Freq.	%
Strongly agree	10	76.9	12	92.3	0	0	0	0
agree	2	15.4	1	7.7	0	0	0	0
neutral	1	7.7			1	7.7	2	15.4
disagree	0	0			4	30.7	6	46.1
Strongly disagree	0	0			8	61.6	5	38.5
total	13	100	13	100	13	100	13	100

	mean	std dev
forecasting	4.69	0.63
trends and cyclical records	4.92	0.28
indifference between maturities	1.54	0.67
effects of deposit on interest	1.77	0.72

76.9% of the respondents strongly agree that the forecasting of future interest rates are important whereas 15.4% agree with 7.7% being neutral, these constituted a standard deviation of 0.63 which means that there were no agreement on accuracy of forecast as there a wide range of variables which influence interest rates which cannot be accurately predicted. An overwhelming 92.3% of the respondents concur that using interest rate can be forecasted more accurately using business cycles, trends and seasonal variations, these posted a standard deviation of 0.28 which means that there was an overwhelming agreement that business use these technique more often to predict future rates.

Table 3: showing preferred habitat theory

	Conductive loan market		Competitors influence		Lucrative treasury bill		Effects of deposit on interest	
	frequency	%	Freq.	%	Freq.	%	Freq.	%
Strongly agree	5	38.5	10	77.0	5	38.5	5	38.5
agree	7	53.8	3	23.0	5	38.5	4	30.8
neutral	1	7.7			2	15.3	3	23.0
disagree	0	0			1	7.7	1	7.7
Strongly disagree	0	0			0	0	0	0
total	13	100	13	100	13	100	13	100

	mean	std dev
Conducive loan market	4.31	0.63
Competitors influence	4.76	0.44
Lucrative treasury bills	3.69	1.04
Effects of deposit on interest	3.62	1.08

38.5% of the respondents agreed that current loan market is lucrative for further lending as the rates of interest are high, 53.8% agree on the same but 7.7% were skeptical as the rates are likely to fall in the year future with the standard deviation of 0.63 which imply that a greater proportion of the respondents are skeptical if the current rates will be conducive for a while.77% of the respondents strongly agree that competitors influence interest while 23% of the respondents agree that competitors influence interest rate this constituted a standard deviation of 0.44 which imply that majority do not base their interest rate with competitors.38.5% of the respondents strongly agree that treasury bill rate offers an alternative investment when rates are low, another 38.5 agree,15.3% are neutral and 7.7% disagree, these constitutes an overwhelming 77% who agree and strongly agree that T-bills offer an alternative investments during periods of low loan interest rate.

Table 4: showing liquidity preference theory

	Mortgage returns		Liquidity limitation		savings		Mortgage is riskfull	
	frequency	%	Freq.	%	Freq.	%	Freq.	%
Strongly agree	0		0		3	23.1	0	0
agree	0		0		8	61.5	4	30.8
neutral	2	15.4	2	15.4	2	15.4	5	38.4
disagree	2	15.4	7	53.8	0		3	23.1
Strongly disagree	9	69.2	4	30.8	0		1	7.7
total	13	100	13	100	13	100	13	100

	mean	std dev
Mortgage return	2.23	1.11
Liquidity limitation	1.85	0.69
savings	3.46	0.91
Mortgage is riskfull	2.93	0.91

69.2% of the respondents strongly disagree that mortgage provides a sound investment; whereas 15.4% were either neutral or disagree these imply that banks do not prefer lending for a long term due to liquidity demands, on the same 30.8% strongly disagree that banks has liquidity limitation whereas 53.8% disagree. If savings increases 23.1% strongly agree that interest rate will reduce, 61.5% agreed whereas 15.4% were neutral thus mean that interest rate is pegged on supply and demand of funds

Table 5: showing market segmentation theory

	Conductive economy		Prefer short lending		Interest rate influence lending	
	frequency	%	Freq.	%	Freq.	%
Strongly agree	0		10	77.0	0	
agree	1	7.7	2	15.3	0	
neutral	2	15.4	1	7.7	2	15.4
disagree	6	46.2	0		3	23.1
Strongly disagree	4	30.7	0		8	61.5
total	13	100	13	100	13	100

	mean	std dev
Conductive economy	1.54	1.03
Prefer short lending	4.69	0.63
Interest rate influence lending	1.54	0.78

30.7% of the respondents strongly disagree that the current economy is conducive for lending whereas only 7.7% agreed, 77% of the respondents strongly agree that they prefer short term lending and 61% strongly disagree that interest rate influence their lending at any particular point in time.

4.4 Findings and Discussion

The most prevalent explanation of fluctuations in the yield curve is the expectation theory which posits that the slope of the yield curve reflects the market expectation of the future change in interest rates. Although the number of studies rejecting the theory is large, the results of these studies are not independent. Indeed, they examine almost identical periods of history, primarily the 1960s and 1970s, the period during which an active market in three-month and six-month Treasury bills existed. It is reassuring that these studies reach the same conclusion, but confirmation requires examination of truly independent data. (Mankiw & Miron, 1985). This theory has been found to work exceptionally and still work well in economic monetary regimes.

Expectation theory is essentially an expected arbitrage condition. It states that, up to a constant, the expected cost of rolling over one-period bills equals the expected cost of rolling over two-period bills. This calculation is exactly the sort that we would expect agents obtaining these time loans to make.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the study

From the study, there are various theories that try to explain the structure of interest rates such as liquidity, pure expectation, market segmentation and preferred habitat. Accurate forecast of interest rate has been a challenge through the use of different and often competing theories of interest rate, of the theories only pure expectation theory posted the least standard deviation from their respective variables thus believe by most loan officers as an accurate way of arriving on the rate of interest.

Other researchers on the same concluded that, in general, the volatility terms do not have predictive power, confirming that most of the information in the term structure for movements in interest rates is contained in the term spread, and that both long rates and short rates move in the direction consistent with the predictions of the expectation theory (Boero & Torricelli,1999). So, the German yield curve conforms to the expectation theory in its predictions of changes in the long rates as well as in the short rates. These results suggest that in Germany the spread can be used as an important indicator for the conduct of monetary policy.

5.2 Conclusions

This study surveyed the various theories of term structure of interest rate in Kenyan banks. The findings demonstrate that a number of commercial banks in Kenya come up with their rate of interest through analysis of past trends either seasonal, trends, events and business cycle with accurate forecast on bond yields to arrive at interest rates on its lending. As compared to liquidity which is easily controlled by the Central bank of Kenya through monetary policies, preferred

habitat and market segmentation theories which keeps on changing with business continuing strategic and competitive environmental realignment. Pure expectation showed consistency across the industry and time to be thus stood out as the most used theory on computing the rate of interest on loans by commercial banks. Investigating forecasts based on market data, the revealed predictions of business firms, and forecasts by professional economists, according to the pure expectations theory of the term structure, forward rates provide unbiased forecasts of future interest rates (Cook and Hahn,1989).

5.3 Recommendations

From the study, most of financial institutions determine their rate of interest basing on accurate forecast of the future using the past data and other forecasting variables through careful analysis of the business trends. It is therefore important that commercial banks should keep accurate data on business trends and cycles. The study recommends that all commercial banks in Kenya should use fully the techniques forecasting future interest rates so that to avoid interest rate risk and capital loss associated with volatility of interest rate in the future.

5.4 Limitations of the study

Most respondents took a lot of time filling the questionnaire as they were busy with their work assigned to them by respective employers. Some respondents also avoided some questions at first thinking that they represent competitive advantages of their financial institutions which they thought that the information may be a valuable tool to have a competitive edge. Data collections were via email and mails addressed to institutions were largely unanswered whereas those addressed to individuals required regular reminders and most of the banks were not locally available.

5.5 Suggestions for further studies

An analysis or survey on the relationship between the factors or variables that determine the each of the structure theories of interest rates could make good further study contributions. In addition, interest rates across the board follow similar trend thus study on the role of central bank of Kenya on follow up on the use of this structure of interest rate to in forecasting to avoid or manage volatility of interest rates. The study mainly focused on commercial banks, it may be worthwhile to the same on microfinance institutions, welfares and sacco determine whether the results presented here reflect the general situation on those institutions that also play a role in lending to their members.

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List of banks in Kenya

Licensed commercial banks

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank
6. CFC Stanbic Bank
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
16. Ecobank
17. Equatorial Commercial Bank
18. Equity Bank
19. Family Bank
20. Faulu deposit taking
21. Fidelity Commercial Bank Limited

22. Fina Bank
23. First Community Bank
24. Giro Commercial Bank
25. Guardian Bank
26. Gulf African Bank
27. Habib Bank
28. Habib Bank AG Zurich
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
36. NIC Bank
37. Oriental Commercial Bank
38. Paramount Universal Bank
39. Prime Bank (Kenya)
40. Standard Chartered Kenya
41. Trans National Bank Kenya
42. United Bank for Africa
43. Victoria Commercial Bank

Source: Central bank of Kenya

QUESTIONNAIRE

Dear Respondent,

I am a student at the University of Nairobi (Kisumu campus) pursuing a degree in Master of business administration and am conducting a survey on the application of the theories of interest rates in Kenyan Commercial Banks. The objective of this research is to try to find out the forces behind the interest rate spread in Kenyan financial market. Enclosed is a questionnaire that I am requesting you to complete, do not write your name nor that of the organization that you represent. Instructions for completing the questionnaire are found on the form.

Please be assured that all information you provide will be kept confidential. Your name or other identifying information will not appear on any study report – all results from the study will be reported as statistical summaries only.

Do not hesitate to call if you have any questions or concerns about the questionnaire. Your participation represents a valuable contribution to this research, and I thank you again for your participation.

Sincerely yours,

[Tom Horace]

Title: Survey on the application of structure theories of interest rates In Kenyan Commercial Banks.

Kindly mark only once on each of the question and send back through the above e - mail address.

	Survey statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Pure Expectation theory						
1	Forecasting of interest rate is important and you can make investment basing on its data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	It is important to keep accurate records on the components of a time series (Trend, Cyclical variation and Seasonal variations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	You are indifferent between lending for 12-months loan and 48-months loan if both of them will provide same rate of return..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The interest rate of your bank is likely to fall to less than the Central bank base rate if your source of cheap funds (deposits) doubles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Preferred habitat theory						
5	You are motivated by good financial return to invest in the current loan market.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Competitors can influence interest rates both on savings and loan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	When interest rates on loans are low you prefer to invest more on Treasury bills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Costs of offsetting of loans by other banks finances are reasonable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	I am motivated by high rate of interest to increase lending to unsecured category of customers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liquidity Preference theory						
10	Mortgage financing provide good financial return.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	The Bank has no liquidity limitation to lend.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12	The perceived low financial liquidity in the banks is due to low amounts of savings by individuals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Mortgage financing represent a very risky form of lending.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Market Segmentation theory						
14	The current economic environment is conducive for investing in the Kenyan loan market.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	You prefer to lend funds with a shorter recovery period.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Interest rates usually do influence your decision on lending.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>