DETERMINANTS OF LONG TERM INTEREST RATES IN KENYA

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DECLARATION

This is to declare that this research project is my original work that has not been presented to any other University or Institution of Higher Learning for examination.

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DECLARATION

This project has been presented for examination with my approval as the university;

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ACKNOWLEDGEMENT

The long and challenging journey that has led to the successful completion of this MBA program would not have been without the incredible support and encouragement of many people I interacted with.

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DEDICATION

This project is dedicated to my dear wife Monica Wangui and my two daughters Njeri and Gathoni who gave me moral support and encouragement during the entire research period. Special thanks to my mum and dad Mr. and Mrs. Gichaga for their prayers and encouragement.
ABSTRACT

Real long-term interest rates are key determinants of longer-term saving and investment decisions, while their influence on business spending, household investment and the consumption of durable goods plays a key role in the business cycle and transmission of macroeconomic policies. The study of long term interest has become a significant global issue after the global financial crisis of 2008. This study therefore was conducted with the objective to establish the determinants of long term interest rates in Kenya. The study sourced data from secondary sources. The data was obtained from CBK, NSE and World Bank website for which data from 2002 to 2012 was obtained. The data extracted included central government debt, inflation rates, external debts and the interest rates. Data analysis involved preparation of the collected data, coding, editing and cleaning of data in readiness for processing using SPSS and Microsoft office excel. In the analysis, multiple regression analysis was used to determine the relationship between long term interest rates and the determinants. The study has established that long term interest rate is influenced by the annual inflation rates, the external debt and the central government debt. The results in the study findings indicate that there is a direct positive relationship between the long term interest rates and the determinants (annual inflation rate, central government debt and the external debt). An increase in these determinants leads to an increase in the long term interest rates. This study highly recommends to the potential investors in companies to use the Altman failure prediction model as an assessment tool. The results could raise certain questions about the state of a company and could ultimately result in an investor investing or purchasing a company that is profitable and well managed company since declining Z-score values depicts a failing company. The study recommends that the government of Kenya should reduce on the foreign borrowing in order to reduce the long term interest rate in the country to encourage local investment that will see the country finance most of its activities through internal borrowing. The study also recommends that the government of Kenya should establish price regulation law to the prices of the basic commodities to curb the ever rising inflation rates in the country that results in rise in the interest rate which in turn discourages borrowing by the people.
# TABLE OF CONTENTS

DECLARATION .......................................................................................................................... ii  
ACKNOWLEDGEMENT ........................................................................................................ iii  
DEDICATION ............................................................................................................................. iv  
ABSTRACT ..................................................................................................................................... v  
LIST OF TABLES ......................................................................................................................... ix  
LIST OF FIGURES ...................................................................................................................... x  
ABBREVIATIONS ......................................................................................................................... xi  

## CHAPTER ONE: INTRODUCTION ....................................................................................1  
1.1 Background of the Study ..................................................................................................... 1  
  1.1.1 Long Term Interest Rates ............................................................................................. 2  
  1.1.2 Determinants of Interest Rates ................................................................................... 4  
  1.1.3 Interest Rates in Kenya ............................................................................................... 7  
1.2 Problem Statement ............................................................................................................... 8  
1.3 Research Objective ............................................................................................................. 10  
1.4 Value of the Study ............................................................................................................... 10  

## CHAPTER TWO: LITERATURE REVIEW ........................................................................12  
2.1 Introduction ......................................................................................................................... 12  
2.2 Theoretical Review ............................................................................................................. 12  
  2.2.1 The Expectation Theory ............................................................................................... 12  
  2.2.2 The Segmented Market Theory .................................................................................... 13  
  2.2.3 The Liquidity Premium Theory .................................................................................... 14  
  2.2.4 The Preferred Habitat Theory ..................................................................................... 15  
  2.2.5 Loanable Funds Theory ............................................................................................... 16  
2.3 Determinants of Long Term Interest Rates ....................................................................... 17
2.3.1 Macroeconomic Variables ................................................................. 18
2.3.2 Country-Specific and Global Variables ................................................. 19
2.3.3 Monetary Policy .................................................................................. 22
2.3.4 Fiscal Policy ........................................................................................ 24
2.3.5 Foreign Borrowing ............................................................................. 25
2.4 Empirical Review ................................................................................... 26
2.5 Conclusion of Literature Review ........................................................... 30

CHAPTER THREE: RESEARCH METHODOLOGY .................................. 31
3.1 Introduction ............................................................................................ 31
3.2 Research Design .................................................................................... 31
3.3 Population .............................................................................................. 31
3.4 Sample Design ....................................................................................... 32
3.5 Data Collection ....................................................................................... 32
3.6 Data Validity and Reliability .................................................................. 33
3.7 Data Analysis .......................................................................................... 33
3.8 Model Specification ............................................................................... 33

CHAPTER FOUR: FINDINGS AND PRESENTATION OF FINDINGS ........ 35
4.1 Introduction ............................................................................................ 35
4.2 Data Presentation ................................................................................... 35
  4.2.1 Interest rates in Kenya ................................................................. 35
  4.2.2 Fiscal policy (Central government debt) ....................................... 38
  4.2.3 Monetary policy (Average annual inflation rate) ....................... 39
  4.2.4 Foreign borrowing ......................................................................... 39
  4.2.5 Determinants of long term interest rates .................................. 40
4.3 Summary based on the findings ........................................................... 44
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS ..........47

5.1 Introduction .......................................................................................................................47
5.2 Summary ..........................................................................................................................47
5.3 Conclusion .......................................................................................................................48
5.4 Recommendations ..........................................................................................................49
   5.4.1 Recommendations for the policy makers .................................................................49
   5.4.2 Recommendations for future study .........................................................................50
5.5 Limitations of the study ...................................................................................................51

REFERENCES ..........................................................................................................................52

APPENDICES ..........................................................................................................................57
Appendix (I) Data Used in the analysis .................................................................................57
LIST OF TABLES

Table 4.1 Central government debt (in USD) .................................................................38
Table 4.2 External debt (USD) .........................................................................................39
Table 4.3 Descriptive statistics .......................................................................................40
Table 4.4 Correlation ........................................................................................................41
Table 4.5 Regression coefficient .....................................................................................42
Table 4.6 Significance of the regression (ANOVA) .........................................................43
Table 4.7 Model summary .................................................................................................43
LIST OF FIGURES

Figure 4.1 Lending Interest rate ................................................................. 35
Figure 4.2 Real interest rate ................................................................. 36
Figure 4.3 Interest rate spread (lending rate minus deposit rate) ................. 37
Figure 4.4 Average Annual interest rate (Long term interest rate) ................. 37
Figure 4.5 Average annual inflation rate ................................................. 39
ABBREVIATIONS

CBK    - Central Bank of Kenya
CCI    - Consumer Confidence Indicator
GDP    - Gross Domestic Product
NSE    - Nairobi Securities Exchange
SAP    - Structural Adjustment Programme
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Real long-term interest rates are key determinants of longer-term saving and investment decisions, while their influence on business spending, household investment and the consumption of durable goods plays a key role in the business cycle and transmission of macroeconomic policies (Gros, 2011). During the past four decades there have been some substantial shifts in world-wide levels of real interest rates. A major increase in real interest rates took place between the 1970s and 1980s. In the early 1990s there was a tendency for real interest rates to decline in most countries but this was followed by a sharp reversal in 1994 and, in a number of countries, a significant widening of real interest differentials vis-a-vis the major economies. From a policy perspective it is important to identify the sources of these trends and to assess the extent to which they may be driven by policy-related factors. In particular, concerns that real interest rates are "too high" due to potential policy related saving shortages need to be assessed.

The determinants of long-term nominal interest rates remain a debated issue, both theoretically and empirically. According to the widely accepted Fisher (1930) relationship, the long-term nominal interest rate is equal to the sum of the long-term real interest rate and inflation expectations. Any macroeconomic variable able to impact expected inflation, the real rate or both should thus affect long-term nominal interest rate. Economic theory effectively suggests that real interest rates are influenced by several macroeconomic factors - potential GDP, the rate of return on investment, households’
time preference and investors’ behavior towards risk (Orr, 1995; Evans and Marshall 2001; Laubach and Williams 2003). Fiscal policy is another potential factor influencing real interest rates, but the relationship between fiscal policy and interest rates remains a vigorously debated issue with no clear-cut conclusion to date. On the other hand, inflation expectations are mainly influenced by monetary policy, which depends itself on the various macroeconomic variables that enter the central bank’s reaction function. Consequently, it seems highly possible that macroeconomic factors have a key role to play in explaining long-term nominal interest rates.

### 1.1.1 Long Term Interest Rates

Interest can be defined as the price a borrower has to pay to enjoy the use of cash which he or she does not own, and the return a lender enjoys for deferring consumption or parting with liquidity (Sarno, 2005). Interest rates form one of the major measurements indicators. Interest rates determine the ease of access to credit by business, individuals as well as government. As a result, the internet rates also determine the type, number and volume of transactions that turn around in the economy.

The concept of interest embraces theories of time preference, marginal productivity, liquidity preference and loanable funds. The apparently diverse views of interest can be grouped into two broad classes: real and monetary. Real theories of interest are long-run theories in which interest is the return for real abstinence and the yield on real capital. Monetary theories, on the other hand, are short-run theories in which the monetary rate of interest is the cost of borrowing money and selling securities, and the yield on lending money and purchasing securities. Expressed differently, the real rate of interest is
determined by the supply of and demand for real savings, whereas the monetary rate of interest is determined by the demand for and supply of money (Linde, 2001). This definition implies that long-term interest rates are determined in the money market by market forces.

There are several reasons why internet rates are considered as indicators of monetary policy and future economic growth. First they have been used by Central Banks as one of the policy instruments. Second, macro-economic theory suggests it is through internet rates that monetary policy actions are transmitted to the economy, for example, when Central Bank increases the money supply, short term rates drop, which stimulate the activity in interest sensitive sectors. Third, studies of the determinants of output movements have found that when internet rates are considered, the monetary aggregate lose most of their explanatory power, suggesting that in terms rates contain important information about future output. (Sims, 1985).

Long-term interest rates are taken to refer to representative low-risk government bonds, generally public sector bonds with a maturity of about 10 years. Several advantages arise from the decision to focus on these rates, including their ready availability and relative comparability across countries and through time, and the low default risk on such securities. Nonetheless, such a focus introduces several possible distortions when comparing real interest rate trends both over time and across countries. First, the use of a single real long-term rate ignores differences between rates available to different agents, cross-country differences in the relative importance of maturity structures in financing, and different risk premia facing similar categories of borrowers. Second, no account is
taken of the different tax regimes across countries or over time (Codogno, 2003) Third, financial liberalization occurred at different times and speeds across countries, affecting the measurement of effective interest rates and possibly putting upward pressure on real rates through a negative impact on saving (Laubach, 2007).

According to Gerlach (2003), the line demarcating the money and capital markets is usually drawn on the basis of term to maturity of the securities traded, and is arbitrarily determined to be one year. Broadly speaking then, the capital market (or bond market) is defined as the market for the issuing and trading of long-term securities. Four main types of financial instrument are traded in the capital market, namely bonds (such as corporate bonds, debentures, government bonds and municipal bonds), variable interest securities, shares and negotiable instruments. The rates on these instruments therefore represent long-term interest rates.

Moore (1988) argues that nominal long-term rates are based on capital market participants’ expectations of future short-term rates, that is, of future central bank policy. Capital market participants base their decisions with regard to the amount of real saving and investment they wish to undertake at the real rates anticipated over the future life of the project. These savings and investment decisions interact to determine the rate of growth of aggregate income and output, and therefore affect various key macroeconomic indices such as unemployment, capacity utilization, and inflation and growth rates.

1.1.2 Determinants of Interest Rates
There are various determinants of long term interest rates. Monetary policy is one of the relevant potential determinants as long-term inflations expectations are an important part of nominal long-term interest rates. An extension of the expectations theory adds a risk
premium to the expected short-term rates, the Fisher effect (Fisher, 1907). Lucas (1978) extended this theory with a risk premium to compensate for uncertainty. The premium rewards the risk of unexpected inflation during the long period at which the bond is held. Lucas (1978) extended this theory with a risk premium to compensate for uncertainty. The premium rewards the risk of unexpected inflation during the long period at which the bond is held.

Fisher’s theory of interest assumes that the movements in nominal yields originate from changes in real interest rates and changes in the expected inflation (Ireland, 1996). Inflation is added to show the influence of a monetary shock on the dynamics of nominal variables.

Bond yields are determined by domestic developments as well as by international capital flows. The global integration of capital markets appears to play a role in the relation between long-term interest rates between countries (Orr et al., 1995). For example, the tightening of monetary policy in the United States or other large countries has a significant influence on the world interest rates. It can be argued that due to international integration of financial markets, the Norwegian long-term interest rates are influenced also by foreign macroeconomic conditions. For countries with a fixed exchange rate, pursuit of an independent monetary and fiscal policy is limited. Flexible exchange rate and independent macroeconomic policy, however, give room for domestic developments to influence long-term nominal interest rates.

Laubach and Williams (2003) investigated the information of domestic macroeconomic variables for the determination of nominal long-term interest rates in the G7. They conclude that inflation uncertainty (monetary policy) and the quality of debt (fiscal policy) are important in the development of the long-term interest rates. Evans and Marshall (2001) find that macroeconomic factors as industrial production, personal consumption expenditure, an index of sensitive materials prices and the Federal funds
rate have a substantial, persistent and statistically significant effect on the level of the interest rates with different maturities. Orr et al. (1995) also use macroeconomic variables to explain (real) long-term interest rates. Their results indicate that the rates are determined by the rate of return on business capital, portfolio risk, inflation uncertainty and indicators of future saving and investment balances, and monetary actions.

In summary, the nominal long-term rate of interest depends on the fiscal policy and government borrowing (Richardian equivalence), the money stock (liquidity effect), the domestic short-term interest rate (expectation hypothesis), inflationary expectations (the Fisher theory), the foreign short-term interest rates (according to the uncovered interest rate parity), the effects of macroeconomic developments fiscal and monetary in major trading partners (due to the integration of international financial markets), the real economic activity (strong real economy leads to a higher loan demand which increases the price of long-term loans), and the current account (Orr et al, 1995).

The relationship between interest rates and its determinants has been theoretically controversial as there is no unanimity amongst various scholars. According to Orr et al (1995), the expected interest rates are assumed to influence the level of interest rates, but the impact is not clear cut. On the other hand, Ang and Piazzesi (2003) do not find a significant relation between some of the determinants of long term interest rates and long-term interest rates. Thus, there is no unified conclusion in the literature regarding the effect of macroeconomic variables on long-term interest rates.
1.1.3 Interest Rates in Kenya

Prior to the implementation of Structural Adjustment Programme (SAP) in 1983, the financial sector in Kenya suffered from severe repression. Interest rates were maintained below market-clearing levels, and direct control of credit was the primary monetary control instrument of the authorities. Accompanying the SAP, interest rate deregulation took place. In September 1991 the maximum lending rate was increased from 10% to 14%. The rediscounting rate for crop finance paper was raised to 11.25%, while the minimum savings deposit rate was raised to 12.5%. Between 1983 and 1987, the differentials between the interest rates of banks and non-bank financial institutions were narrowed. This improved the competitiveness of commercial banks. One of the first steps towards freeing interest rates was taken in 1989, when the government started selling Treasury Bonds through an auction.

In July 1991, interest rates were completely freed. Since then, interest rates have been following a steep upward ascent, with the gap between loan deposit rates shrinking (Naude, 1995). After the liberalization period, interest rates were liberalized and indirect monetary policy tools adopted. Steps were taken to establish financial markets, decontrol foreign exchange, liberalize trade and tighten prudential regulations. The role of the Central Bank was strengthened and monetary policy was tightened. All these were accompanied by declining economic performance. From the financial repression theory, a major achievement in the financial liberalization is the decontrol of interest rates. This has a positive impact on economic performance and also in indicating the direction the financial sector takes after the liberalization process (Ngugi and Kabubo, 1998).
High real short-term interest rates have reduced the demand for capital market instruments and crowded-out substantial domestic savings to short-term government securities (Kibuthu, 2005). This situation was particularly evident in 2001 when the Treasury bill (T-bill) rate was 12.6% compared to an inflation rate of 0.8%. However, the situation is being reversed as T-bill rates have fallen to about 8% resulting in increased demand for both equity and debt instruments (World Bank, 2002). Interest rate spreads are high and currently standing at about 13%.

Deposit rates are too low and lending rates too high thereby discouraging domestic savings and investment. The domestic savings are less than 10% of Gross Domestic Product (GDP) and thereby insufficient to meet investment needs and generate demand for equities and debt instruments (World Bank, 2002). Risk free interest rates play a fundamental role in finance. Theoretical models of interest rates are of interest both for the pricing of interest rate sensitive derivative contracts and for the measurement of interest rate risk arising from holding portfolios of these contracts. There is a vast literature focusing on modeling its dynamics. This study sought to specify a model for modeling volatility of short-term interest rates in Kenya.

1.2 Problem Statement

Before the global financial crisis less effort was devoted to understanding the real long-term interest rate dynamics as compared to the early 1980s. Low real yields in the late 1990s and 2000s might have an effect on keeping intellectual attention away from understanding real interest rate dynamics. Yet we should be aware of the fact that long-term real yields, as the key determinant of saving-investment dynamics, are highly
critical for the sustainability of investments, thus sustainable growth in the long run. A high level of real interest rates caused by excessive government deficits or debt may reduce investments, and may hinder durable consumption expenditures, which are sensitive to interest rates. Moreover, long term interest rates also reflect the risk perceptions in an economy.

Relatively higher long-term interest rates in an economy is a clear indication of a sustainability bias, which might trigger a sudden capital outflow after a certain threshold, as happened in the case of Greece (Strauch, 2013). Even more, chronically high real interest rate returns in a country may distort the operation of financial markets as speculative activities attract more and more resources. When governments have to pay relatively high real interest rates for a certain period of time, private capital might move away from job-creating activities to financial investments since the corporate sector would also have to pay high real borrowing costs, as banks demand higher real rates on their loans as well. In this context, sustainability of investments, and thus sustainability of growth in an economy, will be affected by long-term interest rates.

Although many theoretical and empirical studies have been devoted to understanding the determinants of long-term nominal interest rates, controversies still exist regarding the role of economic fundamentals in interest rate dynamics (Laubach, 2003). The long-term nominal interest rate is the sum of the long-term real interest rate and inflation expectations, thus any factor that impacts expected inflation, the real rate or both should affect long-term nominal interest rates (Wu, 2003). While economic theory suggests that real long-term interest rates are influenced by potential GDP, households’ time
preference and the rate of return on investment, inflation expectations are strongly influenced by monetary policy, which depends itself on the various macroeconomic variables that enter the central bank’s reaction function. Macroeconomic shocks should, therefore, have a role to play in explaining long-term nominal interest rates. Existing literature indicates that monetary policy is widely viewed as an important determinant of long-term nominal interest rates, while the impact of fiscal policy and supply shocks on long-term yields remains an open issue with no clear-cut conclusion.

In Kenyan context, various studies on the topic of interest rates have been reviewed. These include Kimutai (2003), Kilonzo (2003), Kibe (2003) and Muriithi (2003), among others and the majority of such studies have examined various aspects of interest rates. Only a few studies, have reviewed the long term interest rates e.g. Muriithi (2003) who carried out a study on comparison of interest rates between short term and long term financial debt securities. Unlike previous related studies, this study will focus in determinants of long term interest rates in Kenya. A gap in literature motivated this study as the study sought to answer the research question, “what are the determinants of long term interest rates in Kenya?

1.3 Research Objective

To establish the determinants of long term interest rates in Kenya

1.4 Value of the Study

Management: The findings of this study would of significant importance to the management. The study would enable the management to appreciate and understand the determinants of long term interest rates in Kenya especially when making a decision as to
whether or not to issue a long term debt instrument for example a long term bond. Clear understanding of determinants of long term interest rates would aid managers in making sound financial decisions in regard to rate to be charged on a long term debt instrument.

Investors: Investors may need to know the desirable long term interest rate that a particular debt instrument offers before investing in it. This would enable the investors to make their investment decisions as whether to invest or disinvest in a debt instrument depending on the returns that an investor is likely to get.

Financial Analysts: The findings of this study would enable them to provide better services to the clients in form of sound financial advice. This is in regard to the return on their investments in form of attractive gains from interest that result from investing in long term financial debt securities such as private or government bonds.

Scholars: The findings of this study would also add value to the existing knowledge in the finance discipline. It has also formed the basis upon which other related and replicated studies can be based on and also has suggested potential research areas for future researchers.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses various theories of long term interest rates, determinants of long term interests, review of empirical studies, and lastly conclusion of literature review.

2.2 Theoretical Review

In the literature of the long term interest rates, there are various theories of long term interest rates. These include; the expectation theory, the segmented market theory, liquidity premium theory, preferred habitat theory and loanable funds theory.

2.2.1 The Expectation Theory

The expectations hypothesis of the term structure states that the interest rate on a long-term bond will equal an average of the short-term interest rates that people expect to occur over the life of the long-term bond (Mishkin, 1999). For example, if people expect that short-term interest rates will be 10% on average over the coming five years, the prediction is that the interest rate on bonds with five years yield to maturity will also be 10%.

In the expectations theory the long-term interest rate is a function of the current and expected future short-term interest rates. The terminology comes originally from Lutz (1940). Many papers have been written on this subject in the last decades. Several different versions of this hypothesis exist and are tested in the literature. Fuhrer (1996) argues that the stance of the monetary policy is important in explaining the expectations
hypothesis. The current forward interest rates are determined by the anticipations in the market of future spot interest rates plus a constant risk premium according to the expectations hypothesis (Sarno, 2005).

Tests of the expectations theory tend to generate paradoxical results. Campell and Shiller (1989) find support for the expectations hypothesis in that the yield spread forecasts the weighted average of the changes in short-term rates over the life of a long-term bond. The hypothesis is rejected for rates less than 2 years, while not rejected for longer maturity rates unless more powerful tests are used that e.g. include macroeconomic factors in Sarno (2005). The expectations hypothesis is rejected by Gerlach (2003). Lee (1994) models the long rate as a function of the distributed lag on realized short-term rates, which performs poorly after 1993 in the US.

Hammersland et al. (1997) have analyzed the relation between German and American long-term interest rates as an indication of integration of financial markets. In contrast with this paper, they use only the expectation hypothesis to explain long-term interest rates. They find a causal relation from US long-term interest rates and German short-term interest rates to German long-term interest rates, thus supporting the expectation hypothesis.

2.2.2 The Segmented Market Theory

This theory of the term structure assumes that credit markets are segmented, separated and distinct. Therefore the interest rate on each bond with a different maturity is determined by the supply of and demand for that bond, with no effects from expected returns on other bonds with other maturities (Mishkin, 1999). This theory holds that
investors have specific investment preferences that are ultimately dictated by the nature of their liabilities (Howells and Bain, 1998)

A key assumption of the segmented market theory is that bonds of different maturities are not substitutes. Some lenders or borrowers prefer short-term bonds, while others prefer long-term ones. Investors and borrowers are concerned with specific maturities only. Interest rates are determined independently in separate markets with different maturities, without affecting other segments of the credit market. Investors or bond issuers only care about one segment of the bond market.

This theory explains why yield curves are usually upward-sloping, and states that investors are risk-averse, so they prefer the safety of short-term bonds. Long-term bonds will have higher yields as a result of their lower demand since investors prefer short-term bonds. It does not, however, explain why interest rates tend to move together over time, and it also does not offer any insights into why yield curves slope upward when interest rates are very low and slope downward when interest rates are very high.

2.2.3 The Liquidity Premium Theory

This theory of the term structure states that the interest rate on a long-term bond will equal an average of short-term interest rates expected to occur over the life of the long-term bond, plus a premium that responds to supply and demand conditions for that bond (Mishkin, 1999). The liquidity premium theory modifies the expectations hypothesis by assuming that investors are risk-averse; therefore they will demand a premium for long-term bonds because of interest rate risk. It is assumed that investors require a liquidity premium to induce them to lock up their funds for longer-term maturity (Howells and
Bain, 2002). That is, investors must be paid an extra return in the form of an interest rate premium to encourage them to invest in long-term securities and compensate them for the increased risk (Botha and Skeritt, 2003).

The liquidity premium theory’s main assumption is that bonds of different maturities are substitutes, but not perfect substitutes, which means that the expected return on one bond does influence the expected return on a bond of a different maturity. Liquidity premium theory also allows investors to prefer one bond maturity over another. Investors tend to prefer shorter-term bonds because these bonds bear less interest-rate risk. As such, if the investors were to hold bonds of longer maturities they must be offered a liquidity premium to induce them to do so.

2.2.4 The Preferred Habitat Theory

According to Mishkin (1999) the liquidity premium theory is closely related to the preferred habitat theory, which takes a less direct approach to modifying the expectations hypothesis, but comes up with a similar conclusion.

This theory assumes that investors have a preference for bonds of one maturity over another, a particular bond maturity (preferred habitat) in which they prefer to invest (Howells and Bain, 2002). The investors are preferring bonds of one maturity over another; as such they will be willing to buy bonds that do not have the preferred maturity only if they can have a somewhat higher expected return. The investors are likely to prefer the habitat of short-term bonds over that of longer-term bonds; they will only hold longer-term bonds if they have a higher expected return. The above reasoning will lead to
the same equation as implied by the liquidity premium theory with a term premium that rises with maturity.

2.2.5 Loanable Funds Theory

The loanable funds theory implies that the interest rate is determined by the supply and demand for loanable funds. The demand comes from business for investments, consumers for consumption and the government to cover their deficit, while funds are supplied by private and public domestic saving and increases in the money supply (Orr et al., 1995). The possible crowding out effect of government borrowing on private spending and the interest rate is subject of a long-standing debate. The direct and indirect effects of crowding out are documented in e.g. Blinder and Solow (1973), and Carlson and Spencer (1975). Most literature concentrates on the short-run indirect crowding out (Hoelscher, 1986), in which increased government borrowing increases the (short-term) interest rates and thus can affect private spending negatively. Most empirical studies find no effect of federal borrowing on the nominal short-term rate, and explain that with the Richardian equivalence (Barro, 1974).

However, several studies find this effect on the long-term interest rates (Holster 1986). Engen and Hubbard (2004) find that there exists a positive relation, in which an increase in government borrowing equal to one percent of the GDP could increase the long-term real interest rate by 3 basis points. Cebula et al. (1992) argue that the long-term interest rate transmits the impact of a deficit to the real sector of the economy, not the short-term interest rate. Barth et al. (1984) examined several empirical studies on the effect of federal deficit on interest rates. According to their results the empirical results appear to
be sensitive to the time period, the choice of variables and how deficit is measured. Also the country in question that is researched affects the results. Linde (2001) tests the effect of budget deficits on Swedish data in the period of 1984 to 1996, but differs from this paper as it does not test for international influence of macroeconomic variables. Linde (2001) concludes that larger budget deficits in Sweden induced higher interest rates. Adding international evidence besides the United States which has had a large persistent trade deficit, tests the relevance of the Richardian equivalence in general.

Ford et al. (1999) test the hypothesis of fiscal crowding out internationally. If international markets are integrated, then the national real interest rates depend on ‘world’ debt, instead of only national debt. This is a theoretical challenge of the Richardian equivalence, but empirical evidence on consumption suggests that public debt should partially crowd out private-sector activity. Although the strict real interest rate parity is empirically rejected, it seems reasonable to suppose that capital markets are to a large extent integrated across advanced economies. International arbitrage between instruments in different currencies reduces deviations between country specific interest rates. Some evidence for this is found in Ford et al. (1991).

2.3 Determinants of Long Term Interest Rates

In the literature of interest rates, there are various determinants of long term interest rates. These include; macroeconomic variables, country-specific and global variables, monetary policy and foreign borrowing.
2.3.1 Macroeconomic Variables

Components of long-term nominal interest rates are potentially affected by macroeconomic variables. Existing literature regarding the impact of macroeconomic shocks on long-term interest rates is, however, rather limited. The main contributions are Evans and Marshall (2001), Ang and Piazzesi (2003) and Wu (2003). With similar US data, however, their conclusions are not the same. Researchers have begun to incorporate macroeconomic variables into interest rate models to shed some light on the fundamental determinants of interest rates (Diebold et al., 2005). The relationship between macroeconomic variables and the yield curve could provide more insight than some latent factors.

Using a structural VAR approach with different identification strategies, Evans and Marshall (2001) consider the impact of both demand (preference) and supply (technology) shocks on the US yield curve, on the 1959-2000 period. Whatever the identification strategy, they show that aggregate demand shocks induce the largest, most significant and most persistent responses in nominal yields, because demand shocks move the real interest rates and inflation in the same direction. Regarding the impact of aggregate supply (technology) shocks, on the contrary, they do not obtain robust conclusions.

Ang and Piazzesi (2003) use a Vector Auto Regression model where identifying restrictions are based on the absence of arbitrage to investigate how macroeconomic variables (inflation and real activity) as well as unobservable factors affects the dynamics of the US yield curve with data covering the 1952-2000 period. Variance decompositions
show that macroeconomic factors explain movements at the short and middle ends of the yield curve, while unobservable factors still account for most of the movement at the long end of the yield curve. Therefore, Ang and Piazzesi’s (2003) conclusions do not support the idea that macroeconomic variables affect long-term nominal interest rates.

In the context of a structural VAR framework where shocks are identified using a recursive strategy with US data covering the 1967-1998 sample, Wu (2003) shows that a positive shock to real output raises all the interest rates with a similar magnitude along the yield curve. Moreover, this effect on the level of the yield curve is more persistent than the effect created by a monetary policy shock. Wu’s (2003) results support thus the idea that a supply shock impacts interest rates.

2.3.2 Country-Specific and Global Variables

A large number of papers, including Blanchard and Summers (1984), argue that interest rates are substantially determined worldwide, rather than domestically, because a large pool of capital flows towards nations with high real rates tends to equalize rates around the world. They stress that this seems to be true not only for small open economies, but also for large economies like the United States. This corresponds to the results presented in Barro and Sala-i-Martin (1990), who find for 10 OECD countries that their respective expected real interest rate depends primarily on world factors, rather than on own country factors. This is in line with the more recent findings of Al Awad and Goodwin (1998) who on the basis of cointegration and Granger causality techniques - find a high degree of integration of international asset markets, which implies a strong cointegration among G10 ex ante real interest rates. Nevertheless, they also find an important role for
transaction costs, which prevent real interest rate equalization across countries. Wu (1999) - by applying cointegration techniques to German and Japanese real interest rate and exchange rate data - finds evidence in favour of a long-run relationship between real exchange rate and expected real interest differentials only if the current accounts are explicitly considered.

The hypothesis of strong cross-country linkages is also confirmed by Pain and Thomas (1997). Applying cointegration techniques to data from several industrial countries, they find evidence for a “European” short-term real interest rate, with Germany being the dominant player. But this result does not seem to be robust with respect to the inclusion of US rates, indicating that US rates determine the trend in European rates. Interestingly, they also find evidence that the degree of integration has increased over time. This is in line with the results presented in Fountas and Wu (1999), who find evidence in favour of bilateral real interest rate convergence between Germany and several other countries for long-term real interest rates. They attach this to the growing degree of integration in the world financial markets. In a more recent paper they apply a comparable cointegration technique to test for bilateral real interest rate convergence in the G7 against the United States (Fountas and Wu (2000)). They find strong evidence for bilateral real short-term interest rate convergence to a long-run relationship between US rates and rates in Canada, France, Germany and the United Kingdom. Moreover, they find evidence in favour of a bilateral real long-term interest rate convergence to a long-run relationship between US rates and rates in France and Germany. This means that for France and Germany, long-term real interest rate changes are influenced by the US monetary policy stance.
Given the strong results pointing at a close interrelationship between national real rates, some papers estimate a world interest rate rather than looking at national interest rates. Kraemer (1996) aggregates national data of the G7 countries and estimates a single-equation error correction model. He finds that the resulting aggregate long-term real interest rate is mainly determined by the real short-term interest rate, capacity utilisation and structural public borrowing. Orr et al (1995) pool data from 17 countries to estimate an error correction model. They find that the low-frequency component of the real interest rate is mainly determined by profitability, a risk measure, the current account, the government deficit and a measure for surprise inflation. The high-frequency component is influenced principally by monetary and fiscal policy. They interpret the low-frequency factors as the fundamentals that influence savings and investment trends, whereas the high-frequency factors change the expectations about the fundamental factors.

On the basis of the idea of a world real interest rate, Ford and Laxton (1999) analyze the role of global fiscal developments. They find that the increase in OECD-wide government debt since the late 1970s was a major factor in the rise in real interest rates. Contrasting these studies, Breedon et al (1999) find that it is hard to argue that national real interest rates converge to a single world rate, although international factors are important. They also find that the large and persistent differences in real interest rates across countries cannot be explained in terms of real exchange rate expectations. Transaction costs and country-specific factors, for example country-specific risk and the portfolio home bias, still seem to play a significant role.
2.3.3 Monetary Policy

Both the Fisher relation and the expectations hypothesis give monetary policy a priori role in determining long-term nominal interest rates. Since inflation is ultimately a monetary phenomenon (Bullard, 1999), long-run inflation expectations are largely set by monetary policy, thereby making monetary policy a relevant candidate as a determinant of nominal interest rates. Several empirical studies effectively support the view that long-term nominal interest rates are affected by monetary policy through its impact on inflation.

Using monthly data on the 1952-1987 periods, Campbell and Ammer (1993) show that bond returns are largely driven by news about future inflation, while real rates have little impact. They find however a small difference in the variance decomposition of bond returns according to the sample period: while the variation in bond returns is essentially explained by news about future inflation over the 1952-1979 period, the news about future excess bond returns also contributes to the overall variance of bond returns in sample periods that include the 1980s. Using cointegration and error-correction methodology in a multivariate framework, Mehra (1996) finds a long-run equilibrium relationship between the US bond rate and the inflation rate that can be interpreted as a Fisher relation in which the (trend) rate of inflation determines the bond rate. The long-run effect of monetary policy on bond yields occurs therefore primarily through the inflation channel. Ireland (1996) shows that movements in nominal bond yields primarily reflect changes in long-run inflationary expectations.
Empirical studies generally find a weak relationship between monetary actions and long-term interest rates (Roley and Sellon 1995), hence questioning monetary authority’s ability to influence longer-term interest rates and, eventually, aggregate demand. In the context of structural VAR models, Evans and Marshall (2001) show that monetary policy shocks have a significant impact on the slope of the yield curve, but no effect on the level of the yield curve. Wu (2003), with a similar approach, confirms that monetary policy shocks have a large and significant but short-lived effect on short-term interest rates with a dissipating effect on longer-term interest rates.

This weak impact of monetary policy on long-term nominal interest rates can be explained by the fact that previous studies only consider current monetary policy, while the expectations theory relates long-term interest rates not only to the current short rate but also to market expectations of future short-term rates. Any change in the view of market participants about future monetary policy can consequently affect the long-term interest rate. By explicitly including market expectations of future monetary actions, Roley and Sellon (1995) find a larger response of long-term interest rates to monetary policy than traditionally: they show that the magnitude of the response of long-term interest rates to monetary actions depends on the expected persistence of those actions. A change in the current short-term interest rate can therefore influence longer yields only if market participants view this change as permanent or as the first of a series of actions. The effect of monetary policy on long-term nominal interest rates is thus linked with the persistence of monetary decisions. In conclusion, existing literature shows that, in the long run, monetary policy is able to impact long term nominal interest rates through its inflation component, which is affecting inflation expectations.
2.3.4 Fiscal Policy

Academic opinions are quite divided in suggesting an exact relationship between long-term interest rates and fiscal policy variables, including various government deficit and debt indicators such as overall fiscal balance, primary balance, cyclically adjusted balance, and gross or net government debt. Some studies in the empirical literature, such as Evans (1985), and Barro and Sala-i-Martin (1990) fail to establish a significant link between interest rates and fiscal variables. Some research, such as Bernoth et al. (2003), Codogno et al. (2003), Engen and Hubbard (2004), and Afonso and Strauch (2005) assign a statistically significant but economically (practically) small role to the fiscal variables in determining the magnitude of the interest rates. On the other hand, numerous others come up with a statistically and economically significant relationship between long term interest rates and fiscal variables, such as Gale and Orszag (2004), Laubach (2003), Faini (2005), Laubach (2007), and Alper and Forni (2010).

The relationship between fiscal policy and long-term interest rates is a vigorously debated issue, both theoretically and empirically. Moreover, it is a politically sensitive issue for which there is no widely-accepted conclusion. There are both elements that indicate that fiscal policy should not influence long-term interest rates and others that suggest an impact of the fiscal position on long term interest rates. According to the Ricardian equivalence (Barro 1974), economic agents understand that any increase in current fiscal deficits will conduct to tax raises in the future. To smooth their consumption over time, economic agents therefore increase their present saving in face of the higher fiscal deficits. This parallel increase in both private saving and public borrowing needs results then in unchanged long-term interest rates. As a result, fiscal policy does not influence interest rates.
2.3.5 Foreign Borrowing

Some scholars suggest that the effects of government debt on long-term interest rates are dependent on funding sources: domestic or foreign investors. According to this argument, when a country depends less on foreign borrowing, long-term interest rates are lower, since investors more firmly form the perception that the government has a strong incentive to avoid defaulting (Gross, 2011).

When the government depends less on foreign borrowing and domestic investors hold a larger share of government bonds, the losses of its citizens are larger in the case of government default. In addition, if domestic banks hold large amounts of government bonds, the losses are even larger because of unease over the financial system. In such a situation, obtaining political support for a government default is considered more difficult, while that for a tax increase to avoid a default is considered easier. Thus, the government’s incentive to choose a tax increase rather than a default becomes stronger (Gros, 2011).

With regard to foreign borrowing, some researchers consider current account balance, a flow variable, in addition to net foreign debt, a stock variable. In contrast, since only a small number of people stand against the losses of foreign investors due to a government default, the probability that the government will choose to default is considered higher when foreign investors have a larger share of government bonds (Laubach, 2003).
2.4 Empirical Review

A number of studies provide empirical evidence that the long term interest has predictive power on economic activity. According to Martinez-Serna and Navarro-Arribas (2003:3), the use of interest rates as predictors of the business cycle dates back to Burn and Mitchell, who included them in a list of useful variables to forecast real economic activity. Later, Kessel (1965) provided evidence, for the first time, about the co-movement between the term structure and the business cycle, and that the slope of the yield curve is associated with economic downturns or recoveries.

Estrella and Mishkin (1997) provide evidence that in France, Germany, Italy, the United Kingdom and the United States the spread between the 10-year government bond yield and the 3-month Treasury bill rate is able to predict real GDP growth up to between four and eight quarters ahead. Mishkin (1990) looked at the information in the longer maturity term structure by examining U.S. data. The empirical analysis was based on the monthly data from 1953 to 1987 for inflation rates and interest rates on one - through five-year Treasury bonds. This study was subdivided into the pre-October 1979 period and post-October 1979 period, because the relationship of nominal interest rates and inflation shifted dramatically with the monetary regime change of October 1979. Mishkin (1990) regressed the change in the inflation rate on the slope of the term structure. The evidence indicates that there is substantial information in the longer maturity term structure about future inflation: the slope of the yield spread has a great deal of predictive power for future changes in inflation. He observed that at longer maturities the term structure of nominal interest rates contains very little information about the term structure of real interest rates. The evidence in Mishkin (1990) indicates that for maturities of six months
or less, the term structure contains no information about the future path of inflation, but contains information about the term structure of real interest rates. Mishkin (1990) indicates further that, at longer maturities, the term structure of interest rates can be used to assess future inflationary pressures: when the slope of the yield curve steepens, it is an indication that the inflation rate will rise in the future and when the slope flattens, it is an indication that the inflation rate will fall.

The results of this study indicated that there is a great deal of information in the longer maturity term structure about the future path of inflation. The results for the two sub-periods indicate the same conclusion, that is, the term structure for maturities greater than a year contains a great deal of predictive power for the changes in future inflation. The results were stronger for the pre-October 1979 period than the post-October 1979 period.

Davis and Fagan (1997) examined the predictive power of the yield curve on real output growth in the European Union countries and found statistical significance in all except Spain, France and Italy. The data employed in this study is quarterly, with samples beginning at various dates in the 1970s (depending on data availability) and ending at 1992. Inflation is measured by the CPI and output by GDP (or, where this is not available at a quarterly frequency in some countries, by industrial production). The slope of the yield curve is measured by the difference between the yield on long-term domestic government bonds in the secondary market and short-term money-market interest rates. They used a relatively straightforward bivariate model in order to assess whether there is a correlation between yield spreads and future inflation and output growth or other measures of economic activity.
Ayuso and Martinez (2001) show that there is little information content pertaining to the predictive ability of the term spread in Spain. Alonso et al. (2001) explored the predictive ability of various financial indicators for output growth and they found poor information content. Engsted (1995), using thirteen OECD countries’ figures from 1962 to 1993, presented evidence that long-term interest rates, to a large extent, reflect expected future inflation. Cointegration techniques were applied to examine the time-series properties of interest rates and inflation rates, and VAR methodology was applied to examine the predictive power of the spread (Engsted, 1995).

The recent study by Martinez-Serna and Navarro-Arribas (2003) analyzed the relationship between the long term interest rates and expected economic growth by testing the model of Harvey (1998) with the Spanish data from January 1993 to December 2001. Harvey’s model has been tested in several countries using ex post consumption or output growth as proxies for expected consumption growth. They employed the Consumer Confidence Indicator (CCI) and the Economic Sentiment Indicator (ESI), drawn up by the European Commission, as dependent variables representing expectations about the future economic situation. The different combinations of interest rates were used as independent variables. For the interest maturities, they used the term spread between the 10-year long rates and the 3-month short rate. They specified two versions of the model: a simplified one in which the only variable is the term spread, and a complete one which also includes the real short rate. A positive and statistically significant relationship between the term spread and these two indicators (CCI and ESI) was found. The results indicated that the Spanish term structure of interest rates contains
useful information to predict the expected economic growth. These results were contrary to those obtained by Alonso et al. (2001).

Harvey (1997) carried out a study on the relation between the long term interest rates and Canadian economic growth. The period under investigation was 37 years from 1958 to 1995. In this study three sets of comparisons were presented: firstly, the predictive power of the three-year yield spread was contrasted with the longer maturity 10-year yield spread. Secondly, the information in the Canadian term structure relevant for economic growth was contrasted with the information in the U.S. term structure relevant for forecasting U.S. economic growth. Thirdly, some sub-period analysis was presented to assess the stability of the relations between term structure and economic activity. The short-term yield is the compounded annual rate for the Bank of Canada ninety-day Treasury bill.

Locally, few aspects relating to the topic of interest rates have been reviewed in Kenya. Muriithi (2003) carried out a study on comparison of interest rates between short term and long term financial debt securities. The study shows that the average interest rate on short term financial debt securities was higher than the average interest rate on long term financial debt securities. This was at 21.636v% and 16.11 for short term and long term financial debt securities respectively. Kibe (2003) carried out a research on the relationship between interest rate spread and profitability of commercial banks in Kenya. The study found that interest rate spread contribute less than 50% towards the profitability of commercial banks in Kenya.
2.5 Conclusion of Literature Review

Although many theoretical and empirical studies have been devoted to understanding the determinants of long-term nominal interest rates, controversies still exist regarding the role of economic fundamentals in interest rate dynamics (Laubach, 2003). The long-term nominal interest rate is the sum of the long-term real interest rate and inflation expectations, thus any factor that impacts expected inflation, the real rate or both should affect long-term nominal interest rates (Wu, 2003). While economic theory suggests that real long-term interest rates are influenced by potential GDP, households’ time preference and the rate of return on investment, inflation expectations are strongly influenced by monetary policy, which depends itself on the various macroeconomic variables that enter the central bank’s reaction function. Macroeconomic shocks should, therefore, have a role to play in explaining long-term nominal interest rates. Existing literature indicates that monetary policy is widely viewed as an important determinant of long-term nominal interest rates, while the impact of fiscal policy and supply shocks on long-term yields remains an open issue with no clear-cut conclusion.

The purpose of this literature review is to investigate the determinants of long term interest rates in Kenya. This study will generally highlight the various aspects of long term interest rates. The knowledge of this information shall be used in data collection so as to meet the objective of the study.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction
This chapter is articulates the methodology to be used in the study to find answers to the research question. In this chapter, the research methodology has been presented in the following order, research design, target population, sampling procedure, data collection methods, instruments of data collection and finally the data analysis.

3.2 Research Design
According to Denvir & Millet (2003), a research design provides glue that holds a project together. A design is used to structure research, to show how all the major parts of the project, which include sample or groups, measures, treatments or programs, and methods of assignment that work together to try to address the central research question. This study adopted a descriptive design that aimed at establishing various determinants of long term interest rates in Kenya. This is because the study sought to establish a relationship between two variables. A descriptive sample study was undertaken in this study.

3.3 Population
According to Mugenda and Mugenda (1999), a population is a well defined as a set of people, services, elements and events, group of things or households that are being investigated. The population comprised all financial debt instruments issued in Kenya between 2002 to 2012. This period was considered long enough to provide sufficient variables to assist in establishing various determinants of long term interest rates. This
period was chosen in order to capture the most recent data and to give results that are conclusive and reflect the current trend.

3.4 Sample Design

The sample consisted of all financial debt securities issued by CBK from 2002 to 2012. The choice of government debt was intended to ensure increased homogeneity in elements of the population. Several advantages arise from the decision to focus on these securities, including their ready availability and relative comparability across countries and through time, and the low default risk on such securities.

A spot check of total financial debt securities issued by the NSE from 2002 to 2012 indicated that 81.6% related to government securities while only 18.4% related to corporate bonds and medium term notes. This proved that a sample drawn from the government financed debt securities was representative enough of the population of the financed debt securities for the purpose of establishing the determinants of long term interest rates in Kenya.

3.5 Data Collection

The study was based on secondary data available in form of published bulletin and other publications from CBK, KNBS and NSE for ten years from 2002 to 2012. The maturity period of each financial debt security was issued and the applicable interest rate was obtained. The average annual interest rates as well as average rates of 10 year period was computed for long term interest rates.
3.6 Data Validity and Reliability

The information used in this study has been compiled from reliable and credible sources justifying the completeness and accuracy of the data used. All information contained in this study was from sources well quoted. Some information was obtained from reliable international journals and the validity of the information published was tied to the institution that carried out the publication(s). CBK, NSE and KNBS were the main sources of information for the study. Data was tested before analysis and subsequent conclusions.

3.7 Data Analysis

According to Marshall and Rossman (1999), data analysis is a process of bringing order, structure and interpretation of mass collected data. Data collected was systematically organized in a manner to facilitate analysis. Data analysis involved preparation of the collected data, coding, editing and cleaning of data in readiness for processing using SPSS package version 20. SPSS was preferred because it is systematic and covers a wide range of the most common statistical and graphical data analysis. Regression model was used to establish the relationship between the variables.

3.8 Model Specification

Multiple regression models was used in this study as it allowed simultaneous investigation of the effect of two or more variables Zikmund (2003). The model established the relationship between long term interest rate and the determinants of long term interest rates. In regression terminology, the variable that is predicted is called dependent variable while the variable used to predict the value of dependent variable is
called independent variable. Data collected was analyzed using multiple regressions. The significance of each independent variable was tested at a confidence level of 95%. In this study, dependent variable was long term interest rate and independent variables were macroeconomic variables, monetary policy, central government debt and external debt. For the variables in this study, an average was computed for each year and then simple average for all 10 years was computed. The equation representing the algebraic expression of multiple regression model of the form below was applied:

Long term interest rate = $f$ (Determinants of long term interest rates)

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where $Y$ = Long term interest rate (dependent variable).

$\beta_0$ = Constant which defines long term interest rate without inclusion of independent variables

$X_{1-3}$ = Independent variables are,

$X_1$ = Fiscal Policy (Central Government Debt/GDP)

$X_2$ = Monetary Policy (Average Annual Inflation Rate)

$X_3$ = Foreign Borrowings (External debt)

$\epsilon$ = Error Term

$\beta_1$ - $K$ Regression coefficients- define the amount by which $Y$ is changed for every unit change in independent variable.
CHAPTER FOUR
FINDINGS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter articulates the data analysis, the finding and interpretations based on the analysis. The results are given in tables and charts for clear visualization.

4.2 Data Presentation

4.2.1 Interest rates in Kenya

Figure 4.1 Lending Interest rate

The study findings in figure 4.1 indicate that the lending interest rates in Kenya was high in the years 2002 and 2012 in which the country reported a lending interest rates of 18.45% and 19.72% respectively. The lending interest rate was low in the year 2005 in which the country recorded a lending interest rate of 12.88%. The study findings indicate
that there was a small increase and small decline in lending interest rates between the year 2004 and the year 2011.

Figure 4.2 Real interest rate

![Real interest rate graph](image)

The study findings in figure 4.2 indicate that there was a sharp decline in real interest rate from 17.36% in the year 2002 to 5.05% in the year 2004. The findings indicate that the real interest rate in Kenya reached its lowest in the year 2011 in which the country recorded 0.58% real interest rate. The findings indicate that the real interest rate rose from 0.58% in the year 2011 to 10.94% in the year 2012.
The findings in figure 4.3 indicate that Kenya has been recording a general decline in the interest rate spread from the year 2002 in which the country recorded 12.97% interest rate and 8.15% in the year 2012. The findings indicate that Kenya recorded 7.80% interest rate spread in the year 2005.

The findings in figure 4.4 indicate that Kenya recorded a lower annual interest rate in the year 2008 in which the country registered an interest rate of 7.81%. The findings however indicate that the country registered almost a stagnating interest rate between the year
2004 to the year 2007 whereby the country registered an interest rate 9.23%, 9.43%, 9.19% and 9.61% respectively. The findings indicate that Kenya recorded the highest annual interest rate in the year 2002 with 16.29% annual interest rate and in the year 2012, the annual interest rate was 12.94%.

4.2.2 Fiscal policy (Central government debt)

Table 4.1 Central government debt (in USD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Central government debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>6177278000</td>
</tr>
<tr>
<td>2003</td>
<td>6922732000</td>
</tr>
<tr>
<td>2004</td>
<td>6976677000</td>
</tr>
<tr>
<td>2005</td>
<td>6482895000</td>
</tr>
<tr>
<td>2006</td>
<td>6680511000</td>
</tr>
<tr>
<td>2007</td>
<td>7522662000</td>
</tr>
<tr>
<td>2008</td>
<td>7607377000</td>
</tr>
<tr>
<td>2009</td>
<td>8589492000</td>
</tr>
<tr>
<td>2010</td>
<td>8801155000</td>
</tr>
<tr>
<td>2011</td>
<td>10257882000</td>
</tr>
<tr>
<td>2012</td>
<td>6450383000</td>
</tr>
</tbody>
</table>

The findings in table 4.1 indicate that Kenya had the highest central government debt in the year 2011 in which the country recorded $10257882000 in debt while the lowest central government debt was in the year 2002 in which the country had a debt totaling to $6177278000.
4.2.3 Monetary policy (Average annual inflation rate)

The findings in figure 4.5 indicate that Kenya had the highest annual inflation rate in the year 2008 in which the country had an inflation rate of 26.24% while the least inflation rate was recorded in the year 2002 and the inflation rate was 1.96%. Kenya recorded an average inflation rate of 14.02% in the year 2011 and 9.38% in the year 2012.

4.2.4 Foreign borrowing

<table>
<thead>
<tr>
<th>Year</th>
<th>External debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>4637057000</td>
</tr>
<tr>
<td>2003</td>
<td>5070450000</td>
</tr>
<tr>
<td>2004</td>
<td>5360786000</td>
</tr>
<tr>
<td>2005</td>
<td>4926336000</td>
</tr>
<tr>
<td>2006</td>
<td>5172295000</td>
</tr>
<tr>
<td>2007</td>
<td>5643752000</td>
</tr>
<tr>
<td>2008</td>
<td>5850834000</td>
</tr>
<tr>
<td>2009</td>
<td>6128798000</td>
</tr>
<tr>
<td>2010</td>
<td>6450383000</td>
</tr>
<tr>
<td>2011</td>
<td>7014804000</td>
</tr>
<tr>
<td>2012</td>
<td>7607377000</td>
</tr>
</tbody>
</table>
The findings in table 4.2 indicate that Kenya had the highest external debt in the year 2012 in which the country recorded $7607377000 in debt while the lowest central government debt was in the year 2002 in which the country had a debt totaling to $4637057000.

4.2.5 Determinants of long term interest rates

Table 4.3 Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term interest rate</td>
<td>10.67</td>
<td>2.56</td>
<td>11</td>
</tr>
<tr>
<td>Fiscal policy (Central government debt)</td>
<td>7497185818</td>
<td>1251492149</td>
<td>11</td>
</tr>
<tr>
<td>Average annual inflation rate</td>
<td>10.98</td>
<td>6.28</td>
<td>11</td>
</tr>
<tr>
<td>External debt</td>
<td>5805715636</td>
<td>923850401</td>
<td>11</td>
</tr>
</tbody>
</table>

From the year 2002 to 2012, Kenya has had an average long term interest rate of 10.67% with a standard deviation of 2.56% as indicated by the findings in table 4.3. The findings indicate that for the period of years stated, Kenya has had central government debt of $7497185818 and external debt of $5805715636. There has been an average of 10.98% in inflation as depicted by the results in table 4.3 from the year 2002 to the year 2012.
The findings in table 4.4 indicate that there is a positive moderate correlation between long term interest rate and central government debt ($r=0.435$). The correlation is significant at 5% significance level given that p-value (0.010) which is less than alpha (0.05). The findings indicate that there is a strong positive correlation between long term interest rate and annual inflation rate ($r=0.745$). The findings indicate that the correlation is significant at 5% significance level given that p-value (0.004) is less than alpha (0.05). The findings indicate that there is a weak positive correlation between long term interest rate and external debt ($r=0.154$) which is significant at 5% significance level given that p-value (0.026) is less than alpha (0.05).
Table 4.5 Regression coefficient

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>11.874</td>
<td>3.866</td>
<td>4.623</td>
<td>.002</td>
</tr>
<tr>
<td>Fiscal policy (Central government debt)</td>
<td>.00008546</td>
<td>.000</td>
<td>.418</td>
<td>2.647</td>
</tr>
<tr>
<td>Average annual inflation rate</td>
<td>.286</td>
<td>.088</td>
<td>.703</td>
<td>3.270</td>
</tr>
<tr>
<td>External debt</td>
<td>.000004044</td>
<td>.000</td>
<td>.146</td>
<td>2.578</td>
</tr>
</tbody>
</table>

The findings in table 4.5 gives the coefficients of the regression model generated. The findings indicate that long term interest rate= 11.87 + 0.00008546 Central government debt + 0.286 Average annual inflation interest + 0.000004044 External debt. The findings indicate that all the regression coefficients are positive and significant at 5% significance level given that their respective p-values are less than alpha (0.05). The findings indicate that the regression constant (17.874) is significant at 5% significance level given that the p-value (0.002) is less than alpha (0.05). This indicates that long term interest rate depends on all the predictor variables (central government debt, average annual inflation rate and external debt).
Table 4.6 Significance of the regression (ANOVA)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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a. Dependent Variable: Long term interest rate

b. Predictors: (Constant), External debt, Average annual inflation rate, Fiscal policy (Central government debt)

The findings in table 4.6 indicate the ANOVA results that test the significance of the regression model obtained. The findings indicate that the regression model obtained is significant at 5% significance level given that p-value (0.036) is less than alpha (0.05).

Table 4.7 Model summary

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<th>Model</th>
<th>R</th>
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<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
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<td>1</td>
<td>.826</td>
<td>.683</td>
<td>.547</td>
<td>1.71976714</td>
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The study findings in table 4.7 gives the summary of the model in which R squared (0.683) indicate that 68.3% of the variation in the long term interest rate is accounted for by central government debt, average annual inflation rate and external debt. The adjusted R squared (0.547) indicate that if population was used rather than a sample then the variation in the long term interest rate would be 45.3% less.
4.3 Summary based on the findings

Real long-term interest rates are key determinants of longer-term saving and investment decisions, while their influence on business spending, household investment and the consumption of durable goods plays a key role in the business cycle and transmission of macroeconomic policies. The long-term nominal interest rate is the sum of the long-term real interest rate and inflation expectations, thus any factor that impacts expected inflation, the real rate or both should affect long-term nominal interest rates. The study of long term interest has become a significant global issue after the global financial crisis of 2008. The study has established that lending interest rates in Kenya was high in the years 2002 and 2012 in which the country reported lending interest rates of 18.45% and 19.72% respectively. The lending interest rate was low in the year 2005 in which the country recorded a lending interest rate of 12.88%. This fluctuation in the lending interest rates indicates that the country underwent some economic shocks that could not make the interest rate fluctuate to the high seen in the year 2012. This confirms the study of Evans and Marshall (2001) in which they used a structural VAR approach with different identification strategies, consider the impact of both demand (preference) and supply (technology) shocks on the US yield curve, on the 1959-2000 period and obtained that the lending interest rates fluctuated due to the fluctuations in the yield. The study has also established that was a sharp decline in real interest rate from 17.36% in the year 2002 to 5.05% in the year 2004. The findings also indicate that the real interest rate in Kenya reached its lowest in the year 2011 in which the country recorded 0.58% real interest rate. Just like the lending interest rates, the real interest rates fluctuated sharply between 2002 and 2012 further confirming the idea of Evans & Marshall (2001) that whatever the identification strategy used in assessing the interest rates, they show that aggregate
demand shocks induce the largest, most significant and most persistent responses in nominal yields, because demand shocks move the real interest rates and inflation in the same direction. The study has also established that there was a fluctuation in the interest rates spread however the fluctuation was not as sharp as the fluctuations in the lending interest rates and the real interest rates. This indicates that the high lending interest rates experienced in the Kenya and the real interest rate tend to lower the interest rates spread. The study has established that the country’s foreign borrowing (external debt) and the central government debt has been increasing from the year 2002 to 2012. This indicates that the government of Kenya bases its budget on borrowing that has continued to raise the figures high.

The study has established that long term interest rate is influenced by the annual inflation rates, the external debt and the central government debt. The results in the study findings indicate that there is a direct positive relationship between the long term interest rates and the determinants (annual inflation rate, central government debt and the external debt). An increase in these determinants leads to an increase in the long term interest rates. This confirms the study of Kraemer (1996) who used the aggregates national data of the G7 countries and estimates a single-equation error correction model. He finds that the resulting aggregate long-term real interest rate is mainly determined by the real short-term interest rate, capacity utilization and structural public borrowing and colluded that the long term interest rates depends on these factors. The findings are also supported by Mehra (1996) in which he used co-integration and error-correction methodology in a multivariate framework, and established that US bond rate and the inflation rate that could be interpreted as a Fisher relation in which the (trend) rate of inflation determines the interest rate. This confirms that long-run effect of monetary policy on bond yields
occurs therefore primarily through the inflation channel. The relationship between the long term interest rates and the fiscal policies as established by the study indicates that the effects of government debt on long-term interest rates are dependent on funding sources such as domestic or foreign investors in which if a country depends less on foreign borrowing, long-term interest rates are lower, since investors more firmly form the perception that the government has a strong incentive to avoid defaulting as supported by Gross,(2011) while if the government depends less on foreign borrowing and domestic investors hold a larger share of government bonds, the losses of its citizens are larger in the case of government default. In addition, if domestic banks hold large amounts of government bonds, the losses are even larger because of unease over the financial system.

The study has established that long-term nominal interest rates are potentially affected by macroeconomic variables that include the domestic interest rates, the foreign borrowing. This is supported by the study of Marshall (2001) in which he indicated that the impact of macroeconomic shocks on long-term interest rates is quite noticeable but limited. Given the study findings, the there is no doubt that the macroeconomic variables affect long term interest rates. Therefore the idea of to incorporating macroeconomic variables into interest rate models to shed some light on the fundamental determinants of interest rates is quite recommendable as indicated by Diebold et al., (2005). This is because the relationship between macroeconomic variables and the yield curve could provide more insight than some latent factors. The study has also established that there is a significant relationship between inflation rates, foreign borrowing (external debt) and the central government debt.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the summary of the study, conclusions that were drawn by the researcher according to the findings of the study and the recommendations made by the researcher for the status improvement. The study further illustrates the recommendations that can be adopted by the relevant authority to ensure effectiveness on the management of long term interest rates effectively.

5.2 Summary

Real long-term interest rates are key determinants of longer-term saving and investment decisions, while their influence on business spending, household investment and the consumption of durable goods plays a key role in the business cycle and transmission of macroeconomic policies. The study of long term interest has become a significant global issue after the global financial crisis of 2008. This study therefore was conducted with the objective to establish the determinants of long term interest rates in Kenya. It is sometimes very difficult to ascertain the factors that determine the long term interest rates. One of the most commonly used tools by credit managers is financial statements and ratio analysis. This process serves to predict the interest rates in the economy. Some of the factors that were considered during analysis are inflation rates from 2002 to 2012, external debt and the central government debt as well as interest rates in Kenya. The study adopted a descriptive design that aimed at establishing various determinants of long term interest rates in Kenya. The study was based on secondary data available in form of
published bulletin and other publications from CBK, KNBS and NSE for ten years from 2002 to 2012. The study has established that long term interest is influenced by the fiscal policies, monetary policies in which the government borrowing that include both foreign borrowing and internal borrowing and the annual interest rates. An increase in the borrowing either internal or external increases the long term interest rate in the country. However, the study was limited to the period running from the year 2002 to 2012 and did not incorporate the years before 2002 in which the country went through major economic hurdles such as the sanctions in the year 1993 due to the agitation of multi-party democracy and the 1998 bombings in Kenya as well as the effect of long term interest rates on the investment opportunities in Kenya.

5.3 Conclusion

The long term interest is influenced by the fiscal policies, monetary policies in which the government borrowing that include both foreign borrowing and internal borrowing and the annual interest rates. An increase in the borrowing either internal or external increases the long term interest rate in the country. Therefore to avoid the economic stress by the government and high cost of living, the government must regulate the borrowing and introduce an investment economy to reduce the long term interest rate as indicate by the study.

From the study, the Kenya has seen an increase in the lending interest rates from the year 2002 to 2012 as well as increase in the real interest and inflation. This indicated that the Kenya government has passed through economic hard times as the country gears towards realizing the world economic goals that include the realization of the millennium
development goals. The study has shown that there was a rise in the central government borrowing and the external debt (foreign borrowing) from the year 2002 to 2012. This indicates that the Kenyan government has been expanding its economy through internal borrowing as well as foreign borrowing to finance its ever expanding budget to facilitate its economic activities and the objectives of realizing a good economy for the success of the people. The study has also revealed that there was a small fluctuation from the year 2002 to 2012 in the interest rate spread of the country.

On the relationship between long term interest rate and the monetary and fiscal policies, the study has established that there is a significant relationship between inflation rates, foreign borrowing (external debt) and the central government debt. An increase in these policies resulted in an increase in the long term interest rate as depicted by the study findings. The study therefore concludes that inflation rates and borrowing are key determinants of the long term interest rates in Kenya.

5.4 Recommendations

5.4.1 Recommendations for the policy makers

The study recommends that the government of Kenya should reduce on the foreign borrowing in order to reduce the long term interest rate in the country to encourage local investment that will see the country finance most of its activities through internal borrowing. This is because foreign borrowing overburdens the economy and makes the government look for other ways of generating income to finance it that leads to rise in the interest rates as a result of rise in the taxation of the people in the economy.
The study recommends that the government of Kenya should establish price regulation law to the prices of the basic commodities to curb the ever rising inflation rates in the country that results in rise in the interest rate which in turn discourages borrowing by the people. The unregulated prices in the market has seen unscrupulous traders increase prices of basic commodities in the market that makes the annual inflation positive and keeps rising each year. This overburdens the citizens in the economy.

The study recommends that the government of Kenya should establish loanable funds which depend on supply and demand for loanable funds by the business for investments and consumers for consumption in order to reduce foreign borrowing to reduce the long term interest rates in the economy. This will enhance local investment by the local population that will see the government finance most of its activities through the domestic tax collection and domestic borrowing and fully make the economy of the country independent of foreign influence.

The study recommends to the government and the policy makers to enhance the macroeconomic factors such as industrial production, personal consumption of the citizen to fasten the economy since it they are sensitive on materials prices and the interest rates in order to persistently and significantly maintain the long term interest rate affordable to all the people and investors in the economy.

**5.4.2 Recommendations for future study**

The study recommends a study to be undertaken on the effects of government bonds and securities on the long term interest rates in Kenya and give recommendations on the
effectiveness management of the government bonds to enhance long term interest rates in a manageable standard by the government.

The study recommends a study to be undertaken to determine the inflation uncertainty and the quality of debt and their effects on the development of the long-term interest rates in Kenya and recommendations be given on how it can be achieved to achieve stability of interest rates in the economy.

The study recommends that there should be a study conducted to determine the effect of political instability and violence on the long term interest rates in Kenya and recommendations be given on how political stability can be achieved to stabilize interest rates in Kenya.

The study recommends that there should be a study conducted to determine the effect of economic sanctions on the long term interest rates in Kenya and how economic sanctions can be avoided by the government.

5.5 Limitations of the study

The study was limited to the period running from the year 2002 to 2012 and did not incorporate the years before 2002 in which the country went through major economic hurdles such as the sanctions in the year 1993 due to the agitation of multi-party democracy and the 1998 bombings in Kenya. The study was also limited to the study of establish the determinants of long term interest rates in Kenya and did not investigate the effect of long term interest rates in Kenya on the investment opportunities available in the Kenyan economy.
REFERENCES


### APPENDICES

**Appendix (I) Data Used in the analysis**

#### Data Set one

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