

**AN INVESTIGATION INTO THE ACTUAL INVESTMENT
PERFORMANCE OF BONDS LISTED AT THE NAIROBI STOCK
EXCHANGE**

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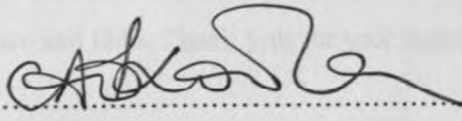
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A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS,
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DECLARATION

This project is my original work and has not been submitted for a degree in any other university.

Signed.......... Date 16.09.2006

OKOOLA, C.A

This project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

To my dear parents

Dr. R. E. Okoola and the late Mrs. G. O. Okoola, who taught me the value of hard work, persistence and faith. Thank you for your support over the years.

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ABSTRACT

This study was carried out to establish returns on investment in bonds listed at the Nairobi Stock Exchange. The objective arose from the realization that in Kenya, information on the yield-to-maturity as a measure of performance has not been adequately analyzed.

Stratified sampling was used to select thirty government bonds out of a total of seventy-four that were listed at the Nairobi Stock Exchange (NSE) from the year 2001 to 2005. However, all the seven corporate bonds listed were considered as part of the sample. Secondary data was collected from the NSE and Capital Markets Authority (CMA) on monthly turnovers, monthly ending prices, interest paid every month, interest rates and maturities of bonds issued. Based on these data, the annual yields-to-maturity of all the bonds was calculated. Yield curves were drawn with the annual yields-to-maturity of the respective bonds plotted against time in years.

The study found that there was low performance of bonds during the years 2001 to 2003, and a marked improvement in the subsequent years. It concludes that the overall performance of the bond market could be enhanced with a friendlier regulatory environment, a market driven benchmark yield and availability of a respected credit rating agency. Finally, it has been recommended that further research in this area should be considered and this time involving a longer period of study. Aside from making efforts to increase market participation (increase demand and supply of bonds), the government should also address the critical role of regulators in this market.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Investment refers to the commitment of funds for purposes of obtaining an economic return over a period of time, usually in the form of periodic cash flows and/ or terminal value. The investor can be an individual, a government, a pension fund, or a corporation. This definition includes investments by corporations in plant and equipment, investments by individuals in stocks, bonds, commodities or real estate.

Many factors affect the extent to which companies draw upon the money and capital markets for funds. One prominent factor is the state of the nation's economy, and the demand for goods and services. A booming economy will generate rapidly growing sales, encouraging businessmen to borrow so as to expand inventories and to issue stocks and bonds in order to purchase new plant and equipment. In contrast, a sagging economy usually will be accompanied by declining sales, and, a reduction in both inventory purchases and long-term investment. Other factors held equal, the need for external fund-raising declines when the economy grows more slowly or heads down into a recession. Thus, rising demand for business goods and services are usually translated into rising demand for short- and long-term capital supplied from the financial markets.

During the period 1996-2000 Kenya's economy was doing badly with GDP growth rate hitting an all time low of -0.2% in the year 2000. The country's gross domestic investment plummeted from 24.3% of GDP in 1990 to 15.6% in the year 2000. A rate hardly enough to maintain the productive capacity of the existing capital stock (Barclays, 2001). It has been indicated that part of this decline in investment has been the result of declines in domestic savings, the source for internally generated resources for investment. However since mid 2003 the economy seems to be on the path to recovery. And to ensure sustainable economic growth the country needs to beef up its investment, as it has been argued that investment is the single most important factor linked to economic growth (Barclays, 2001).

Investments are facilitated through securities markets: Money markets and Capital markets. It has been argued that Kenya has a large pool of funds, which, if mobilized and invested in the capital markets, can give it the boost it needs (Ondigo, 2005). But like many developing economies, Kenya's capital market is underdeveloped. Pardy (1992) contends that the basic building blocks on which a sound securities market can thrive are based on two preconditions. The first of these preconditions is a macro-economic and fiscal environment that is conducive to the supply of good quality securities and sufficient demand for them. Second, is the presence of a market infrastructure that is capable of supporting the efficient operation of the securities' market. This is linked to the state of the macro-economy. A conducive macro-economy enables a number of businesses to develop to the stage where access to securities' markets is useful for their continued growth. Such infrastructure include institutional, regulatory and legal infrastructure.

Players in the Kenyan capital market include investors (individual, institutional and foreign), brokers, investment advisors and regulators. Since the introduction of the capital markets regulator, the Capital Markets Authority (CMA) in 1990, tremendous changes in the industry have been witnessed among them are:

- (i) Enactment of legislation to allow for the setting up of investment banks and mutual funds;
- (ii) Improved regulatory environment as reflected in the CMA themes for the years 2000 (building an efficient capital market for all stakeholders) and 2001 (enhancing the legal and regulatory framework, and creating a new market infrastructure).

The crucial role of regulation cannot be over emphasized. La Porta et al. (1997) show that countries, which protect shareholders, have more valuable stock markets, larger numbers of listed securities per capita, and a higher rate of Initial Public Offerings (IPO) activity than do the unprotective countries. La Porta et al. (2000) also found out that when investor rights such as the voting rights of the shareholders and the reorganization and

liquidation rights of the creditors are extensive and well enforced by regulators or courts, investors are willing to finance firms. Statutory law sets bounds on the kinds of contracts into which individuals and organizations may enter without risking criminal prosecution (La Porta et al., 2000).

The capital market provides a multitude of securities for the willing investor. The rising popularity of bonds as a form of fixed interest investment has created significant interest and participation by private individual investors, institutional investors and fund managers. The Kenyan bond market is characterized by fixed interest rate, floating interest rate and the zero coupon rate bonds. The listing of the government treasury bond started in 1986 while the primary bond market has its origin in 1996.

Typically, the capital markets provide an avenue for companies and governments to raise funds for their expenditures. Governments borrow from the capital markets by issuing treasury bills (T-Bills) or treasury bonds, both commonly referred to as Treasuries. T-Bills are short-term (normally 91 or 182 days) while bonds are long-term (3-30 years). Government bonds are listed on the Nairobi Stock Exchange whereas T-Bills are not. So far, in Kenya, the 10-year bond is the longest-term bond. On the other hand, companies raise funds by issuing corporate bonds, commercial paper and/ or shares.

Treasuries are commonly referred to as 'risk-free'. This is because they are backed by the full faith and credit of the government. Thus the probability of default is low. Typically, treasuries set the benchmark for corporate bonds, determine the depth of the bond market, and influence a variety of transactions. Companies do not enjoy the same risk-free status as governments. In developed markets, all companies that trade on most respectable stock exchanges must be credit rated. Typically, the credit rating system runs from triple A down to Bs or Cs. Triple A rated companies have good finances and are referred to as blue chips, whereas the Bs and Cs carry more risk. It follows, therefore, that higher rated companies will issue bonds that closely mirror the government bonds in terms of price and risk. Hence a triple A rated company will find risk averse investors lining up to buy or trade in its bonds. B or C rated companies will have non-risk averse investors banging

on its doors. Thus A rated bonds pay almost the same interest as Treasuries, while C rated bonds pay a premium because of the higher levels of risk. Hence the name 'high yield bonds' or 'junk bonds'. Nonetheless, junk bonds have a special appeal to investors because of their rate of interest. Many institutional investors invest in junk bonds over the short-term to take advantage of the high yields. Further more, individual investors looking to make quick profits find junk bonds, if appropriately priced, appealing. They also offer an excellent mix to investment portfolios because one can take advantage of the high return and also hedge the risk exposure by diversifying through investing in higher rated bonds. An understanding of bonds is helpful in an efficient market because U.S. and foreign bonds increase the universe of investments available for the creation of a diversified portfolio (Statman and Ushman, 1987)

In Kenya so far there have been more than sixty-seven government bonds, and seven corporate bonds listed on the Nairobi Stock Exchange (NSE). The corporate bonds were issued by Faulu Kenya, Safaricom, PTA Bank Limited, Mabati Rolling Mills, East African Development Bank, Athi River Mining and Celtel.

Considering that the capital market is currently awash with liquidity, limited in investment avenues and that most medium-sized or young companies require access to capital, it is ripe for 'high yield bonds' (Kibe, 2006). Junk bonds further deepen the capital markets by providing additional investment products and creating an awareness of risk versus return.

1.2 Statement of the Problem

In Kenya, the bond market is comparatively younger than the equities market. However, in spite of this, over the years the Kenyan bond market has turned out to be vibrant with turnover recorded at Kshs 33.21 billion, Kshs 36.31 billion and Kshs 48.38 billion in the years 2002, 2003 and 2004 respectively as compared to turnovers of Kshs 2.02 billion, Kshs 7.51 billion and Kshs 20.35 billion during the same period in the equities market (CMA Annual Report and Accounts, 2003, 2004). This draws attention to the growing

importance of the bond market as an alternative window for individual investors in the capital markets. Corporates are also seemingly attaching greater importance to this market as a source of funds; recent corporate bonds issued by Safaricom and Celtel are excellent examples. The government has also increased its participation in bonds as evidenced by the increase in Treasury bond issues of varying maturities. Knowledge of how the bond markets works, and more importantly its investment performance, will enable both individual and corporate investors make more informed decisions regarding investment in the Kenyan bond market.

Reilly et al. (1992) in their study on global capital market risk adjusted returns found that stock returns were superior to bond yields. The specific situation in Kenya is unknown because so far there is no known study investigating the investment performance of bonds. This study will therefore go a long way in providing much needed insight into the investment performance of bonds

1.3 Objective of the Study

The objective of this study is to establish returns on investments in bonds listed at the Nairobi Stock Exchange.

1.4 Importance of the Study

This study will be useful to the following:

(i) The Government

The government has the mandate to create a conducive environment for investment by encouraging the development of a market infrastructure in which a sound securities' market can thrive. Information from this research will, among others, provide information to support the government in fulfilling this duty.

(ii) Investment advisors

These include investment advisory departments of banks and other investment advisors such as Loita Asset Managers, stock brokers, dealers and financial analysts. Information from this study will be useful in making investment decisions.

(iii) Fund managers

The information will provide valid input for fund managers who have to make decision on portfolio formation process while investing in financial securities.

(iv) Regulatory authorities

The research will provide additional information that will further facilitate regulation and development of capital markets in Kenya and liquidity.

(v) Academicians

The research findings will provide a basis for further research.

It also provides a wealth of knowledge for those pursuing studies in related areas such as investment and portfolio management, investment banking, and financial management.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The term investment refers to the current commitment of funds for a period of time in order to derive future payments that will compensate an investor for the time the funds are committed, the expected rate of inflation, and the uncertainty of future payments

Investors include individuals, central governments and government agencies, state and local governments, companies, and supranational institutions. The reasons they engage in investment may be for capital preservation, for capital appreciation, to complement or earn current income, or to realize appreciation of total return.

Investments generally involve real assets and/ or financial assets. Real assets are tangible, material things such as buildings, automobiles and equipment. Whereas financial assets are pieces of paper representing a financial claim to real assets held by someone else, for example common stock, preference shares and bonds. Jensen and Meckling (1976) view financial claims as contracts that give outside investors, such as shareholders and creditors, claims to cash flows. Financial assets are traded in financial markets. In terms of time these markets can be divided into money markets and capital markets. Money markets refer to those markets that deal with short-term securities which have a life of one year or less. Examples of securities traded in these markets include treasury bills, commercial paper and negotiable certificates of deposit. Capital markets on the other hand, refer to those markets that deal with securities that have a life of over one year. Examples of securities traded in these markets include common stock, preferred stock and bonds.

According to Rose (1983), security markets exist to aid the allocation of capital among households, corporations and governmental units, with financial institutions acting as intermediaries. These markets provide liquidity in two ways. First and foremost, they enable corporations to raise funds by selling new issues of securities rapidly at fair and

competitive prices. Secondly, and equally important, they allow the investor who purchases securities to sell them with relative ease and speed, thereby turning a paper asset into cash.

Security markets can also be divided into primary markets and secondary markets. Primary markets are those markets where new securities are sold to acquire new capital. While secondary markets are those markets in which outstanding issues are traded between current and potential owners. The proceeds from a sale in these markets do not go to the issuing unit, as is the case with primary markets, but rather they go to the current owner of the security (Reilly et al., 1992). If there were no secondary markets, investors who bought securities from a company would have no opportunity to sell (Bodie et al., 1999).

Bonds are among the securities traded in the capital markets. The issuance of bonds payable is a technique for splitting a very large loan into many transferable units called bonds. Each bond represents a long-term interest-bearing note payable. When bonds are issued, the issuer usually utilizes the services of an investment-banking firm (called an underwriter). This underwriter guarantees the issuer a specific price for the entire bonds issue and makes a profit by selling the bonds to the investing public at a higher price. The use of an underwriter assures the issuer that the entire bond issue will be sold without delay, and the entire amount of the proceeds will be available at a specific date. Fabozzi (2003) recognizes two major types of bonds are traded in the bond market: Treasury bonds and Corporate bonds. There are various categories of corporate bonds which include mortgage bonds, equipment trust certificates, debentures, income bonds, convertible bonds, variable interest bonds and zero coupon bonds. From the point of view of an investor, the performance of a bond will be determined by the rate of return earned. This rate of return can be determined using the coupon rate, the current yield, or the yield to maturity approaches.

The yield to maturity is the most widely accepted measure of the rate of return investors earn if they buy a bond at a specific date and hold it to maturity (Rose, 1983). It is that

discount rate which causes the present value of the promised payment stream to equal the current price of the bond. However, a major flaw of this approach is that it assumes that an investor will hold the bond until it matures. The transferability feature of corporate bonds makes it possible for an investor to sell the bond within a matter of minutes at the going market price just by placing a call to a broker. This is because corporate bonds are traded daily on organized security exchanges. According to Reilly et al. (1997), the major determinants of the market value of a bond are:

- (a) The relationship of the bond's contract interest rate to the market interest rate for similar investments;
- (b) The length of time until the bond matures; and
- (c) Investors' confidence that the issuing company has the financial strength to make all future interest and principal payments promptly.

After bonds are issued, their market prices vary inversely with changes in market interest rates. As interest rates rise, investors will be willing to pay less to own a bond that pays a given contract rate of interest. Therefore the market price of the bond will fall. Conversely, as market interest rates fall, the market prices of bonds rise.

The development of financial markets is an important ingredient for the economic growth of a nation. According to Beck et al. (2000), financial development can accelerate economic growth in three ways:

- (i) It can enhance savings;
- (ii) It can channel these savings into real investments and thereby foster capital accumulation; and
- (iii) To the extent that financiers exercise some control over investment decisions of the entrepreneurs, financial development allows capital to flow towards the more productive uses, and thus improves the efficiency of resource allocation.

2.2 Investment Motivations

It has been argued that the East African countries underplayed the importance of private sector enterprise development in the early years of independence (Stephen et al., 2001). There was a widespread notion that entrepreneurial skills and trust were lacking, and the public could be better served by the state rather than the private enterprise. This obviated the more intangible factors such as risk taking, innovation, entrepreneurship opportunities and choice. The resultant effect was poor economic performance, misallocation of funds and lower per capita incomes (Kibua, 2005).

In 2002, the entire African continent had over twenty active stock exchanges with market capitalisation of only one percent of the world's total market capitalisation of US \$ 38 trillion (African Stock Exchanges Handbook, 2003). Their capital markets were characterised by relatively small capitalisation and liquidity levels. This is with the exception of South Africa and to some extent North Africa.

Alison (2000) explains that emerging markets should focus on developing local bond markets as this will have the benefit of helping their governments and corporations reduce their financing risks. Lack of strong local bond markets exposes governments and borrowers to large spreads of interest rate, refunding and foreign currency risk.

Suszynska (2003) notes that, a well functioning primary market for government and corporate securities is essential for an orderly functioning bond market.

The key question here is what does the investor want to achieve? All investors have goals, which must be expressed in terms of both risk and return. An investor's return must be commensurate with his risk tolerance. An individual's risk tolerance is a function of, among others, psychological make-up, current insurance coverage, cash reserves, current net worth and income expectation, and age (Reilly and Brown, 1997).

Return on the other hand is what the investor demands for giving up the current use of funds. Broadly, the reasons why investor's invest are: capital preservation, capital appreciation, supplement current income and earn total returns (Reilly et al., 1997).

The investor's goal under capital preservation is to maintain the purchasing power of an investment, while minimizing the risk of loss. This implies that the return on investment needs to be no less than the rate of inflation. This is a strategy employed by the strongly risk-averse investor; or in the case where funds will be needed in the short-run, for example in payment of tuition or down payment of a house.

Capital appreciation is the case where an investor wants the portfolio to grow in real terms over time to meet some future need. For such investments, growth mainly occurs through capital gains. It is an aggressive strategy suited to investors who are willing to take on higher risk to meet their objective. Generally long-term investors seeking to build retirement or college education funds may have this goal.

For current income, the investor wants or needs a portfolio that will largely concentrate on generating income rather than making capital gains. This strategy suits those investors who want to supplement their earnings with income generated by their portfolio to meet their living expenses. Retirees may favour this objective for part of their portfolio to help generate expendable funds.

The motive to earn total return is similar to the capital appreciation motive since the investor wants the portfolio to grow over time so as to meet a future need. However, whereas the capital appreciation strategy seeks to do this primarily through capital gains, the total return strategy seeks to increase portfolio value by both capital gains and reinvesting current income.

From the foregoing discussion, specific investment motivations for an investor will then vary greatly from one investor to another.

Alison (2000) contends that issuers, investors and intermediaries will participate in a market if they see an economic benefit (for example in terms of better costs and structures), are willing (by having the right attitudes), are able (they must have skills and be provided with an enabling regulatory environment), and are structured right as an industry to participate.

2.3 Investment in Financial Securities

Financial securities are traded in financial markets. In terms of time, these markets can be categorized into: Money markets and Capital markets (Pandey, 1993). Money markets refer to those markets that deal with short-term securities which have a life of one year or less. These include Treasury bills, Commercial paper and Negotiable certificates of deposits. While capital markets are generally defined as those markets that deal with securities, which have a life of over one year. These include Common stock, Preferred stock and, Corporate and Government bonds.

Since there are a wide range of securities that investors may trade in, for purposes of this paper the discussion will be limited to those securities that are traded in the capital markets. Some of these securities are:

Common Stock

Common stock represents ownership interest in a company. The stockholder owns a percentage interest in a firm consistent with the percentage of outstanding stock held. A company may have various classes of common stock depending on, for instance, the distribution of dividends or voting rights or some other attributes. It is therefore important for investors to know what rights go along with the shares of stock being contemplated.

Features of common stock

According to Block and Hirt (2002), there are three main features of common stock:

The voting rights' feature implies that each share of common stock entitles the holder one vote in the election of directors, and on special issues. Votes are generally assignable and must be cast at the annual stockholders' meeting. Many companies, which have issued two or more classes of common stock, usually have unequal voting rights being the key difference among its classes of stock. The issuance of different classes of common stock has frequently been used as a defense against hostile takeovers in which an outside group, without management support, tries to gain voting control of the firm by buying its shares in the market place. At other times, a class of nonvoting common stock is issued when the firm wishes to raise capital through the sale of common stock but does not want to give up its voting control.

The second feature of common stock is payment of dividends. Payment of dividends is at the discretion of the Board of Directors. Dividends may be paid in cash, stock or merchandise. Before dividends are paid to common stockholders, the claims of the government, all creditors, and preferred stockholders must be satisfied.

Finally the pre-emptive rights feature allows common stock holders to maintain their proportionate ownership of the corporation when new shares are issued. It allows existing shareholders to maintain voting control and protect against dilution of their ownership.

Common stock entitles its owner to dividend payments but only when the firm has earnings out of which dividends can be paid, and only if management chooses to pay dividends rather than to retain and reinvest all earnings. Stocks can also be sold at some future date at a price higher or lower than the purchase price earning the investor capital gains or capital loss.

Valuation of common stock

Reilly et al (1997) distinguish two basic approaches to equity valuation.

Under the discounted cash flow valuation techniques, the value of stock is estimated based upon the present value of some measure of cash flow such as dividends, operating cash flow and free cash flow.

Under the relative valuation techniques, the value of stock is estimated based upon its current price relative to variables considered significant to valuation such as earnings, cash flow, and book value or sales.

The discounted cash flow valuation techniques tend to be more popular. The premise of these techniques is that the value of a share of common stock is equal to the present value of all future benefits (dividends) it is expected to provide over an infinite time horizon. Thus for any individual investor, the expected cash flows consist of expected dividends plus expected sales price of the stock.

General formula:

$$P_0 = \frac{D_1}{(1+K_s)} + \frac{D_2}{(1+K_s)^2} + \dots + \frac{D^\infty}{(1+K_s)^\infty}$$

Where:

P_0 = Value of common stock at time 0 (the present)

D_n = Dividend paid at time n

K_s = Required rate of return on common stock

However, the above formula will vary depending on the nature of the stocks, for instance whether they are zero growth stocks, normal or constant growth stocks, or non-constant growth stocks.

Preferred Stock

Preferred stock is a hybrid security. It is similar to bonds in that preferred dividends are fixed in amount and generally must be paid before common stock dividends can be paid, and similar to common stock in that like ordinary (common) dividends, preferred dividends can be omitted without bankrupting the firm and some preferred issues have no specific maturity date (Pandey, 1993).

Preferred stockholders are promised a fixed periodic return, which is stated as either a percentage or as a dollar amount. How the dividend is specified depends on whether or not the preferred stock has a par value. Par value preferred stock has a stated face value, and its annual dividend is specified as a percentage. No-par preferred stock has no stated face value, and hence its annual dividend is stated in dollars.

Preferred stock is most often issued by public utilities, by acquiring firms in merger transactions, or by firms that are experiencing losses and need additional financing (Block et al., 2002).

The use of preferred stock declined during the post-world war II period (Carosso, 1970). Recently however, it has become important among active investors and venture capitalists (Sahlman, 1990).

Features of Preferred Stock

Pandey (1993) recognizes nine features of preferred stock.

Preferred stock has restrictive covenants. Such covenants have provisions relating to passing dividends, sale of senior securities, mergers, sale of assets, minimum liquidity requirements, and the payment of common stock dividends or common stock repurchases. Restrictive covenants are aimed at ensuring the continued existence of the firm and regular payment of the stated dividend.

The cumulation feature requires dividends in arrears to be paid along with current dividends prior to the payment of common stock dividends. However, if preferred stock

is non-cumulative, passed (unpaid) dividends do not accumulate. In this case, only the current dividend must be paid prior to paying dividends to common stock holders. Since preference shares do not have the dividend enforcement power, the cumulative feature is necessary to protect the rights of preference shareholders.

The claims on income and assets' feature recognize that preferred stockholders have prior claim on the company's income. This means that the company must first pay preference dividend before paying ordinary dividend. It also has prior claim on company assets in the event of liquidation.

Fixed dividend feature. The dividend rate is fixed and preference dividends are not tax deductible. The preference dividend rate is expressed as a percentage of the par value. Payment of preference dividend is not a legal obligation but usually a profitable company will honour its commitment of paying preference dividends.

Redemption feature. Perpetual or irredeemable preference shares do not have maturity dates. But redeemable preference shares do have specified maturity dates.

Sinking Fund feature. Sinking fund refers to money that has been set aside to either purchase preference shares in the open market or to buy back (call) the preference share.

Callable feature. Preferred stock is generally callable. This feature permits the issuer to buy back preference shares at a stipulated buy-back (call) price. The call option generally cannot be exercised until after a specified date. The call price is normally set above the initial issuance price but may decrease as time passes. The difference between call price and par value of the preference share is called the call premium. Making preferred stock callable provides the issuer with a method of bringing the fixed-payment commitment of the preferred issue to an end.

Participation feature. Preference shares may in some cases have this feature. It entitles the holder a right to participate in extraordinary profits earned by the company- the preference shareholder may get dividend amounts in excess of fixed dividends. The

preference shareholder may also be entitled to participate in the residual assets in the event of liquidation.

The conversion feature allows holders of convertible preferred stock to change each share into a stated number of shares of common stock.

Valuation of Preferred Stock

General formula:

$$V_p = \frac{D_p}{k_p}$$

Where:

V_p = Value of the preferred stock

D_p = Preferred dividend

K_p = Required rate of return on preferred stock

Where the preferred stock has a finite maturity date, then it will be valued in the same way as a bond.

In this case, the preferred dividend payment is equivalent to a bond's coupon payment, while the par value corresponds to a bond's maturity value.

ASSET-BACKED SECURITIES

This refers to the sale of receivables. In former years, companies that sold receivables were viewed as short of cash, financially shaky, or in some financial trouble (Block & Hirt, 2002). This negative perception has been diminished by new issues of receivables-backed securities by such companies as Bank of America (credit card receivables), General Motors Acceptance Corporation (car loan receivables), and Mack Trucks (truck loan receivables), although the securitization of residential mortgage loans is by far the largest type of asset that has been securitized. The largest sectors of the asset-based securities market in the United States are securities backed by credit card receivables,

auto loans, home equity loans, manufactured housing loans, student loans, small business administration loans, and collateralized bond obligations.

One of the benefits to the issuer is that they trade future cash flows for immediate cash. The asset-backed security is likely to carry a high credit rating of AA or better, even when the issuing company has a low credit rating. This allows the issuing firm to acquire lower cost funds than it could with a bank loan or a bond offering.

CONVERTIBLES

Occasionally companies issue convertible securities. These are hybrid securities combining the features of debt and common equity. They are bonds or share of preference stock that can be converted, at the option of the holder, into common stock. Thus the owner has a fixed income security that can be transferred into common stock if and when affairs of the company indicate that such a conversion is desirable.

Even though convertible securities are most often converted into common stock, some convertible preference stock is exchangeable into convertible bonds first, then eventually into common stock (Fabozzi, 2003).

Convertible bonds

These have interest and principal characteristics of other bonds, but with the added feature that the bondholder has the option to turn them back to the firm in exchange for its common stock. They appeal to investors because they combine the features of a fixed income security with the option of conversion into common stock should the company prosper (Pandey, 1993). And because of their desirable conversion option, convertible bonds generally pay lower interest rates than non-convertible debentures of comparable risk. The difference in the required interest rate increases with the growth potential of the company because this increases the value of the option to convert the bonds into common stock.

Reilly et al (1997) indicate that the value of convertible bonds is affected by three things: The market's assessment of the likely performance of the common stock; the gap between the stipulated conversion price and the current price of the common stock; and Finally, the coupon interest it pays semi-annually.

Normally, the conversion price is set higher than the prevailing market value of the common stock at the time of issue to allow for expected value growth of the common stock over time. Conversion is essentially at the investor's discretion when found advantageous, although the indenture usually stipulates a time limit. Moreover, the issuing company usually has the right to call the bonds for redemption at a slight premium price after a certain date. As share prices approach and surpass the conversion price, the bond's value will rise above par because of the growing value of the equivalent shares it represents (Reilly et al., 1992).

WARRANTS

A warrant is an option to buy a stated number of shares of stock at a specified price (exercise price) over a given time period (Pandey, 1993). They are sometimes issued as a financial sweetener in a bond offering, and they may enable the company to issue debt when this would not be otherwise feasible because of low quality rating or a high interest environment. Warrants are usually detachable from the bond issue, have their own market price, and are generally traded on the stock exchange or over-the-counter. After warrants are detached, the initial debt to which they were attached remains in existence as a stand-alone bond. Often the bond price will fall and the yield will rise once the warrants are detached (Block et al., 2002).

Since a warrant is dependent on the market movement of the underlying common stock and has no 'security value' as such, it is highly speculative. If the common stock of the company is volatile, the value of the warrant may change dramatically.

Features of warrants:

According to Pandey (1993) warrants have the following five main features:

Warrants have an exercise price. This is the price at which the holder can purchase the issuing firm's ordinary shares.

A second feature is the exercise ratio. This is the ratio, which states the number of ordinary shares that can be purchased at the exercise price per warrant. For example an exercise ratio of 2:1 implies that the holder of the warrant is entitled to buy two ordinary shares in exchange for one warrant at the exercise price.

3.3 Nature and Types of Warrants

Expiration date of warrants refers to the date at which the option to buy ordinary shares in exchange for warrants expires. Some warrants are perpetual and thus do not have expiration dates.

The detachability feature of a warrant means that a warrant can be sold separately from the debenture (or preference share) to which it was originally attached, it is called a detachable warrant. In this case, the debenture holder may sell his warrant when price increases but continue holding the debenture. The company will list a detachable warrant separately, and it will be traded on the stock exchanges. On the other hand, warrants that cannot be sold separately from the debenture to which they are attached are called non-detachable warrants.

Rights' feature entitles the holder of a warrant to purchase ordinary shares. The holders of warrants are not the firm's shareholders until they exercise their option.

Valuation of a Warrant:

$$I = (M - E) \times N$$

Where, I = Intrinsic value of a warrant

M = Market value of common stock

E = Exercise price of a warrant

N = Number of shares each warrant entitles the holder to purchase

2.4 Nature and Types of Bonds

A bond represents a contract whereby the issuing company agrees to pay the investor interest at specified times, and the principal amount at the maturity of the bond (Reilly et al., 1992). Thus, the expected cash flows consist of annual interest payments plus repayment of the principal. The appropriate capitalization (discount) rate to be applied will depend upon the riskiness of the bond. For instance, the risk in holding a government bond is lower than the risk associated with holding a corporate bond. As a result, a lower discount rate is applied to the cash flows of the government bond and a higher rate to the cash flows associated with a corporate bond.

Features of a bond:

There are five main features of a bond (Pandey, 1993).

Bonds have a face value. This is also called the par value. Interest is paid on this value.

Interest rate, also called the coupon rate, is fixed and known to the bondholder. The interest paid on a bond is tax deductible.

The maturity feature of a bond recognizes that bonds are generally issued for a specified period of time and repaid on maturity.

Redemption value. This is the value, which a bondholder will get on the maturity of the bond. A bond may be redeemed at par or at a premium (more than par value) or at a discount (less than par value).

Market value refers to the price at which a bond is currently sold or bought. This value may differ from the par value or the redemption value.

Valuation of bonds

Bonds may be of two types: bonds with maturity, and perpetual bonds (Reilly et al., 1997).

Bonds with maturity are those bonds that are issued for a specific period of time. That is, it has a finite maturity. As is true of all securities, a bond's value is the present value of expected cash flow streams. In this case it is the present value of an annuity plus the present value of the lump sum paid at the maturity.

Formulae:

$$V = \frac{I}{(1+k_d)^1} + \frac{I}{(1+k_d)^2} + \dots + \frac{I}{(1+k_d)^n} + \frac{M}{(1+k_d)^n}$$

The above formulae can be rewritten as follows:

$$V = I(PVIFA_{k_d,n}) + M(PVIF_{k_d,n})$$

Where, I = Annual coupon payment (in amounts)

M = Par value of the bond (amount repaid at maturity)

K_d = Required rate of return on the debt

n = Number of years to maturity

Perpetual bonds are bonds which will never mature. In practice such bonds are rarely issued. After the Napoleonic War, England issued these types of bonds to pay off many smaller issues that had been floated in prior years to pay for the war. Since these bonds have no maturity and hence terminal value, their values are derived by discounting the infinite stream of interest flows.

Formulae:

$$V = \frac{I}{k_d}$$

Where, I = Annual coupon payment (in amounts)

k_d = Required rate of return on the debt

There are various types of bonds issued in the securities markets, and they include the following:

Mortgage Bonds

These are issued to purchase specified real estate assets and the acquired assets serve as collateral (Fabozzi, 2003). This means that if the firm defaults on the interest or principal repayments, the creditor(s) may take title to the pledged property.

Equipment Trust Certificates

These are issued to finance specified equipment and such equipment is pledged as collateral. Such bonds are primarily issued by railroads and airlines to finance rolling stock and airplanes. The equipment, which serves as collateral is considered to be of excellent quality, for unlike fixed assets, it can be readily moved and sold to other railroads and airlines should the firm default in the certificates.

Debentures

Debentures are unsecured promissory notes of a company supported by the general credit of the firm (Reilly et al., 1997). They are risky because in the event of default or bankruptcy, secured debt will be redeemed before the debentures.

Subordinated Debentures

These are bonds with a lower (subordinate) claim on the firm's assets than the claims of other debt instruments (Pandey, 1993). Subordinated debentures are among the most risky types of debt issued and usually have significantly higher interest rates or other features such as convertibility into the stock of the company to compensate lenders for the increased risk.

While the use of debentures may not decrease the ability of the firm to issue additional debt, default on the debentures usually means that all superior debt is in default. A frequent indenture clause stipulates that if any of the firm's debt is in default, all debt issues are in default, in which case the creditor may declare the entire debt to be due.

Income Bonds

These refer to those bonds whose interest is only paid if it is earned by the firm. If the firm is unable to cover its other expenses, it is not legally obligated to pay interest on these bonds (Pandey, 1993). These are the riskiest of all types of bonds and are rarely issued by corporations today.

Revenue Bonds

The state and local governments frequently issue these bonds. They are supported by the assets financed and interest is paid only if revenue is earned (Pandey, 1993). Examples include bonds issued to finance toll roads. The interest on the debt is paid if tolls generate sufficient revenue (after operating expenses) to cover the interest payments.

Convertible Bonds

These are a hybrid security. They not only pay interest and have a maturity date, but they also may be converted into a number of shares of common stock (Block et al., 2002). For example Viacom convertible bonds may be exchanged for 20 shares of Viacom common stock.

The value or market price of these bonds depends on both the value of the stock and the interest the bonds pay. These bonds offer investors the advantages of both debt and equity. If the price of the common stock rises, the value of the bond must rise. The investor has the opportunity for capital gain should the price of common stock rise. If however the price of common stock does not appreciate, the investor still owns a debt obligation of the company. The company must pay interest on this debt and must retire it at maturity. Thus the investor has the safety of an investment in a debt instrument (Block et al., 2002).

Variable Interest Rate Bonds

These are long-term debt instruments whose interest payments vary with changes in short-term interest rates (Block et al., 2002). They were introduced in the US in the mid-1970s and became popular during the periods of high interest rates. The typical variable interest rate bond has two distinct features.

The first, on completion of the initial 6-8 months during which time a minimum rate is often guaranteed, the coupon rate floats so that every 6 months it changes to follow some standard. Usually it is pegged 1% above a stipulated short-term rate.

The second feature is that after the first year or two, the bonds are redeemable at par on the option of the holder. This is usually at intervals of 6 months.

Although the six-month redemption feature provides liquidity, the variable rates can cause these issues to experience wide swings in semiannual coupons (Fabozzi, 2001).

Zero Coupon Bonds

These are bonds that are initially sold at a discount and on which interest is paid at maturity (Pandey, 1993). It sells for a large discount and the investor's return accrues from the appreciation of the bond's value as it approaches maturity.

High –Yield Securities (Junk Bonds)

This is the name given to debt of low quality (bonds rated below triple B). More often than not, junk bonds are usually debentures and may be subordinated to the firm's other debt obligations. The poor quality of this debt requires that junk bonds offer high yields, which may be three to four percentage points higher than the yield available on high quality bonds (Fabozzi, 2003).

These bonds have existed for as long as there have been rating agencies (Perry and Taggart, 1988). However, the high-yield bond market exploded in size and activity at the beginning of 1983. As of the year 2002, the total outstanding high-yield debt constituted about 20% of the outstanding debt in the United States (Reilly and Wright, 2001).

These bonds are often issued to finance takeovers and mergers, and they may be bought by financial institutions and individuals who are accustomed to investing in poor-quality bonds and who are willing to accept the larger risk in order to earn the higher yields.

The major owners of these bonds have been mutual funds, insurance companies, and pension funds. As at the end of the year 2001, over one hundred mutual funds were either exclusively directed to invest in high-yield bonds or included such bonds in their portfolios (Reilly and Wright, 2001).

Foreign Bonds

This term refers to bonds issued in foreign countries to raise funds for foreign investments such as plant and equipment (Fabozzi, 2003).

Eurobonds

These are bonds sold in a foreign country but denominated in the currency of the issuing firm (Block et al., 2002). For example if IBM sells Eurobonds in Europe, it promises to make payments in dollars and avoids the risks associated with changes in exchange rates.

2.5 The term structure of interest rates

The term structure of interest rates (also known as a yield curve) is a static function that relates the term to maturity to the yield to maturity for a sample of bonds at a given point in time (Sundaresan, 2002). It represents a cross section of yields for a category of bonds that are comparable in all respects but maturity. The accuracy of the yield curve will depend on the comparability of the bonds in the sample.

Shape of the yield curve

Although individual yield curves are static, their behaviour over time is quite fluid (Fabozzi, 2003). There are four main shapes of the yield curve: Rising yield curve, Declining yield curve, Flat yield curve and Humped yield curve.

The most common relationship is that of a rising yield curve where the yields on short-term issues are low and rise consistently with longer maturities, and then flattens out at the extreme. A declining yield curve is formed when the yields on short-term issues are high and yields on subsequently longer maturities decline consistently. Flat yield curves indicate that yields on short-term and long-term issues are approximately equal. While a humped yield curve is formed when yields on intermediate-term issues are above those on short-term issues, and the rates on long-term issues decline to levels below those for the short-term, and then level out (Sundaresan, 2002).

In their study on common factors affecting bond returns, Litterman and Scheinkman (1991) found that three factors explained historical returns on bonds: Changes in the level of rates change in the slope of the yield curve, and change in the curvature of the yield curve. They employed regression analysis to determine the relative contribution of these

three factors in explaining the returns on zero coupon treasury securities of different maturities.

The Theories of the Term Structure of Interest Rates

Yield curves change their shape over time in respect to changes in the public's interest rate expectations, fluctuations in demand for liquidity in the economy, and other factors (Rose, 1983). Each shape of the yield curve has implications for lenders and savers, borrowers and investors, and the financial institutions that serve them.

The Expectations Theory

This theory argues that investor expectations regarding future change in short-term interest rates determine the shape of the curve (Cox et al., 1981). Expectations are a potent force in the financial market place because investors act on their expectations. A rising yield curve is presumed to be an indication that investors expect short-term interest rates to rise above their current levels in the future. A declining yield curve suggests declining short-term interest rates in the future. While a horizontal yield curve implies that investors expect interest rates to remain essentially unchanged from their present levels.

This theory assumes that investors act as profit maximizers over their planned holding periods and have no maturity preferences. All securities in a given risk class, regardless of their maturity, are perfect substitutes for each other. Each investor will seek those individual securities or combination of securities offering the highest rates of return.

Rising interest rates result in falling prices for bonds and other debt securities. The longer the term of a bond, the more sensitive its price is to changes in rates. Faced with the possibility of falling bond prices, many investors will sell their long-term bonds and buy shorter-term securities or hold cash. As a result, the prices of long-term bonds will plummet, driving their rates (yields) higher. At the same time increased investor purchases of short-term securities will send the prices of these securities higher and their

yields lower. With rising long-term rates and falling short-term rates, the yield curve will gradually assume an upward slope (Hourdouvelis, 1988).

The Liquidity Theory

The strong assumptions underlying the Pure Expectation Theory coupled with the real world behaviour of investors led securities' dealers and analysts, who trade actively in the financial markets, to argue that other factors besides rate expectations also exert a significant impact on the character of the yield curve (Rose, 1983).

This theory contends that uncertainty and volatility cause investors to favour short-term issues over bonds with longer maturities because short-term bonds are less volatile and can easily be converted into predictable amounts of cash should an impromptu need arise. Therefore, to induce investors to lend long-term funds, it is necessary to offer higher yields (Cox, 1981). This theory argues that the yield curve should slope upward and that any other shape should be viewed as an aberration.

In the instances when the yield curve slopes downwards, the expectations of declining interest rates plus other factors simply overcome the liquidity premium effect. This theory does not preclude the significant role of interest rate expectations in influencing the shape of the yield curve. It recognises that other factors, such as liquidity also play an important role. Moreover, the liquidity argument may help explain why yield curves tend to "flatten out" at the longest maturities (Fabozzi, 2003).

The Market Segmentation Theory

This theory assumes that all securities are not perfect substitutes in the minds of investors. Maturity preferences exist among major investor groups and these groups will not stray from their "preferred habitats" along the maturity spectrum unless induced to do so by higher yields or other favourable terms on longer- or shorter-term securities (Fabozzi, 2003). For example, because life insurance companies and pension funds have stable and predictable long-term liabilities, they prefer to invest in bonds, stocks and other long-term assets. Commercial banks on the other hand have volatile deposits and

short-term money market liabilities, and therefore prefer to confine the majority of their investments to short-term loans and securities. These important investor groups use the hedging principle of portfolio management- correlating the maturity of their liabilities with the expected cash flow generated by their assets. This strategy reduces the risks of fluctuating income and loss of principal.

The market segmentation theory does not rule out the possible influence of expectations in shaping the term structure of interest rates, but it argues that other factors related to maturity-specific demand and supply conditions are of dominant importance. The theory has significant implications for public policy. If markets along the maturity spectrum are relatively isolated from each other due to investor preferences, government policy makers can alter the shape of the yield curve merely by influencing supply and demand conditions in one or more market segments. For example, if a positively sloped yield curve is desired, with long-term interest rates higher than short-term rates, the Treasury and the Central bank could flood the market with long-term bonds. Simultaneously, the government could purchase large quantities of short-term securities. The expanded supply of bonds would drive long-term rates higher, while purchases of short-term securities would push short-term rates down, other factors held equal (Fama, 1976).

Uses of the Yield Curve

The yield curve is an important concept and has been found extremely useful to investors in a variety of ways. Some of its uses include the following:

Forecasting interest rates

If the expectations theory holds true then, the yield curve gives the investor a clue concerning the future course of interest rates' movement. Where the curve has an upward slope, the investor may well be advised to move away from bonds and other long-term securities into investments whose market price is less sensitive to interest rate changes (Fabozzi, 2001).

Uses for financial intermediaries

A rising yield curve is generally favourable for these institutions (especially commercial banks, savings and loans associations, and savings banks) because they borrow most of their funds by selling short-term deposits and lend a major proportion of those funds long-term. The more steeply the yield curve slopes upward, the wider the spread between borrowing and lending rates, and the greater the potential profit for a financial intermediary. But if the yield curve begins to flatten out or slope downwards, this should serve as a warning signal to portfolio managers of these institutions (Fama, 1976).

Detecting under priced and over priced securities

In equilibrium, the yields on all securities of comparable risk should come to rest along the yield curve at their appropriate maturity levels. If a security's rate of return lies above the yield curve, this sends a signal to investors that that particular security is temporarily under priced relative to other securities of the same maturity. Other things equal, this is a buy signal. And if the security's rate of return lies below the yield curve, this indicates a temporarily over priced financial instrument. This is a sell signal (Fama, 1976).

Indicating trade-offs between maturity and yield

If the investor wishes to alter the maturity of a portfolio, the yield curve indicates what gain or loss in rates of return may be expected for each change in the portfolio's average maturity (Reilly, 2000).

Riding the yield curve

Active security investors can 'ride' the yield curve for profit. If the curve is positively sloped, with a slope steep enough to offset transaction costs from buying and selling securities, the investor may gain by timely portfolio switching (Reilly, 2000).

2.6 Performance of Bonds

Financial crisis in the world financial markets marked by, among others, the collapse of the Mexican peso in late 1994 and early 1995 saw a significant drop in the performance of major emerging markets around the world (Ingo et al., 2001). However, with the dismal performance of equities markets, banks and bond markets investors took up where the equity market left off. The J.P. Morgan's Emerging Market Bond Index, which measures the performance of bonds in emerging markets, rose by 39.3% in 1996, having doubled in early 1995 (JP Morgan Securities, 1999).

Lenders of funds have a pressing need to secure accurate financial information on those individuals and institutions that seek to borrow funds or sell their stock. Particularly, lenders of long-term funds pay special attention to the long-term viability of the individuals and institutions to which they grant funds.

One way to measure the cost of issuing a bond is to compare the net proceeds available for the borrowing company's use from a bond sale to the present value of the stream of cash payments the firm must make to the bondholders (Rose, 1983).

More often than not, an issuer will use the services of investment bankers (underwriters) to sell their bonds to the public. And what happens to the market prices of securities being sold by investment banking syndicates is the key determinant of success or failure of the underwriting process (Reilly et al., 1997). If the market price at which a new issue can be sold falls far enough, the syndicate will disband with individual underwriters scrambling to sell their allotment of securities at whatever price the market dictates. Unfavorable price movements can damage the reputation of the investment banker with both investors and the issuing companies who issue securities for public sale. The price of a security and its yield or rate of return is inversely related. A rise in the yield implies a decline in price; conversely, a fall in yield is associated with a rise in the security's price.

According to Rose (1983) there are three approaches through which the rate of return on a bond, and therefore performance, can be assessed.

The coupon rate is the contracted rate at which the bond issuer agrees to pay the investor at the time the security is issued. The amount of annual interest income paid by a bond (coupon) is determined as follows:

$$\text{Coupon} = \text{Coupon Rate} \times \text{Par Value}$$

The coupon rate is not an adequate measure of the return on a bond or other debt security unless the investor purchases the security at a price equal to its par value, the borrower meets all of the promised payments, and the investor sells/ redeems the bond at its par value. However, the prices of bonds fluctuate with market conditions, and rarely will a bond trade exactly at par.

The second approach of measuring bond performance uses the current yield. The current yield is the ratio of the annual income (dividends or interest) generated by the security, to its current market value.

That is:

$$\text{Current Yield} = \text{Annual Income} / \text{Market Price of Security}$$

Frequently, the yields reported on stocks or bonds in the financial press are current yields. However, this measure is usually a poor reflection of the rate of return actually received by the lender (investor) because it ignores the stream of actual and anticipated cash flows associated with a security, and the price for which the investor will be able to redeem it.

Finally, the Yield to Maturity (YTM) approach. The YTM is the rate of interest at which the market is prepared to pay for a financial asset in order to exchange present dollars for future dollars. This is the most widely accepted measure of the rate of return on a security.

Specifically, the YTM is the rate, which equates the purchase price of a security (P) with the present value of all its expected annual net cash inflows

(I) as in the formula below:

$$P = \frac{I_1}{(1+y)^1} + \frac{I_2}{(1+y)^2} + \dots + \frac{I_n}{(1+y)^n}$$

Where:

y= Yield to Maturity

I = Expected annual income from the security presumed to last for n years and terminate when the financial asset is retired (includes both receipts of income and repayments of principal)

The merits of this approach include (Rose, 1983):

- i. Unlike the coupon rate approach, the YTM approach is based upon market values rather than par or book values;
- ii. Unlike the current yield approach, this return measure considers the time distribution of expected cash flows from a security or other financial asset; and
- iii. Dealers and brokers typically use this measure when quoting rates of return to investors.

The approach also has limitations (Rose, 1983):

- i. It assumes that the investor will hold a security until it reaches final maturity; and
- ii. It also assumes all cash flowing to the investor can be reinvested at the computed yield to maturity.

Another critical aspect in the performance of bonds relates to risk. In their paper, "Common risk factors in the returns on stocks and bonds," Eugene F. Fama and Kenneth R. French identified two common risk factors in the returns on bonds:

(i) Unexpected changes in interest rates

Prices of bonds fluctuate with market interest rates. The risk that an investor faces is that the price of the bond held will decline if market interest rates rise.

(ii) Likelihood of default

This is the risk that the issuer will fail to meet terms of the obligations with respect to timely payment of interest and repayment of amounts borrowed.

However other risks associated with bonds as identified by Fabozzi, F. J. (2003) include Call and prepayment risk, Yield curve risk, Reinvestment risk, Credit risk, Liquidity risk, Exchange rate risk, Volatility risk, Inflation or purchasing power risk, and Event risk.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Population

The population of interest was based on all bonds listed on the Nairobi Stock Exchange from 2001 to 2005. During this period, a total of eighty one bonds were listed at the NSE, of which seven were corporate bonds and seventy four were government bonds. It is believed that results based on this period will be reflective of the current developments in the bond market.

3.2 Sample

The sample captured all bonds that traded on the Nairobi Stock Exchange throughout the research period. A minimum of five years seemed acceptable with studies on capital markets as observed in Beaver (1998) and Kross (1982); and in Kenya, Kiweu (1990) and Oluoch (2003) who used a five-year period to test the efficiency of the capital markets.

Stratified random sampling was used to select thirty government bonds that consistently traded on the NSE during the mentioned period. The strata were based on bond maturities. However, all the seven corporate bonds listed were considered as part of the sample.

3.3 Data Collection

Secondary data was used for this study.

The following data was collected for the period of research (2001-2005):

- Monthly turnovers in the bonds market;
- Monthly ending prices and interest paid every month; and
- Interest rates and maturities of all the bonds;

All the data required was collected from the CMA Resource Centre and the NSE Library through examination of existing literature.

3.4 Data Analysis

The annual yield-to-maturity (YTM) of the bonds was computed using the data collected on prices, interest rates and maturities of the bonds traded on the Nairobi Stock Exchange (NSE) for the period of study.

The YTM is the interest rate that makes the present value of the cash flows from a bond equals its market price plus accrued interest. From the bond valuation formula, below, the YTM can be derived:

$$P_0 = \sum_{t=1}^n \frac{I_t}{(1+k_d)^t} + \frac{M_n}{(1+k_d)^n}$$

Where:

P_0 = Present value of the bond

I_t = Amount of interest paid in period t

k_d = Required rate of return on the bond (%)

M_n = Terminal or maturity value of the bond in period n

n = Number of years to maturity

In computing the YTM from the bond valuation formula above, the rate, k_d , was solved for the value that equated the current price, P_0 , to all cash flows from the bond to maturity. k_d was thus computed by trial and error method.

Based on the results above, graphs were drawn where the annual yields was plotted against time in years. The first graph indicated annual yields of both the corporate bonds and government bonds plotted against time (years), then graphs for individual bonds YTM against time were computed to find out the individuals contribution on the overall performance.

Through an examination of the above graphs, conclusions were drawn regarding the investment performance of bonds, and whether this performance depends on the type of bonds.

CHAPTER 4

4.0 DATA ANALYSIS AND FINDINGS

4.1 Introduction

Among the Eastern African countries of Kenya, Uganda, Tanzania, Djibouti, Somalia, Eritrea, Sudan, Rwanda and Burundi, only Kenya, Uganda and Tanzania have recognized stock markets (Kibua, 2005). The biggest of these is the Nairobi Stock Exchange (NSE). The NSE has developed over time to be sub-saharan Africa's fourth-largest bourse with forty-nine listed companies (inclusive of the corporate bond market) and a total capitalization of approximately four billion dollars as of August, 2004 (CMA, 2004).

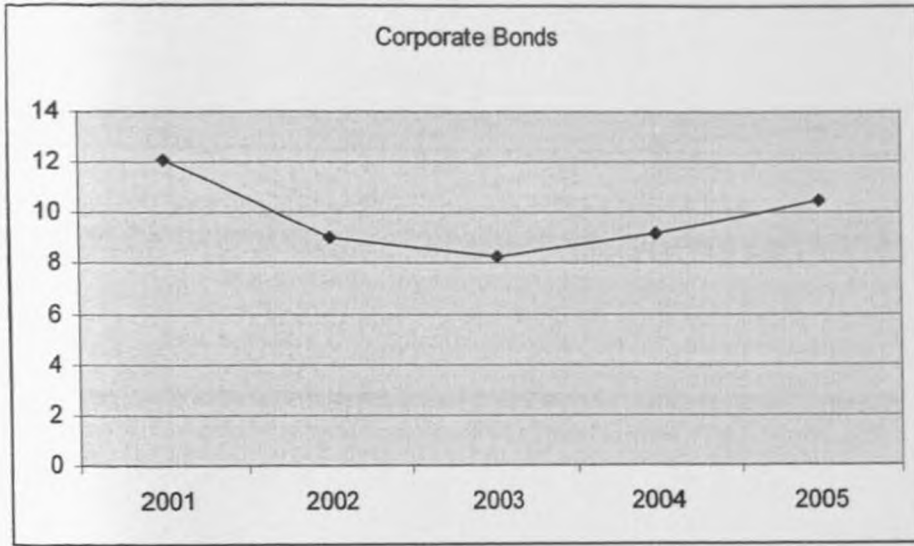
The data collected and analysed was used to compute the monthly ^{YTM} yield-to-maturity of all the bonds under study. An average of these yields was then obtained for all the years under study. Various yield curves were drawn indicating the annual yield-to-maturity of the respective bonds plotted against time.

4.2 Performance of corporate bonds

After listing of the first corporate bond in the year 1996 (the East African Development Bank Bond), the years beginning 2000 to 2005 saw enhanced activity in the market. Corporate investors acknowledged the importance of the bond market as an alternative instrument for raising much needed long-term funds. It was also observed that lack of credit rating may be one of the key factors that have slowed down growth of this market. Credit rating is critical for debt instruments since it promotes confidence in the capital markets as investors are made aware of a firm's credit worthiness.

The performance of corporate bonds between the years 2001 to 2005 is illustrated in the graph below:

Figure 4.2 Performance of corporate bonds, 2001-2005



Source: NSE Data Base

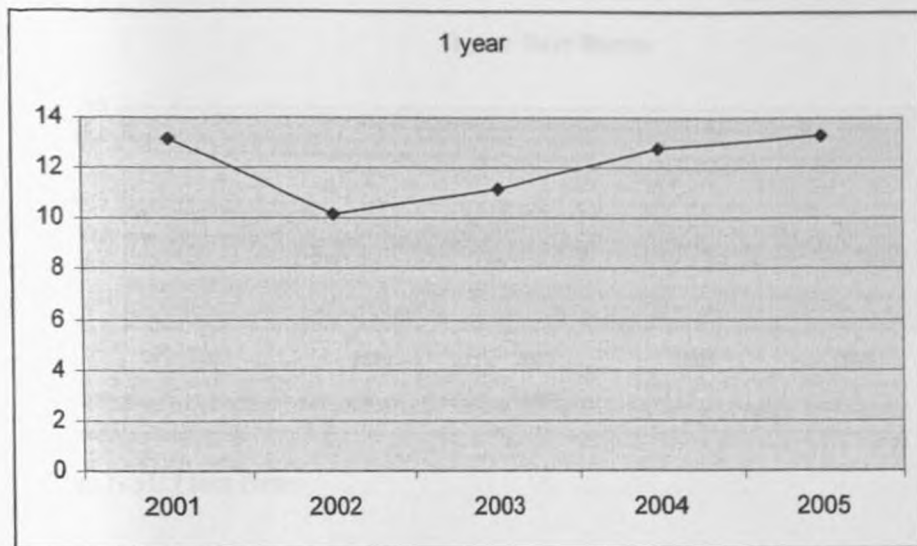
From the above figure, the study revealed an interesting trend in the performance of corporate bonds plotted against time in years. There was a high yield to maturity of 12% which dropped to 9% in 2002 and further drop to 8.3% in 2003 before rising steadily to 9.2% in 2004 and lastly to 10.5% in 2005.

4.3 Performance of government bonds

The listing of Government of Kenya Treasury bonds started in 1986. The government bonds account for approximately ninety-five percent of the total bonds in the market (NSE, 2005). Due to the withholding of donor funding in the year 2001, the government opted to resort to the domestic debt market to raise funds. During this year, the debt market became more active mainly due to the stimulus received from the restructuring of short-term debt into long-term treasury bonds.

The performance of government bonds from the year 2001 to the year 2005 is illustrated in the graph below:

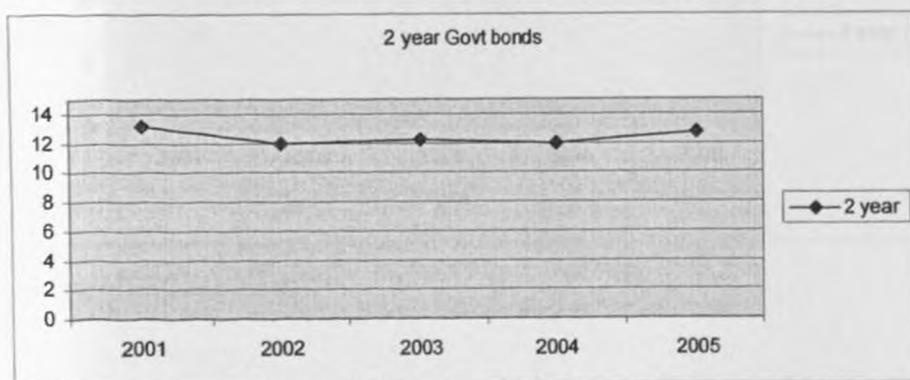
Figure 4.3 Performance of 1-year government bonds, 2001-2005



Source: NSE Data Base

From the above figure, the bonds performed poorly in 2002 but have been rising since then to hit a mark of 13.275%. In 2001 it was 13.14% which dropped to 10.2% in 2002 but rose to 11.15% in 2003 and 12.75% in 2004.

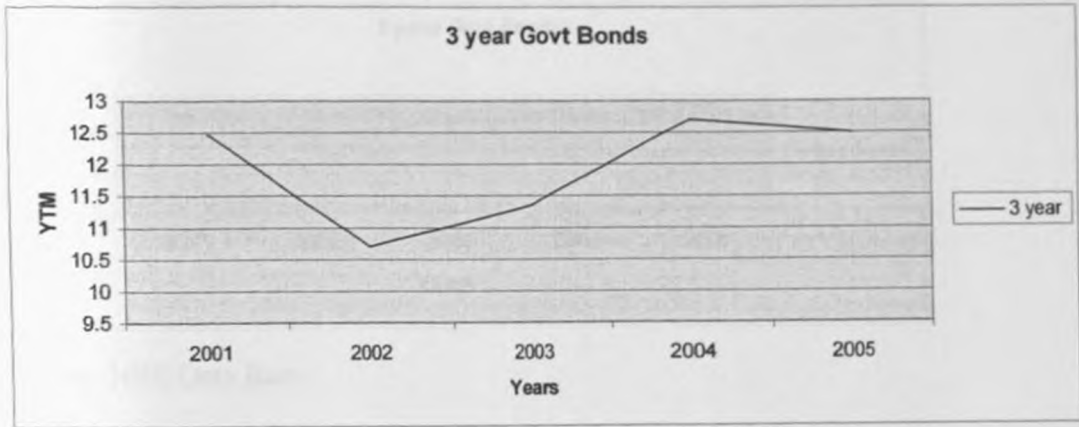
Figure 4.4 Performance of 2-year government bonds, 2001-2005



Source: NSE Data Base

Just like the 1-year government bonds, the 2-year bonds have been rising steadily after a drop in 2002 to stand at 12.7% in 2005. In the year 2001, the YTM reached a high of 13.19%, and then declined to 12% in 2002. After which it rose to 12.26% in 2003 but went down again, to 12% in 2004.

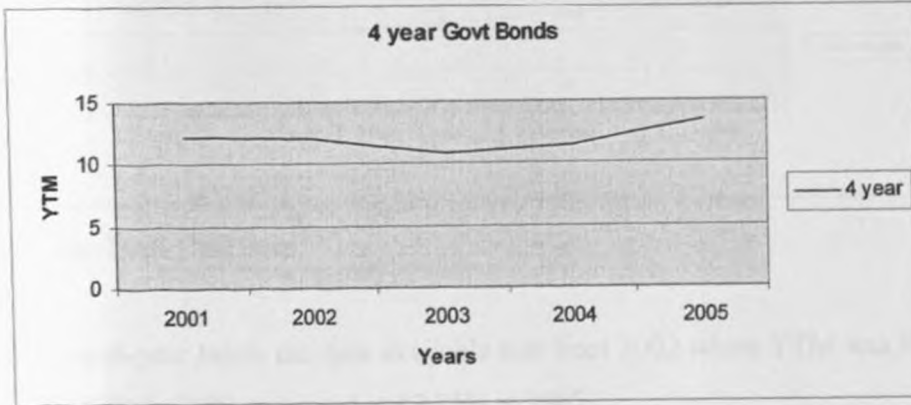
Figure 4.5 Performance of 3-year government bonds, 2001-2005



Source: NSE Data Base

There was a sharp drop in the YTM of 3-year government bonds from 12.3% in 2001 to 10.7% in 2002, and then it rose to 12.7% in 2004 before settling at 12.5% in 2005.

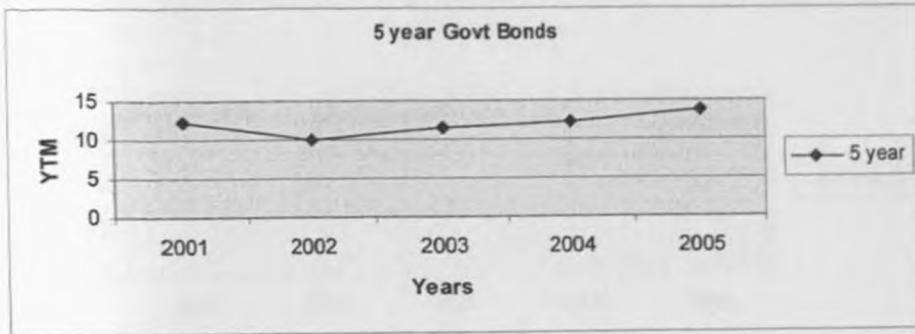
Figure 4.6 Performance of 4-year government bonds, 2001-2005



Source: NSE Data Base

The YTM of the 4-year government bonds fell gradually from 12.3% in the year 2001 to 10.8% in the year 2003 then started rising slowly to reach 11.5% in 2004 and finally hitting 13.4% in the year 2005.

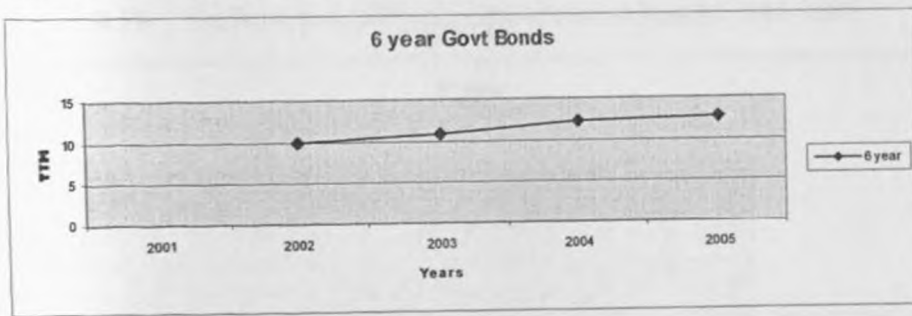
Figure 4.7 Performance of 5-year government bonds, 2001-2005



Source: NSE Data Base

The performance fell from 12.3% in 2001 to 10% in 2002 before rising to stand at 13.87% in 2005.

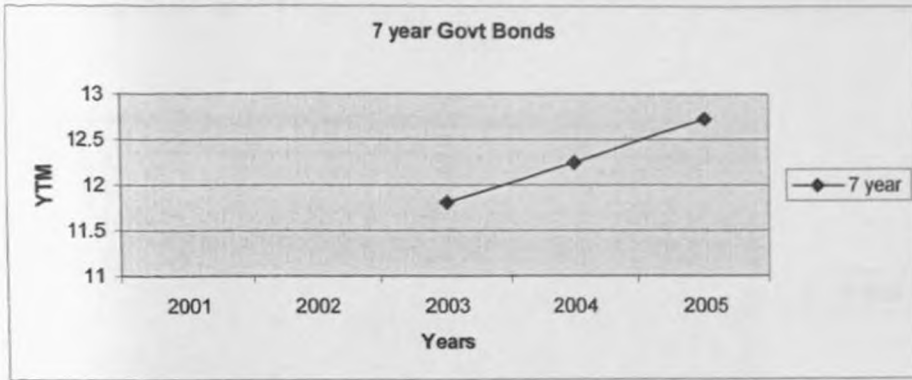
Figure 4.8 Performance of 6-year government bonds, 2001-2005



Source: NSE Data Base

For the 6-year bonds the data available was from 2002 where YTM was 9.91% and rose to 10.87% in 2003 and stood at 12.75% in 2005.

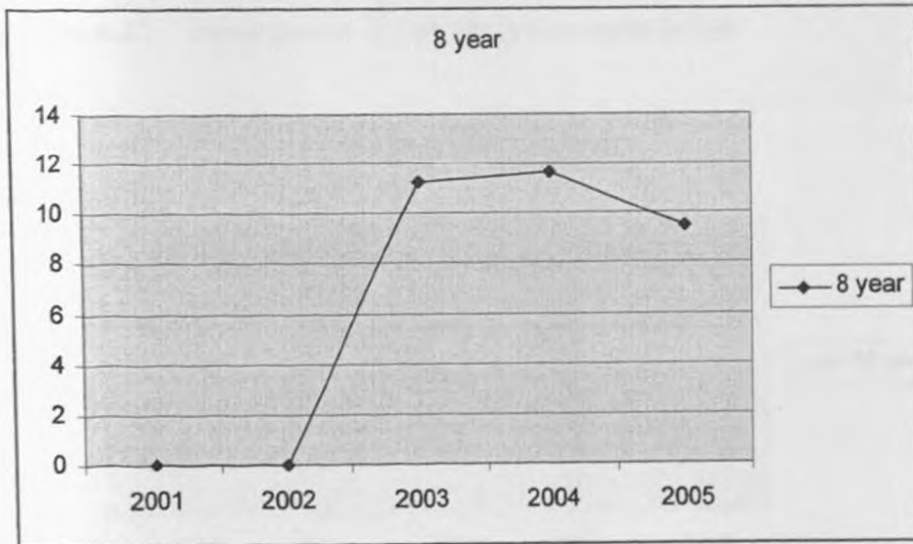
Figure 4.9 Performance of 7-year government bonds, 2001-2005



Source: NSE Data Base

The study found the YTM for 2003 as 11.8% and rose to 12.3% in 2004 and lastly 12.7% in 2005

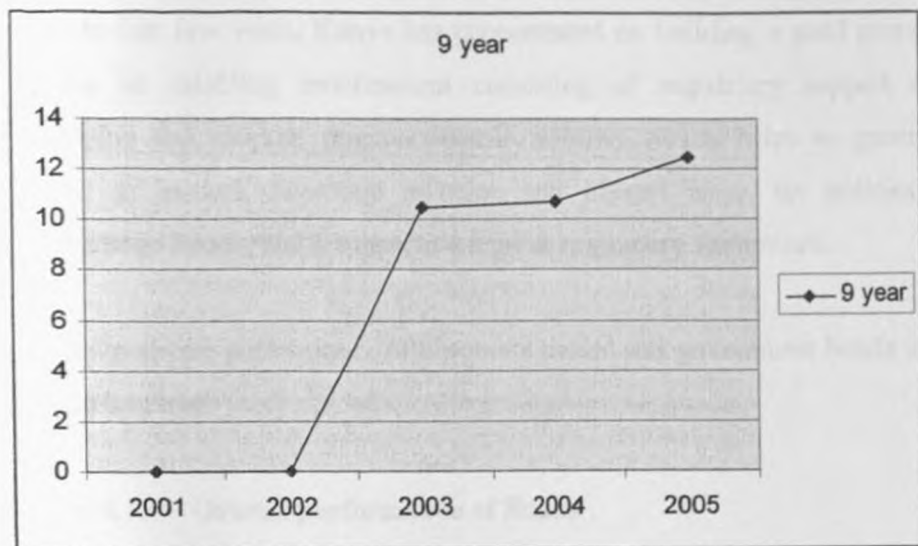
Figure 4.10 Performance of 8-year government bonds, 2001-2005



Source: NSE Data Base

As shown above the researcher was not successful in accessing required data for the years 2001 and 2002. Consequently it was not possible to compute the YTM for this period. But the YTM for the year 2004 was found to be 11.6% in 2004 rising from 11.2% in 2003, and then falling to 9.5% in 2005.

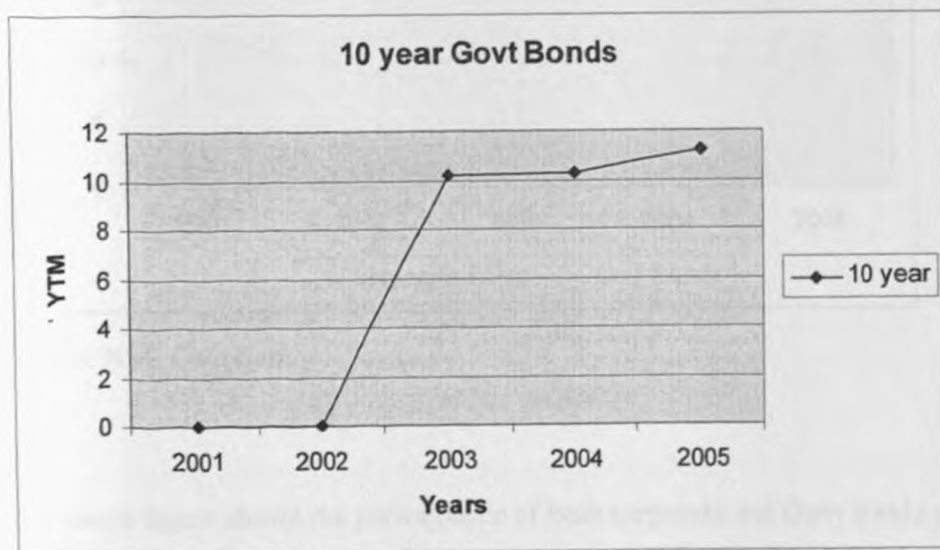
Figure 4.11 Performance of 9-year government bonds, 2001-2005



Source: NSE Data Base

The 9-year government bonds maintained an upward trend with a YTM of 10.5% in 2003, 10.7% in 2004 and finally hitting a high of 12.5% in 2005.

Figure 4.12 Performance of 10-year government bonds



Source: NSE Data Base

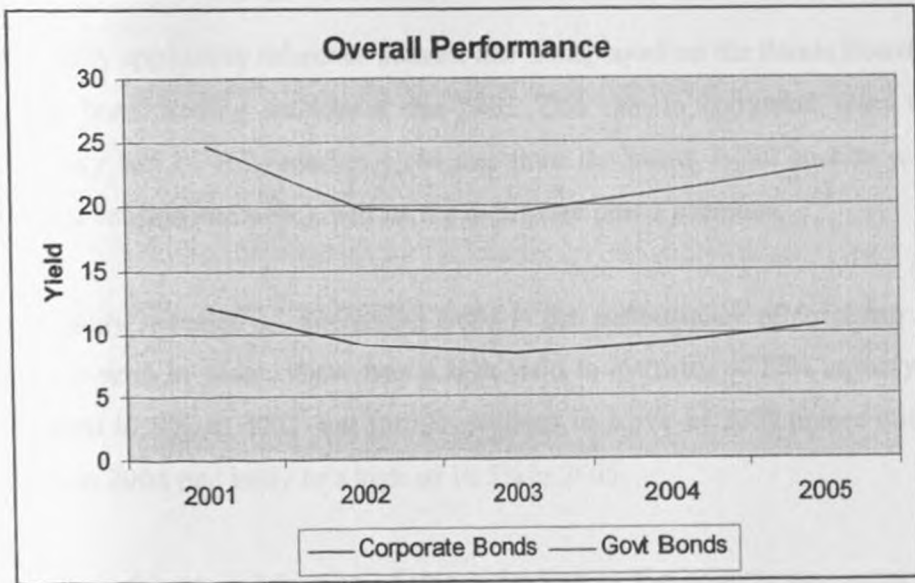
The 10 year bonds had a rising trend in performance rising from 10.16% in 2003 to 10.29% in 2004 and finally 11.25% in 2005.

4.4 Overall performance of bonds

Over the last few years, Kenya has concentrated on building a good primary market by creating an enabling environment consisting of regulatory support committed to developing the market, macroeconomic stability which helps to generate sufficient number of issuers, favorable inflation and interest rates, tax policies that do not disadvantage bonds, and a supportive legal & regulatory framework.

The comparative performance of corporate bonds and government bonds is illustrated in the graph below:

Figure 4.13 Overall performance of Bonds



Source: NSE Data Base

The above figure shows the performance of both corporate and Govt bonds performance for a five-year period. The graph shows a drop in both types of bonds in 2002 and a further drop in 2003 for corporate bonds before rising steadily in 2004 and 2005. For Govt bonds there was a steady increase in performance in 2003, a trend that was maintained in 2004 and 2005.

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

Trading of bonds is regulated by the CMA regulations and the bond trading rules of the NSE. Only the authorised dealers from the Members of the NSE are allowed to deal in bonds on the trading floor of the NSE. Foreign investors are allowed to participate through local custodians.

The daily applicable reference interest rate is displayed on the Bonds Board at the start of every bond trading session at the NSE. This rate is computed from the prevailing Treasury bill (T-Bill) market yield rate from the latest T-Bill auction results; and the current coupon rate which will be the T-Bill rate plus a premium.

The study revealed an interesting trend in the performance of corporate bonds plotted against time in years. There was a high yield to maturity of 12% in the year 2001, this dropped to 9% in 2002 and further declined to 8.3% in 2003 before rising steadily to 9.2% in 2004 and lastly to a high of 10.5% in 2005.

In 2001, the second tranche of donor funding to the country was suspended after the donors felt that certain conditionalities were not met by the government. As a result, the government relied heavily on domestic debt to finance its budget. This had the effect of a huge increase in domestic borrowing through the bond market. To encourage growth of this market, the beginning of year 2002 saw implementation of tax incentives. For instance, all companies seeking listing on the NSE paid 27% corporate tax down from 30%. This was for the first three years after listing. They were also granted a tax amnesty from previously undeclared profits on condition that they maintained full disclosure in the first year after listing, and undertaking to henceforth pay their due taxes in full.

Generally the performance of both corporate and government bonds dropped in 2002; further declining in 2003 for corporate bonds before rising steadily in 2004 and 2005. For government bonds there was a steady improvement in performance during the year 2003. A trend that was maintained in 2004 and 2005.

5.2 CONCLUSIONS

The main objective of the research was to establish returns on investment in bonds listed at the Nairobi Stock Exchange as measured by the yield-to-maturity. It was found out that there has been a slow growth in the bond market in terms of returns. The study found a sharp decline in YTM from 2001 to 2002. This trend was maintained in 2003. After which the YTM rose in 2004 and maintained this trend in 2005, although it kept below the mark that had been set in 2001.

The unique issue characteristics of a bond have an impact on its risk premium (Suszynska, 2003). This study concludes that the differences in yield observed on corporate and government bonds are caused by the different issue characteristics that result in differences in the risk premiums.

Kibua et al., 2005, found that the key factors which contribute to an enhanced and deepened bond market include: a friendly regulatory environment, sound legal framework, macroeconomic stability, vibrant money markets and banking systems, among others.

5.3 LIMITATIONS OF THE STUDY

In some of the months there was insufficient data on the variables needed to calculate the YTM, thus excluding them from the study.

Given the nature of the study, the time allowed was not sufficient enough to exhaustively carry out the project.

Limited resources. The research involved several trips to Capital Markets Authority and Nairobi Stock exchange in an effort to gain clarity, seek more information and generally check authenticity of data.

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

This research only restricted to five year period, I recommend a further research to capture a wider time frame and possibly include all the bonds that have traded at the NSE unlike these that sampled a total of 30. A further research should also establish why there was a drop in performance in 2002 for all the bonds that traded at NSE in that period.

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APPENDIX A :

YIELD TO MATURITY DATA

Corporate Bonds Govt Bonds

2001	12.1	12.6788
2002	9	10.80167
2003	8.3	11.16075
2004	9.2	11.8407
2005	10.5	12.4485

	2001	2002	2003	2004	2005
Corporate Bonds	12.1	9	8.3	9.2	10.5
1 Year	13.14	10.2	11.15	12.75	13.275
2 Year	13.189	12	12.257	12	12.7
3 Year	12.477	10.7	11.358	12.71	12.5
4 Year	12.288	12	10.77	11.48	13.41
5 Year	12.3	10	11.52	12.337	13.875
6 Year	0	9.91	10.878	12.3	12.75
7 Year	0	0	11.8075	12.25	12.725
8 Year	0	0	11.2475	11.61	9.5
9 Year	0	0	10.4575	10.68	12.5
10 Year	0	0	10.162	10.29	11.25

APPENDIX B:

LIST OF BONDS

BONDS MARKET

CORPORATE BONDS

- 1 PTA Bank 2011
- 2 Shelter Afrique
- 3 Celtel Kenya Ltd (TB+1%) 2009
- 4 Athi River Mining Ltd (TB+1.75%) 2010
- 5 Faulu Kenya Ltd (TB+0.5%)
- 6 Mabati Rolling Mills Ltd (TB+1.25%) 2007
- 7 East Africa Development Bank (TB+0.75%) 2006

ONE YEAR BONDS

- 8 1 year Treasury Bond Issue ZC 3/2005
- 9 1 year Treasury Bond Issue ZC 4/2005
- 10 1 year Treasury Bond Issue ZC5/2005
- 11 1 year Treasury Bond Issue ZC6/2005

TWO YEAR BONDS

- 12 2 year Treasury Bond Issue ZC 1/2005
- 13 2 year Treasury Bond Issue FXD 2/2006(Fixed at 10.50%)
- 14 2 year Treasury Bond Issue FXD 1/2006(Fixed at 10.50%)
- 15 2 year Treasury Bond Issue FXD 1/2005(Fixed at 10.875%)
- 16 2 year Treasury Bond Issue FXD 2/2005(Fixed at 10.875%)
- 17 2 year Treasury Bond Issue FXD 3/2005(Fixed at 10.25%)
- 18 2 year Treasury Bond Issue FXD 1/2004 (Fixed at 4.00%)
- 19 2 year Treasury Bond Issue FXD 2/2004 (Fixed at 4.00%)
- 20 2 year Treasury Bond Issue FXD 3/2004 (Fixed at 4.25%)
- 21 2 year Treasury Bond Issue FXD 4/2004 (Fixed at 4.50%)

THREE YEAR BONDS

- 22 3 year Treasury Bond Issue FXD 2/2003 (Fixed at 5.25%)
- 23 3 year Treasury Bond Issue FXD 3/2003 (Fixed at 4.00%)

24 3 year Treasury Bond Issue FXD 4/2003 (Fixed at 4.00%)
25 3 year Treasury Bond Issue FXD 1/2004 (Fixed at 4.75%)
26 3 year Treasury Bond Issue FXD 2/2004 (Fixed at 5.25%)
27 3year Treasury Bond Issue FXD 1/2005(Fixed at 11.625%)
28 3year Treasury Bond Issue FXD 2/2005 (Fixed at 11.625%)
29 3year Treasury Bond Issue FXD 3/2005 (Fixed at 11.5%)
30 3year Treasury Bond Issue FXD 1/2006(Fixed at 11.00%)

FOUR YEAR BONDS

31 4 year Treasury Bond Issue FXT 1/2002 (Fixed at 13.75%)
32 4 year Treasury Bond Issue FXD 2/2002 (Fixed at 13.25%)
33 4 year Treasury Bond Issue FXD 1/2003 (Fixed at 12.50%)
34 4 year Treasury Bond Issue FXD 2/2003 (Fixed at 9.50%)
35 4 year Treasury Bond Issue FXD 3/2003 (Fixed at 4.50%)
36 4 year Treasury Bond Issue FXD 1/2004 (Fixed at 5.00%)
37 4 year Treasury Bond Issue FXD 2/2004 (Fixed at 6.00%)
38 4 year Treasury Bond Issue FXD 1/2005(fixed at 12.25%)
39 4 year Treasury Bond Issue FXD 3/2005(fixed at 12.25%)
40 4 year Treasury Bond Issue FXD 1/2006(fixed at 11.25%)
41 4 year Treasury Bond Issue FXD 1/2002 (Fixed at 13.25%)

FIVE YEAR BONDS

5 year Treasury Bond Issue FR 1/2005 (91 Day MA, TB
42 +0.75)%
43 5 year Treasury Bond Issue FXD 1/2002 (Fixed at 14.00%)
44 5 year Treasury Bond Issue FXT 1/2002 (Fixed at 14.50%)
45 5 year Treasury Bond Issue FXD 2/2002 (Fixed at 14.00%)
46 5 year Treasury Bond Issue FXD 3/2002 (Fixed at 13.50%)
47 5 year Treasury Bond Special Issue 1/2002 (91 Day TB)
48 5 year Treasury Bond Issue FXD 1/2003 (Fixed at 13.50%)
49 5 year Treasury Bond Issue FXD 2/2003(Fixed at 11.50%)
50 5 year Treasury Bond Issue FXD 3/2003 (Fixed at 5.50%)
51 5 year Treasury Bond Issue FXD 1/2004(Fixed at 6.00%)

52 5 year Treasury Bond Issue FXD 1/2005 (Fixed at 12.50%)
53 5 year Treasury Bond Issue FXD 2/2005 (fixed at 13%)
54 5 year Treasury Bond Issue FXD 1/2006 (fixed at 13%)
55 5 year Treasury Bond Issue FXD 2/2006 (fixed at 13%)

SIX YEAR BONDS

56 6 year Treasury Bond Issue FR 1/2001 (91 Day MA, TB
+0.80%)
6 year Treasury Bond Issue FR 1/2004 (91 Day MA, TB
57 +0.80%)
58 6 year Treasury Bond Issue FXD 1/2002 (Fixed at 14.25%)
59 6 year Treasury Bond Issue FXD 1/2003 (Fixed at 14.00%)
60 6 year Treasury Bond Issue FXD 2/2003 (Fixed at 11.50%)
61 6 year Treasury Bond Issue FXD 3/2003 (Fixed at 6.00%)
62 6 year Treasury Bond Issue FXD 1/2004(Fixed at 6.50%)
63 6 year Treasury Bond Issue FXD 2/2004(Fixed at 6.75%)
64 6 year Treasury Bond Issue FXD 1/2005(fixed at 13%)
65 6 year Treasury Bond Issue FXD 1/2006(fixed at 13%)

SEVEN YEAR BONDS

66 7 year Treasury Bond Issue FXD 1/2003 (Fixed at 13.75%)
67 7 year Treasury Bond Issue FXD 2/2003 (Fixed at 6.50%)
68 7 year Treasury Bond Issue FXD 1/2004 (Fixed at 6.75%)
69 7 year Treasury Bond Issue FXD 2/2004 (Fixed at 7.00%)
70 7 year Treasury Bond Issue FXD 1/2006 (fixed at 13.25%)

EIGHT YEAR BONDS

71 8 year Treasury Bond Issue FXD 1/2003 (Fixed at 12.50%)
72 8 year Treasury Bond Issue FXD 2/2003 (Fixed at 7.00%)
73 8 year Treasury Bond Issue FXD1/2004 (Fixed at 7.50%)
74 8 year Treasury Bond Issue FXD 1/2006 (Fixed at 13.25%)

NINE YEAR BONDS

75 9 year Treasury Bond Issue FXD 1/2003 (Fixed at 12.75%)
76 9 year Treasury Bond Issue FXD 2/2003 (Fixed at 9.50%)

77 9 year Treasury Bond Issue FXD 1/2006 (Fixed at 13.50%)

TEN YEAR BONDS

78 10 year Treasury Bond Issue FXD 1/2003 (Fixed at 13.25%)

79 10 year Treasury Bond Issue FXD 2/2003 (Fixed at 8.50%)

80 10 year Treasury Bond Issue FXD 1/2006 (Fixed at 14%)

81 10 year Treasury Bond Issue FXD 2/2006