MACRO-ECONOMIC VARIABLES AND PERFORMANCE OF CORPORATE BONDS AT THE NAIROBI SECURITIES EXCHANGE, KENYA

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D53/NYI/PT/27251/2013

A RESEARCH PROJECT REPORT SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF BUSINESS ADMINISTRATION (FINANCE OPTION) DEGREE OF KENYATTA UNIVERSITY

MAY, 2019
DECLARATION

This research project is my original work and has not been presented for a degree or other award in any other university. No part of this research project should be reproduced without authority of the author or/and Kenyatta University.

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I confirm that this project report has been submitted with my approval as the university supervisor.

Signature ____________________ Date ____________________

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DEDICATION

I devote this research towards the individuals who always encouraged me to push on despite the many challenges; my parents Mr. and Mrs. Maina. I am also appreciative to my siblings Sarah, Carol, Francis, Esther and Christine for their continued backing, constant reassurance and understanding during the entire period.
ACKNOWLEDGEMENT

Boundless acknowledgement and gratitude is accorded to supervisor Ms. Gladys Kimutai because of her insights, commitment and guidance throughout the entire progress of the research. I likewise appreciate my colleagues in Kenyatta University’s class of 2013.
TABLE OF CONTENTS

Declaration .......................................................................................................................... ii
Dedication .......................................................................................................................... iii
Acknowledgement ........................................................................................................... iv
Table of contents .............................................................................................................. v
List of tables ....................................................................................................................... vii
List of figures ...................................................................................................................... viii
Abbreviations and acronyms ............................................................................................ ix
Operational definition of terms ........................................................................................ x
Abstract ............................................................................................................................. xii

CHAPTER ONE: INTRODUCTION ............................................................................... 1
  1.1 Background to the Study ............................................................................................ 1
  1.2 Statement of the Problem ......................................................................................... 10
  1.3 Objectives of the Study ............................................................................................ 11
  1.4 Research Questions .................................................................................................. 12
  1.5 Significance of the Study ......................................................................................... 12
  1.6 Scope of the Study .................................................................................................... 13
  1.7 Limitations of the Study .......................................................................................... 13
  1.8 Organization of the Study ....................................................................................... 14

CHAPTER TWO: LITERATURE REVIEW ..................................................................... 15
  2.1 Introduction ................................................................................................................. 15
  2.2 Theoretical Literature Review .................................................................................. 15
  2.2.1 Efficient Market Hypothesis Theory ..................................................................... 15
  2.2.2 Trade off Theory .................................................................................................... 16
  2.2.3 Arbitrage Pricing Theory ....................................................................................... 17
  2.3 Empirical Review ....................................................................................................... 18
    2.3.1 Inflation Rate and Performance of Corporate Bonds ......................................... 19
    2.3.2 Interest Rate and Performance of Corporate Bonds ........................................... 21
    2.3.3 Exchange Rate and Performance of Corporate Bonds ....................................... 24
    2.3.4 Government Spending and Performance of Corporate Bonds ........................ 27
  2.4 Literature Summary and Study Gaps ......................................................................... 29
  2.5 Conceptual Framework ............................................................................................. 34
CHAPTER THREE: RESEARCH METHODOLOGY .............................................35
  3.1 Introduction ..............................................................................................35
  3.2 Research Design ......................................................................................35
  3.3 Target Population ....................................................................................35
  3.4 Data Collection .........................................................................................36
  3.5 Data Analysis ...........................................................................................37
  3.6 Data Presentation .....................................................................................39
  3.7 Ethical Considerations ............................................................................39

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION .........................41
  4.1 Introduction ..............................................................................................41
  4.2 Diagnostic Tests .......................................................................................41
    4.2.2 Inflation Rates ..................................................................................44
    4.2.3 Interest Rates ...................................................................................45
    4.2.4 Exchange Rates ...............................................................................47
    4.2.5 Government Expenditure .................................................................48
  4.3 Inferential Analysis ..................................................................................51
    4.3.1 Diagnostic Tests ...............................................................................51
    4.3.2 Correlation Analysis .......................................................................56
    4.3.3 Multiple linear Regression Analysis ..................................................59

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .......64
  5.1 Introduction .............................................................................................64
  5.2 Summary ..................................................................................................64
  5.3 Conclusion ................................................................................................66
  5.4 Recommendations ...................................................................................67
  5.5 Suggestions for further research .............................................................68

REFERENCES ..................................................................................................69

APPENDICES .................................................................................................74
  APPENDIX I: Kenyatta University Research Approval .................................74
  APPENDIX II: NACOSTI Research Permit ....................................................75
  APPENDIX III: Secondary Data Collection Sheet .........................................76
  APPENDIX IV: Firms that have issued Corporate Bonds at NSE .................77
LIST OF TABLES

Table 4.1: Performance of Corporate Bonds ................................................................. 43
Table 4.2: Inflation Rates ............................................................................................. 45
Table 4.3: Interest Rates .............................................................................................. 46
Table 4.4: Exchange Rates .......................................................................................... 48
Table 4.5: Government Expenditure .......................................................................... 49
Table 4.6: Government Budget Deficit ....................................................................... 51
Table 4.7: Autocorrelation Test Using Durbin Watson ................................................. 52
Table 4.8: Tolerance and Variance of Inflation Factors Collinearity Statistics .......... 53
Table 4.9: Test of Heteroscedasticity ......................................................................... 53
Table 4.10: Test for Normality ..................................................................................... 54
Table 4.11: Analysis of Variance of the Regression Model .......................................... 55
Table 4.12: Summary of the Model ............................................................................ 56
Table 4.13: Relationship between Macroeconomic Variables and Performance of Corporate Bonds .......................................................... 57
Table 4.14: Analysis of Variance F- Test .................................................................... 59
Table 4.15: Summary of the Model of Regression ......................................................... 60
Table 4.16: Regression Coefficients Output ................................................................. 61
LIST OF FIGURES

Figure 4.1 Trend in Performance of Corporate Bonds ........................................42
Figure 4.2 Comparing Corporate Bond Performance to Treasury Bonds ..............43
Figure 4.3 Inflation Rate on the Performance of Corporate Bonds .....................44
Figure 4.4 Interest Rates and Corporate Bond Performance .............................46
Figure 4.5 Exchange Rate and Performance of Corporate Bonds .......................47
Figure 4.6 Government Spending and corporate bond performance ...................49
Figure 4.7 Government Budget Deficits and Corporate Bond Performance ..........50
### ABBREVIATION AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CBK</td>
<td>Central Bank of Kenya</td>
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<tr>
<td>EMH</td>
<td>Efficient Market Hypothesis</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
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<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
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<tr>
<td>NACOSTI</td>
<td>National Commission for Science Technology and Innovation</td>
</tr>
<tr>
<td>N.S.E</td>
<td>Nairobi Securities Exchange</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets</td>
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<td>ROE</td>
<td>Return on Equity</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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**OPERATIONAL DEFINITION OF TERMS**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Bond market size:</strong></td>
<td>Total bond debt that is outstanding meaning that it has not been settled by the borrower to lender.</td>
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<tr>
<td><strong>Bond market turnover:</strong></td>
<td>Quantity of newly issued longer-term obligation to borrowers for a given period</td>
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<tr>
<td><strong>Bond value:</strong></td>
<td>The amount payable on a debt when the debt is repaid which is usually the face value of the bond if it is paid on maturity.</td>
</tr>
<tr>
<td><strong>Bond:</strong></td>
<td>A long-term fixed income security representing a loan that has been advanced by an investor to the government or corporation.</td>
</tr>
<tr>
<td><strong>Corporate Bonds:</strong></td>
<td>Company bond that is long-term debt tool issued in a business entity. It has a maturity date of at least one year from date of issuance.</td>
</tr>
<tr>
<td><strong>Exchange Rate:</strong></td>
<td>It is worth of a nation’s currency when it’s converted to a different state’s currency</td>
</tr>
<tr>
<td><strong>Government deficit:</strong></td>
<td>This when the budget of the government has more expenditure than revenue.</td>
</tr>
<tr>
<td><strong>Government Spending:</strong></td>
<td>Government consumption, investment, and transfer payments</td>
</tr>
<tr>
<td><strong>Inflation Rate:</strong></td>
<td>Is the degree on which normal price levels for products soars consequently, leading to a fall in purchasing power of money.</td>
</tr>
<tr>
<td><strong>Interest Rate:</strong></td>
<td>Charges for a loan or borrowed funds that a borrower is expecting to reimbursement to lender over and above the principal sum loaned.</td>
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Macroeconomic variables: Refers to the variables indicating functionality of an economy in its entirety or for its key aspects, instead of that of its specific households, firms or industries.

Nairobi Securities Exchange: It’s only securities marketplace found in Kenya that offers a computerized trading platform for the transaction and listing of various securities of government and businesses.

Performance: Refers to productivity or yield in terms of the accomplishment of measurable objectives. The accomplishments are usually articulated in financial terms.

Securities Market: Marketplace where purchasers, dealers, agents and vendors engage in trade of securities of companies that are listed publicly, municipal, corporate or government bonds and bills among other money and capital market instruments.
ABSTRACT

Corporate bond recorded a poor performance at the Nairobi Securities exchange (NSE) despite its role in funding companies and in spite of its huge potential as a sustainable source of investment. The primary role of a developed also functioning market for bond is provision of cheaper, long-term finance for funding capital investments. Growth of bond markets is critical to the financial and economic systems of a nation. There is a dearth of studies on performance of corporate bonds in NSE, though the attention is growing. Investors have demonstrated a growing interest in bonds to a point that some of the bonds have been oversubscribed. The study purpose was to examine influence of macro-economic variables on corporate bonds performance at NSE duration spanning from 2001-2015. The study was anchored on efficient market hypothesis theory, trade off theory and arbitrage pricing theory. The study target population was every of the 16 firms quoted at the NSE that had issued corporate bonds in that period. A quantitative research design was adopted for the study using the longitudinal approach. Secondary data was collected form the NSE by means of a data collection form. Analysis of the secondary data was through descriptive procedures assisted by SPSS Version 21 software. Multiple linear regression analysis and Pearson correlation was conducted to ascertain impact of each of the predictor variables on the response variable. Data was presented using graphical, pictorial representation, tables as well as percentages to demonstrate how macro-economic variables influence performance of corporate bonds. Pearson correlation analysis results demonstrated an inverse relationship between three macro-economic variables; exchange rates, interest rates and inflation rates with performance of corporate bonds. The analysis for multiple linear regression results demonstrated that exchange rates, inflation rates, and commercial banks rates of interest have negative effect on performance of corporate bonds. Government expenditure had a significant positive association on performance of corporate bonds. Government spending showed a positive association to performance of corporate bonds. Recommendations were made for the government to strengthen its regulatory framework, majorly through monetary policy, to keep the macro-economic factors under check to reduce detrimental effects on performance of corporate bonds.
CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Securities market also referred to as an equity market; it serves an integral role in a market economy by provision of capital to firms, company ownership to main financiers and prospects of returns in accordance to the company’s projected performance of subordinate depositors (Osoro, 2013). The Kenyan bond market plays a critical part in promotion of economic expansion in the republic by way of proposing investment prospects to indigenous also overseas savers and funding government budget deficit. As at 2012, the magnitude of Kenyan local bond markets was almost worth $ 6 billion which was about 16% of the GDP in 2012 in terms of absolute value (CBK, 2012; Kenya Economic Update, 2012; KNBS, 2013).

The benefit of corporate bonds to a developing economy like Kenya was exemplified by International Monetary Fund (IMF) (2012) by observing that debts from private sector absorb the pressures from the banking sector through credit risk diversification across the economies. These debts can also be utilized as a provision for long-term resources for long-term ventures. It also provides products for long-term investments for long-term savings hence lower costs of funding; enhancing flexibility of financial products so as to satisfy investors’ needs and borrowers as well as efficient capital reallocation.

More succinctly, Karigu (2010) found proof to back the claim that markets for stock are certainly key predictors of direction of economy. Therefore, it is vital that measures be engaged to enhance and encourage better performance of the NSE since
it has been found that when the NSE is performing well, the state of the economy as represented by the macroeconomic variables is also performing well.

The fundamental role of a stock market involves supporting industry growth and a country’s economy. It also acts as an indicator to industry growth and a source of idea and steadiness of an economy including its performance. Constant growth index is an indicator of a growing economy. When the stock returns and prices are declining or keep fluctuating with increasing tendencies, this demonstrates existence of unstable economy in a country (Garza-Garsia & Yu, 2010).

While the domestic bond market in Kenya is relatively small compared to world standards, it is ranked number three with South Africa and Nigeria leading in that order in sub-Saharan Africa. This market remains as instrumental particularly government bond that enables the government to raise finances locally to counter its fiscal deficits. According to Ngugi & Agoti, (2014) most debt markets in Africa, the bond experiences problems such as poor performance, high volatility and inefficiencies As stated by Ndung’u (2013), though Kenya’s bond market is well diversified, it needs to be developed further. Bond demand and bank loans enhance capital flow in the market. By end of 2014, the percentage of corporate bond market capitalization to Gross Domestic Product was 2% while proportion of corporate bond income to cumulative bond market capitalization was 0.1%. This contradicts the percentage of equity market capitalization to GDP that was reported at 50% over similar period (CMA, 2014).
Performance in the secondary market is a crucial factor towards functioning bond markets because investors have to be able to liquidate their holdings in reasonable time without major costs (Backberg, 2014). Though 90% of the bonds issued in Kenya are government bonds, more companies are turning to the bond market to raise funds as put forth by Thiong’o (2012). This enables companies to avoid the high interest rates charged by banks and the widely incomparable efficacy of stock issues which would hardly register the same level of subscription relative to bonds. Companies that have ventured into local fixed income markets include KenGen, Centum Investments, Safaricom and Consolidate Bank of Kenya. Currently, there is an increasing interest in investors some of these are Safaricom Limited to an extent of oversubscription (Irving, 2012).

1.1.1 Performance of Corporate Bonds
Several attributes predispose a corporate bond to have performed well. According to Mbewa et al., (2014) first, it must be efficient, liquid, and less volatile. Performance can be regarded as a symbol of an actively efficient market that is instrumental in market development. This is mainly depicted in a higher level of revenue that is relative to price stability and market size. When a market is liquid, prices of secondary markets will reflect efficiently due to increased flow of information (International Organization of Securities Commissions (IOSCO), 2012).

The IOSCO Emerging Markets Committee report (2014) proposes that secondary markets performance of affects public offerings. This minimizes costs as well as risks by underwriters and market makers. It also minimizes investors’ costs by maintaining a low volatility and transactional costs. O’hara (2001) indicates that performance is
assessed by the level of information availability to traders. To know whether the
traders are informed, one can establish their level of familiarity with the bonds traded
or close substitutes.

Transparency in trading, market performance is increased by minimizing
opportunities that can be used to take advantage of less unformed investors. Share
price is considered as a guarantee towards security performance. This is because
price of shares relay information to market stakeholders regarding the recent and
projected upcoming performance of the firm (Pagano and Röell, 2008). Essentially
firm’s management should consider factors that affect share prices since this can help
in improving market firm value (Martel, 2008).

The performance of bonds is of critical importance because a bond is regarded as an
essential tool in developed financial markets. This is because of the positive
contribution that it makes towards the development of a financial and economic
structure and the benefits it provides to the bond market. The wellbeing of the
economy and financial structure is critical to advancement of local market for bonds
(Fabella & Madhur, 2003).

Performance of a bond is usually evaluated on the bases of financial returns to the
issuer, subscription and returns to investors. A bond is termed as a debt tool whereby
legal issuer owes bond holders and based on the bond terms, they might be obligated
to pay interests or repay the principal amount later on (O’Sullivan & Sheffrin, 2003).
Consolidate Bank and Centum investments gave out corporate bonds valued at KES. 5.2 billion (Thiong’o, 2012). Commercial banks have recorded low issuance which is mainly attributed to poor corporate bond liquidity in secondary markets. For instance, in case government securities record a turnover ratio of 88%, corporate issues report a turnover of 2%. Poor levels of liquidity by these bonds, is largely associated with risks, this implies that investors will demand a premium to acquire these bonds (Thiong’o, 2012).

Several studies have recognized the dynamics affecting performance and development of different kinds of bonds in the Kenyan market including corporate, government, municipal and sovereign bonds. Ringui (2012) investigated progression of the Kenyan bond market and its determinants. His study revealed a confluence of aspects influencing the expansion of the bond market included size of banking sector, political environment, the regulatory framework, complexity associated with issuance processes and macro-economic factors.

Were (2010) pursued the elements that upset the advancement of market for corporate bond and found out that firms listed in NSE face market for corporate bond expansion challenges due to statistics measures and scarce revelation of data on public debt issuance. Njihia (2005) steered study on elements that stimulate progress of corporate bond market. His study discovered interest rate, rate of exchange and bank credit aspects negatively influenced advancement of corporate bond market which calls for implementation of sound policies.
For a bond market to grow sustainably, there are various preconditions such as an effective information disclosure system, established money market, market involvement, favorable tax policies, a diversified investor base, favorable macroeconomic policies, effective financial structure, appropriate trading system, and a rigorous regulatory and legal framework (Ngugi & Afande, 2015). It stands projected that advancement of treasury debt market is a requirement for corporate bond market advancement (Ngugi and Agoti, 2007).

1.1.2 Macro-Economic Variables

The performance of a stock exchange usually dependent on a mix of macro-economic variables which comprise of rates of interest, foreign direct investment, GDP, rate of exchange, remittances, rate of inflation, money supply among many others (Aduda, Masila & Onsongo, 2012). These factors are the mainstay of every economy. Fluctuations in the prices of stocks is influenced by the variations in basics of the economy and the prospects about these fundamentals.

Macroeconomics is focuses on the entire economy, and average demand and supply. Average demand is the cumulative amount spent in an economy, be it consumers overseas, export consumers, government, or firms when purchasing capital equipment or when stocking up raw materials (Mishkin, 2010). Factors that typically influence the rate of development of a bond market differ and comprise variety of firm, market, industry also macro-level elements (Sprcic and Wilson, 2007). Interest rates charged by the commercial banks have been cited as critical macro-economic influencers of performance of corporate bond. Banks can increase or decline the rates of interest to stimulate economic growth as a monetary policy tool. When the business acquires
debt for expansion of its business activities, high rates of interest will affect debt cost. This might mitigate company profits and stakeholder dividends. As a consequence, share prices will decline. When interest rates are high, investments that earn interest are attractive to investors than stocks (Githinji, 2013). Government expenditure is a tenured variable in influencing performance of securities and bonds.

According to Bureau of Economic Analysis (2010) government spending or expenditure excludes government consumption, investment and payments transfer. When accounting for national income, government acquirement of goods and services for present usage, to fulfil distinct and collective society necessities is categorized as government financial consumption expenditure. High inflation levels could impact negatively on firm profitability and affect input cost thus lowering the ultimate output demand. Eventually, consequence of inflation on the business is affected by nature of its processes including the competitive environment. Inflation might impact on erosion of real value of outstanding financial claims unlike the nominal value of those entitlements that might encounter receivables that have diminished real value; as such lenders are adversely affected by inflation whereas borrowers’ benefit (Myers, 2014).

Apart from the above discussed macro-economic variables, there are other indicators in an economy that dictate both the growth of the economy and the securities exchange. These include the stability of the political environment and the degree of regulation and supervision of critical industries such as banking and trading in securities to weed out unethical practices and build investor confidence.
Based on the findings by Ringui (2012), businesses can go on to do much better when the political, regulatory and macroeconomic aspects in the nation are advantageous for the company bond market to flourish. Furthermore, if businesses are encouraged by each one of the aspects to follow obligation financing, then good improvements might remain observed in the enterprises' profits.

1.1.3 Nairobi Securities Exchange

In most of the African nations, markets for bonds are still in underdeveloped while most of them are controlled by government bonds and a small number of corporate bonds. However, things seem headed for change and the bond market is become very active in some African countries Kenya being one of them (Kibua et al, 2005). The government has made tremendous efforts to support this market by providing incentives to enhance growth. The government allocates an annual budget that is intended to boost bond trading; Kenya’s government has significantly minimized withholding tax from to 10 percent from 15 percent for corporate bonds with maturities of 10 years or more. This contributed to a significant decline of listing fees to give room for more listings (Kihuro, 2009).

Existing empirical literature seem to attribute the following factors to this stunted growth of corporate bonds including: domination of institutional investors in the market who choose an approach to buy and hold the issued bonds, a extraordinary and wobbly interest rate system, information asymmetry among probable issuers, the crowding out outcome of state’s local obligation as well as absence of yield curve to price extensive term instruments (Ochenge, 2014). There are studies that have investigated influence of macro-economic elements on performance of various

Numerous reasons have been put forward towards rationale of development of bond market. The underlying motive is to develop a capital and financial market that is comprehensive by creating interest rates that depict prospect price of finances on the end of each maturity which is key in making financing decisions and achieving efficient investments (Myers, 2004). Kenya’ electricity generating company, KenGen placed a 15-billion-shilling bond sales infrastructural bond in September 2009. The 10-year bond was priced at face value, 12.5% annual coupon and was oversubscribed. This was considered a strategic incentive to most investors who looked at the government effort to tax all streams of income. Funds that was raised from this bond was meant for investing in different energy sources such as geothermal that was congruent with the company’s strategy to invest in at least 40 billion shillings so as to generate revenues annually and sustain the increasing energy demand (Kihuro, 2009). Kenya’s corporate bond has successfully attracted other companies and banks such as CFC Stanbic bank, which has been benefited from this project. A couple of financial institutions have invested in this market. Recently, CFC Stanbic bank floated KES. 5 billion fixed with a floating note, Shelter Afrique also floated KES. 1B corporate bond that was oversubscribed (Kihuro, 2009).

Today, NSE has reported that there are 37 government bonds issues by Kenya also another 18 corporate bonds and notes offered through 9 corporations. Of these corporate bonds, none of them has issued value exceeding KES 2 billion. The total value of all registered bonds by government was estimated at KES 400 billion,
whereas the total value of registered corporate bonds was KES 13 billion. This brings NSE debt market capitalization to an estimated KES. 413 billion shillings. Government bond maturity ranges between 1-20 years whereas corporate bonds range between 2-8 years. All floated government bonds consist of fixed interest rate bonds with 6%-14% coupon rates (CMA, 2015).

1.2 Statement of Problem

Performance of Kenya’s corporate bonds has mostly been poor (Ngabirano, 2016). Various studies such as Baraza (2014), Karanja (2014) and Wanjiru (2015) indicate that debt market in Kenya is thin also underdeveloped. In Kenya the debt market explains for below ten percent of the entire dealings in bonds at the NSE (CMA, 2015).

The Treasury bond market has always surpassed the corporate bond market in trading activity (Ngugi & Agoti, 2007). The corporate bonds market has experienced some volatility in issuances since 2011 with some private firms being reluctant to issue corporate bonds to fund their functions despite the availability of a stable yield curve and in its place preferring to raise funds through equity offers and rights issues. This has resulted in sub-optimal economic productive capacity and financial system allocation inefficiency (World Bank Report, 2012; CBK, 2013, CMA, 2013, KNBS, 2012). This is in sharp contrast with the fact that, in terms of trading volumes, the Nairobi Securities Exchange stands as the fourth largest securities exchange in Africa, also, it’s fifth regarding market capitalization as a proportion of GDP (CMA Bulletin, 2009). However, Ngabirano (2016) indicates that there is uncertainty on the real influencers of bond performance in the NSE. This is compounded by the fact that
there has been oversubscription in recent bond issues indicating strong investor interest (Irving, 2012).

However, these studies have some glaring gaps in relation to shedding clarity on the wholesome performance of corporate bonds which this study seek to cure. First most of these studies targeted mostly the determinants of bond pricing, yields, maturity, subscription or characteristics of the issuing company. Most of the recent and comprehensive studies were focused on the treasury bonds and most recently infrastructure bonds. The few that were done on corporate bonds (for example Ngabirano, 2016; Wanjiru, 2015; Karanja, 2014) were primarily focused on issuing firm characteristics and not the macro economic elements which would alter the general performance of corporate bonds. Invariably, these studies took a narrow time scope of five years unlike this study which will take a fifteen years’ span.

1.3 Objectives of the Study

1.3.1 The General Objectives

To explore the macro-economic variables and performance of corporate bonds at the Kenyan N.S.E.

1.3.2 Specific Objectives

This research sought to attain the following specific objectives;

i. Establish the effect of inflation rate on performance of corporate bonds at the NSE

ii. Investigate the effect of commercial banks interest rates charge on performance of corporate bonds at the N.S.E.
iii. Determine rates of exchange effect on performance of corporate bonds at the N.S.E.
iv. Assess the effect of government spending on performance of corporate bonds at the NSE.

1.4 Research Questions

The study provided solutions to the research enquiries that are provided below;

i. How does inflation rate affect the performance of corporate bonds at the N.S.E?
ii. Which is the effect of commercial bank interest rates on performance of corporate bonds at the N.S.E?
iii. What is the impact of exchange rates on corporate bonds performance at the N.S.E?
iv. How does government spending affect performance of corporate bonds at the N.S.E?

1.5 Significance of the Study

The outcomes from research will stay valuable to government bodies for instance CBK, CMA and the National Treasury as they will know in what way to regulate the macro-economic variables. It will also benefit investors and companies wishing to float corporate bonds at NSE because they will understand the dynamics that alter how corporate bonds performs. The research similarly will be of importance to scholars and academicians interested in the sector of corporate bonds and macroeconomics. By studying this relationship, a broader group of financiers are able to make choices on the basis of the success of bond issues, for instance, for them to
purchase, dispose or hold the stocks of a company also when not to do so. A strong relationship between these two will make this a good indicator.

Institutional investors, who seem to especially have deeper pockets with less stringent terms than banks, could also use the subscription level of bonds they’re involved in as a pointer to how safe and well utilized their money will be. This will encourage them to either invest more due to predictable company performance or equally grant them peace of mind with the knowledge that their money is safe. This study may help potential investors make informed decisions about what offers to participate in and which ones to ignore.

1.6 Scope of the Study
The emphasis of this investigation remained publicly quoted firms in the N.S.E which had floated bonds for the period January 2001 up to December 2015. It only used secondary statistics from the NSE, CMA and CBK to ascertain the effect macro-economic elements and performing of corporate bonds. Its scope of investigation was guided by the study objectives of effect of rate of exchange, inflation rate, rate of interest and government spending on performance of corporate bonds.

1.7 Limitations of the Study
The research encountered several challenges mainly in the data collection and interpretation phases. The officials at the NSE were reluctant to avail the details of the performance of corporate bonds, though the researcher used personal persuasion and introduction letter from the institution and NACOSTI to convince them. Data was also sought from other sources like NSE and CBK for corroboration.
1.8 Organization of the Study

This research study is ordered into five chapters. The first chapter covers the study’s background, problem statement, objectives of the study, study questions, significance of the research, the scope of the study and the limitations faced in the research. Second chapter covers the theoretic basis, empirical review, summary of the reviewed literature, research gaps that the current study sought to fill and the study’s conceptual framework. Third chapter describes the design applied, study population, procedures applied in collecting data, data analysis and presentation techniques and the moral concerns in the research. Fourth chapter comprises of how data will be analyzed, interpretation and findings while chapter five gives a comprehensive briefing of study results, commendations for further research, policy and practice.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction
This second chapter consists of literature to be reviewed which is pertinent to macro-
economic variables and their role in the performance of corporate bond markets. It
discusses the empirical review, theoretic review, summary of reviewed literature,
conceptual structure and the study gaps it sought after to satisfy.

2.2 Theoretical Literature Review
Theories guiding the study are as follows:

2.2.1 Efficient Market Hypothesis Theory
Fama (1970) postulated efficient market hypothesis (EMH) theory which describes
behaviours of a perfect market in which securities are held at the equilibrium and
prices of securities (stock and bonds) are displayed as public information which can
be accessed and acted upon immediately this has been announced. This is so because;
securities that are priced fully and fairly call for quick action by the investors. In
simple terms, the idea is to have a market whose price is a reflection of accurate
indicators for apportionment of funds. This suggests that a marketplace in where
corporations know how to craft venture choices on production are capable to choose
investments that reflect tenure of firm undertakings with the supposition that security
prices will show the available facts. It stipulates that an efficient market is a
marketplace where prices portray all available data.
Capital markets that trade in stock and bonds help in the discovery of prices, liquidity, reduction in transactional costs and transfer of risks. Development of capital markets is a key ingredient towards finance sector development since it supplements the functions of banking systems in steering economic development. Yartey and Adjasi (2007) posit that they aid in minimizing information cost by creating and sharing of information with firms ensuing into efficient markets whose prices reflect existing information. Efficient markets support domestic growth of economy. Apart from availing resources to investors, efficient markets channels financial resources into local market economies. The credit market has increased its activities in financing investments with deposits forming a significant proportion of their financial asset basket this is because the bond and equity markets have not been thriving as they should be (Ngugi et al., 2009).

Various macroeconomic variables comprising rate of inflation, rate of exchange and money supply were determined such as one of the elements that affect performance of bonds by various researchers (Oriwa, 2012; Mayasami and Sims, 2002 and Fama, 1981). EMH enables to create a suggestion that varies these macroeconomic factors certainly influence the corporate bond performance. The study is hence set in the direction of shaping the anticipated link among the various macroeconomic elements and the corporate bonds performance in Kenya.

2.2.2 Trade off Theory
Modigliani and Miller (1963) note that trade-off theory maintains the firm’s optimal ratio of debt is measured by a trade-off among the outlays involved and the paybacks derived from acquiring debts, this holds the firm’s properties and asset plans
constantly. Static trade-off theory opines that organizations that have large tangible assets have a greater liability to equity proportion. Firms that depend solely on opportunities for growth intangible assets might be exposed to distress cost. Firms that are exposed to business risks are uncertain about generating adequate income to optimize their debt tax shield and thus issue less debt. Bruslerie and Latrous, (2012) argue that leverage is beneficial to shareholders provided they are compensated to a point where tax gains deductibility of interest counterbalances potential costs from bankruptcy.

Litzenberger and Kraus (1973) opine that perfect leverage depicts a trade-off amongst tax returns of debt and burden of bankruptcy costs. A firm that adopts a trade-off establishes a ratio of liability to value and moves progressively to its objective. Target is achieved through maintaining a balance amidst debt tax shields against bankruptcy costs (Myers ,1984). A firm might reach a certain level of debt whereby the risks of bankruptcy become too high such that it cannot compensate for tax deductions. At this stage, the company starts to finance itself using sale of stocks. It is of importance to note that the level of trade-off is different in each and every company given the risk level tolerance of each particular company (Frank & Goyal, 2005).

2.2.3 Arbitrage Pricing Theory

According to Stephen Ross (1976) Arbitrage Pricing Theory (APT), is theory of asset pricing that explains the return that is expected from an investment or a commercial asset and be able to be modeled into a linear relationship of several macro-economic factors of where the level of correlation changes in each variable as depicted by a beta coefficient. The rate of return from the model that is derived will be applied to get the
price or an asset value correctly. Value of an asset is expected to be similar to the anticipated.

APT concurs that while many dissimilar specific forces may impact on the return of an individual stock or bond, this impact may stop in well-defined portfolios. As such, this is the diversification principle that influences corporate bond. Chen, Roll and Ross (1986) remained among the original authors that utilized macroeconomic elements as substitutions for all the indefinite elements in A.P.T. These scholars tried to describe equity as an important utility of macroeconomic variables. This is because financial factors for example Treasury bill, interest rates impact on anticipated surpluses and the rebate rate.

A supposition was derived that prices of stocks were affected systematically by economic factors such as exchange rate and interest, Roll and Ross (1995) indicate that the underlying premise of Arbitrage Price Theory is cognition only limited systematic factors impact on long-term aggregate returns of financial assets. APT disregards the various reasons that impact price variability on daily basis of stocks and bonds, and emphases key factors that drive aggregates in huge portfolios. Through identification of these forces, an intuition recognition of their effect on portfolio returns in achieved. Return on assets largely dependent on expected or unexpected events.

2.3 Empirical Review

The review of literature empirically as guided by the study objectives is arranged as follows:
2.3.1 Inflation Rate and Performance of Corporate Bonds

There is a growing rift of the findings of empirical literature in the developing and the developing world in respect the encouragement of micro-economic variables on performance of security exchanges. According to Garcia and Liu (1999) they tested level of volatility among macro-economic factors and how this bears on the performance of securities market, alternatively Maku and Atanda (2010) exposed the functionality of securities market in Nigeria was impacted by macro economic dynamics in the long run. While Ting et al. (2012) explored Kuala Lumpur composite index the findings depicted that the securities market was mostly impacted by rates of interest, source of cash as well as customer price index both in shorter and longer term. There was presence of an converse association between real interest rates and over development of the securities market in Pakistan (Mehwish, 2013).

Sprcic and Wilson (2007) delved the issues which guided pace of business bond improvement in Croatian markets. The study explored the factors which chief financial officers in big Croatian firms considered crucial in utilizing company bonds as a funding strategy also the limits faced when allotting corporate bonds. It was unearthed that a set of variables which entailed industry level, market level, macro level as well as firm level factors impacted speed which business bond markets grew. One of those factors was inflation. While in Croatia, it was anticipated to be unavoidable, but sluggish.

Inflation has been captured by empirical literature as critically affecting critical determinants of financial and security markets across the globe. Only the scale of influence and degree of control of inflations in various jurisdictions make a
difference. Dammon (2008) notes that inflation impacts capital framework as well as firm worth hence greater inflation forces bond holders to sell bonds in exchange for shares and hence firms’ capital structure assessed as debt equity ratio, becomes lower.

Dokko (2009) discovered empirical backing for a variation in inflation produces wealth reallocation involving debtors and creditors. Booth et al. (2001) discovered that high inflation results in a lessening both long-term and total debt proportions in the developing world. Gajurel (2015) discloses that for the firms mentioned for Nepalese stock switches inflation which is badly associated with leverage ratio. While, Noguera (2011), investigation on the connection between inflation and capital structure discovered a good significant positive connection among inflation and capital leverage.

Karigu (2010) did a study on relationship between Nairobi Securities Exchange 20 share index performance and selected macro-economic variables. It was established that performance of 20 share index at N.S.E has substantial association with selected macro-economic variables including inflation rate, except for foreign portfolio flows where the relationship was found to be insignificant.

According to Kimani and Mutuku (2013) who assessed effect of Central Depository System, inflation along with other macroeconomic elements as well as net highly effective exchange fee, terms of trade, gross domestic product and also the deposit fee on N.S.E performance using three-monthly details from the Central Bank of Kenya and N.S.E from December 1998 to June 2010. The findings from the cointegrating model indicated a significant negative association between NSE performance and
inflation. Another study by Gajurel (2015) recognized that macroeconomic variables were important that inflation was adversely interrelated with leverage ratio for Nepalese companies.

Baraza (2014) investigated inflation as some of the macro-economic element affecting in Kenya the performance of securities market and established that an inverse but insignificant link amongst inflation and security market performance existed. The study concluded that regulators including CBK need be positive rather rashly relating to managing of the macroeconomic variables. Additionally, the study depicted while macro-economic variables along with stock market performance declined right before, in and right after electioneering phases, terse political and poll structures can be put in place, and procedures supported to avert attainable alterations of macro economic elements as well as stock market efficiency along with other economic variables.

2.3.2 Interest Rate and Performance of Corporate Bonds

Henry, Olekalns and Suardi (2005) did a study on equal influences and equity return volatility and uneven changing aspects of interest rate on short-term in Australia. Focal aim of research remained to examine association amid equity yields and interest rates in the short-term. Data from the results endorse that that interest rate in the short-term unpredictability summits with rate of short-term rates of interest, whereas instability of equity retorts irregularly to negative and positive shocks.

Kim and Stock (2011) concentrated on impact rate of interest instability on business income ranges on both callable and non-callable bonds. Their analysis said an supposition if higher interest rate instability escalates a organization's liability
instability, its business more aptly attains a serious risk aimed at defaulting, therefore causing a more return spread. They discovered that there is a positive association of interest rate volatility with yield spreads on non-callable bonds. Results from study long-established that beneficial effect of interest rate volatility on yield spreads is actually weak on callable bonds. The outcome suggests there being an adverse relation among default spreads and call spreads. It was furthermore recognized there being a connection amongst interest rate volatility and yield spreads is more optimistic for bonds that are junk than for grade bonds investment.

Ringui (2012) examined the factors determining how the market on corporate bonds has grown in Kenya. The study outcomes suggested macroeconomic, political, and regulatory features explains entirely the essential market of corporate bond growth and expansion in Kenya. Overall, outcomes showed a combination of aspects that matters for progress of Kenyan market of corporate bonds which encompassed the financier base, burdensome process of issuance, regulatory framework, country’s political environment, shares of banking industry besides various macro-economic factors.

Empirical literature has over the years unearthed a schism in the defining determinants of corporate bond performance between developed and the developing economies. Bhattacharyay (2013) sought to recognize the determining factor of Asian economies debt market improvement in by evaluating connection of bonds issued with selected essential financial as well as economic factors. The study was done with a view to boost business bond financing by checking out elements which impacted the real improvement of markets for bond in Asia. He discovered that main determinants
for bond market improvement in Asia had been discovered including the dimensions of banking structure, openness of an economy, dimensions of the economy, the rate of exchange erraticism and stage of economic growth and rate of interest inconsistency.

Singh (2013), when interest rate is actually high asset falls, a reduced price in interest causes a boost into expense actions. Improved investment might infer usage of even additional liability. Nevertheless, in short course interest is inflexible hence does not affect amount of investment. Henceforth there exists a relationship among use, expenditure degree and debt of interest rates. Mutuku and Kimani (2013) proved that there's an inverse relationship amongst stock market performance in Kenya and inflation. Jahur et al. (2014) established macro-economic elements like rates of interest and price index of consumer, take considerable influence on the securities market performance in Bangladesh.

Barasa (2014) did a study in line macroeconomic elements of stock market overall performance at NSE and discovered there was a positive but weak connection between the a number of macro economic elements, including interest rates, collectively and stock market efficiency. A report through Waweru (2014) looked at outcome of macroeconomic rudiments on the overall performance of infrastructural debt instruments. The outcomes advocated that rates of interest consume a positive association by advancement of infrastructural bonds.

Research indicate that interest rates impact capital system choices. Harris and Jalilv (2014) did a study of United States of America (USA) firms got scans it recommended fiscal choices are firm and interdependent measurement, interest rate
situations as well as stock price amounts impact pace of changes to capital system suggesting they affect it.

Interest rates are able to influence the progress of an industry in a number of ways. First, increased interest rates prevent businesses from investing in new capital and development. On the flip side, reduction in interest rates are able to stimulate industries to develop, that can result in greater employment levels and development, more personal spending and higher GDP (Mohr, 2015).

A case in point is a study conducted on 18 companies that had issued bonds at the N.S.E by Ngabirano (2016) who brought into being that internal and external aspects do not alter how corporate bonds performed as allotted by listed firms at the N.S.E. Most of the internal factor such as size, terms and liquidity do not affect performance of the bonds. Even the external factor such as rate of interest took insignificant consequence on how corporate bond performed.

2.3.3 Exchange Rate and Performance of Corporate Bonds

The exchange rate in many countries is one of the critical price aspects in state of economy since it regulates internationally the balance of payments (Levich, 2001). Investors opt for investment where rate of exchange is unstable since they the risks are minimal (exchange rate risk). Bradley and Moles (2002) defined rate of exchange as the unit of price of the domestic to foreign currency compared. Mbugua (2003) found rate of exchange negatively altered progress of the market for corporate bond. Murthy and Sree (2003) argued that exchange rate enables comparison of prices of commodities quoted in diverse currencies.
Murthy and Sree (2003) postulated that country’s foreign debt is significantly had an effect on the variations in rates of exchange. The central bank typically under a fixed exchange rate system will set a par value between foreign and domestic currencies (Reid and Joshua, 2004). Adetayo, Dionco and Oladejo (2004) explain that exchange rate variation is significant in determining a country’s balance of trade. According to Omagwa (2005), fluctuations in exchange rates impacts on prices of imports directly thus inversely affecting a country’s external sector.

Mbugua (2005) studied that factors that enhanced the Kenyan growth of market of corporate. Study identified and tested this link amid macroeconomic factors and the results depicted that exchange rate negatively affected how the corporate bonds market developed. Omagwa (2005) posit that exchange rates like any other commodity are explained through law of demand and supply. Currency supply is explained by changes in fiscal policies whereas currency demand is affected by a varied range of factors for instance rates of interest and inflation.

Wong and Leung (2008) surveyed the Chinese banks on exposure of international exchange. They revealed foreign exchange as well as size of bank visibility favorably has correlation. They discovered that increase of international exchange reduces values of equity hence hindering the banks’ efficiency. Adelegan and Radzewicz-Bak (2009) completed a study improvement of market for bonds in Sub Saharan Africa by way of finding out determining factor of growth of bond market. They observed constraint on savings is actually critical obstacle to bond domestic markets growth and economic sector deepening, noting that it resulted to minimal amount of fiscal intermediation by banks. Several variables had been discovered to have a role in
improving domestic bonds market of SSA which included exchange rate among others.

Maina (2010) surveyed in Kenya effect of rate of exchange variability and investing’s in the electric power industry. Maina’s findings showed that the investing’s were great in the power industry when the rate of exchange was stable in comparison to when there is high variations. Bhattacharyay (2011) opines that minimal reduced volatile exchange will drive bond market development. Mongeri (2011) examined influence of foreign exchange reserves and rates on performance on stock markets at NSE using foreign exchange on time series data on a monthly basis, reserves and NSE share index rates from 2003 up to 2010. Study found foreign rates of exchange takes a negative substantial influence on performance of stock market. It also recognized that reserves on foreign exchange had positive significant outcome on performance of stock marke.

Ringui (2012) contends that firms can record better performances when the political, macroeconomic and regulatory framework of a country is conducive for corporate bond market to thrive. These imply that if factors prevail for firms to access debt financing, positive results might be realized in the performance of these firms. Korajaczyk and Levy (2012) examined choice of the structured of capital macro-economic situations and financial macro-economic situations and financial limitations. In addition, macroeconomic situations were revealed to explain between 12% and 51% of time series variance in financial leverage which reflects the condition of economy. The growth rate of economy was favorably linked to leverage ratio.
Songole (2012) recognized that market interest rate, customer price index and exchange rate had a negative association with yield of stock. Mwaniki (2012) examined the Kenyan sensitivity on sensitivity stock yields in relation to rate of exchange and rates of interest changes. His study measured performance in Kenya using stock returns. The findings showed a 73.2% changes in price of stock of commercial banks listed in the NSE might be explained by fluctuations in foreign exchange. Musyoki, Poklanyal and Pundo (2012) examined in Kenya the real rate of exchange volatility influencers of on growth of economy they established rate of exchange volatility positively impacts on growth of GDP but is not significant in upsetting its growth rate.

Ebaidalla (2014) examined impacts of real rate of exchange misalignment in Sudan on how the economic performed. His study revealed that policy on economy significantly affects equilibrium exchange rate. Lado (2015) explored the association among inflation and exchange rate in South Sudan. He concluded that currency depreciation negatively influences growth of economy.

2.3.4 Government Spending and Performance of Corporate Bonds
Mitchell (2005) assessed the influence of government spending on economic performance in the developed world. He assessed the newest academic research, evaluated the international evidence, cited instances of nations which have considerably decreased government expenditure as a proportion of nationwide spending and assessed the economic effects of this reforms. Not considering the unit employed or the methodology used, the study results concluded that a big and growing government isn't favorable to better economic overall performance. The
findings further depicted that reducing the dimensions of government will result in higher incomes and enhance American's competitiveness.

Were (2010) sought to investigate aspects influencing growth of the market for corporate bonds. The study found out that corporations listed in Kenyan bourse meet challenge of development of the corporate bond market over insufficient disclosure of facts on issuance of public debt, government spending and measures of statistics. The companies have unsatisfactorily dealt with forming repurchase market in addition to setting issuance calendars to enhance transparency.

Maingi (2010) looked at the result of government expenditure in Kenya’s growth of the economy from 1963 to 2008. On basis of empirical results, he resolved that for growth of economy composition of government expenditure counts. In the long-term, expenditure on defense, economic affairs, education, general administration, government services and investment also physical infrastructure had positive bearings on economic growth. In short term public order, health care also national security had positive effects on growing of the economy while economy growing was negatively affected by public debt servicing.

Yuan (2012) showed that federal administration is able to promote performance by issuing securities to be able to take in the expense of obtaining systematic facts henceforth adopt all externalities of information. Issuances which are Sovereign, both main as well as secondary business bond markets lead to information-efficiency and more liquidity. Thus, the federal state has a job in facilitation of the improvement of money markets.
Government spending has an impact on economic happenings and how stock market performs in a number of ways. Increased investments on resourceful activities like industrial production are vital in determining the ability of a nation to achieve economic growth. Greater budgeting discipline that will reduce wastage in government expenditure should be encouraged in the nation and the government should readdress its monetary policy that would give the private investor advantage by discouraging great government spending and sustaining low financial deficit (Winnyrose, 2013).

Gikabia (2015) conducted a study in Kenya on public infrastructure bond financing and government spending. The research findings disclosed that there is a connection amongst amounts raised via infrastructure bonds and government spending. The nature of the relationship was a positive one in that increments in amounts collected via bond issued led to higher government spending in the study period. The study presented a positively a link amid total revenue collected and amount of government expenditure. It revealed that increments in inflation rates led to additional spending by the government. This was due to high price of supplies in times of inflation.

2.4 Summary of Literature and Research Gaps

Various theories debated through the study have strived to elucidate the phenomena of elements of macro-economic on how corporate bonds performed around the literature. A handful of researches have been executed in the lesser developed bond market countries on various aspects of bond market development. In Kenya a few studies have been done on bond markets but rarely on influencers of macro-economic factors
and corporate bonds performance. Majority of the reports were centered on treasury bonds but scarcely on corporate bonds.

The few studies on corporate bonds performance targeted characteristics of issuing firm. Therefore, research gap that exists as limited studies has been done to investigate in Kenya the macro-economic factors and performance of corporate bonds at the bourse. Table 2.1 shows the relevant research gaps filled by this study in respect to studies done in the Kenyan context.
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Title</th>
<th>Findings</th>
<th>Study Gaps and how they will be addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngabirano (2016)</td>
<td>Determinants of corporate bonds performance</td>
<td>Internal factors such as bond size, rating, coupon, bond terms and liquidity do not affect performance of corporate bonds. External factor including interest rates, inflation, and exchange rates had negative end results on corporate bonds performance.</td>
<td>The study only focused on 5 years (2011 – 2015). The current study has a longer-term outlook (2001 – 2015).</td>
</tr>
<tr>
<td>Baraza (2014)</td>
<td>Macro-economic variables that determine development in Kenya of securities market.</td>
<td>It was discovered the existence of a weak positive association amongst the securities market efficiency and a selection of macroeconomic elements (GDP per capita and money supply). Additionally, the study concluded that there was an insignificant converse linkage among inflation and performance of stock market.</td>
<td>Though the topic was on influences of macro-economic factors on securities performance, it used different variables to this study and used five-year data only thus failing to get the actual trends. This study will investigate fifteen years (2000-2015)</td>
</tr>
<tr>
<td>Kiuna (2010)</td>
<td>Impact of automated trading system on market activities at the NSE</td>
<td>Bond turnover, prices, and deals were substantially higher for periods after stock market automation than before the automation.</td>
<td>The study only assessed technology as a variable affecting performance of bonds. This study will expand the scope to cover four macro-economic variables</td>
</tr>
<tr>
<td>Karanja (2014)</td>
<td>Determinant of issuance of corporate bonds at NSE, Kenya</td>
<td>The demand of corporation bonds is affected by Tenancy period. Investors being rational are skeptical about postponing consumption of money for longer period and would rather invest in ‘short-term’ periods. The higher the frequency of redemption of the principle reduces the return of the bonds as it affects interest generating ability of the bonds, thus investors don’t prefer higher</td>
<td>The study only investigated corporate bond characteristics that affect their performance to the exclusion of the role of macroeconomic factors which will this study’s focus</td>
</tr>
<tr>
<td>Study</td>
<td>Title</td>
<td>Findings</td>
<td>Limitations</td>
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<tr>
<td>Waweru (2014)</td>
<td>Effects of macro-economic variables in Kenyan NSE and the liquidness of infrastructural bonds issued thereof.</td>
<td>Exchange rates and rate of interest and had a positively significant association with infrastructural bonds liquidity. The findings, however, depicted that diaspora remittances, real GDP and variability in inflation rate have a significant negative association with liquidity of infrastructure bonds</td>
<td>The study was limited to infrastructure bonds and did not investigate performance of the bonds but only the liquidity. This study will use slightly different variable to assess performance of all corporate bonds at the NSE</td>
</tr>
<tr>
<td>Wanjiru (2015)</td>
<td>Impact of government bond market advancement on growing of the economy in Kenya</td>
<td>The advancement of market for bond has substantial positive impact in Kenyan GDP. However, when control variables are introduced, the two bond market variables become statistically insignificant, an indicator of the extent to which the bond market is still in Kenya underdeveloped.</td>
<td>The study was based on treasury bonds and not corporate bonds as was the case with this study</td>
</tr>
<tr>
<td>Karigu (2010)</td>
<td>Association between selected macro-economic variables and 20 indicator of share at N.S.E</td>
<td>Performing of 20 indicator of share at N.S.E had significant relationship with a selection of elements of macro-economy such as growth rates of GDP, Gross Domestic Product (GDP), exchange rates, inflation rate, and interest rates also domestic savings) except foreign portfolio flows where the relationship was found to be insignificant.</td>
<td>The study did not factor the variables of foreign exchange and government spending nor investigate corporate bonds exclusively as was the case with this study.</td>
</tr>
<tr>
<td>Wanjiku (2014)</td>
<td>The effects of issuance of bonds on prices of shares of</td>
<td>It established that many companies experienced a turning point in outstanding cash flows at the date of issuance of bond. The study</td>
<td>The study did not extend to interrogate the causes of the performance and prices of the bond at NSE. The study pursued to satisfy this gap by</td>
</tr>
<tr>
<td>Mwangangi (2013)</td>
<td>How indicators of Economic performance influence securities returns at corporations registered at Kenyan N.S.E.</td>
<td>Research established positive association between overall and underlying inflation, interest lending rate, economic growth and stock returns. Results also discovered existence of an inverse link among rate of exchange and securities returns. However, only exchange rate and economic growth variables were statistically significant.</td>
<td>The study explored the role of macro-economic elements on returns on bonds and not the comprehensive performance. It was not exclusive to corporate bonds and it went short on factoring government spending in preference of GDP. This study filled these gaps.</td>
</tr>
</tbody>
</table>
2.5 Conceptual Framework

**Independent Variables**

- **Inflation Rate**
  - Average annual Inflation rate

- **Interest Rate**
  - Average annual commercial banks’ Lending Interest rate

- **Exchange Rate**
  - Average Annual Kenyan Shilling against US$

- **Government Spending**
  - Government expenditure per annum
  - Government Deficit

**Dependent Variable**

- **Corporate Bond Performance**
  - Bond market turnover ratio per year
  - Bond value traded per year

**Figure 2.1 Conceptual Model**

Source: Author (2018)
3.1 Introduction

Chapter presents detailed account of methodology that researcher utilized within the study. It comprises adopted research design, targeted population of the study, sampling procedure and sample size and procedures and methods applied in gathering the data that was made use of in the study. It also presents testing of reliability and validity of data, the empirical model utilized and the presentation of the findings. Lastly, the chapter provides the ethical considerations that the researcher factored.

3.2 Research Design

Research adopted was Quantitative research design. It is usually planned towards offering additional understanding into the study problem by relating the variables under investigation (Mugenda and Mugenda, 2003). According to Bryman and Bell (2007), there are two principal categories of quantitative research: longitudinal surveys and cross-sectional surveys. This study adopted a longitudinal survey. A longitudinal survey seeks to investigate a situation by taking repeated measures over time. This study assessed the macro-economic variables that affected the successful issuance and performance of corporate bonds at the NSE over a period of fifteen years.

3.3 Target Population

The population target was derived from all corporate bonds traded at the N.S.E within a period of fifteen-year from January 2001 to December 2015. Records maintained at the NSE indicate that a total of 16 treasury bonds were consistently traded over the
fifteen-year period. The fifteen-year period was considered enough to monitor trend for corporate bond performance against macroeconomic variables. The entire population (census) was used for the study.

According to Cooper and Schindler (2011), a census refers to a count of every element in a populace. Additionally, they argued that there are two conditions under which a census study is appropriate: feasibility and necessity. When the population is slightly low a census is practicable but essential when variables and units of analysis are quite dissimilar from each other. A census was appropriate for this study the reason being that the study population will not only be small but also variable.

3.4 Data Collection Procedure
This study utilized secondary sources of data to get the information required to satisfy the research objectives. Time series data on corporate bond performance was computed for a fifteen-year period from January 2001 to December 2015, thus making use of 15 data points. The corporate bonds turnover, market size and value traded was obtained from the NSE. The macroeconomic elements included were rate of inflation, rate of interest, rate of exchange along with government spending. Mean rates per year for the macroeconomic variables were used. Interest rate was based on CBK lending rates while the United States Dollar (USD) was used for exchange rates.

Data on interest and exchange rates were acquired from the CBK reports as well as publications. Rate of Inflations were extracted from Government of Kenya Economic survey reports prepared by KNBS. Data on Time series on all the selected
Macroeconomic variables were extracted on a yearly average basis over the fifteen-year period. These data were subjected to quantitative analysis processes.

Since the data was quantitative, there was no need to test for reliability as the sources were more reliable in themselves. The information was useful for comparisons, identification of cycles and trends within the period.

### 3.5 Data Analysis

Marshall and Rossman (2003) contend that analysis of data is the procedure of providing organization, direction also interpretation to variety of statistics that is gathered. The process of data analysis entailed preparation of the collected data through cleaning, editing and coding so that statistics could be keyed in the SPSS (statistical package for social sciences) package. Collected data were introduced into spreadsheets by use of MS Excel. Data was then coded into the SPSS analysis package version 21. This software has various statistical tools that can be used to manipulate quantitative data for interpretation. The analysis was done through mean scores and standard deviations.

The analysis also encompassed use of paired t-tests to establish whether there were any statistical differences in the performance of corporate bonds. The t-tests were done by listing down the performance of bonds in terms of turnover, market size, and value traded then the differences observed was tested for significance using the paired t-test. The significance was tested at 5% confidence levels. The significance or confidence level is the probability of obtaining similar results through chance. The aim of the tests is to establish whether a significant association occurs among independent variables and dependent variable (Stephan & Levine, 2010).
Time series secondary data was used for analysis. The study intended to explore link amongst macroeconomic variables and how corporate bond performed, that is, interest rates, inflation, exchange rates and government budget deficit. This study applied the econometric model of multiple linear regression where corporate bond performance was regressed against government budget deficits, exchange rates, interest rates and inflation. The link test was employed to assess goodness of fit and importance of this relationship.

The regression model that was applied is provided hereunder.

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \]

Where \( Y \) = Corporate bonds performance

\( \beta_0 \) = Intercept

\( X_1 \) = Rate of Inflation

\( X_2 \) = Bank Interests

\( X_3 \) = Rate of Exchange

\( X_4 \) = Government Spending

\( \beta_1, \beta_2, \beta_3, \beta_4 \) = Coefficients

\( e \) = Error variable

The study conducted several diagnostics tests to ascertain that data collected was appropriate for regression analysis. These included test of autocorrelation, heteroscedasticity, normality and multicollinearity. The Durbin Watson test for autocorrelation was used for the data. Tsay (2005) contends that autocorrelation
denotes a scientific depiction of the extent of comparability of one time series data and its lagged version over consecutive intervals of time.

The test of multicollinearity in the study involved the use of Variance of Inflation Factors (VIF) study and tolerance. Multicollinearity depicts the probability that a predictor variable considered in a regression model might have a significant linear relationship with another independent variable. Glejser test statistic will be used to test heteroscedasticity. Heteroskedasticity denotes the probability of residual variances having differences from one period to the next or from one level of independent variable to the other. This can influence the efficiency of the results (Long and Ervin, 2000).

Normality was also assessed by application of the Shapiro-Wilk test. Normality tests seek to define if the residuals after a regression model is fitted are normally distributed (Yazici & Yolacan, 2007). Whenever the residual errors are not normally distributed, the regression estimates may not be reliable (Razali & Wah, 2011).

**3.6 Data Presentation**

Data were presented by means of graphical, pictorial representation, tables as well as percentage to depict the extent of impact of macro-economic elements on performance of corporations bonds.

**3.7 Ethical Considerations**

Bougie and Sekaran (2010) note that ethical norms in addition provide the objective and aims of the study and apply to individuals that conduct scientific research or any
other scholarly or innovative tasks. To conform to ethical requirements, the analysis ensured a complete disclosure of planned study. Secondary data was collected within reliable and valid sources which ensured valid and reliable data. Further, the findings of study remained informed by the analysis conducted from the collected data.
CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction
This chapter gives a discussion of analysis of data, interpretation also findings which has been done as per with the objective of this study which was to explore the effects of macro-economic variables on how corporate bond performs at Kenyan N.S.E. The analysis includes diagnostic tests, correlation and regression analysis also descriptive figures.

4.2 Diagnostic Tests
The study conducted multicollinearity tests these included variance inflation factor and heteroscedasticity to find out if the assumptions of linear model were met.

4.2.1 Performance of Corporate Bonds
The study strived to ascertain how corporate bonds performed over the study period and compare the trend with that of the macro-economic elements so as to draw valuable lessons on the impacts of the macro-economic elements and performance of corporate bonds. It was noteworthy that the how corporate bonds performed at NSE was as well tumultuous over years for reasons that are not very clear cut in the Kenyan context, but the role of macro-economic variables will be delineated by this study. Figure 4.1 gives the movement in the performance of corporate bonds issued at bourse of duration the study wishes to examine.
The performance of the corporate bonds as indicated by volumes traded were in conformity with the trend of most of the macro-economic variables especially economic growth, though not part of the study variable, to a great extent than other variables under consideration. The pattern of corporate bond performance at NSE is very noticeable and well established. At one point in 2007, the rate of growth was negative showing that the economy had actually declined during that period.
Outcomes in figure 4.2 above indicate the treasury bonds value always surpassed that of treasury bonds for all the considered years. It should be noted that ordinarily, treasury bonds outperform corporate bonds but, in the data, provided the figures for corporate bonds was higher because of the inclusion of both local and foreign bonds.

Table 4.1: Performance of Corporate Bonds

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Sum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of Treasury Bonds</td>
<td>15</td>
<td>13.59</td>
<td>563.80</td>
<td>3314.74</td>
<td>220.9827</td>
<td>20.38676</td>
</tr>
<tr>
<td>Value / Market size of Bonds</td>
<td>15</td>
<td>1.90</td>
<td>89.39</td>
<td>327.44</td>
<td>21.8293</td>
<td>27.72354</td>
</tr>
<tr>
<td>Total Value of Bonds</td>
<td>15</td>
<td>21.35</td>
<td>574.56</td>
<td>3642.19</td>
<td>242.8127</td>
<td>21.59474</td>
</tr>
</tbody>
</table>

Source: Study data (2018)
Average annual value of treasury bonds stood at Kshs. 220 billion with a total of Kshs. 3.315 Trillion worth of treasury bills having been traded for the period between 2001 and 2015. The average market size of corporate bonds traded per year stood at Kshs. 21.82 Billion with the total market size of corporate bonds traded for the period between 2001 and 2015 being Kshs. 327.44 billion. The average annual value of bonds traded stood at Kshs 0.575 Trillion with total value of bonds traded over the period of review (2001-2015) being approximately 3.642 trillion. Thus, the corporate bonds represented only a small slice of the total bond market.

4.2.2 Inflation Rates

This section looks at the descriptive statistics of inflation rates. The indicators reflected are means, standard deviations, minimum and maximum rates. Table 4.2 shows the descriptive statistics on inflation rates.

**Figure 4.3 Inflation Rate on the Performance of Corporate Bonds**

![Inflation Rate on the Performance of Corporate Bonds](image)

Source: *Study data (2018)*
Mean inflation in Kenya is at two-digit level and may be a disincentive to invests. It is noted from the figure above that inflation is subjected to more dramatic falls unlike the NSE 20 Share Index which has been steadier whether declining or increasing. This can be attributed to the spontaneity of inflation as it is fueled by monetary policies as well as rumors and panicky consumer behavior. Whenever the government initiates mechanisms to address inflation mostly through monetary and fiscal policies, the rate goes down with the same spontaneity as when it was going up. The inflation rates have been noted takes a negative influence on corporate bond performance because as inflation increases, the performance of corporates bonds declines. This is in consistence with results of studies by Fama and Schwert (2007) also (Mandelker, 2006) who indicated to a negative relationship amongst inflation and stock indices.

Table 4.2: Inflation Rates

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Annual Inflation Rates</td>
<td>15</td>
<td>1.98</td>
<td>16.15</td>
<td>7.9933</td>
<td>3.56412</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Study data (2018)

Inflation in economy over period 2001 to 2015 stood at an average of 7.993%. Inflation was highest at 16.15% (2008) and lowest at 1.98% (2002). The high standard deviation of 3.56 indicate that data was highly spread about the mean indicating uncertainty on inflationary trends in the economy.

4.2.3 Interest Rates

This section provides descriptive statistics on commercial banks interest rates in the economy as a macroeconomic variable of interest to the current analysis. The means,
standard deviations, minimum and maximum figures for commercial banks’ interest rates in the Kenyan economy are shown by Table 4.3.

**Figure 4.4 Interest Rates and Corporate Bond Performance**

![Interest Rates and Corporate Bond Performance Graph]

Source: *Study data (2018)*

In Figure 4.4, is noted that interest rates shift in a similar direction as corporate bond performance though the interest rate movement is more pronounced. This signifies that there is a connection amongst the two. Results in figure above express that rate of interest took a negative influence on corporate bonds.

**Table 4.3: Interest Rates**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Annual</td>
<td>15</td>
<td>12.53</td>
<td>19.67</td>
<td>15.6533</td>
<td>2.34203</td>
</tr>
<tr>
<td>Interest Rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Study data (2018)*
Over the period between 2001 to 2015, the commercial banks interest rates stood at average of 15.63%. Standard deviation of 2.342 is fairly low indicating that the data sets are nearly kept to the mean confirming validity of that condition. Interest rates were highest at 19.67% (2012) and lowest at 12.53% (2004). An observation is made that rates of interest charged by commercial banks in the Kenyan economy were generally high with only minor differences on interest rates charged across institutions.

4.2.4 Exchange Rates

Descriptive statistics relating to exchange rates as a macroeconomic variable are offered in the segment. Descriptive information comprise standard deviations, mean, minimum and maximum exchange rates.

**Figure 4.5 Exchange Rate and Performance of Corporate Bonds**

![Exchange Rates and Corporate Bond Performance](image)

Source: *Study data (2018)*

Corporate bond is positively related with exchange rate. This positive relationship is supported by Mukherjee and Naka (1995) who found that return on stock market will
be positively correlated to variations in rate of exchange and can be explained by the level of foreign investments which have been noted to be increasing at the NSE due to a sustained effort by stakeholders to attract foreign investors (NSE Handbook); Economic Survey, (2010).

**Table 4.4: Exchange Rates**

<table>
<thead>
<tr>
<th>Exchange rates (Average USd/Ksh)</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid N (listwise)</td>
<td>15</td>
<td>67.32</td>
<td>98.70</td>
<td>80.1200</td>
<td>8.32606</td>
</tr>
</tbody>
</table>

Source: *Study data (2018)*

It is observed, average rate of exchange amongst the US Dollar and Kenya Shillings in the middle of 2001 to 2015 stood at 80.12. Standard deviation (8.33) signposts reveal that observations remained fairly near the mean. For period under review, the exchange rate was highest at 98.70 (2015) and lowest at 67.32 (2007). The results demonstrate that the Kenyan shilling has generally been on a weakening trend during the review period especially the latter years.

**4.2.5 Government Expenditure**

This part of the report covers descriptive statistics on government expenditure as one of the macro-economic variables assessed. Statistics are also provided on government deficit or surplus during the review period. The statistics captured include mean, standard deviation, minimum and maximum government expenditure in the period under review.
Figure 4.6 indicates that government spending influenced how corporate bonds performed at NSE. In early years of 2001 and 2002 the government spending was low thus low corporate bonds performance. However, in recent years 2014/2015, there has been rising performance of corporate bond which together with increase in expenditure by government.

Table 4.5: Government Expenditure

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Expenditure (KSHS Bn)</td>
<td>15</td>
<td>324.16</td>
<td>2032.51</td>
<td>519.4233</td>
<td>42.49380</td>
</tr>
</tbody>
</table>

From output, annual government expenditure over the period reviewed (2001-2015) stood at an average of 519.42 Billion shillings. The highest annual expenditure stood at approximately 2.033 Trillion (2015). On the other hand, the least annual
expenditure was 324.16 Billion Shillings (2001). From a close check on data reviewed, government expenditure has been on a rising trend during the review period. The highest expenditure was on the last year reviewed which stood at 6.27 times the least spending which was on the first year reviewed.

**Figure 4.7 Government Budget Deficits and Corporate Bond Performance**

![Graph showing government budget deficits and corporate bond performance](image)

Source: *Study data (2018)*

Fig 4.7 shows a complicated relationship. In most of the years the government budget deficits negatively impacted on the how corporate bonds performed in issuance of corporate bonds that were either mostly internally consumed or involving government entities. In some other years the performance of corporate bonds was quite indifferent and insensitive to government budgetary deficits mostly in cases of significant foreign involvement in bond issues. For instance, from year 2004 upto 2009 the government deficits were increasing yet the bond performance change insignificantly.
Table 4.6: Government Budget Deficit

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget Deficit</td>
<td>15</td>
<td>-8.70</td>
<td>2.00</td>
<td>-3.3400</td>
<td>2.98108</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Study data (2018)

On average, government budget in the review period (2001-2015) represented a deficit of 3.34 billion. The highest deficit stood at 8.70 Billion (2015) with the highest surplus being reported at Kshs. 2 Billion (2002). The results show that the government faced budget deficits often.

4.3 Inferential Analysis

This segment looks at statistics which allow generalization to the entire population. The inferential statistics are majorly the output of regression analysis which is multiple linear, Correlation analysis output of Pearson’s and analysis of variance statistics. Prior to these analysis procedures, diagnostic tests were done to determine that ordinary least squares assumptions are not violated.

4.3.1 Diagnostic Tests

Pre and post test diagnostics were conducted before analyzing the data using multiple regression and Pearson correlation. The diagnostic assessments were conducted to guarantee that the collected secondary data satisfied the principal expectations of the statistical measures pursued. Diagnostic tests comprised of test for heteroscedasticity, autocorrelation, normality and multicollinearity.
4.3.1.1 Autocorrelation Test

The Durbin Watson Test for autocorrelation was used for the data. Study results are presented in Table 4.7. Tsay (2005) contends that autocorrelation denotes a scientific depiction of the extent of comparability of one data of time series with its lagged form on consecutive intervals of time.

Table 4.7: Autocorrelation Test Using Durbin Watson

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.765a</td>
<td>.586</td>
<td>.420</td>
<td>1.648</td>
<td>1.121</td>
</tr>
</tbody>
</table>

i) Predictors: (Constant), Government Expenditure, Inflation Rates, Interest Rates, Exchange Rates
ii) Dependent Variable: Corporate Bond Performance
Source: Study data (2018)

Study findings revealed that the Durbin- Watson indicator was 1.121 this implied that according to Durbin and Watson (1971) when the Durbin- Watson indicator is amid 1.5 and 2.5, there is no evidence to depict that autocorrelation exists. This hence led to the conclusion there was no auto-correlation in the data that was considered for multiple regression analysis.

4.3.1.2 Multicollinearity Test

Test of multicollinearity in study involved the use of Variance of Inflation Factors (VIF) study and tolerance. Multicollinearity depicts the probability that a predictor variable considered in a regression model might have a significant linear relationship with another independent variable. The outcomes from multicollinearity is provided on Table 4.8.
Table 4.8: Tolerance and Variance of Inflation Factors Collinearity Statistics

<table>
<thead>
<tr>
<th>Model</th>
<th>Collinearity Statistics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tolerance</td>
<td>VIF</td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td>.409</td>
<td>2.445</td>
</tr>
<tr>
<td>Inflation Rates</td>
<td></td>
<td>.358</td>
<td>2.796</td>
</tr>
<tr>
<td>Interest Rates</td>
<td></td>
<td>.360</td>
<td>2.780</td>
</tr>
<tr>
<td>Exchange rates</td>
<td></td>
<td>.442</td>
<td>2.263</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td></td>
<td>.442</td>
<td>2.263</td>
</tr>
</tbody>
</table>

Source: Study data (2018)

4.3.1.3 Heteroscedasticity Test

Data sets were also tested for heteroskedasticity. It was conducted with utilization of Glejser test statistic. Heteroskedasticity symbolises likelihood of residual variances having differences from one period to the next or from one level of independent variable to the other (Long and Ervin, 2000). Study results presented in Table 4.9 show that there was no heteroscedasticity in all the variables as all had significance values less than 0.05 (Glejser, 1969).

Table 4.9: Test of Heteroscedasticity

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>187.730</td>
<td>25.050</td>
<td>.749</td>
<td>.471</td>
</tr>
<tr>
<td>Inflation Rates</td>
<td>-.462</td>
<td>.567</td>
<td>-.026</td>
<td>.937</td>
</tr>
<tr>
<td>Interest Rates</td>
<td>1.877</td>
<td>.101</td>
<td>.069</td>
<td>.857</td>
</tr>
<tr>
<td>Exchange rates</td>
<td>-.982</td>
<td>.386</td>
<td>-.128</td>
<td>.804</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>.030</td>
<td>.068</td>
<td>.197</td>
<td>.674</td>
</tr>
</tbody>
</table>

Source: Study data (2018)
4.3.1.4 Test for Normality

Test of Normality also assessed by application of the Shapiro-Wilk test. Normality tests seek to conclude if the residuals after a regression model is fitted remain distributed normally (Yazici & Yolacan, 2007). Null and alternate hypotheses in the normality test is (Shapiro & Wilk, 1965)

H₀: The residuals from the regression model are normally distributed
H₁: The residuals from the regression model are not normally distributed

Results from test of normality are presented in Table 4.10. The results point out that at hand no evidence that can lead to rejection of null hypothesis (p greater than 0.05) therefore inference was that residuals were normally spread (Razali & Wah, 2011).

Table 4.10: Test for Normality

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnovᵃ</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance of Corporate Bonds</td>
<td>2.85</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>.532</td>
<td>.809</td>
</tr>
</tbody>
</table>

4.3.2 Multiple linear Regression Analysis

Research employed ordinary least squares analysis of regression towards establishing the quality, strength also direction of effect of macro-economic variables (interest rates, inflation, exchange rates and government spending) on how corporate bonds performed at Kenyan N.S.E.

4.3.2.1 Analysis of Variance (ANOVA)

Analysis of Variance stood important towards determining whether, from a general orientation, macroeconomic variables could be valuable interpreters of performing’s
of corporate bonds. Outcomes for analysis of variance providing the f test and its significance are showed in Table 4.11.

**Table 4.11: Analysis of Variance of the Regression Model**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>382307.946</td>
<td>4</td>
<td>95576.987</td>
<td>3.533</td>
<td>.043b</td>
</tr>
<tr>
<td>Residual</td>
<td>270557.891</td>
<td>10</td>
<td>27055.789</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>652865.837</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

i) Dependent Variable: Corporate Bonds Performance  
ii) Predictors: (Constant), Government Expenditure, Inflation Rates, Interest Rates, Exchange Rates  
Source: Study data (2018)

Study findings shown by Table 4.11 reveal a 95 percent level of confidence, there was evidence that the regression line’s slope was statistically significant and different from zero. The conclusion was arrived at due to the fact that the value of P was 0.043 below the level of significance of 5 percent. The consequence of these findings was that, one of the independent elements (macro-economic variables) was a valuable indicator of how corporate bonds performed. Outcomes agreed like Ngabirano (2016) who indicated that macro-economic factors have an effect on corporate bond performance.

**4.3.2.2 Regression Model Summary**

The regression analysis also wanted to determine usefulness of model while predicting performance of corporate bonds. The key output of the model summary table signposts the fraction of variation in the dependent variable influenced by the predictors included in model as illustrated in Table 4.12.
Table 4.12: Summary of the Model

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>R Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.765a</td>
<td>0.586</td>
<td>0.420</td>
<td>1.64486</td>
<td>1.121</td>
</tr>
</tbody>
</table>

i) Predictors: (Constant), Government Expenditure, Inflation Rates, Interest Rates, Exchange Rates

ii) Dependent Variable: Performance of Corporate Bonds

Source: Study data (2018)

Explanatory power of the model was tested using the coefficient of determination ($R^2 = 0.586$). The suggestion was that 58.60% of the change in performance of corporate bonds (dependent variable) was influenced by variation in macro-economic variables namely; inflation, interest rate, exchange rate and government expenditure (independent factors). The effect being, a 41.40% of change how performance of corporate bonds stood clarified by other aspects not factored in the model. Then, according to Seber and Lee (2012) and Draper, Smith and Pownell (1966), a supposition was made stating no less than one and only of the macro-economic variables was a beneficial predictor of corporate bonds performance. Results share with Ngabirano (2016) who indicated that macro-economic variables are good predictors of corporate bond performance. The results further follow the suggestions of the efficient market hypothesis that assert that macro-economic variables affect performance of bonds (Yartey & Adjasi, 2007).

4.3.2 Correlation Analysis

Further, study adopted the correlation analysis of Pearson’s to assess the direction, strength and kind of association that existed amid the considered macroeconomic variables and corporate bonds performance. Table 4.13 displays the discoveries of the analysis.
Table 4.13: Relationship between Macroeconomic Variables and Performance of Corporate Bonds

<table>
<thead>
<tr>
<th></th>
<th>Performance of Corporate Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>-0.572*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.044</td>
</tr>
<tr>
<td>N</td>
<td>15</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>-0.402*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.014</td>
</tr>
<tr>
<td>N</td>
<td>15</td>
</tr>
<tr>
<td>Exchange rate</td>
<td>-0.689*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.004</td>
</tr>
<tr>
<td>N</td>
<td>15</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>0.555*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.036</td>
</tr>
<tr>
<td>N</td>
<td>15</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Study data (2018)

Research findings presented on Table 4.13 depict a three macro-economic variables (exchange rate, inflation rate and interest rate) having an inverse association by way of performance of corporate bonds. Government expenditure, the fourth macroeconomic variable analysed showed a positive association with performance of corporate bonds. The Pearson correlation coefficient for inflation rate (r = -0.572, p = 0.044) reveals a robust, statistical significance and negative association with how corporate bonds performed. Moreover, there is strong association because the correlation co-efficient is more than 0.50. Additionally, this association has p-value is 0.044 which remains below the five percent significance level hence significant. These study results come to an agreement with past studies by Oriwa (2012), Mayasami and Sims (2002) and Ngabirano (2016) who demonstrated that inflation has negative bond with corporate bond performance.
The Pearson Correlation Coefficient for rate of interest (r = -0.402, p = 0.014) demonstrates moderate, negative, and statistically significant affiliation with corporate bonds performance. The linkage is deemed adequate because its coefficient is below 0.50 then again above 0.30. Further, link is considered significant since the significance value of 0.014 is under the five percent significance level. These study outcomes agree through earlier empirical works with Ringui (2012), Kim and Stock (2011) and Ngabirano (2016) who established that commercial banks interest rates have a negative association with how corporate bond performed.

The Pearson Correlation Coefficient for exchange rates (r = -0.689, p = 0.004) reveals a robust, negative, and significant statistical association among exchange rates and how of corporate bonds performs. The connection is reflected as robust because the coefficient of correlation is over 0.50. Exchange rates are considered to be significant statistically because the value of significance 0.004 is under the critical significance level of 5%. The study results agree with the results by Oriwa (2012), Mayasami and Sims (2002), and Ngabirano (2016) who indicated that rates of exchange has negative bond with how corporate bond performed.

The Pearson Correlation Coefficient for government expenditure (r = 0.555, p = 0.036) illustrates a strong, positive, and statistically significant association between government expenditure and performance of corporate bonds. The association is regarded as robust as the coefficient of correlation is greater than 0.50. Moreover, association is considered to be significant statistically as value of significance of 0.036 remains less the critical level of significance of 5%. This study findings come to an agreement with study results from past empirical orientations by Maingi (2010)
and Mitchell (2005) who showed that government expenditure positively influenced how corporate bond performed.

4.3.3 Multiple linear Regression Analysis

The multiple linear regression analysis was used to establish the nature, strength, and direction of effect of macro-economic variables (inflation, interest rates, exchange rates and government spending) on performance of corporate bonds at the Nairobi Securities Exchange, Kenya.

4.3.3.1 Analysis of Variance (ANOVA)

ANOVA was important to establish whether, from a general orientation, macroeconomic variables could be valuable predictors of how corporate bonds performs as illustrated by Table 4.14.

Table 4.14: Analysis of Variance F- Test

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>382307.946</td>
<td>4</td>
<td>95576.987</td>
<td>3.533</td>
<td>.043</td>
</tr>
<tr>
<td>Residual</td>
<td>270557.891</td>
<td>10</td>
<td>27055.789</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>652865.837</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

i) Dependent Variable: Corporate Bonds Performance
ii) Predictors: (Constant), Government Expenditure, Inflation Rates, Interest Rates, Exchange Rates
Source: Study data (2018)
The outcomes as provided in Table 4.14 give indication that no less than one of the independent variables was important in influencing how corporate bonds performs at 5% significance level. This conclusion was arrived at from the fact that the value of significance of 0.043 is less than the critical significance level of 5%. Inference being, a minimum of one of the independent variables (macro-economic variables) could significantly predict performance of corporate bonds. The findings agreed with Ngabirano (2016) who indicated that macro-economic factors have an effect on corporate bond performance.

### 4.3.3.2 Regression Model Summary

The goal of the regression analysis was determination of the influence of the macroeconomic variables in predicting how corporate bonds performs. The key output of the model summary table depicts the extent of disparity in the response variable influenced by the predictors included in the regression model. Study findings regarding this offered in Table 4.15.

**Table 4.15: Summary of the Model of Regression**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.765^a</td>
<td>.586</td>
<td>.420</td>
<td>1.64486</td>
<td>1.121</td>
</tr>
</tbody>
</table>

i) Predictors: (Constant), Government Expenditure, Inflation Rates, Interest Rates, Exchange Rates  
ii) Dependent Variable: Performance of Corporate Bonds  
Source: *Survey data (2018)*

Study end results as shown by Table 4.15 indicate r squared (coefficient of determination) as 0.586. The inference from these results is that 58.60% of the change in corporate bonds performance remained influenced by way of deviation in the macro-economic variables that were included in the study which comprised of
exchange rate, interest rate, inflation and government expenditure (independent variables). This means that only 41.40 percent of the change in corporate bonds performance was unexplained by other variables that were excluded in the model. Therefore, a supposition was arrived at indicating that at one of the macro-economic variables was a valuable predictor of corporate bonds performance (Seber & Lee, 2012). Moreover, Draper, Smith, and Pownell (1966) observed that for a regression model to be credible, it requires at least to explain above 30% of the variation in the outcome variable. The results share with Ngabirano (2016) who indicated that macro-economic variables are good predictors of corporate bond performance. The results further follow the suggestions of the efficient market hypothesis that assert that macro-economic variables affect performance of bonds (Yartey & Adjasi, 2007).

Table 4.16: Regression Coefficients Output

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1670.621</td>
<td>5.718</td>
<td></td>
<td>2.922</td>
</tr>
<tr>
<td>Inflation Rates</td>
<td>-5.027</td>
<td>2.937</td>
<td>-.083</td>
<td>-.389</td>
</tr>
<tr>
<td>Interest Rates</td>
<td>-2.804</td>
<td>3.146</td>
<td>-.030</td>
<td>-.121</td>
</tr>
<tr>
<td>Exchange Rates</td>
<td>-2.648</td>
<td>1.804</td>
<td>-1.021</td>
<td>-3.007</td>
</tr>
<tr>
<td>Government Expenditure</td>
<td>.238</td>
<td>.156</td>
<td>.469</td>
<td>1.530</td>
</tr>
</tbody>
</table>

i) Dependent Variable: Performance of Corporate Bonds
Source: Study data (2018)

Ordinary least squares regression analysis show that three macroeconomic variables analysed; inflation rate, exchange rate and interest rate take a negative and statistically substantial influence on how corporate bonds performed. Government expenditure, the fourth macroeconomic variable analysed demonstrated statistically and positive substantial effect on performance of corporate bonds. Statistical significance threshold
for all variables analysed is considered met since all the associated p-values are below 5% level of significance.

The coefficient for inflation rates (-5.027) infers decrease or increase in a single unit of inflation will cause to a rise (fall) of 5.027 unit in corporate bonds performance. Inflation rates were also significant predictors as p value of 0.007 is less than critical significance level of 5%. Consequently, inflation rate is a suitable predictor of performance of corporate bonds. The results agree with past studies by Oriwa (2012), Mayasami and Sims (2002) and Ngabirano (2016) who indicated that inflation has an inverse influence on corporate bond performance.

The coefficient for interest rates (-2.804) indicates a unit rise in interest rates result in 2.804 units deterioration in performance of corporate bonds. The influence is regarded as statistically significant as accompanying p-value (0.019) is below 5% significance level. Therefore, rate of interest had substantial negative influence on how corporate bonds performs. Study findings support previous findings by Ringui (2012), Kim and Stock (2011) and Ngabirano (2016) who indicated that commercial banks rate of interest have adverse effect on corporate bond performing’s.

The coefficient for exchange rates (-2.648) shows a unit rise in exchange rates will result to 2.648 units decline in performance of corporate bonds. Significance of Statistics ceiling is observed because accompanying p-value (0.013) below the 5% significance level. As such, exchange rates are a valuable forecast of performing of corporate bonds. This study agrees with Oriwa (2012), Mayasami and Sims (2002), and Ngabirano (2016) indicated that rate of exchange has negative outcome on corporate bond performance.
Government spending scored a coefficient of (0.238). This illustrates that increasing government spending by one unit would result to an improvement of 0.238 units in corporate bonds performance. This is a statistically significant positive effect since the significance value of 0.016 is less than the critical significance level of 5%. As such, government spending has a significant positive effect on performance of corporate bonds. These study results support previous findings by Maingi (2010) and Mitchell (2005) who indicated that increased government spending would enhance corporate bond performance.

In summary, the results demonstrated that all the independent variables (macro-economic variables) under total reward system (inflation rates, interest rates, exchange rates and government expenditure) were useful predictors of performance of corporate bonds. This agreed with theoretical basics of efficient market hypothesis which postulates that macro-economic variables affect performance of bonds (Yartey & Adjasi, 2007). After fitting of the multiple linear regression model, it provided below the effect that the considered macroeconomic variables would have on corporate bonds performance;

Performance of corporate bonds = 1.670.621 -5.027X1 -2.804X2 – 2.648X3 + 0.238X4
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter covers a summary of study and empirical findings that were derived after the analysis. It similarly captures main conclusions based on inferential statistics. On the basis of unique results, fundamental policy commendations are made. It also provides recommendation for further research informed by an analysis of research gaps left uncovered by the research done currently.

5.2 Summary

Research pursued an aim of determining influence of macro-economic variables that is inflation rate, exchange rate, interest rate and government expenditure on performance of corporate bonds at the Nairobi Securities Exchange, Kenya for the period between 2001 and 2015. During the review period, the corporate bonds represented only a small slice of the total bond market. Findings from the regression analysis depict greater than half of disparity in performance of corporate bonds is influenced by variants in macro-economic variables that is; interest rate, exchange rate, government expenditure and inflation.

5.2.1 Inflation rate and performance of corporate bonds at the N.S.E

Study established highly unpredictable inflationary trends in the economy with the highest annual inflation rate during the period being more than eight times the least annual inflation rate reported in the review period. The results of Regression analysis demonstrated inflation rate as a valuable predictor of how corporate bonds performed. Pearson correlation analysis output further indicated that inflation rate had a robust, negative also significant statistical association with how corporate bonds performed.
5.2.2 Interest rates and performance of corporate bonds at the N.S.E

The results indicated that commercial banks interest rates were generally high in the Kenyan economy. The interest rates charged by individual players were however not highly variant. Multiple linear analysis of regression outcomes specified that interest rates was significant negative forecaster of how corporate bonds performs. The correlation analysis using Pearson analysis outcomes recognised that interest rate has a moderate, negative, and statistically significant relationship with corporate bonds performing’s.

5.2.3 Exchange rates and performance of corporate bonds at the N.S.E

Results demonstrated that the Kenyan shilling had generally been on a weakening trend during the review period especially the latter years. Study results from multiple linear regression indicated that exchange rates was an independent variable that statistically and significantly predicted performance of corporate bonds. Pearson correlation analysis results indicated that rate of exchange has strong, negative, and significant statistical link by performance of corporate bonds.

5.2.4 Government spending and performance of corporate bonds at the NSE

Results indicated a high level of government spending. A close check on data further demonstrates ballooning trends in government spending with passage of time over the review period. Multiple linear regression an analysis demonstrated that government expenditure was a beneficial predictor of how corporate bonds performed. Pearson correlation analysis output demonstrated that government expenditure takes strong, positive also significant statistical link with how corporate bonds perfomed.
5.3 Conclusion

The subsequent conclusions were made based on study findings. First, the study was informed by coefficient of determination that the macroeconomic variables assessed formed a good model in predicting performance of corporate bonds at the Kenyan bourse market. On inflation, study resolved that inflationary conditions and trends were highly unpredictable in the economy. From regression analysis outcomes, it was concluded that rate of inflation has substantial, negative effect on how corporate bonds performed. From coefficients, an increase in unit of inflation would cause an approximate five times unit decrease in how corporate bonds performed. Further, study concludes that rate of inflation was inversely related with achievement of corporate bonds.

On rates of interest, based on analysis on regression outcomes an inference was completed which indicated interest rates as valuable in predicting performance of corporate bonds. An increase in one unit of interest rates would cause an approximate three times unit deterioration in performance of corporate bonds. Further, a conclusion was made on the existence of an inverse connection amongst interest rates and corporate bonds performance.

On rate of exchange, the findings led to the conclusion there was substantial consequence of rates of exchange on how corporate bonds performed. Moreover, study concludes a one increase in unit in exchange rates will lead to approximately three times unit decline in how of corporate bonds performed. Moreover, it was concluded presence of a significantly inverse link among exchange rates and corporate bonds performance.
On government expenditure, based on regression analysis output, a conclusion was made that the level of government expenditure positively affects the performance of corporate bonds. An increase in single unit government spending would cause to an approximated two times unit improvement in the performance of corporate bonds. Further, centered on analysis output of Pearson correlation it concluded government expenditure had a positive affiliation with how corporate bonds performed.

5.4 Recommendations

A commendation is put together to state and economic planners to move to control the macro-economic factors in the economy and especially inflation, rate of interest, and rate of exchange which would take deteriorating influence on how corporate bonds performed. There is need for the government and its fiscal agents to regularly review the policy on monetary issues to keep the condition of inflation in the economy under check.

The study makes recommendation on need by the government and regulatory agents, principally the C.B.K to move to strengthen the rate of interest regulatory framework. High level of interest rates established in the Kenyan economy but also on overall economic performance. There is need to strengthen the capital markets and enhance governance spending to enhance financial deepening in the bond market.

An additional recommendation was made on need enhance Kenyan currency stability in order upscale not only the performance of corporate bonds but also of the economy as a whole. The government should apply monetary policy instruments to keep check on exchange rate fluctuations.
On government expenditure, a recommendation is made for the government to ensure prudence in government spending. Government should enhance its revenue collection so as to fund government projects which would enhance bond performance. Options should be explored to prudently bridge the gap between budget and actual expenditure to address constant deficits observed. This should chiefly focus on enhancing revenue collection.

5.5 Suggestion for further research

Empirical analysis focused going on influence of macro-economic variables and corporate bond performing’s at the NSE. Though the study provided new dimensions of corporate bond performance, there are still other areas that could be explored. Apart from the macroeconomic factors, future studies should interrogate industry and company level factors that influence performance of corporate bonds. Further, a study should compare performance of bonds from different firms and establish the key difference and factors informing those differences.
REFERENCES


Bergen, J.V. (2010) 6 Factors that influence exchange rates. Investopedia,


APPENDICES

APPENDIX I: KENYATTA UNIVERSITY RESEARCH APPROVAL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke
P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Dean, Graduate School
DATE: 11th September, 2017

TO: Susan Nyambura Maina
C/o Accounting and Finance Dept.

REF: D55/NYI/PT/27251/2013

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting of 6th September, 2017 approved your Research Project Proposal for the M.B.A Degree Entitled, “Macro-economic variables and performance of corporate bonds at the Nairobi Securities Exchange, Kenya”.

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University’s Website under Graduate School webpage downloads.

Thank you.

ELIJAH MUTUA
FOR: DEAN, GRADUATE SCHOOL

C.c. Chairman, Accounting and Finance.

Supervisors:

1. Ms. Gladys Kimutai
   C/o Department of Accounting and Finance,
   Kenyatta University
APPENDIX II: NACOSTI RESEARCH PERMIT

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Ref. No: NACOSTI/P/17/43417/19300

Date: 22nd September, 2017

Susan Nyambura Maina
Kenyatta University
P.O Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Macro-economic variables and performance of corporate bonds at the Nairobi Securities Exchange Kenya” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for the period ending 21st September, 2018.

You are advised to report to the County Commissioner and the County Director of Education, Nairobi County before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a copy of the final research report to the Commission within one year of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:
The County Commissioner
Nairobi County.
The County Director of Education
Nairobi County.
### APPENDIX III: SECONDARY DATA COLLECTION SHEET

<table>
<thead>
<tr>
<th>Average Annual Inflation Rates</th>
<th>Average Annual Interest Rates</th>
<th>Exchange rates (Average USd/Ksh)</th>
<th>Government Spending</th>
<th>Corporate Bond Turnover</th>
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</thead>
<tbody>
<tr>
<td>5.80</td>
<td>19.67</td>
<td>78.59</td>
<td>0</td>
<td>0.078071183</td>
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<tr>
<td>1.98</td>
<td>18.51</td>
<td>78.62</td>
<td>2.00</td>
<td>0.061488673</td>
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<tr>
<td>9.63</td>
<td>16.37</td>
<td>75.94</td>
<td>(2.20)</td>
<td>0.200816744</td>
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<td>11.03</td>
<td>12.53</td>
<td>79.17</td>
<td>(1.50)</td>
<td>0.15656355</td>
</tr>
<tr>
<td>9.85</td>
<td>12.89</td>
<td>75.55</td>
<td>1.50</td>
<td>0.363517205</td>
</tr>
<tr>
<td>6.90</td>
<td>13.64</td>
<td>71.96</td>
<td>(2.30)</td>
<td>0.180680846</td>
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<tr>
<td>4.38</td>
<td>13.33</td>
<td>67.32</td>
<td>(3.00)</td>
<td>0.070520383</td>
</tr>
<tr>
<td>16.15</td>
<td>14.02</td>
<td>69.19</td>
<td>(4.10)</td>
<td>0.093483805</td>
</tr>
<tr>
<td>10.50</td>
<td>14.80</td>
<td>77.35</td>
<td>(5.30)</td>
<td>0.098445709</td>
</tr>
<tr>
<td>4.10</td>
<td>14.36</td>
<td>79.23</td>
<td>(5.80)</td>
<td>0.029225666</td>
</tr>
<tr>
<td>9.44</td>
<td>15.05</td>
<td>88.23</td>
<td>(4.50)</td>
<td>0.021099332</td>
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<tr>
<td>10.96</td>
<td>19.65</td>
<td>87.67</td>
<td>(4.80)</td>
<td>0.003358671</td>
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<tr>
<td>5.72</td>
<td>17.31</td>
<td>86.20</td>
<td>(6.60)</td>
<td>0.122160241</td>
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<tr>
<td>6.88</td>
<td>16.51</td>
<td>88.08</td>
<td>(4.80)</td>
<td>0.122313379</td>
</tr>
<tr>
<td>6.58</td>
<td>16.16</td>
<td>98.70</td>
<td>-8.7</td>
<td>0.278712153</td>
</tr>
</tbody>
</table>
APPENDIX IV: FIRMS THAT HAVE ISSUED CORPORATE BONDS AT NSE

1. Centum Investment Company Limited
2. CFC Stanbic Holdings Limited
3. Housing Finance Company Limited
4. KenGen Limited
5. Safaricom Limited
6. Britam Holdings
7. Athi River Mining Ltd
8. Barclays Bank
9. Consolidated Bank of Kenya Ltd
10. EADB Ltd
11. Faulu Kenya LTD
12. I&M Bank
13. Mabati Rolling Mills
14. PTA Bank Ltd
15. Sasini
16. Shelter Afrique