

# **DETERMINANTS OF TREASURY BONDS UPTAKE IN KENYA**

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## DECLARATION

I, the undersigned, declare that this project is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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## **DEDICATION**

This research project is dedicated to my lovely boys, Dean Martin Mureithi and Sean Lewis Njiru. The world is yours for the taking

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## ABBREVIATIONS

<b>BIS</b>	-	Bank of International Settlements
<b>CBK</b>	-	Central Bank of Kenya
<b>CMA</b>	-	Capital Markets Authority
<b>EAC</b>	-	East African Community
<b>EADB</b>	-	East Africa Development Bank
<b>EMCIOSC</b>	-	Emerging Markets Committee of the International Organization of Securities Commissions
<b>FDI</b>	-	Foreign Direct Investment
<b>FY</b>	-	Financial Year
<b>IDB</b>	-	Inter-American Development Bank
<b>ILF</b>	-	Intra-day Liquidity Facility
<b>IMF</b>	-	International Monetary Fund
<b>KEPSS</b>	-	Kenya External Payments and Settlements System
<b>MLF</b>	-	Market Leaders Forum
<b>MoF</b>	-	Ministry of Finance
<b>MTDS</b>	-	Medium Term Debt Strategy
<b>NSE</b>	-	Nairobi Securities Exchange
<b>REPO</b>	-	Repurchase Agreements
<b>SSA</b>	-	Sub-Saharan Africa
<b>TB</b>	-	Treasury bond
<b>US</b>	-	United States of America
<b>USD</b>	-	United States Dollar
<b>VIF</b>	-	Variance Inflation Factor

## ABSTRACT

Treasury bonds are an important component of a country's financial system and represent a critical component of central bank's monetary policy. They act as a benchmark interest rate and form part of the yield curve, which conveys important information for monetary policy. Markets are said to be efficient if they quickly and correctly incorporate information into prices. Treasury bonds demand and consequent uptake or subscription play a vital role in the running of an economy such as Kenya. Despite such quintessence, little academic research has been done to establish the determinants of Treasury bonds in the Country. The study adopted a descriptive survey design. The target population was Treasury bonds issued between 2001 and 2014 whereby the study selected fixed coupon, floating interest, zero coupon and infrastructure bonds available in both CBK and the Nairobi Securities Exchange. The data was analyzed using both description statistics as summary of the data findings and inferential analysis such as multiple linear regression and Pearson product-moment correlation coefficient to establish the influence of each factor on Treasury bond uptake. An R-square value of 0.986 established depicted that this relationship was very strong and the independent variables influences 98.6% of the investor's decision to invest in Treasury bonds offered. The study established the determinants of treasury bonds uptake were liquidity; credit rating; rate of interest; floating rate bonds; gearing ratio; infrastructure bonds; zero coupon bonds; years to maturity and fixed coupon bond. The study concluded that long years to maturity of Treasury bonds affect investments in the same issue. This follows that some investors take longer to decide on whether to invest in the bond and/or others look to financial resources for the same thus short period cut them off. The study also recommended that further studies should be done on the effect of inflations and exchange rate on the Treasury bond uptake/investment.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

The global financial crisis that occurred in 2007-2008 significantly increased the importance of the bond market as a source of finance as corporate shift from overreliance on bank debt and increased government borrowing. Developed countries such as the United States of America (US) have the largest, the best and the most developed bond market in the world. The US bond statistics indicates that the bond market is dominated by the developed countries. The US accounted for 39% of the world value of outstanding domestic bonds; its market is well diversified with products such as mortgage backed securities, federal agency securities, corporate and treasury bonds (BIS, 2009). It is followed by Japan (18%). United Kingdom (UK) and emerging markets follow closely (Kibua *et al.*, 2005).

Over the years, bond markets in developing and emerging markets have been growing steadily. According to emerging markets committee of the international organization of securities commissions, emerging markets bond markets comprised of 11% of global bond markets, which totalled over USD55 trillion as at 2007. By 2030, this is projected to rise to just over 30%, and by 2050 to nearly 40% of the total global bond markets. During the last decade, Kenya has changed rapidly in the range of sophistication of market, intermediaries and product range (Ngugi and Agoti, 2007).

The East African bond market is dominated by treasury bonds and is significantly underdeveloped (Kibua *et al.*, 2005). As compared to other EAC member countries, the Kenyan bond market is the largest and most developed. Beyond the EAC, financial markets in the Sub Saharan Africa (SSA) countries are shallow, and have inadequate access to finance (Adelegan and Radzewicz-Bak, 2009). Treasury bonds are an important component of a country's financial system and represent a critical component of central bank's monetary policy. They act as a benchmark interest rate and form part of the yield curve, which conveys important information for monetary policy (Biepke, 2004). Markets are said to be efficient if they quickly and correctly incorporate information into prices. This is important because many traders are unable to devote time and resources to gathering information given the cost this portends for them, preferring instead to depend on the market itself to properly reflect all available information in prices.

For uninformed traders who rely on information reflected by all the available information, a market that is inefficient is also unattractive because it means that trades may be made at unfavorable prices and if they realize that later they may be discouraged from trading. Aggressive bond investors must consider market liquidity, investment risks and interest rate behavior (IMF and World Bank (2001).

### **1.1.1 Treasury Bonds Uptake**

The Treasury bond market is a very large and liquid trading market. Its uptake looks at the subscription rates of issued bonds and is highly influenced by the market liquidity. Treasury securities are one of the safest income-earning investments although they usually pay lower rates of interest than other investment choices such as stock market. Governments borrow money

through bonds to finance their treasury and promise to repay this money plus an interest rate at a fixed time (maturity). Treasury bonds are important for a variety of public policies ranging from taxation issues and financial regulation. A government running a deficit finances its budget by floating treasury bonds (Ndung'u, 2013).

Bonds remain an important means for raising capital for the government (Becker and Ivashina, 2011). The uptake of Treasury bonds is higher in investors who are primarily interested in preserving capital or maintaining a consistent stream of income. Treasury bond uptake as shown by its demand and supply is impacted by factors such as wealth, expected interest rates, risk, liquidity and expected inflation. Factors affecting bond supply are importance of investment opportunities such as developmental projects, expected inflation and government fiscal activities (Ngugi, 2011).

Holding wealth in the form of money come with the opportunity cost of not earning the interest associated with investing in financial assets such as Treasury bonds explaining the direct relationship between wealth and bond demand. Economic actors heavily rely on expectations of long term changes in the economy to make important economic decisions on treasury bonds uptake (Mussa and Kihongo, 2011). This applies to interest rates expectations just as it does to other important economic indicators. Expectations that bond interest rates may rise in the future induces economic agents to postpone their demand for bonds in anticipation of investing in bonds offering higher returns when the expectation actually materializes. In contrast, expectations that bond interest rates may fall induces more people to invest in bond assets hoping

to cash in before the lower returns in the future sets in (Mishkin, 2004; Becker and Ivashina, 2011).

### **1.1.2 Determinants of Treasury Bonds Uptake**

Treasury bond is a medium to long term financial instrument issued by the Treasury or Central Bank of the relevant country on behalf of the Government to enable the Government borrow from the general public. The treasury bond is also known as the long term domestic debt. It can be purchased by both the citizens and foreigners. The bonds are usually of different types such as Fixed Coupon interest bond, Zero coupon interest bond, Floating interest rate bond and Infrastructure bond. Apart from the Zero coupon bond, the other bonds pay interest semiannually throughout the life of the bond with the principle amount payable at the end of the life of the bond (Grigorian, 2003).

Several factors determine the uptake of Treasury bonds. The micro and macro factors range from the economic factors to individual investors and bonds characteristics. When a bond is being floated, there are factors prevailing at any given time. These factors are liquidity, fixed coupon rate, floating rate bonds, infrastructure bonds, zero coupon bonds, the country's gearing ratio, the country's credit rating and years to maturity.

Market liquidity is the ease by which the clients can trade the Treasury bond in the secondary market and the initial issue. The investors would be willing to readily buy the Treasury bonds if they are assured of the active trading in the secondary market. Behind the failure of the Kenya Treasury bond market is the lack of integrity of issuance process and transparency by all involved regulatory and oversight bodies. The transparency of the Treasury bond transactions

may play a significant role towards the improvement of the Treasury bond uptake in Kenya. Kenyan economy has been unstable over the years due to lack of managed Treasury bonds. This has affected the lack of maintained sound public finance (Longstaff, Mithal and Neis, 2005).

The sensitivity of bond prices is considered a vital instrument in the treasury bond uptake. Changes in market interest rates are obviously of great concern to investors. The bond prices are influenced by the following three factors: time to maturity; coupon rate and yield to maturity. The bonds are usually of different types such as fixed Coupon interest bond, zero coupon interest bond, floating interest rate bond and infrastructure bond. Apart from the zero coupon bond, the other bonds pay interest semiannually throughout the life of the bond with the principle amount payable at the end of the life of the bond (Grigorian, 2003).

### **1.1.3 Relationship between Factors and Treasury Bonds uptake**

Determinants of Treasury bond uptake can either influence bond uptake directly or inversely. These indicators such as the government liquidity, fixed coupon bond, floating rate bonds, infrastructure bonds, zero coupon bonds, Country's gearing ratio, Country's credit rating and years to maturity are a clear determinant as to how controlled prices of treasury bonds provide a benchmark yield curve and help establish the overall credit curve, (Jianheng,2003). The price paid by the borrower to the lender for use of money during some interval is the interest rate. It is a cost to the issuer and a measure of return to the investor (Fabozzi, 2000).

Malkiel (1962), described the following five general properties sometimes known as the Malkiel's bond pricing relationships namely; that bond prices and yields are inversely related: as yields increases, bond prices fall; as yields fall, bond prices rise, an increase in bond's yield to



maturity results in a small price change than a decrease in yield of equitable magnitude, prices of long term bonds tend to be more sensitive to interest rate changes than prices of short term bonds, the sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases. The interest rates are directly proportional to bond maturity and are inversely proportional to the coupon rate of bonds. Prices of high coupon bonds are less sensitive to changes in interest rates than prices of low coupon bonds. Homer and Liebowitzs (1972) added a sixth property that established that the sensitivity of a bond's price to the change in its yield is inversely related to the yield to maturity at, which the bond sells.

Suppliers issue bonds in order to borrow money from investors, who cumulatively make up demand in a given bond market. What is unique about the bond market is that the most relevant and often quoted characteristic of a bond is not the price, but the interest rate. Bond prices are a function of, and inversely related to, the interest rate (Fixler, 2010). Therefore higher bond prices mean lower interest rate which encourages borrowing from the treasury bonds market other factors being constant.

#### **1.1.4 Treasury Bonds in Kenya**

Development of Kenya's bond market has been a dynamic process developed from elements that can be applied to other African markets. At the macro level, Kenya has established and strengthened institutions leading to credibility in implementing sound fiscal and monetary policies, improved the legal and regulatory environment, and liberalized its financial system and improved payments and settlement arrangements. This is the bedrock on which other reforms

were undertaken. The elements that led to rapid growth of the Kenya bond market are various, (Ngugi & Agoti, 2007). The government used Treasury bond for the first time in 1986 to finance budget deficit. As the budgetary deficit was worsening in the 1990s, overreliance on Treasury bills becoming expensive, foreign direct investment FDI into Kenya was deteriorating and relationship with key donors was soaring. This made the Treasury and the CBK to go long-term by use of Treasury Bonds (Kibua *et al.*, 2005). This was also intended to enhance stability in the securities market, lengthen maturities of domestic bonds as well as develop a yield curve for pricing treasury bonds (Ngugi & Agoti, 2007).

Initially, the country had a poor legal framework that did not properly anchor some debt market activities in the law. The lack of a legal basis hindered implementation in the market giving rise to avoidable risks and uncertainties. The Kenyan Government therefore enacted laws to provide the basic framework for how the bonds markets would operate in the country in particular how public debt will be procured and managed. The Internal Loans Act, Cap 420 (repealed) and now the Public Finance Management Act of 2012 provided the legal framework for the Minister for Finance to borrow on behalf of the Government from the domestic market through issuance of treasury bills and treasury bonds, with the Central Bank of Kenya appointed the fiscal agent. The law now provides for the establishment of a public debt management office, a sinking fund and provides for bond exchanges and buy-back operations which were not previously catered for (Jianheng, 2003).

Traditionally the Treasury Bond market in Kenya are dominated by institutions as investors such as National Social Security Fund, National Hospital Insurance Fund, Parastatals, Insurance

companies, Mutual funds organizations and the commercial Banks. This is because institutional investors prefer opportunities with stable regular income to enhance their liquidity to meet obligations as they fall due (Shiller, 1990). The sensitivity of bond prices to factors that may influence the Treasury bond uptake in Kenya is considered a vital instrument in the development of the bond market in the country.

## **1.2: Research Problem**

Debt and capital markets in Africa and other parts of the world have over the years played a very important role by providing governments and corporate entities with a platform to raise funds to enable them meet their funding needs. The Kenya's Vision 2030 is anchored on three pillars namely; social political and economic pillars. The economic pillars lays emphasis on the private sector led growth. Long-term finance, from the capital market, is crucial in financing infrastructure projects as well as for corporate growth. A domestic capital market is mainly composed of the commercial banks, the equity market, the non-banks financial institutions and the bonds market (Bose and Coondoo, 2003). The equity market is more developed than the bonds market in Kenya. Equity financing and long term debt have been more common with firms in Kenya. Various studies indicate that bond market in Kenya is thin and underdeveloped. The Treasury bond market has always had a lower trading activity than Treasury bond market (Ngugi and Agoti, 2007). It is the wish of this study to investigate factors that may significantly affect the Treasury bond uptake in Kenya.

However, as stated by Ndung'u (2013), though Kenya's bond market is well diversified, it needs to be developed further. Demand for bonds and bank loans triggers the flow of capital in the

market. By the end of 2014, ratio of Treasury bond market capitalization to GDP stood at 2% and ratio of Treasury bond market turnover to total bond market capitalization stood at 0.1%. This is contrasted by the ratio of equity market capitalization to GDP which stood at 50% in the same period (CMA, 2014). Without a demand for bonds and functioning bond market firms lack a clear measure of the opportunity cost of funds. They rely on commercial banks for debt financing and the same constraint that prevents the development of bond markets also leads banks to prefer short term credit which implies higher risks for business (Ndungũ, 2011).

Though a few studies have been done on treasury bonds in Kenya, its uptake and demand, study's findings have been inadequate to holistically bring out the factors determining Treasury bonds uptake. Ringui (2012) for instance did a study of the factors determining development of treasury bonds market in Kenya. The factors established by the study were political environment, investor base, and regulatory framework, size of the banking sector and cumbersome nature of issuance process. Ngugi (2011) did a study on the effect of regulation on infrastructure bonds uptake in Kenya. The regulatory factors negating the bond uptake were: regulations regarding the minimum initial subscription amount, tenure period and Skepticism regarding bond uptake. Bii (2009) looked at the underlying impediments to issuance of treasury bonds through NSE, but failed to address the whole issue of factors determining development of treasury bonds market. Thus, these studies failed to bring to the fore the factors affecting Treasury bonds uptake leaving a wide knowledge gap which this study sought to fill-in. The study, thus, investigated the factors determining the uptake of the Treasury bonds in Kenya.

### **1.3 Research Objective**

To establish the relationship between various factors and the uptake of the Treasury bonds in Kenya.

### **1.4 Value of the Study**

To the academicians, the study provides a useful basis upon which further studies on the TB uptake in Kenya could be conducted. This research makes a contribution to the academic literature on the field of financial institutions in Kenya where very little is known about its structure and applications. This study may benefit investors that need to understand the pricing of these security as well as the gains that result in investing in TB. This ultimately promotes the comfort level of current and potential investment in the security.

To the Government, the study is useful in policy formulation regarding regulatory requirements of The National Treasury through the resulting findings. It might act as a reference point by the Central Bank of Kenya, the Treasury department and in particular, the Capital Market Authority in managing the issuance and investment in Treasury bond.

This study sheds light on TB uptake among Kenya investors; hence creating awareness on who is investing on the security, how much of it is on offer and if so what the subscription level is. Investment advisors can advise clients in making investment decisions and inform them of its availability. Fund managers might also consider this investment options as part of their portfolio in line with their investment objectives and risk appetites. The study opens an avenue to scholars and form the basis for further research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews studies that have been done in the area of bond market development. The study is divided into sections; the first review on four theories that include, Efficient-Market Hypothesis, Expectation Theory of Term Structure of Interest Rates, Liquidity Preference Theory and Market Segmentation Theory. The other sections are on General literature review, Empirical review and finally on the summary of Literature review.

#### **2.2 Theoretical Review**

Several theories in finance and economics have endeavored to explain investor behaviour and preferences in securities markets. The Efficient Markets Hypothesis tries to explain the ability of financial markets to factor in all available information in the prices of various securities. The term structure of interest rates and liquidity preference theories try to explain the rationale behind investor preference and risk appetite with regard to the different maturity ranges of financial instruments.

However, in practice investors may be influenced by other financial markets developments in making their investment choices. For instance, an investor who is theoretically and traditionally biased towards short term bonds may be influenced by the high liquidity nature of a bond market to invest in medium to long term bonds (Bulla, 1992). The market segmentation theory explains

that investors in the short end are completely different from those at the medium and long end; however, institutional investors with a traditionally strong bias for short dated securities such as banks often find themselves venturing into long dated bonds depending on their perception of the liquidity of the bond market since they are almost certain of liquidating their bond holdings with ease.

### **2.2.1 Efficient-Market Hypothesis**

Fama (1970) explains that financial markets are "informationally efficient". The theory postulates that one cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis. There are three major versions of the hypothesis: "weak", "semi-strong", and "strong". The weak EMH claims that prices on traded assets (e.g., stocks, bonds, or property) already reflect all past publicly available information. Semi-strong EMH claims both that prices reflect all publicly available information and that prices instantly change to reflect new public information.

Strong EMH additionally holds that prices instantly reflect both public and privately available - "insider" information. According to Fama (2009) there is evidence for and against the weak and semi-strong EMHs, while there is powerful evidence against strong EMH. Past studies on NSE have supported the weak form efficiency.

In application of the theory, government efficient market as affected by competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future.

In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value (Juan, 2006).

### **2.2.2 Trade Off Theory**

In trade-off theory, a decision maker running a firm evaluates the various costs and benefits of alternative leverage plans. Often it is assumed that an interior solution is obtained so that marginal costs and marginal benefits are balanced. The original version of the trade-off theory grew out of the debate over the Modigliani-Miller theorem. When corporate income tax was added to the original irrelevance proposition this created a benefit for debt in that it served to shield earnings from taxes (Modigliani & Miller, 1963). Since the firm's objective function is linear, and there is no offsetting cost of debt, this implied 100% debt financing. To avoid this extreme prediction, an offsetting cost of debt is needed; the obvious candidate is bankruptcy.

Practically, idea that a government chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. The classical version of the hypothesis goes back to Kraus and Litzenberger (1973), who considered a balance between the dead-weight costs of bankruptcy and the tax saving benefits of debt. Often agency costs are also included in the balance. This theory is often set up as a competitor theory to the pecking order theory of capital structure. Increase in debt ó equity ratio leads to trade off between interest tax shield and bankruptcy costs hence increase in firm value.

### **2.2.3 Liquidity Preference Theory**

Keynes (2010) explained that investors prefer assets which are liquid and are prepared to pay a premium for liquidity or pay less than market value for illiquid securities. This is clearly



evidenced in the yield pricing of bonds where a long dated maturity pays higher interest than the one with a shorter maturity so as to entice investors to buy the less liquid, and more risky, bonds. This theory assumes that long dated bonds are harder to trade or sell than short dated bonds. This theory asserts that the yield curve will have an upward bias because investors prefer the greater certainty of short term gilts which are less volatile than long dated gilts; volatility tends to be greater the lower the coupon and longer the redemption date (Winfield & Curry, 1995). Some investors prefer to own shorter rather than longer term securities due to the greater liquidity nature associated with the former. Such investors will often require an incentive, in the form of a liquidity premium, for them to hold long term securities that are often associated with lower degree of liquidity.

Reily & Brown (2000) claim that uncertainty causes investors to favour short term issues over bonds with longer maturities because short term bonds can easily be converted to predictable amounts of cash should unforeseen cash requirements events occur. Although long term securities may be liquidated prior to their maturity, this theory argues, their prices are more sensitive to interest rate movements. In contrast, short term securities, due to their perceived liquid nature are more likely to be converted to cash without a loss in value.

#### **2.2.4 Market Segmentation Theory**

Winfield & Curry (1995) assert that borrowers and lenders at the short end of the market are entirely different from those at the long end and therefore, short term and long term interest rates are determined by the interplay of separate sets of demand and supply. According to Reilly and Brown (2000), different institutional investors have different maturity needs that lead them to

confine their securities selections to specific maturities segments; banks and general insurance companies are predominant investors at short end while life insurance companies and pension funds are at the long end.

The idea that firms pay attention to market conditions in an attempt to time the market is a very old hypothesis. Baker and Wurgler (2002), claim that market timing is the first order determinant of a corporation's capital structure use of debt and equity. In other words, firms do not generally care whether they finance with debt or equity, they just choose the form of financing which, at that point in time, seems to be more valued by financial markets. The theory states that a firm will utilize either equity or debt based on the market value of stocks. Equity financing is preferred when company's stock have high value compared to past and book value, hence lower cost of equity.

### **2.3 Empirical Review**

Pao, Pikas and Lee (2003) adopted four linear models (multiple regression model, variance-component model, first-order autoregressive model, and variance-component moving average model) with 10 independent variables to analyze the important determinants of debt markets. The results of their study showed that the determinants of debt markets of the high tech industry are asset structure, non-debt gearing ratio, growth, credit ratings, industries classification, years to maturity, earnings, volatility and profitability, but found credit ratings was the highest in significance.

Muhammad and Banafe (2002) carried out a study on development of debt markets in emerging economies with a special focus on the Saudi Arabian experience. The study, while acknowledging the importance of the secondary bond market, established that sufficient volumes of outstanding treasury bonds spread along certain key maturities stream is a major condition for boosting bond market uptake. They further found that this can be complemented by the establishment of private financial intermediaries, primary dealers, who would provide firm two-way price quotes which in essence provide a ready market for bonds in the secondary market. The aspect of having sufficient volumes of outstanding bonds is ingrained in the establishment of Treasury bond by concentrating issuances of bonds on a few tenors or maturities.

Panyanukul and Chabchitrchaidol (2005) carried out a study to identify the determinants of liquidity in the Thai bond market. The study used secondary data from the Bank of Thailand and Thai Bond Dealing Centre and they used both descriptive and inferential statistics to analyze the data. The study revealed that there exist a negative relationship between trading volume and bid-ask spread since when there is a high degree of liquidity, resulting from a high level of demand for trades, the spread between bid and offer prices will narrow. Their study was conducted in a relatively developed financial market and it would be good to find out how counterparts in developing financial markets like Kenya would perform.

Perraudin and Taylor (2003) examined the difference in spreads between liquid and illiquid treasury bonds in 46 Caribbean oil companies and estimated that relative illiquidity accounts for between 10basepoints and 40 basepoints of spread. They conclude that for high credit quality debt liquidity spreads are 16 as large (or larger) than risk premiums and much larger than

expected losses. De Jong and Driessen (2005) similarly found that lower-rated and longer-maturity treasury bonds have greater exposure to liquidity with an estimated liquidity premium for long-maturity investment grade bonds is around 45 basepoints.

Krishnamurthi (2002) studied the yield difference between on-the-run and off-the run 30 year bond yields and concluded that the yield difference results from a demand for liquid assets. These findings are consistent with the theory mooted by Duffie et al. (2002) and Vayanos and Weill (2005). Longstaff (2004) found that the yield differential between zero-coupon Treasury and Resolution Funding Corporation (a government agency) bond yields range from 10 to 16basepoints. The liquidity premium is larger for long-term bonds, representing around 10%-15% the value of Treasury bond.

Webber (2007) did a study on the determinants of treasury bonds uptake using a structural model and demonstrated that market segmentation and liquidity both appear to have increased abruptly during the recent financial market turmoil. The study concluded that the underestimation of bond spreads from structural models may not stem from an inability to properly account for treasury bonds uptake but rather from other factors such as liquidity, fixed coupon bonds, gearing ratio and credit ratings.

Kumar and Woo (2010) studied the impact of high public debt on long-run economic growth for a panel of advanced and emerging economies over 1970-2007 using a multiple regression model. The findings of the study were contrasting to those of Taylor, (2003), since the study exhibited a strong non-linear negative impact of Government debt on economic growth. Their empirical results suggest an inverse relationship between initial debt and subsequent bond uptake: on

average, a 10 percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of around 0.2 percentage points per year, with the impact being somewhat smaller in advanced economies.

Mbewa *et al.*, (2007) carried out a study on the development of the bond market in Kenya. The study was carried out through a situational analysis of the bonds market by examining the performance of the market, appropriateness of the institutional set up and the policy development. The study established that Kenya's bond market, at the time, was far from what can be referred to as a developed bond market.

Ngugi and Agoti (2007) analyzed the microstructure characteristics of the bonds market in Kenya and the factors that influence these characteristics. The study used traded values and trading activity measured by the number of deals to capture liquidity. The study showed that a higher number of deals have a positive relationship with the traded value of the bonds hence the higher the number of deals the higher the liquidity.

Amante *et al.*, (2007) in their study on liquidity in the Brazilian domestic treasury bond market found out that in an effort to improve the liquidity of treasury bonds, the Central Bank of Brazil, among a host of other measures, introduced treasury bond issues through a reduction in the frequency of offerings and a concentration of issues in a few maturities along the yield curve. In their concluding remarks, they noted that the ability by Brazil to develop a highly liquid fixed income market has helped in reducing transaction costs to financial market participants and also a recognized reference curve for economic agents. This study, although in a relatively higher active bond market, relates strongly with the efforts of the Central Bank of Kenya to introduce

Treasury bond partly to eliminate the problem of bond fragmentation to boost liquidity hence the need to study the impact of Treasury bond on liquidity of bond market in Kenya.

Were (2010) identified the factors influencing the development of corporate bonds market in Kenya. The objective of the study was to investigate the corporate bonds market development in companies listed in the NSE. A descriptive approach was adopted and a census method was used to collect the information. The study found out that the key challenge towards a developed corporate bond market was hinged on the regulatory framework touching on inadequate disclosure of information on public debt issuance measures, market structures such as repurchase agreements (repo) and transparency. A developed corporate bond market segment arises from an efficient Treasury bond market since the latter acts as a treasury not only for pricing but also for product structuring purposes.

Bulla (2012) sought to investigate market impediments to issuance of corporate bonds at the exchange. The general objective was to test the significance of issuance procedure, cost of issue, state of secondary market and level of transparency in attracting corporate bonds to the market. Methodology was to survey selected finance officers from the listed companies and stockbrokers to determine if they thought the factors had retarded growth of the public debt market and offering opinion on how the situation could be reversed. Analysis of data was conducted using chi-square which returned a no- difference between observed and expected value for the factors under study. The significance level was 0.05 for each impediment tested. The findings showed that bonds as debt instruments are a cheaper source of external capital for companies when interest rates are comparatively low. The market impediments were found to hold some answers

to why the Kenya's corporate bond market lags behind the equity market and other markets in Africa like South Africa and Egypt. The study recommended that the secondary market for bonds should be developed both for cash transactions and derivatives while domestic and foreign investors and issuers encourage to participation in local and foreign currencies.

Karanja (2014) investigated the determinants of corporate bonds issuance by listed firms in the Nairobi Securities Exchange, Kenya. The study was done on the eleven companies that had issued Corporate Bonds in Kenya from 2001 to 2013. The study findings established that tenure period of corporate bonds affects their demand. Investors being rational are skeptical about postponing consumption of money for longer period of time and would rather invest in short-term periods. The higher the frequency of redemption of the principle reduces the return of the bonds as it affect interest generating ability of the bonds, thus investors don't prefer higher short redemption periods. Besides, long subscription period of corporate bonds affect investments in the same. The study recommended that in order to increase bond subscription, the issuers should address the regulations governing the particular issue especially the regulations on the tenure period which should be shorter.

Ngugi and Afande (2015) sought to examine the motivations for issuance of corporate bonds among the firms listed on the Nairobi Stock Exchange. A descriptive survey focusing on all the 56 firms listed on the Nairobi Stock Exchange. Findings of the study indicate that reputation and liquidity incentives influence issuance of corporate bonds. The findings indicate that companies float bonds to get cash to solve liquidity problems. In addition, liquidity depends on long term investments and good liquidity in the market reduces the cost of funding. Net worth indicators

have a very low influence on the issuance of a corporate bond; majority of the respondent considers debt and equity as a ratio influence the issuance of bonds.

#### **2.4 Summary of Literature Review**

There is the need to investigate the specific factors affecting uptake in Kenya. This is due to the research gap that exists as no study has been done to investigate factors affecting uptake in Kenya despite their crucial role in growth of bond market.

The available literature provides insights on how Treasury bond affects the growth of bond markets in different contexts. Due to contextual and levels of bond market development in different markets or economies, issues of effects of factor affecting treasury bond uptake should be undertaken with a view to making relevant recommendations that can improve the bond uptake in Kenya which in turn have a positive effect on the economic growth. It is in this light that the researcher carries out a study on the factors affecting Treasury bond uptake in Kenya.



# **CHAPTER THREE**

## **RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter deals with the procedures that were used in conducting the study. It set out the various stages and phases that was followed in completing the study. It identified the procedures and techniques that were used in the collection, processing and analysis of data. The following subsections were included; research design, target population, sample design, data collection and data analysis.

### **3.2 Research Design**

This study used a descriptive survey. A descriptive study attempts to describe or define a subject, often by creating a profile of a group of problems, people, or events, through the collection of data and tabulation of the frequencies on research variables or their interaction as indicated by Cooper and Schindler (2003). The design best suits this study since it allowed for an in-depth study of the bond market prior to and after the introduction of the Treasury bond programme. It also focused the study on gaining a rich understanding of the context of the research and the process that was followed.

### **3.3 Population**

The target population for this survey is the Treasury bonds issued between 2001 and 2014. This implies that the information on these variables will be available to be included in the data. The

treasury Bonds issued are on monthly basis, leading to a total population of:  $12 \times 14 = 168$  Issues (CBK, 2009-2010). Out of these, a target sample of size 60, 15 for each category in terms of Fixed coupon Bond, Floating Interest Bond, Zero Coupon Bond and Infrastructure Bond, was randomly selected. This is calculated to 35% of the population. At least 30% of the total population is a good representative of the whole (Kothari, 2004).

### **3.5 Data Collection**

This study made use of secondary data on bond issuance from the Central Bank of Kenya. This data is available at the CBK and the Nairobi Securities Exchange libraries.

### **3.6 Data Analysis**

Pearson Product-Moment Correlation Coefficient as measures of association was used to examine the relationship between the variables and bond market uptake. Analysis was done with the help of Statistical package for social scientists (SPSS version 20) complemented by Microsoft Excel. First, data collected was cleaned, sorted and collated. Then, data was entered into the computer, after which analysis was done. Descriptive statistics such mean score, frequencies and percentages for each variable was calculated and tabulated using frequency distribution tables, or pie charts and/or bar charts to describe the characteristics of the data.

Descriptive analysis was conducted on quantitative data. Descriptive statistics included: mean, standard deviation, percentages and frequency distribution. Inferential statistics was conducted using product moment correlation technique. The study used Pearson correlation coefficient to test the significance of the linear relationship between variable. Correlation coefficient values

ranging between -1 and 1 which measures the degree to which two variables are linearly related with the higher magnitude indicating higher degree of association between two variables (Adejimi, Oyediran and Ogunsanmi, 2010). This analysis was conducted at 95% confidence level.

### 3.6.1 Analytical Model

The Simple Regression was used to analyze the effect of each independent variable on the Bond uptake in Kenya. The independent variables are: rate of interest liquidity, fixed coupon bond, floating rate bonds, infrastructure bond, zero coupon bonds, gearing ratio, credit rating, years to maturity.

The multiple regression below was used to analyze the effect of all the selected independent variables on the bond uptake as the dependent variable. The study used regression equation similar to Poghosyan (2012) and Karanja (2014) who studied determinants of corporate bonds uptake. As stated by Amante, Araujo and Jeanneau (2007), correlation matrix however was used to isolate the independent variable with high correlation.

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e$$

Where: Y= Uptake of treasury bonds

$\alpha_0$  = Constant to be estimated by the model

$\beta_i$  = Coefficient indicating influence of independent variables on the dependent variable.

$X_1$  = Rate of interest

$X_2$  = Liquidity

$X_3 =$  Country's gearing ratio

$X_4 =$  Country's credit rating

$X_5 =$  Years to maturity.

$X_6 =$  Fixed coupon bond

$X_7 =$  Floating rate bonds

$X_8 =$  Infrastructure bonds

$X_9 =$  Zero coupon bonds

= error term

**Table 3.1: Operationalization of Study Variables**

<b>Variable</b>	<b>Definition</b>	<b>Measurement</b>
Uptake of Treasury Bond		Measured by subscription rate of the Treasury Bonds
Rate of Interest	Amount charged on borrowings as a proportion of the principal	Measured as the average bank lending rate for the year
Liquidity	Extent to which a market allows assets to be bought and sold without affecting the asset's price	Measured as the market's bid-ask spread
Gearing Ratio	Financial risk to which bond investors are subjected, based on country's indebtedness	Measured as debt to equity ratio
Credit Rating	Estimate of the ability of a country to fulfill its financial commitments (credit worthiness)	Measured by the country's Moody rating score
Years To Maturity	Maturity is the time between when the bond is issued and when it matures (its maturity date),	Measured as the remaining time in years to bond maturing
Fixed Coupon Bond	Bonds with a fixed coupon rate	Measured as bonds coupon rate
Floating Rate Bond	Bonds that have a variable coupon	Dummy, measured as one for floating coupon bonds or zero otherwise
Infrastructure Bond	Borrowings to be invested in government funded infrastructure projects	Dummy, measured as one for infrastructure bonds or zero otherwise
Zero Coupon Bond	Bond issued at a deep discount to its face value but pays no interest	Dummy, measured as one for zero coupon bonds or zero otherwise

This model defines the regression equation used in this study, a negative/positive relationship is expected between bonds proxy measures and frequency of bond market proxy as a measure of the strength of linear association between the four variables. The study used zero coupon bonds, infrastructure bonds, and floating rate bonds as dummy variables.

## CHAPTER FOUR

### DATA FINDINGS AND ANALYSIS

#### 4.1 Introduction

This chapter presents the findings on how several factors affect the uptake of Treasury bonds. The study assessed bond market performance for a twelve year period; between 2001 and 2014. To achieve the study's objective, the data obtained was analyzed through descriptive statistics, correlation, and multiple linear regression analysis.

#### 4.2 Descriptive Statistics

Table 4.1 presents the descriptive statistics and the distribution of the variables considered in this research: rate of interest, liquidity, country's gearing ratio, years to maturity, fixed coupon bond, floating rate bond, infrastructure bond and the zero coupon bond. The descriptive statistics considered were minimum, maximum, mean, standard deviation, skewness and kurtosis.

Table 4.1 shows that the rate of interest had a mean of 0.225 and standard deviation of 0.1535. That is, rate of interest accounts, on average, 22.5% of the uptake of treasury bonds. However, the value went as high as 73% and as low as 1%. Liquidity calculated an average of .4624. That is, liquidity explained 46.24% of the uptake of treasury bonds in Kenya. The value was noted to fluctuate from a high as 48% and as low as 45%. The country's gearing ratio was noted to calculate an average of 0.7707. This implied that the gearing ratio explained 77.07% of the changes in treasury bonds uptake in the country. This value went as high as .97 and as low as

0.38. The country's credit rating had a mean of 0.6307; this indicated that the country's credit rating explained 63.07% of the uptake of treasury bonds in Kenya. The study also noted that the values went as high as .85 and as low as .27. The mean value for the years to maturity, was calculated to a mean of 0.5550 which implied that the years maturity explained 55.5% of the changes in the uptake of treasury bonds in Kenya. This value went as high as 0.84 and as low as .22.

Mean value of the fixed coupon bond was on average 0.6624 which denotes that it, averagely 66.24% of the changes in the uptake of treasury bonds was explained by fixed coupon bonds. However, the values went as low as 35% and as high as short as 92%. Floating rate bonds, on average, was .7712. That is averagely 77.12% of the uptake of the treasury bonds was explained by floating rate bonds. This values were however noted to fluctuate to percentages as high as 99% and as low as 31%. Infrastructure bonds were calculated to .4462, this calculated to 44.62% of the changes in the uptake of treasury bonds. However these values were noted to go as high as 75% and as low as 22%. The study thus noted that all the independent variables had each some level of explanation to the uptake of the country's treasury bonds.



**Table 4.2: Descriptive Statistics**

	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
<b>Rate of interest</b>	.01	.73	.2250	.1535	.900	.289	.707	.570
<b>Liquidity</b>	.45	.48	.4624	.6011	.892	.289	2.105	.510
<b>Country's gearing ratio</b>	.38	.97	.7707	.3609	2.520	.314	10.109	.533
<b>Country's credit rating</b>	.27	.85	.6307	.6528	1.451	.259	3.779	.524
<b>Years to maturity</b>	.22	.84	.5550	.2575	.927	.159	.787	.534
<b>Fixed coupon bond</b>	.35	.92	.6624	.6311	.572	.199	2.123	.528
<b>Floating rate bond</b>	.31	.99	.7712	.3610	2.347	.314	10.144	.518
<b>Infrastructure bond</b>	.22	.75	.4622	.2528	1.051	.189	2.579	.512
<b>Zero coupon bond</b>	.45	.48	.4624	.6011	.292	.089	1.105	.589

### 4.3 Regression Analysis

The study conducted multiple regression analysis of:

$$Y = \beta_0 + \beta_1\chi_1 + \dots + \beta_9\chi_9 + \varepsilon$$

$\beta_0$  is the regression model constant;  $\beta_1 - \beta_9$  are the regression coefficients. Y is the Treasury Bond Uptake depicted by the ratio of the amount subscribed/amount issued to the extent

oversubscribed.  $\chi_1$  is the rate of interest;  $\chi_2$  is liquidity;  $\chi_3$  is Country's gearing ratio;  $\chi_4$  is Country's credit rating,  $\chi_5$  is years to maturity;  $\chi_6$  is fixed coupon bond;  $\chi_7$  is Floating Rate Bonds;  $\chi_8$  is infrastructure bonds;  $\chi_9$  is zero coupon bonds and  $\varepsilon$  is the error term.

**Table 4.3: Model Goodness of Fit**

<b>R</b>	<b>R Square</b>	<b>Adjusted Square</b>	<b>R</b>	<b>Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
.993 <sup>a</sup>	.986	.954		21.99424	2.103

a. Predictors: (Constant), Rate of Interest, Liquidity, Gearing Ratio, Credit Rating, Years to Maturity, Fixed Coupon Bond, Floating Rate Bonds, Infrastructure Bonds, Zero Coupon Bonds

b. Dependent Variable: Uptake of Treasury Bonds

Table 4.7 above presents the regression model goodness of fit to establish if regression analysis is suited for the data. Pearson Correlation value of 0.993 was established depicting that the independent variables (rate of interest, liquidity, gearing ratio, credit rating, years to maturity, fixed coupon bond, floating rate bonds, infrastructure bonds, zero coupon bonds) had a very good linear relationship with the dependent variable (Treasury bond uptake). An R-square value of 0.986 was established depicting that this relationship was very strong and the independent variables influences 98.6% of the investors's decision to invest in Treasury bonds offered.

A Durbin Watson test for autocorrelation value of 2.103 was established depicting no (serial) autocorrelation within the regression model residuals. Thus, the random (non-stationary) data was used in the regression analysis.

**Table 4.4: Collinearity Statistics**

<b>Variables</b>	<b>Tolerance</b>	<b>VIF</b>
Liquidity	.947	1.056
Credit Rating	.272	3.679
Rate of Interest	.330	3.032
Floating Rate Bonds	.101	9.885
Gearing Ratio	.857	1.167
Infrastructure Bonds	.776	1.288
Zero Coupon Bonds	.203	4.931
Years to Maturity	.151	6.633
Fixed Coupon Bond	.332	3.010

In line with the Durbin Watson statistics, Table 4.8 shows the collinearity statistics. For tolerance and VIF, value less than 0.1 and above 10.0 suggested multicollinearity. The values of tolerance were greater than 0.1 and those of VIF were less than 10. This shows lack of multicollinearity among independent variables.

**Table 4.5: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	135599.943	9	15066.660	27.212	.003b
Residual	401,992.926	831	483.746		
Total	537,592.869	840			

a. Dependent Variable: Uptake of Treasury Bonds

b. Predictors: (Constant), Rate of Interest, Liquidity, Gearing Ratio, Credit Rating, Years to Maturity, Fixed Coupon Bond, Floating Rate Bonds, Infrastructure Bonds, Zero Coupon Bonds

Analysis of Variance (ANOVA) analysis was conducted to determine the significance of the regression model. An F-value of 27.212 at  $p = .003$  significance was established depicting that the regression model had high significance (confidence level) ( $p < 0.05$ ).

**Table 4.6: Regression Coefficient**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	21.154	9.217		2.366	.077
Liquidity	6.503	.428	.809	4.175	.015
Credit Rating	1.326	.574	1.640	2.998	.043
Rate of Interest	-5.005	1.764	-4.851	-2.837	.047
Floating Rate Bonds	1.683	1.293	2.253	4.301	.013
Gearing Ratio	-.742	1.400	-1.887	-3.530	.034
Infrastructure Bonds	.711	1.354	1.631	3.525	.035
Zero Coupon Bonds	1.648	.884	3.523	3.865	.026
Years to Maturity	.247	.593	.542	3.416	.039
Fixed Coupon Bond	-1.965	1.339	-2.948	-3.468	.036

a. Dependent Variable: Uptake of Treasury Bonds

The study established the following regression model:

$$\text{Uptake} = 21.154 + 6.503 * \text{Liquidity} + 1.326 * \text{Credit Rating} - 5.005 * \text{Rate of Interest} + 1.683 * \text{Floating Rate Bonds} - 0.742 * \text{Gearing Ratio} + 0.711 * \text{Infrastructure Bonds} + 1.648 * \text{Zero Coupon Bonds} + 0.247 * \text{Years to Maturity} - 1.965 * \text{Fixed Coupon Bond}$$

The study established that when the rate of interest, liquidity, gearing ratio, credit rating, years to maturity, fixed coupon bond, floating rate bonds, infrastructure bonds and zero coupon bonds are zero, the Treasury bond uptake would be 21.154 depicting that subscription be above the amount offered.

The study also established that holding other factors constant at a time, a unit increase in liquidity of Treasury bonds would lead to a 6.503 increase in uptake; a unit increase in credit rating would yield a 1.326 increase in uptake; a unit increase in floating rate bonds would result

in a 1.683 increase in Treasury bond uptake; a unit increase in infrastructure bonds would lead to a 0.711 increase in bond uptake; a unit increase in zero coupon bonds would yield a 1.648 increase in uptake; while a unit increase in years to maturity would yield a 0.247 increase in Treasury bond uptake.

On the other hand, a unit increase in fixed coupon bond would yield a 1.965 decrease in Treasury bond uptake; a unit increase in Country's gearing ratio would yield a 0.742 decrease in Treasury bond uptake; and, a unit increase in rate of interest would yield a 5.005 decrease in Treasury bond uptake. This depicts that while liquidity of the bond market, Country's credit rating, floating rate bonds and zero coupon bonds increase the uptake of Treasury bonds, rate of interest, fixed coupon bond and Country's gearing ratio negates the same.

#### **4.4 Summary and Interpretation of the Findings**

The study established that Country's gearing ratio ( $p = .034$ ) is highly negatively related to Treasury bond uptake while its Credit Rating ( $p = .043$ ) is positively related to the same. Gearing ratios which shows the country's indebtedness including external debt amortization, interest payments, and the amount of short-term debt, which together with the fiscal balance and the current account balance characterize the country's gross financing needs (Karanja, 2014). On the other hand Credit rating shows the Country's ability to finance its debt. It is therefore expected that gearing ratio variable to have a negative impact on Treasury bond uptake, with greater financing needs implying greater compensation for risk.

Credit rating is linked to a sustainable level of external indebtedness and factors that affect it, such as the current account balance. It expresses of how likely the assigning credit rating agency thinks it is that the country will pay back its debts. It also influences the interest rates the Country will have to pay on its debt; if its debtholders know the debt will be paid back, they do not have to price the chance of default into the interest rate (Bodie, Kane & Marcus, 2008). Thus, the study established that interest rate (-5.005,  $p = .047$ ) will have a negative influence on Treasury bond uptake.

Liquidity conditions remain important determinants of Treasury bond uptake. The study established that liquidity (6.503,  $p = .015$ ) is positive and highly significant. Liquidity conditions in the bond market are affected by the economic environment (Dong, Kempf and Yadav, 2007). Liquidity is characterized by a high level of trading activity in the Bond market characterized by ease of purchase or sale. According to Driessen (2005), liquidity and credit risk have long been perceived as two justifications for the existence of the yield spreads above benchmark Treasury bonds. The finding shows that zero return percentage is more related to yield spread.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter is a synthesis of the entire study, and contains summary of research findings, exposition of the findings, commensurate with the objectives, conclusions and recommendations based thereon.

#### 5.2 Summary of the Findings

The study presented the descriptive statistics and the distribution of the variables considered in this research: rate of interest, liquidity, country's gearing ratio, years to maturity, fixed coupon bond, floating rate bond, infrastructure bond and the zero coupon bond. The descriptive statistic considered were minimum, maximum, mean,

The study showed that the rate of interest had a mean of 0.225 and standard deviation of 0.1535. That is, rate of interest accounts, on average, 22.5% of the uptake of treasury bonds. However, the value went as high as 73% and as low as 1%. Liquidity calculated an average of .4624. That is, liquidity explained 46.24% of the uptake of treasury bonds in Kenya. The value was noted to fluctuate from a high as 48% and as low as 45%. The country's gearing ratio was noted to calculate an average of 0.7707. This implied that the gearing ratio explained 77.07% of the changes in treasury bonds uptake in the country. This value went as high as .97 and as low as

0.38. The country's credit rating had a mean of 0.6307; this indicated that the country's credit rating explained 63.07% of the uptake of treasury bonds in Kenya.

Pearson Correlation value of 0.993 was established depicting that the independent variables (rate of interest, liquidity, gearing ratio, credit rating, years to maturity, fixed coupon bond, floating rate bonds, infrastructure bonds, zero coupon bonds) had a very good linear relationship with the dependent variable (Treasury bond uptake). An R-square value of 0.986 established depicted that this relationship was very strong and the independent variables influences 98.6% of the investors' decision to invest in Treasury bonds offered. Durbin Watson test for autocorrelation value of 2.103 was established depicting no (serial) autocorrelation within the regression model residuals

The study conducted formal detection-tolerance or the variance inflation factor (VIF) for multicollinearity. For tolerance, value less than 0.1 suggest Multicollinearity while values of VIF that exceed 10 are often regarded as indicating multicollinearity. The values of tolerance were greater than 0.1 and those of VIF were less than 10. This shows lack of multicollinearity among independent variables.

The study established that when the rate of interest, liquidity, gearing ratio, credit rating, years to maturity, fixed coupon bond, floating rate bonds, infrastructure bonds and zero coupon bonds are zero, the Treasury bond uptake would be 21.154. The study also established that holding other factors constant at a time, a unit increase in liquidity of Treasury bonds would lead to a 6.503 increase in uptake; a unit increase in credit rating would yield a 1.326 increase in uptake; a unit increase in floating rate bonds would result in a 1.683 increase in Treasury bond uptake; a unit



increase in infrastructure bonds would lead to a 0.711 increase in bond uptake; a unit increase in zero coupon bonds would yield a 1.648 increase in uptake; while a unit increase in years to maturity would yield a 0.247 increase in Treasury bond uptake.

On the other hand, a unit increase in fixed coupon bond would yield a 1.965 decrease in Treasury bond uptake; a unit increase in Country's gearing ratio would yield a 0.742 decrease in Treasury bond uptake; and, a unit increase in rate of interest would yield a 5.005 decrease in Treasury bond uptake. This depicts that while liquidity of the bond market, Country's credit rating, floating rate bonds and zero coupon bonds increase the uptake of Treasury bonds, rate of interest, fixed coupon bond and Country's gearing ratio negates the same.

The study also established Liquidity is characterized by a high level of trading activity in the Bond market characterized by ease of purchase or sale. According to Driessen (2005), liquidity and credit risk have long been perceived as two justifications for the existence of the yield spreads above benchmark Treasury bonds. The finding shows that zero return percentage is more related to yield spread. In summary the study noted that all the variables taken into account that is liquidity, credit rating, rate of interest, floating rate bond, gearing ratio, infrastructure bonds, zero coupon bonds, and years to maturity and fixed coupon bonds had significant influence on the uptake of treasury bonds.

### **5.3 Conclusions**

Investors being rational are skeptical about postponing consumption of money for longer period of time and would rather invest in short-term periods. Thus they are hesitant to invest in bonds

that take longer time to mature. The study concluded that the higher the frequency of liquidity of the principle reduces the return of the bonds as it affect interest generating ability of the bonds, thus investors don't prefer higher short redemption periods.

It was concluded that long years to maturity of Treasury bonds affect investments in the same issue. This follows that some investors take longer to decide on whether to invest in the bond and/or others look to financial resources for the same thus short period cut them off. Interest rate is the major revenue centre for Treasury bonds, thus, the higher the interest, the higher the return. Thus, investors prefer higher interest generating bonds.

#### **5.4 Recommendations**

There are many other factors that affect the uptake of treasury bonds not taken into account, due to its limited scope, the impact of most of the other factors other than the bonds themselves was not critically dealt with, the issue of public perception of treasury bonds was also not dealt with. There is thus need for further studies on the influence of public perception on the uptake of treasury bonds in Kenya. The study recommends that in order to increase bond subscription, the issuers should address the regulations governing the particular issue. Of more importance are the regulations on the tenure period which should be short and principle redemption structure to be reduced as this increases the interest generating ability of the bonds making it more attractive.

From the study findings there is need to create awareness on the role of bond market in the economy. Further there is need to establish how sound macroeconomic policies influence the uptake of treasury bonds. The study also recommends that bond markets should have an important role to play when it comes to providing financing to small and medium enterprises in the country.

### **5.5 Limitations of the Study**

One of the limitations of this study was the time engaged in the collection, analysis and interpretation of data. The voluminous data required plenty of time to collate and check for quality. This is especially so because the required data was not available in one file, format or location and had to be collated from several different sources. The cost of obtaining some of the data was also inhibitive with each yearly data set being sold separately. For some of the inputs, the data had to be purchased on a month by month basis making the cost even more prohibitive.

The study findings established that there have been fewer Treasury bond issues; thus, the study could be limited by the low number of cases or observations with regards to Treasury bonds. This could have affected the outcome of the analysis. Treasury bond issuance could have been affected by other factors other than those studied such as inflation, GDP performance, exchange rate and other macro-economic aggregates that were hard to isolate from the study.

### **5.6 Areas for Further Research**

The study recommends that further studies can be done on the effect of inflations and exchange rate on the treasury bond uptake/investment. Further studies can also be on the factors

influencing treasury bond investment decisions. The study majorly considered liquidity, credit rating, rate of interest, floating rate bonds, gearing ratio, infrastructure bonds, zero coupon bonds, years to maturity and fixed coupon bonds as the major factors influencing the uptake of treasury bonds. Further studies should be carried out to establish the other factors that may have an influence on the uptake of treasury bonds.

Furthermore, investigation may be done to establish the effect of other determinants of the uptake of treasury bonds outside this study. Additionally, further studies should be done on the effects of bond market determinants on the bond market size. A similar study should also be done to include other emerging economies in the East African region as well as members of the Common Market for Eastern and Southern Africa.

The market for Treasury bonds is vast and serves important functions for numerous investors. The characteristics and behavior of the market are not static but instead evolve with the changing objectives and needs of both the Treasury and investors. There is thus the need to study effects of the bond market characteristics such as introduction of indexed debt securities, budgetary needs, and changes in the way Treasury securities are traded on the uptake of treasury bonds.

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## APPENDICES

### Appendix I: Treasury Bonds Tenure Structure

	Treasury Bond – Tenure Structure															Total
	1	2	3	4	5	6	7	8	9	10	11	12	15	20	25	
<b>2001</b>	6	3	5	1	1	1	0	0	0	0	0	0	0	0	0	<b>17</b>
<b>2002</b>	4	7	5	3	5	1	0	0	0	0	0	0	0	0	0	<b>25</b>
<b>2003</b>	3	2	4	3	3	3	2	2	2	2	0	0	0	0	0	<b>26</b>
<b>2004</b>	5	5	2	2	1	2	2	1	0	0	0	0	0	0	0	<b>20</b>
<b>2005</b>	6	5	3	2	2	1	0	0	0	0	0	0	0	0	0	<b>19</b>
<b>2006</b>	3	4	4	1	2	2	2	1	1	2	1	1	0	0	0	<b>24</b>
<b>2007</b>	3	5	1	1	3	1	1	1	0	1	0	1	3	0	0	<b>21</b>
<b>2008</b>	3	5	0	0	4	0	0	0	0	3	0	0	1	1	0	<b>17</b>
<b>2009</b>	1	3	0	0	1	0	0	0	0	1	0	0	1	0	0	<b>7</b>
<b>2010</b>	4	0	0	0	2	0	0	0	0	2	0	0	2	0	1	<b>11</b>
<b>2011</b>	1	4	0	0	1	0	0	0	0	0	0	0	0	1	0	<b>7</b>
<b>2012</b>	3	4	0	0	5	0	0	0	0	1	0	0	1	1	0	<b>15</b>
<b>2013</b>	2	3	1	1	3	0	0	0	0	2	0	0	1	1	0	<b>15</b>
<b>2014</b>	1	3	2	1	3	1	0	0	0	2	0	0	2	1	0	<b>16</b>

**Appendix II: Treasury Bonds Trading Deals 2001-2014**

	200 1	200 2	200 3	200 4	200 5	200 6	200 7	200 8	200 9	201 0	201 1	201 2	201 3	201 4
January	27	112	98	97	152	66	123	61	111	362	195	194	290	325
Feb	28	48	93	99	58	198	176	38	158	430	440	177	417	473
March	28	41	76	112	38	95	101	119	133	430	311	153	303	328
April	84	57	91	95	40	67	59	79	98	321	220	179	276	308
May	18	52	71	97	65	65	91	47	94	354	197	279	364	421
June	28	60	71	172	112	89	145	34	258	101 5	307	124	416	439
July	60	63	111	68	86	80	91	50	157	891	220	217	426	466
August	136	116	149	82	83	82	64	108	144	551	301	477	585	674
Sept	63	123	88	102	83	43	63	118	330	602	263	495	568	636
Oct	54	100	128	41	107	136	129	118	140	288	196	436	443	512
Nov	71	130	76	72	59	41	38	49	112	259	81	227	243	276
Dec	20	51	116	99	106	55	107	89	200	235	174	174	218	232
<b>Total</b>	<b>617</b>	<b>953</b>	<b>1168</b>	<b>1136</b>	<b>989</b>	<b>1017</b>	<b>1188</b>	<b>910</b>	<b>1935</b>	<b>5738</b>	<b>2905</b>	<b>3132</b>	<b>4548</b>	<b>5090</b>

**Appendix III: Treasury bonds determinants 2001-2014**

	<b>Credit ratings</b>	<b>Interest rate</b>	<b>Liquidity</b>	<b>Floating rate bonds</b>	<b>Gearing ratio</b>	<b>Infrastructure bonds</b>	<b>Zero coupon bonds</b>	<b>Years to maturity</b>	<b>Fixed coupon bond</b>
2001	1.18	3.34	0.87	0.90	0.10	0.09	0.87	0.10	0.39
2002	0.91	5.39	0.64	0.96	0.06	0.12	0.93	0.06	0.12
2003	1.82	1.77	1.06	0.67	0.01	0.07	0.77	0.08	0.17
2004	0.78	2.14	0.35	0.94	0.01	0.10	0.93	0.13	0.16
2005	1.31	9.67	0.90	0.95	0.03	0.05	0.92	0.12	0.05
2006	1.57	21.62	0.96	0.97	0.01	0.22	0.94	0.11	0.22
2007	1.45	7.31	0.76	0.97	0.07	0.24	0.95	0.27	0.24
2008	0.75	9.35	1.03	0.94	0.14	0.08	0.98	0.14	0.28
2009	5.86	6.32	1.30	0.94	0.03	0.09	0.95	0.03	0.19
2010	6.30	2.90	1.18	0.83	0.35	0.20	0.79	0.39	0.26
2011	1.80	1.52	0.54	0.62	0.03	0.22	0.62	0.03	0.12
2012	3.02	2.34	0.86	0.82	0.03	0.20	0.83	0.03	0.26
2013	5.05	2.78	1.07	0.91	0.04	0.05	0.94	0.04	0.05
2014	4.13	4.54	1.70	0.89	0.12	0.22	0.90	0.19	0.24

