

**THE EFFECT OF GOVERNMENT BENCHMARK BONDS  
PROGRAMME ON THE LIQUIDITY OF BOND MARKET IN  
KENYA**

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## DECLARATION

I declare that this is my original work and has not been submitted for a degree in this or any other University for examination.

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## **DEDICATION**

I dedicate this project to my dear parents Julius Mwangi and Agnes Njeri Mwangi who gave me encouragement throughout the course. To my wife and Daughter, I say a big thank you for your moral and material support that you accorded me during the research process. All praise goes to our Almighty Father.

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## **ABSTRACT**

The main objective of this study was to determine the effect of benchmark bonds on the liquidity of bond market in Kenya. In detail, the study sought to establish whether tradefrequency bid-ask spread, tenor structure and volume of issuance influences the liquidity in bond market in Kenya.

This study was conducted through analysis of secondary data on Government bonds. The population of this study consisted of government bonds issued between 2001 and 2012. This data is available at the CBK Library and can also be obtained from the NSE or other licensed data vendors such as Reuters or Bloomberg. To identify the effect of benchmark bonds on liquidity of bond market, the study considered yearly average statistics of volumes issued, number of deals, tenors issued and bid-ask spread in absolute numbers.

From the findings one can safely conclude that the average volume of issuance per bond and trade frequency have a larger effect on liquidity of bond markets in Kenya. A narrower spread contributes to positive liquidity and likewise, an increasing bid-ask spread would serve to reduce liquidity in bond markets in Kenya. The tenor structure contributes positively to liquidity of bond market by reducing bond fragmentation through large issues of standardized tenors rather than having small fragments of similar maturities.

The study recommends that the CBK should firm up the debt management strategy plan so as to rid the market of small illiquid and high cost bonds. This can be achieved through conducting bond buy backs of the high cost non benchmark bonds. Secondly, there is a need to manage the placement of secondary trade orders so as to avoid possible manipulation of bid-ask spreads by small value orders at wide spreads. Thirdly, the introduction of market makers or primary dealers who would be required to quote firm two-way quotes is inevitable to supplement a liquid bond market.

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## ABBREVIATIONS

BIS	Bank of International Settlements
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
EADB	East Africa Development Bank
EMCOSC	Emerging Markets Committee of the International Organization of Securities Commissions
EMH	Efficient Markets Hypothesis
FY	Financial Year
IDB	Inter-American Development Bank
ILF	Intra-day Liquidity Facility
IMF	International Monetary Fund
KEPSS	Kenya External Payments and Settlements System
KIPPRA	Kenya Institute for Public Policy Research and Analysis
MoF	Ministry of Finance
MTDS	Medium Term Debt Strategy
NSE	Nairobi Stock Exchange
REPO	Repurchase Agreements
USD	United States Dollar

## CHAPTER ONE

### INTRODUCTION

#### 1.1. Background of the Study

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. 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 (EMCOSC), emerging markets bond markets comprised of 11% of global bond markets, which totaled 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.

In developing countries and most of the emerging markets, government bonds dominate the bond markets compared to corporate bonds. In Kenya, the corporate bonds comprise of a partly 8.71% of the total tradable government bonds as at 30<sup>th</sup> June 2012, CMA monthly statistical bulletin (June 2012). Out of the 11 outstanding corporate bonds, the Banking industry dominate the issuance with 5 corporate bonds followed by Housing sector with 3 bonds while Manufacturing, energy and telecommunication sectors each has 1 corporate bond issued. However, in the East Africa region, Kenya leads the pack with the highest number and volume of corporate bonds issuance. With the development of a liquid and deep liquid corporate bond market in Kenya, corporates will have a cost efficient way raising funds and at the same time providing investors with a diversified range of investment products

The government securities market is at the core of financial markets in most countries. It deals with tradeable debt instruments issued by the government for meeting its financing requirements. Given the risk free nature of Treasury securities, the government securities market is regarded as the backbone of fixed income securities markets as it provides benchmark yields for valuing and pricing other financial markets products and imparts liquidity to other financial markets. The existence of an efficient government securities market is seen as an essential precursor, in particular, for development of the corporate

debt market and the financial sector at large. A vibrant, liquid and sustainable financial market must, almost entirely, be preceded by establishment of benchmark financial instruments upon which introduction, issuance and pricing of other financial products is based upon.

### **1.1.1. Government Benchmark Bonds Programme**

A benchmark bond is the security against which others are priced, Favero et al (2000) a benchmark bond can be described as the instrument to which the prices of other bonds react, Dunne et al (2002). Government benchmark bonds can be distinguished by their features; typically benchmark bonds are characterized by tenors, coupon rates and issuance volumes. Most countries have defined the specific benchmark bond tenures that pass as benchmark bonds and seek to build up volumes around these tenures to create the desired outstanding volumes. In the United Kingdom, benchmark bonds are targeted around 5, 10, 20, and 30 year tenures while in Canada, Italy, Japan, Germany, France, Belgium and the United States, all on-the-run issues for each maturity are usually regarded as benchmarks.

Government benchmark bonds are a brain child of many governments the world over. Many governments in the developing world are many often than not, faced with national budget deficits and as such, in addition to grants and other forms of external funding, result to domestic borrowing by issuance of government securities in form of Treasury bills and Treasury bonds or notes. To succeed in meeting the budget deficits by way of successfully issuing treasury securities, governments or their issuing agencies must strive to ensure positive market uptake of bond issues. This can be achieved by boosting market confidence not just in the financial markets infrastructure but also in financial products on offer; investors would want to invest in financial instruments that they can easily and conveniently liquidate; otherwise they will demand a premium for holding such instruments.

Every government that seeks independence in budgetary financing must have a deliberate plan to develop its domestic financial markets by supporting capital market growth. Governments do this by strategically managing public debt majorly comprised of

government securities. Public debt is the totality of all outstanding financial liabilities of the government arising from past borrowing and includes guaranteed debts to state agencies and municipalities. The establishment of benchmark bonds programmes assists governments to inject aspects of competitiveness in government securities market. The concentration of bond maturities around certain tenures, consistency of coupon rates and adequate supply for trading creates investor confidence which in turn diversifies the investor base for government securities. An increased market confidence and a diversified investor base increases competition and effectively lowers the cost of issuance and servicing domestic debt to the government. Beyond the cost savings to governments, there are also beneficial side effects of building benchmark government bonds in terms of developing a broader financial market. In particular, markets tend to use yields on benchmark government securities to price a range of other financial instruments; IMF (2001).

### **1.1.2. Benchmark Bonds and Liquidity**

According to Mohanty (2001) benchmark bonds are a major contributor to bond market liquidity. By concentrating government bond issues in a relatively limited number of popular, standard maturities, governments can assist the development of liquidity in those securities and thereby lower their debt-issuance costs. Governments can often reduce their debt-service costs through measures that promote the development of deeper, more liquid government securities markets by concentrating their government bond issues in a relatively limited number of maturities. Market participants are typically prepared to pay a premium for a security that can be subsequently traded in a more liquid market; IMF (2001).

The concentration of high volume issues at certain maturity points along the yield curve boost trading by providing adequate supply across a wide range of investors with different investment horizons. Benchmark bonds by virtue of building up maturities of outstanding issues through reopening eliminates bond fragmentation, whereby several bonds of similar maturities but with relatively smaller volumes are issued, and as a result provides adequate supply for secondary trading thereby boosting liquidity. Trading volume, though an indicator of liquidity also depends on the level of activity as measured

by the number of deals or transactions since a single deal with a relatively high volume is in itself not an indicator of liquidity.

### **1.1.3. The Bond Market in Kenya**

The local currency bonds market in Kenya has experienced tremendous growth in the recent past. According to Mbewa et al (2007), although treasury bonds were introduced into the Kenyan market in the early 1980s, the market faced various challenges that constrained its development. However, in the last few years the Government securities market in Kenya has seen some improvements in terms of product development and market infrastructure. Treasury bonds were first issued in 1985, but it was not until after May 2001 that the segment gained the momentum. This growth in size and composition of the current primary and secondary markets for bonds could be traced back to government bonds' re-launch in May 2001(CBK). Consequently, the volume and maturity profile of these instruments have increased significantly during the same period.

The re-launch was the government's deliberate policy move to restructure domestic debt portfolio from short-term in June 2001 to long-term; in June 2001 the average maturity profile stood at 8 months compared to average maturity of 3 years, 8 months by end of May 2007. Hence, the ratio of short-term to long term debt reversed from 70:30 in June 2001 to 28:72 in May 2007. Until early 2000, the government bond market was characterised by a narrow investor base dominated by commercial banks, pension funds and to some extent insurance companies. This was largely due to the nature of instruments issued, low investor awareness and legal and regulatory framework. For instance, in 2003, the government enacted the Retirement Benefits Authority Act, which required that pension schemes and trust funds redirect members' contributions from real estate and other risky investments to bonds.

There were also amendments to the Insurance sector Act which stipulated that every Insurance company must purchase certain amount of government securities to act as a security incase the company goes under. Despite the fact that these regulations oiled the captive market for government securities, it also provided some liquidity at the primary

market therefore contributing to the growth of the bond market. Kenya's bonds market is dominated by government bonds, ranging from 1 year to 30 years. Types of bonds issued include; Fixed Coupon Rate, Floaters, Amortized Bonds, Zero Coupon Bonds, and securitized (special) bonds, however, zero coupon bonds are no longer being issued while floaters are mostly being issued by the corporate sector. The investor base in the bonds market has also broadened over time; from commercial banks dominance in 2001, to level the cumulative proportion held by pensions & trust companies, Insurance companies, Non-Bank Financial Institutions, retail investors and other institutional investors.

This balance has made it possible for the market to take up bonds of maturities range from 1 to 30 years. However, Corporate bonds market has experienced some volatility in issuances since 2001 with private firms being reluctant to issue corporate bonds to finance their operations despite the availability of a stable yield curve and in its place preferring to raise funds through equity offers and rights issues. This problem is attributed to stiff competition from cheap syndicated loans offered by commercial banks; and lengthy and expensive approval procedures by regulators. To establish a stable local currency bond market in Kenya, the government through CBK adopted market-friendly issuance strategies and undertook critical reforms. In the FY2001/02 the government adopted the strategy of issuing more Treasury Bonds and less of Treasury Bills. In addition, it changed its issuance method from non-auction to Multiprice bid auction method which promoted competitive bidding and achieved price discovery.

The implementation of Kenya Electronic Payment and Settlement Systems (KEPSS) facilitated efficient payment and settlement of government securities; paving the way for introduction of products such as ILF that further promotes bonds market in Kenya. The outcome of this policy move boosted trading of bonds in the secondary market, with total turnover rising from Ksh 14.08bn by end of 2001 to Ksh 54.16bn in 2006 and Ksh 523.99bn by end of 2012, (CBK). Consequently, the resultant reliable yield curve became an important pricing benchmark for corporate entities to issue corporate bonds and price other financial facilities such as mortgage facilities and long term loans. It was during

this period that firms such as Safaricom, Mabati Rolling Mills (MRM), Athi River Mining, Shelter Afrique, Celtel Kenya, PTA Bank, East African Development Bank Bonds (EADB), among others were able to mobilize close to Ksh 20bn through issuing corporate bonds to finance their growth. In addition, commercial banks and mortgage companies reduced interest rates on mortgage facilities and long-term loans significantly.

## **1.2. Research Problem**

The approach of the study hinges upon the hypothesis that benchmark bonds improve the liquidity of bond markets as in the works by Mbewa et al (2007) and Goldstein and Folkerts-Landau (1994). According to Dunne et al (2002) there is no official designation of benchmark securities, nor any established market convention. However, they do agree that benchmark bonds are a precursor of growth in bond markets; further studies in Europe show that benchmark bonds impact positively on liquidity of bond markets.

The bond market in Kenya has faced various challenges since its inception in 1980s. It has been dogged by the problem of bond fragmentation, low liquidity at the secondary market; high bid spreads at the primary market, little or no corporate issuances and unstable yield curve. Development of government benchmark securities by concentrating new issues of debt securities in a relatively limited number of popular, standard maturities can assist governments in the development of liquidity in bond markets. Benchmark bonds are meant to provide supply or volumes at the secondary market and benchmark interest rates at key maturity points along the yield curve with a goal of providing reference yields or pricing benchmarks for other financial instruments, and also to boost secondary market trading activity along those key maturity points thereby improving liquidity.

Previous studies done have not fully focused on benchmark bonds which are the cornerstone of a developed bond market. For instance, Mbewa et al (2007) carried out a study on the development of bond market in Kenya and among their recommendations was the adoption of benchmark bonds to improve efficiency in the bond market in terms of improved liquidity. Ngugi and Agoti (2007) in their study on the microstructure elements of the bond market in Kenya looked at trading values and trading activity to capture

liquidity. Mohanty (2001) in BIS working paper number 11 on improving liquidity on government bond markets in emerging market economies noted that a wide investor base, presence of primary dealers and development of benchmark bonds are major contributors to a liquid bond market.

Previous studies on Kenyan bond market have established the need for benchmark bonds to improve efficiency in terms of pricing and liquidity in the Kenyan bond market. However, minimal studies have been done on the impact of benchmark bonds on liquidity of bond market which is a key component of an efficient and developed market. There is little information on how the benchmark bonds introduced in the Kenyan bond market have affected the liquidity of bond market in Kenya and whether the intended goal of introducing them has been achieved. This study is intended to fill this gap by assessing the effect of benchmark bonds on liquidity with the aim of offering information to complement other bond market development initiatives.

The study will seek to address the following question.

Has the introduction of Government benchmark bonds affected the liquidity of the bond market in Kenya?

### **1.3. Research Objective**

To establish the effect of Government benchmark bonds to the liquidity of the bond market in Kenya.

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

This research project seeks to assess the Kenya government benchmark bond programme and its impact on growth of the bond market in Kenya. Development of government benchmark securities can assist governments in the development of liquidity in those securities and thereby lower their issuance costs. Markets can then use such liquid issues as convenient benchmarks for pricing a range of other financial instruments, Mbewa et al (2007).



This research will give insight to the Government, as policy formulators, and the Central Bank of Kenya, as the fiscal agency of government, on the effects the treasury benchmark bonds programme has had on the quest for developing the Kenyan bond market. It will also provide an interrogation platform of the effectiveness of benchmark bonds on the implementation of the public debt management strategy as emphasized in the Kenya government Medium Term Debt Management Strategy.

To other developing bond markets especially in East African region, the study will provide a practical example closer home of the benefits of a benchmark bond programme to the growth of bond markets. Many studies have been carried out with regard to Equities and bond markets. However with Kenya's bond market being a developing market there is need for more academic inquisition into the benchmark bonds since most studies carried have focused on the general bond market liquidity.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter reviews studies that have been done in the area of bond market development. The specific areas covered here are treasury bonds, benchmark bonds, bond features, bond market liquidity and secondary trading for bonds. The chapter will highlight a theoretical review on the theories that have informed this study.

#### **2.2. Theoretical Review**

Several theories in finance and economics have endeavoured 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. The market segmentation theory explains that investors in the short end are completely different from those at the 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 (1969) 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. Dickinson and Muragu,(1994) studied data from the market and found evidence that small markets such as the NSE may provide empirical results consistent with weak-form efficiency.

### **2.2.2 Expectation Theory of Term Structure of Interest Rates**

According to Reilly and Brown (2000), expectations theory holds that any longer-term interest rates simply represents the geometric mean of current and future 1-year interest rates expected to prevail over the maturity of the issue. Such that  $(1 + R_2)^2 = ((1 + R_1) \times (1 + E(R_1)))$

Where:

$R_2$  = the rate on two-year securities,

$R_1$  = the rate on one-year securities,

$E(R_1)$  = the rate expected on one-year securities one year from now.

The theory postulates that long term interest rates reflect the markets expectations of future short term interest rates; thus a downward slopping yield curve implies that short term rates are expected to fall in future, Winfield and Curry (1995). Bonds with short time to maturity tend to have reduced risk of capital loss emanating from movements in interest rates as opposed to long dated bonds thereby prompting investors to demand a risk premium on such bonds resulting in an upward sloping yield curve.

### **2.2.3 Liquidity Preference Theory**

Keynes (1936) explained that investors prefer for 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 and 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 and 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.

### **2.3. The History of the Bond Market**

The bond market has been in existence for quite a long time; historical facts show that governments across modern day Europe and America borrowed funds by way of issuing bonds or certificates mostly to finance military operations during times of war. The first ever recorded government bond was issued by the Bank of England in 1693, to finance the war with France, when the government for the first time borrowed by creating a permanent debt that was transferable, Broz & Grossman (2002).

According to the bureau of the public debt of the United States of America, U.S government bonds can be traced as far back as during the American revolution in 1776 when the government issued 'loan certificates' which were equivalent to present day bonds, to secure funding for the fledging government from France and Netherlands. The Swedish National Debt Office indicates that it was first formed in 1789 in order to manage the central government debt which had grown as a result of the government borrowing for purposes of financing the war with Russia.

With modern civilization and better foreign relations among nations, debt markets and by large bond markets grew beyond borders to tap into foreign market. From the 1820s onwards, foreign issuers of bonds- most commonly governments and railway companies were often evident in the London financial market. Throughout the second half of the nineteenth century and until the outbreak of the First World War, London and Paris were the principal financial centres in which foreign bond markets existed, Benzie (1992).

### **2.4. Measuring Bond Market Liquidity**

Liquidity is the ability of a market to absorb a large number of transactions without dramatically affecting price. The absence of liquidity for an asset implies difficulty in converting it into cash, and generally reduces incentives to hold the asset, unless a countervailing premium is offered. A number of approaches have been taken to measure bond market liquidity in various studies. D'Souza and Gaa (2004) suggest a number of measures for liquidity, including bid-ask spreads, volatility, trading volume and

frequency, as well as quote size and frequency. While trading volume is an intuitive and widely cited measure of market liquidity, one drawback is that it is also associated with price volatility, which tends to be negatively related to market liquidity. This becomes especially apparent during times when the market is under stress. In addition, trading volume has no direct relation with any of the four dimensions of liquidity mentioned earlier. For example, large trades may still occur even when liquidity is poor but traders have a need to trade, such as for hedging purposes. Jiwei Dong et al (2007) assert that the concept of market liquidity cannot be captured by a single measure. The seminal literature on liquidity (Garbade (1982), Kyle (1985), and Harris (1990)) identifies three main dimensions of liquidity: spread, depth and resiliency.

A more commonly used measure for market liquidity is the bid-ask spread, or the difference between the best bid and offer prices. Not only is data for this measure easily available, bid-ask spreads reflect the tightness aspect of liquidity in the bond market. In practice, a market that has very low transaction costs is characterized as liquid; in this sense, the bid-ask-spread is a relatively direct measure of market liquidity. The bid-ask spread directly measures the cost of executing a “small” trade, and being a major part of trading costs, it is commonly used as an indicator of the quality of market functioning.

Market liquidity has several dimensions and there is no one satisfactory definition that captures all the features of a liquid market. Nevertheless, some of the important characteristics by which a market could be judged liquid are; market tightness as measured by the bidask spread, market depth as reflected by the ability of the bond market to handle large transactions without causing sharp changes in prices. Further, market liquidity can be measured by resiliency. Resilience determines the speed with which price fluctuations finally dissipate. According to Kyle (1985), market resiliency is the speed with which pricing errors caused by uninformative order-flow shocks are corrected or neutralized in the market. The less resilient a security is, the greater is the risk faced by an investor trading on the assumption that price is the best available signal of true value, Jiwei Dong et al (2007).

## **2.5. Characteristics of Government Benchmark Bonds**

Benchmark bonds are characterized by a stable tenor structure that is spread across key points on the yield curve, have large outstanding volumes, stable coupon rates structure and trade on a frequent basis at the secondary market.

### **2.5.1. Tenor Structure**

The demand for government securities may be fragmented into several components implying that the demand curve is not uniformly downward sloping, but is rather kinked (Commonwealth of Australia, 2002). For instance, the demand by investors such as insurance companies and superannuation funds is in the nature of ‘buy and hold’ as the revenue streams from government securities generally match with their liability payment stream. The Kenya Medium Term Debt Strategy 2010 cites bond tenors of 2, 5, 10, 15 and 20 years as the benchmark bond maturities in Kenya, MoF (2010). However, this has been upgraded with the inclusion of a 25 year tenor to provide a reference for longer dated debt securities.

### **2.5.2. Reopening**

Reopening refers to the issuance of an outstanding bond which basically means a previously issued bond is availed to the market again, with the same features like coupon rate, maturity date and interest payment dates save for settlement date. This serves to eliminate bond fragmentation by building up outstanding amounts of previously issued bonds rather than issuing new bonds of the same tenors.

### **2.5.3. Market Determined Coupon Rates**

In mid 2010, the Central Bank of Kenya in liaison with the Market Leaders Forum, a group composed of the financial sector regulators and representatives from umbrella institutions in the financial sector adopted an issuance strategy of issuing market determined coupon bonds for treasury bonds with maturities below ten years. This was in an effort to improve bond market liquidity by promoting competitiveness at the primary market. Shifting from administrative determination of bond rates to auction-based sales promotes liquidity in bond markets, Mohanty (2002).

For bonds whose interest rates are determined by the market to be successful and achieve the desired results by the issuer, the issuer must first ensure that there is no collusion in the market; this can be achieved by way of promoting a broad investor base thereby eliminating any chances of a few dominant players colluding to push the interest rates higher. Benchmark bonds integrate the re-issuance feature, commonly referred to as 'reopening'. These features enable the issuer to auction additional amounts of a previously issued bond, with the same features, at a later date in future to build up its outstanding volume.

#### **2.5.4. Bond Issue Size**

The larger the issue size of a security, the greater is the likelihood that more investors hold the bond in their portfolio; this increases the number of interested parties that already may know the credit characteristics behind the security on issue which may help provide fair value for liquidity Fabozzi & Mann (2005).

A large issue size avails the supply and builds up volume necessary for boosting secondary market trading. Small issues size may create scenarios where one bond may be held by a few players in the market who may choose to hold it to maturity, given its other features such as high coupon rates, thereby stifling its liquidity at the secondary market. Fragmentation of government debt outstanding into a large number of distinct issues hinders liquidity while concentrating issuance on a few benchmark securities typically improves liquidity, Litan, Pomerleano & Sundararajan (2003). Increasing the size of issuance and reopening existing issues can make a useful contribution to liquidity, Philip Turner (2003).

#### **2.5.5. Trading Frequency**

Trade frequency, or the number of trades observed per unit of time, is another indirect measure for liquidity. However, as with trading volume, while higher trading frequency may reflect a more liquid market, it may also be associated with increased price volatility, which is in turn associated with reduced liquidity.



### **2.5.6. Trading Turnover**

Benchmark bonds are characterized by fairly large turnovers at the secondary market as investors buy and sell and in the process establishing benchmark prices for other financial markets instruments, further, higher turnover is generally associated with lower bid-askspreads as market-makers can more easily manage their inventory risks, Amante et al (2007).

### **2.5.7. Bid-Ask Spread**

Benchmark bonds are considered to be fairly liquid and are thus characterized by a relatively thin bid-ask spread. A wider spread tends to discourage secondary market trading thereby reducing liquidity.

## **2.6. Empirical Review**

The Committee on the Global Financial System (1999), argues that bond market liquidity can be influenced by micro-determinants that are broadly categorized as product design, market microstructure and the behaviour of participants. A sound and legal framework is the central pillar of an efficient bond market as it tends to boost investor confidence since the investors interests and are covered since the rights and obligations of the issuer, the investor and the trading counter parties at the secondary market are clearly defined. A diversified investor base with different time horizons, risk preferences, trading motives and high liquidity ensures high liquidity and stable demand in the market

Muhammad and Banafe (2002) carried out a study on development of debt markets in emerging economies with a special focuss on the Saudi Arabian experience. The study, while acknowledging the importance of the secondary bond market, established that sufficient volumes of outstanding government bonds spread along certain key maturities stream is a major condition for boosting bond market liquidity. 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 benchmark bonds 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. This 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.

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. Among the factors that have contributed to this observation was lack of benchmark bonds, whose yields, can be used to efficiently price other financial instruments in the Market. One of the recommendations of this study was the introduction of benchmark bonds to facilitate the establishment of a benchmark yield curve. This study provides a good Kenyan background to evaluate the recommendation of the adoption of benchmark bonds in Kenya as means of improving the bond market in Kenya.

Ngugi and Agoti (2007) analysed 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. This study used data that was obtained prior to firming up of the benchmark bonds and introduction of other market development complementaries such as automated trading system and it

would be good to test if the introduction of benchmark bonds has impacted on the liquidity of bond market in Kenya

Amante et al (2007) in their study on liquidity in the Brazilian domestic government bond market found out that in an effort to improve the liquidity of government bonds, the Central Bank of Brazil, among a host of other measures, introduced benchmark 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 recognised 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 benchmark bonds partly to eliminate the problem of bond fragmentation to boost liquidity hence the need study the impact of benchmark bonds 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 benchmark not only for pricing but also for product structuring purposes.

## **2.7. Summary of Literature Review**

The available literature shows that there exist a strong relationship between benchmark bonds and bond market liquidity. As noted by Garbade (1982), Fleming (2001) and Mohanty (2002) benchmark bonds do have positive effects on growth of bond markets. There is, however, need to investigate the specific effects of benchmark bonds with a specific reference on bond market liquidity. This is due to the research gap that exists as

no study has been done to investigate the effects of benchmark bonds on bond market liquidity in Kenya despite their crucial role in growth of bond market. The available literature provided insights on how benchmark bonds affect 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 benchmark bonds on bond market liquidity gained from these studies may not be assumed to explain effects of benchmark bonds on bond market liquidity in Kenya. It is in this light that the researcher carries out a study on the effects of benchmark bonds on bond market liquidity in Kenya.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter deals with the procedures that were used in conducting the study. It sets out the various stages and phases that were followed in completing the study. This chapter identifies 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 was best suited for this study since it allowed for an in-depth study of the bondmarket prior to and after the introduction of the benchmark bond programme. It also focussed 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 was the Government bonds issued between 2001 and 2012, given that benchmark bond programme in Kenya was introduced in 2007. This implies that the information on these variables was available for at least 5 years before and 5 years after the introduction of the benchmark bond programme to be included in the data.

#### **3.4 Sample**

The study focused on the treasury bonds transactions data at issuance and secondary market level. The sample data was extracted for the period between 2001 and 2012 which formed the basis of this study. This is because the benchmark bond programme was introduced in late 2007 hence this research paper analysed the liquidity scenarios 5 years prior to the introduction of the benchmark bonds. The research project also evaluated data between

2008 and 2012 to establish the effect of introduction of benchmark bonds on bond market liquidity

### 3.5 Data Collection

This study made use of secondary data on bond issuance from the Central Bank of Kenya while data on bond trading volumes at the Nairobi Securities Exchange was used to assess the liquidity of the bond market. This data was available at the CBK, Reuters, Bloomberg 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 liquidity. Analysis was done with the help of Statistical package for social scientists (SPSS version 20) complemented by Microsoft Excel. First, data was cleaned, sorted and collated. Then, data was entered into the computer, after which analysis was done. Descriptive statistics such as mean score, frequencies and percentages for each variable were calculated and tabulated using frequency distribution tables to describe the characteristics of the data

#### 3.6.1 Analytical Model

The regression model below was used to determine the impact of each variable on the liquidity of bond market in Kenya.

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where:  $Y =$  **Liquidity of Bond Market** where  $Y$  is measured by traded volume in Kshs.

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

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

$X_1 =$  Trade Frequency

$X_2 =$  Tenor structure which measure the Government Benchmark Bonds

$X_3 =$  Bond Bid-Ask Spread

$X_4 =$  Bond Size

$e =$  error term

This model defined the regression equation used in this study, a negative/positive relationship was expected between benchmark bonds proxy measures and liquidity of bond market proxy as a measure of the strength of linear association between the four variables.

### 3.6.2 Test of Significance

The purpose of this study was to establish the effect of introduction of benchmark bond program to the liquidity of bond market in Kenya. The null hypothesis states that change in bond market liquidity due to introduction of benchmark bonds is not significantly different from zero;  $H_0: LIQ_t=0$ . While the alternative hypothesis states that changes in bond market liquidity due to introduction of benchmark bonds is significantly different from zero.  $H_1: LIQ_t \neq 0$  indicating that there is a significant relationship between the dependent and the independent variable

The study used the R square and t- test to test the levels of significance. A positive t-test indicated that there is a significant relationship between government benchmark bonds and bond market liquidity with a positive R square indicating that movement in the dependent variable is explained by the independent variables.

## CHAPTER FOUR

### DATA ANALYSIS RESULTS AND DISCUSSION

#### 4.1 Introduction

This chapter presents the data analysis results, interpretation of the results and discussion. Data analysis was done using SPSS with the main analysis tools being descriptive statistics (frequencies, percentages, mean and standard deviation) and regression analysis.

#### 4.2 Summary Statistics

**Table 4.1: Statistical Data**

The results in table 1 shows the summary statistics of the variables used in the study.

Year	Liquidity	Trade Frequency	Tenor Structure	Bid Ask Spread	Bond Size	Spread 20-yr	Spread 15-yr	Spread 10-yr	Spread 5-yr	Spread 2-yr	Average
2001	14,076.30	617.00	17	283.77	92,188.49				304.45	263.08	283.77
2002	33,629.70	953.00	25	218.18	91,076.60				238.35	198.00	218.18
2003	41,128.20	1,168.00	26	206.88	88,781.85			277.62	166.10	176.93	206.88
2004	34,111.80	1,136.00	20	180.37	53,329.80			268.20	123.27	149.64	180.37
2005	13,634.50	989.00	19	189.23	74,854.80			198.75	188.22	180.72	189.23
2006	54,160.30	1,017.00	24	156.80	88,773.26			164.61	166.10	139.70	156.80
2007	84,135.85	0.00	21	122.42	99,509.60			109.47	137.00	120.78	122.42
2008	63,212.79	910.00	17	37.40	65,681.85	31.85	27.98	42.81	43.79	40.55	37.40
2009	107,851.37	1,935.00	7	31.24	108,274.05	33.93	30.00	31.13	30.01	31.14	31.24
2010	466,067.85	5,738.00	11	33.21	132,324.00	35.22	31.98	36.00	31.43	31.43	33.21
2011	427,684.55	2,905.00	7	30.63	144,576.10	33.81	29.27	30.78	29.63	29.63	30.63
2012	523,986.11	3,132.00	15	24.31	140,812.75	24.24	24.68	27.58	22.53	22.53	24.31

Source: Research data

**Table 4.2: Summary of Statistics of Independent Variable**

Table 4.2 below, shows the means of the variables with the respective standard deviations from a sample size of 12 denoting 12 years from 2001 to 2012



	Mean	Std. Deviation	N
Liquidity	155306.609	194296.66	12
Trade Frequency	1708.33	1557.405	12
Tenor Structure	17.42	6.473	12
Bid Ask Spread	126.20213	91.810159	12
Bond Size	98348.596	28784.75	12

**Table 4.3 Correlation Matrix**

The result in table 4.3 shows the correlation matrix of the study variables. According to the table, there exists a positive and statistically significant relationship between liquidity and trade frequency (Pearson Correlation Coefficient=0.852, p-value=0.000), and with bond size (Pearson Correlation Coefficient=0.875, p-value=0.006) at 5% level of significance.

		Liquidity	Trade Frequency	Tenor Structure	Bid Ask Spread	Bond Size
Pearson Correlation	Liquidity	1.000	.852	-.614	-.717	.875
	Trade Frequency	.852	1.000	-.604	-.611	.701
	Tenor Structure	-.614	-.604	1.000	.706	-.605
	Bid Ask Spread	-.717	-.611	.706	1.000	-.570
	Bond Size	.875	.701	-.605	-.570	1.000
Sig. (1-tailed)	Liquidity	.	.000	.017	.004	.000
	Trade Frequency	.000	.	.019	.017	.006
	Tenor Structure	.017	.019	.	.005	.019
	Bid Ask Spread	.004	.017	.005	.	.026
	Bond Size	.000	.006	.019	.026	.
N	Liquidity	12	12	12	12	12
	Trade Frequency	12	12	12	12	12
	Tenor Structure	12	12	12	12	12
	Bid Ask Spread	12	12	12	12	12
	Bond Size	12	12	12	12	12

Table 4.4(a) below shows the coefficients of the regression model with the Trade frequency, Tenor structure and Bond size indicating positive coefficients while the Bid-Ask spread shows a negative coefficient indicating negative relationship with the dependent variable

**Table 4.4: Coefficients (a)**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	-274874.460	154131.479		-1.783	.118	-639337.493	89588.574					
Trade Frequency	50.511	21.478	.405	2.352	.051	-.276	101.297	.852	.664	.266	.432	2.314
Tenor Structure	4057.758	5176.543	.135	.784	.459	8182.821	16298.336	.614	.284	.089	.431	2.322
Bid Ask Spread	-569.750	359.777	-.269	-1.584	.157	1420.486	280.987	.717	.514	.179	.443	2.256
Bond Size	3.509	1.136	.520	3.089	.018	.823	6.195	.875	.760	.350	.452	2.211

a- Dependent Variable: Liquidity

Tables 4.4 (b) and (c) below are a summary of the model indicating the regression statistics R-squared and Analysis of variance (ANOVA) values to explain the model

**Table 4.4 (b) Model Summary (b)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.954(a)	.910	.859	72934.592934248900000	.910	17.766	4	7	.001	1.592

a - Predictors: (Constant), Bond Size, Bid Ask Spread, Trade Frequency, Tenor Structure

b -Dependent Variable: Liquidity

ANOVA (c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	378026953793.844	4	94506738448.461	17.766	.001(a)
	Residual	37236183925.393	7	5319454846.485		
	Total	415263137719.236	11			

a: Predictors: (Constant), Bond Size, Bid Ask Spread, Trade Frequency, Tenor Structure

b: Dependent Variable: Liquidity

### 4.3 Regression Analysis

Table 4.5 below summarizes regression results. As indicated in the regression statistics R-squared was 0.91. This means that 91% variations from the expected and actual output (dependent variable: liquidity of the bond market) are explained by the independent variable. This indicates good fit of the regression equation used. Further Analysis of variance shows that f-calculated is greater than f – critical ( $17.766 > 0.01$ ). This implies that the regression equation was well specified. Thus, this is a good reflection of the true position that liquidity can be explained by Trade frequency and bond size.

#### Estimated Equation:

$$LIQ = -274874.460 + 50.511X_1 + 4057.758X_2 - 569.750X_3 + 3.509X_4$$

Where:

LIQ = Liquidity measured in Trading Turnover

X1 = Trade Frequency

X2 = Tenor structure which measure the Government Benchmark Bonds

X3 = Bond Bid-Ask Spread

X4 = Bond Size

The above shows that Trade frequency, Tenor structure and bond size have a positive relationship with the liquidity of bond market in Kenya.

#### **4.4 Interpretation of the Findings**

The result reveals that the coefficient number of Trade frequency, Tenor structure and bond size have a positive relationship with the bond market liquidity. This indicates that benchmark bonds which are characterized by large issue sizes at primary market and standard tenor structures have a positive relationship with bond market liquidity at 1% level. An increase in number of deals by 1 transaction will lead to the increase in liquidity by Kes 50.51 millions. likewise, an increase in tenor structure by 1 bond and increase in bond issue size by a factor of 3 will lead to increased liquidity by Kes 4 billion and 3 million respectively. An increase in the bid-ask spread by 1 basis point will lead to a decrease in liquidity by Kes 569 millions. This is what was expected since a wider bid-ask spread reflects reduced liquidity whereas a narrow bid-ask spread reflects a fairly competitive market leading to increased liquidity

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMENDATIONS**

#### **5.1 Introduction**

This chapter is a synthesis of the entire study. It presents a summary of the research findings, conclusions and recommendations. The chapter is organized as follows: first it presents a summary of the findings presented according to the research objectives. This is followed by conclusions and recommendations.

#### **5.2 Summary**

The result reveals that Trade frequency, Tenor structure and bond size have a positive relationship with the bond market liquidity. This indicates that benchmark bonds which are characterized by large issue sizes at primary market and standard tenor structures have a positive relationship with bond market liquidity which is in line with theory as reflecting liquidity preference. An increase in number of deals by 1 transaction will lead to the increase in liquidity by Kes 50.51 millions. likewise, an increase in tenor structure by 1 bond and increase in bond issue size by a factor of 3 will lead to increased liquidity by Kes 4billion and 3million respectively. An increase in the bid-ask spread by 1 basis point for all benchmark bonds will lead to a decrease in annual liquidity by Kes 569 millions. This is what was expected since a wider bid-ask spread reflects reduced liquidity whereas a narrow bid-ask spread reflects a fairly competitive market leading to increased liquidity.

#### **5.3 Conclusion**

The study was guided by the objective; to assess the effect of benchmark bonds on bond market liquidity in Kenya. The results indicated that benchmark bonds have a positive effect on bond market liquidity.

Based on the summary of major findings, the following conclusions are drawn: the adoption of benchmark bonds by the Central Bank of Kenya has led to increased liquidity in the Treasury bonds market. In addition through introduction of benchmark bonds, the CBK has greatly reduced the problem of bond fragmentation as reflected in the tenor structure of outstanding bonds.

## **5.4 Recommendations for Policy**

From the conclusions above, the following recommendations were made: First, the CBK should firm up the debt management strategy plans so as to rid the market of small illiquid and high cost bonds. This can be achieved through conducting bond buy backs of the high cost non benchmark bonds. Secondly, there may be a need to manage the placement of secondary trade orders so as to avoid possible manipulation of bid-ask spreads by small orders at wide spreads. Thirdly, the introduction of market makers or primary dealers who would be required to quote firm two-way quotes is inevitable to supplement a liquid bond market.

## **5.5 Limitations of the Study**

In undertaking this study a number of challenges were faced. First missing data on some variables was not wholly available as a result of migration from manual to automated systems while some benchmark bonds were only issued after 2007. Secondly there was bureaucracy in obtaining data especially from data vendors such as Reuters and bloomberg and especially on the bid-ask spreads. This led to delays in obtaining the required data for analysis in time. Thirdly, it was not possible to identify and separate sell-buy back transactions from the normal trading transactions from 2011 and 2012. This is because in 2011 there was an introduction of Sell-buy-back transactions in bond market secondary trading as a liquidity distribution tool amongst financial market participants. These Sell-Buy-Back transactions though included and not seperately identified in the daily trading reports from the NSE, are not actual trades but merely a form of borrowing and lending.

## **5.6 Recommendations for Further Research**

Since the present study was only based on benchmark bonds, future studies should seek to improve on the findings of this study by examining the effect of adminstrative determination of coupon rates versus market detarmination of coupon rates on bond market liquidity. Market determination of coupon rates allows market forces to determine interest rates payable on bonds. Additionally, future studies should be focused on factors affecting growth of the bond market in Kenya. This is so because various developments

in the bond market have occurred since 2006 and it would provide a clear picture on the level of influence of each factor. Further studies can also be carried out on the relationship between changes in interest rates and bond market liquidity.

## APPENDICES

Appendix 1: Treasury Bonds Secondary Market Trading Volume 2001-2012

MONTH	YEAR 2001	YEAR 2002	YEAR 2003	YEAR 2004	YEAR 2005	YEAR 2006	YEAR 2007	YEAR 2008	YEAR 2009	YEAR 2010	YEAR 2011	YEAR 2012
JAN	0.15	3.48	3.80	4.58	1.02	0.85	1.65	4.87	5.65	27.28	19.67	24.25
FEB	0.02	1.92	3.18	4.99	0.64	5.33	4.45	3.18	6.86	41.06	46.19	24.89
MAR	0.18	2.11	2.83	3.62	0.13	3.20	5.73	14.29	8.45	49.05	37.94	36.87
APR	1.24	2.69	2.72	2.14	1.01	6.36	8.51	3.07	4.53	22.38	31.01	31.07
May	0.14	1.56	2.15	3.18	0.79	4.79	9.90	3.04	10.48	36.73	30.03	45.08
JUN	1.10	3.01	2.77	5.34	1.30	9.19	10.32	2.45	11.10	93.38	60.73	25.94
JUL	4.48	3.97	2.42	2.40	1.46	10.11	10.14	1.89	7.54	62.23	35.93	31.13
AUG	1.98	3.34	5.32	0.84	1.78	5.29	9.78	8.42	6.14	22.87	45.09	77.95
SEPT	1.71	3.97	3.55	1.44	1.28	2.86	9.50	10.99	10.67	30.65	35.81	90.24
OCT	2.17	2.55	6.54	2.25	1.52	1.62	4.22	4.32	11.71	26.31	34.13	68.22
NOV	0.70	3.73	3.03	2.12	1.23	2.80	3.46	3.12	9.43	31.56	26.28	41.99
DEC	0.70	1.30	2.82	1.21	1.48	1.76	6.47	3.58	15.28	22.57	24.87	26.34
<b>Total</b>	<b>14.56</b>	<b>33.63</b>	<b>41.13</b>	<b>34.11</b>	<b>13.63</b>	<b>54.16</b>	<b>84.14</b>	<b>63.21</b>	<b>107.85</b>	<b>466.07</b>	<b>427.68</b>	<b>523.99</b>



## Appendix 2: Secondary Trading Transactions/Deals 2001-2012

<b>Secondary Trading Transaction/Deals</b>												
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
January	27	112	98	97	152	66	-	61	111	362	195	194
February	28	48	93	99	58	198	-	38	158	430	440	177
March	28	41	76	112	38	95	-	119	133	430	311	153
April	84	57	91	95	40	67	-	79	98	321	220	179
May	18	52	71	97	65	65	-	47	94	354	197	279
June	28	60	71	172	112	89	-	34	258	1015	307	124
July	60	63	111	68	86	80	-	50	157	891	220	217
August	136	116	149	82	83	82	-	108	144	551	301	477
September	63	123	88	102	83	43	-	118	330	602	263	495
October	54	100	128	41	107	136	-	118	140	288	196	436
November	71	130	76	72	59	41	-	49	112	259	81	227
December	20	51	116	99	106	55	-	89	200	235	174	174
<b>Total</b>	<b>617</b>	<b>953</b>	<b>1,168</b>	<b>1,136</b>	<b>989</b>	<b>1,017</b>	<b>-</b>	<b>910</b>	<b>1,935</b>	<b>5,738</b>	<b>2,905</b>	<b>3,132</b>

Appendix 3: Number of Bonds issued in Tenors; 2001-2012

Years	Tenor															Total
	1- year	2- Year	3- Year	4- Year	5- Year	6- Year	7- Year	8- Year	9- Year	10- Year	11- Year	12- Year	15- Year	20- Year	25- Year	
2001	6	3	5	1	1	1	0	0	0	0	0	0	0	0	0	17
2002	4	7	5	3	5	1	0	0	0	0	0	0	0	0	0	25
2003	3	2	4	3	3	3	2	2	2	2	0	0	0	0	0	26
2004	5	5	2	2	1	2	2	1	0	0	0	0	0	0	0	20
2005	6	5	3	2	2	1	0	0	0	0	0	0	0	0	0	19
2006	3	4	4	1	2	2	2	1	1	2	1	1	0	0	0	24
2007	3	5	1	1	3	1	1	1	0	1	0	1	3	0	0	21
2008	3	5	0	0	4	0	0	0	0	3	0	0	1	1	0	17
2009	1	3	0	0	1	0	0	0	0	1	0	0	1	0	0	7
2010	4	0	0	0	2	0	0	0	0	2	0	0	2	0	1	11
2011	1	4	0	0	1	0	0	0	0	0	0	0	0	1	0	7
2012	3	4	0	0	5	0	0	0	0	1	0	0	1	1	0	15

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