Empirical Analysis of Major Determinants of Bond Market Development in Nigeria and South Africa: 1994-2016

Okafor, Chioma Nnenna

2013417009p

Being a dissertation presented in partial fulfilment of the requirements for the award of Doctor of Philosophy (PhD) degree to the Department of Banking and Finance, Faculty of Management Sciences Nnamdi Azikiwe University, Awka

Supervisors: Prof. S.N. Ibenta
Dr.C.S Okaro

August, 2018.

Declaration

I declare that this dissertation titled 'Empirical Analysis of Major Determinants of Bond Market Development in Nigeria and South Africa: 1994-2016' was carried out by Okafor, Chioma Nnenna: Reg. No: 2013417009p. To the best of my knowledge, this work has not been previously submitted to this university or any other institution.

-------------------------------------   -------------------------

Okafor, Chioma Nnenna.   Date

Approval

We hereby certify that this Dissertation titled 'Empirical Analysis of Major Determinants of Bond Market Development in Nigeria and South Africa: 1994-2016' by Okafor, Chioma Nnenna with registration number 2013417009p, satisfied the standard in partial fulfillment for the requirements for the award of Degree of Doctor of Philosophy (Ph.D.) in Banking and Finance, Faculty of management sciences, Nnamdi Azikiwe University, Awka.

-------------------------------------   -------------------------
Prof. Steve Ibenta   Date
(Supervisor1)

-------------------------------------   ---------------------------
Dr. Celestine Okaro   Date
(supervisor11)

---------------------------------------   ----------------------------
Dr. P.K. Adigwe   Date
Head of Department

---------------------------------------   ----------------------------
 External Examiner   Date

---   ----------------------------
 Prof. Chizoba Ekwueme   Date
Dean, Faculty of Management Sciences

---   ----------------------------
Prof. Harris Ike Odumegwu   Date
Dean, School of Post Graduate Studies

Dedication

This work is dedicated to the Almighty God, The fountain of life.

ACKNOWLEDGMENTS

To God Almighty be all the glory for the gift of life, wisdom and the grace to complete this programme. I am greatly indebted to my supervisors: Prof Steve Ibenta and Dr. Celestine Okaro whose advice gave this work a meaningful direction. I am particularly grateful to my Head of Department, Associate Prof. P.K. Adigwe and the PG coordinator of the Department, Dr. Celestine Okaro for the encouragement and the tireless effort they made to ensure the speedy completion of this progamme. And to all the lecturers in my department: Prof. Clem Nwakoby, Prof. Vincent Ezeabasili, Sir E.S. Ekezie,   Dr. V.I. Okonkwo, Dr. Ifeanyi Nwanna, Dr. Felicia Anyanwu, Dr. Gideon Ezu, Dr. Felix Echekoba and Dr. Ifeoma Amakor. I am grateful to you all for the knowledge imparted in me in one way or the other. I am also grateful to the Dean of the Faculty Prof. Chizoba Ekwuemefor her contributions to the success of this programme. I appreciate the effort of my reviewers, Prof. Vincent Ezeabasili and Prof. Frank Nwankwo for making this work come out better. My profound appreciation goes to all my friends and classmates ; Mrs. Ijeoma Okeke, Kenechukwu Mojekwu, Mrs. Victoria Obi-Nwosu, Stanley Ogbonna, Mrs. Gloria Izundu   Angela Atsanan, Okoye Uzoamaka and others who assisted me in the course of this programme.

 I thank my lovely parents, Ven. and Mrs. B.O. Okafor, for their prayers, moral and financial support at various stages of my academic pursuit. They laid a solid foundation for me to build on. To my siblings; Uzo, Ify, Uju, Obiora and wife, Nchee, Chinwe and Chike, I appreciate your prayers and concern throughout this period.

To my beloved husband, Chidi I lack words to express my gratitude to you. You patiently watched me evolve and you provided all that I needed to come to this stage. Thanks to you and to God who made your dream come true. I want to finally thank my lovely children; Chinwe, Chidinma, Cee Jay and Uju and my nephew, Somtoo. They all played their own part to the success of this programme. God Bless you all. Amen.

TABLE OF CONTENTS

1.0 CHAPTER ONE: INTRODUCTION

2.0 CHAPTER TWO: REVIEW OF RELATED LITERATURE

3.0 CHAPTER THREE: METHODOLOGY

4.0 CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

5.0 CHAPTER FIVE SUMMARY OF FINDINGS, CONCLUSION AND

RECOMMENDATION

REFERENCES

APPENDIX

LIST OF TABLES

List of Figures

ABSTRACT

This study analyzed the major determinants of bond market development in Nigeria and South Africa. The scanty empirical evidence, which is mainly on developed and Asian economies coupled with mixed findings in related studies call for the need to examine the effect of major determinants of bond market development on the Nigerian and South African economy. The main objective is to examine the major determinants of bond market development in Nigeria and South Africa. The study employed expost facto research design involving a 24-year time series data that were mainly sourced from CBN statistical bulletin and the Debt Management Office (DMO), Bond Exchange of South Africa (BESA), South African Reserve Bank (SARB) statistical bulletin and online version of World Bank economic development indicators. The Ordinary Least Square OLS multiple regression was carried out. The results of this study are consistent and anchored on Rational Expectation Theory which asserts that macroeconomic factors have significant effects on financial markets, both in terms of asset returns and their volatility. The study found that Budget deficit and interest rate are determinants of government bond market development in Nigeria while budget deficit, interest rate, inflation rate, exchange rate and external debt are determinants of government bond market in South Africa. Stock market size and bank size drives the bond market positively in both countries. GDP has positive and significant effect on government bond market size in both countries while HDI has positive and significant effect on corporate bond market size for South Africa but negative effect in Nigeria. The study recommended that Government should maintain a stable macroeconomic environment for instance government should retain stable monetary and fiscal policies in order to fight inflation in the Nigerian economy, ensure effective governance and proper protection other financial sectors, strengthen the regulatory framework of the bond market, and engage in aggressive sensitization programme on the available opportunities in the bonds market.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The bond market, also known as the debt, credit, or fixed income market, is a financial market where participants buy and sell debt securities usually in the form of bonds while the equity market (often referred to as the stock market) is the market for trading equity instruments. Bonds are considered to be less risky investments for at least two reasons. First, bond market returns are less volatile than stock market returns. Second, should the company run into trouble, bondholders are paid first, before other expenses are paid. Shareholders are less likely to receive any compensation in this scenario (Times of India, 2017).

The bond market plays a pivotal role in fostering economic development in the country through offering investment opportunities to both local and foreign investors and also financing government budget deficit. According to Herring and Chatusripitak (2007), the development of bond markets is the key for the efficiency of the economic system, besides the fact that it would bring more opportunities for investors and deepen the financial markets. Developing a bond market would shift the focus of an economy away from foreign debt dependence thereby contributing in alleviating the challenges of having to repay such loan with foreign currency. Eichengreen, Hausmann, and Panizza (2002), Turner (2004), Bordo, Meissner & Redish (2003) in Kahn (2005), and Kahn (2005) all agree that a well-developed bond market will contribute to alleviating the problem of 'original sin', which emanates from currency mismatch. Original sin is a term coined by Eichengreen and Hausmann (2002) and refers to the inability of developing countries to borrow abroad in their own currencies, and involves denominating a country's external debt in foreign currency, resulting in a currency mismatch.

1

Most Sub-Saharan African countries face the challenge of funding infrastructural projects on a long term basis. This justifies the need to rely on other sources like bonds and concessions derived from private sector participation. Thus, it is obvious that both government and the corporate bond market are crucial to stimulating economic growth especially in such developing countries. In addition, a robust bond market will help to modify the currency and maturity mismatches, provide better tools for risk pricing, enable efficient asset management and enhance the role of the country on the international capital markets.

There are other benefits of having a sound bond market which include achieving the monetary targets or inflation objectives because it can strengthen and enhance the implementation and transmission of the monetary policy, and can also enable the use of market-based indirect monetary policy instruments (World Bank, 2000). When unexpected events or shocks occur, countries with a sound government bond market would be able to smooth the consumption and investment expenditures in the response, governments are also able to reduce the adverse impact of interest rate, currency, and other financial risks if sound debt management is incorporated.

The Nigerian bond market is still small relative to other large economies but South African bond market is one of the largest in African countries. Due to the developments in the market, it is described by Ambrosi (2010) as one of the leading emerging bond markets in the world although, the South African debt market when measured in terms of debt issued comprises but a fraction of the world's debt markets combined, yet it constitutes the lion's share of the African debt market.

A similar feature of the bond market in both countries under study is that it is predominantly government bond market. For instance, the Federal Government of Nigeria (FGN) is the main issuer of government bonds, which is implemented under a monthly programme for bond

issuance. In the same vein the subnationals (States and Local Governments) and corporate organisations issue state government bonds, local government bonds, and corporate bonds occasionally. The Nigerian bond market as at 2012 was dominated by FGN bonds to the tune of 86.0%, states 10.6% and corporate 3.4% (George, 2013).

Republic of South Africa (RSA) Government Bonds are issued primarily to support the fiscal budget. The government and the South African Reserve Bank played key roles in the development of the South African bond market. However, it is interesting to note that as soon as a certain level of market depth was reached, the private sector started to play a much more active role (Mboweni, 2006). The Africa Securities Exchange Association, (ASEA) annual report (2014) recorded 198 and 1452 companies for government bond and corporate bond respectively listed in Johannesburg stock exchange while for Nigeria stock exchange, the number of companies listed is 15 for government bond and 13 for corporate bond.

The development of the domestic bond market hinges on, among other things, a number of macroeconomic factors which reflect the state of the economy. Akers (2001) defines macroeconomics as a branch of economics dealing with the performance, structure, behaviorand decision-making of an economy as a whole, rather than individual markets. Other factors like default risks and high inflation are important impediments to the health of bond markets. In order to borrow abroad in domestic currency, domestic bond market development is essential. Low inflation is important for building deeper local bond markets. When inflation is stable, the fixed income structure of bonds can be particularly attractive to certain investors whose risk profiles demand a steady real rate of return. Economic growth can also encourage firms to turn to thecapital market for debt financing or for capital restructuring, given the right fiscal incentives and favorable monetary conditions. Countries

that exhibit higher rates of economic growth and moderate inflation might therefore be expected to be associated with relatively more developed bond markets will enable policy makers develop the necessary policy recommendations to address issues challenging the market.

To enhance bond financing and spur further development, it is necessary to identify and analyze the factors that determine the development of the bond market in the countries under study, which

This study seeks to identify the determinants of bond market development in Nigeria and South Africa through examining the effect of selected key financial and macroeconomic variables on bond market size. These determinants, in line with the works of Adelegan and Radzewicz-Bak, (2009); Eichengreen and Luengnaruemitchai and that of Thotho (2010) are classified under institutional, financial market related, structural, developmental and macroeconomic factors. This study is driven by the fact that prior studies on the determinants of bond market development focus more in the developed markets and as a result enough attention has not been given to the emerging markets. Therefore this study attempts to take advantage of this research gap to extend the existing literature in the context of emerging markets and examine countries like Nigerian and South African bond market through examining their relationship with selected key financial and economic factors.

1.2 Statement of the problem

Several literature have studied government debt markets, but the particular attention on government bonds emerged as governments replaced bank borrowing with bond issuance and most of these studies highlighted macroeconomic stability and political economy factors as general determinants of governments desire and ability to issue debt. However, what actually determine bond market development has continued to receive conflicting answers. Some

scholars revealed that bond market development is stimulated by fundamental institutional factors (guscina, 2008; Raghavan & Sarwono, 2012) others show that bond market development is perhaps stimulated by fundamental macroeconomic factors such as inflation rate, exchange rate, banking sector development, trade openness, fiscal balances, foreign direct investment, savings among others (Ogilo, 2014; Adelegan & Radzewicz-Bak, 2009; Bhattacharyay, 2013).

 While the benefits of having good institutions in developing equity markets have been well documented, (Chukwudum, 2014; Onyeke, 2016; Okpara, 2010; Osaze, 2014) such evidence is scanty for bond markets. Among the few are Eichengreen and Luengnaruemitchai (2004), with a focus on emerging Asia, who show that larger country size, stronger institutions, less volatile exchange rates, and more competitive banks tend to be positively associated with bond market capitalization. They also show that Asia's generally strong fiscal balances have not been conducive to government bond market growth.

Again, macroeconomic policies have played a major role in determining the level of development of the bond markets. Countries with stable and more predictable macroeconomic environments tend to witness rapid growth in their financial markets, however empirical literature on the effect of the macroeconomic determinants of bond market, development has been scanty especially in emerging markets. These factors have led to a growing interest regarding the determinants of bond market development. Essentially,Eichengreen and Hausmann (2002)and Bhattacharyay, (2013) maintained that macroeconomic variables are indispensable elements in bond market development i.e. every bond market is characterized by macroeconomic factors and basic economic challenges but it is worth noting that the study focused on developed and Asian economies with scanty literature on the determinants of bond market development especially in Nigeria and South Africa. Despite the notable progress in the bond markets in emerging markets including

South Africa, majority of emerging economies bond markets are still underdeveloped, their secondary markets are illiquid, offering relatively low quality of bonds and the bond issuance sizes are also small (International Organization of Securities Commissions, 2011). Meanwhile, in countries where the macroeconomic environment has been relatively volatile, the corporate bond market has had to rely heavily on government support in one form or another (Fabella & Madhur, 2003).

The level of development in the bond market in Nigeria is reflected through the depth of the market, level of investors' confidence, inflationary pressure coupled with the continuous depreciation of the Naira, level of bank-dominance, macroeconomic instability and other indices which indicate the fundamentals of the market (Mailafia, 2014). For instance, bond holders are exposed to capital losses through inflation and therefore represent a potential anti-inflationary force. This has led to loss of competitiveness and breadth of financial products available in the market, affecting the development of the market. On the contrary, South African debt market when measured in terms of debt issued constitutes the lion's share of the African debt market. Looking at both countries as the largest in Africa, it is expected that as South African's bond market grow, Nigeria's bond market should grow as well. Moreover, the study includes Human Development Index (HDI) as proxy for developmental factor which has not been explored in previous researches to determine its effect on the bond markets in the countries under study. This goes beyond GDP to provide a measure for literacy level, life expectancy and command over the resources for the people in the country to enjoy a decent standard of living,

1.3 Objectives of the study

The broad objective of the study is to empirically analyzethe determinants of bond market development in Nigeria and South Africa from 1994 to 2016.

The specific objectives of the study are:

1. To examine the effect of exchange rate, external debt, budget deficit, interest rate and inflation rate on government bond market development in Nigeria and South Africa.

2. To examine the effect of exchange rate, external debt, budget deficit, interest rate and inflation rate on corporate bond market development in Nigeria and South Africa.

3. To evaluate the effect of bank size and stock market capitalization on government bond market development in Nigeria and South Africa.

4. To evaluate the effect of bank size and stock market capitalization corporate bond market development in Nigeria and South Africa.

5. To assess the effect of GDP and HDI on government bond market development in Nigeria and South Africa.

6. To assess the effect of GDP and HDI on corporate bond market development in Nigeria and South Africa.

7. To determine the direction of causality between macroeconomic variables and bond market development in Nigeria and South Africa.

1.4 Research Questions

1. How have exchange rate, external debt, budget deficit, interest rate and inflation rate influenced government bond market development in Nigeria and South Africa?

2. To what extent have exchange rate, external debt, budget deficit, interest rate and inflation rate determined corporate bond market development in Nigeria and South Africa?

3. To what extent have bank size and stock market capitalization influence the development of government bond markets in Nigeria and South Africa?

4. To what extent have bank size and stock market capitalization influence the development of corporate bond markets in Nigeria and South Africa?

5. How haveGDP and HDI affected government bond market development in Nigeria and South Africa?

6. How have GDP and HDI affected corporate bond market development in Nigeria and South Africa?

7. What is the causal relationship between macroeconomic variables and bond market development in Nigeria and South Africa?

1.5 Statement of Hypotheses

Ho_1 Exchange rate, external debt, budget deficit, interest rate and inflation rate have no significant effect on government bond market development in Nigeria and South Africa.

Ho_2 Exchange rate, external debt, budget deficit, interest rate and inflation rate have no significant effect on corporate bond market development in Nigeria and South Africa.

Ho_3bank size and stock market capitalization have no significant effect on government bond market development in Nigeria and South Africa.

Ho_4 bank size and stock market capitalization have no significant effect on corporate bond market development in Nigeria and South Africa.

Ho_5 GDP and HDI have no significant effect on bond market development in Nigeria and South Africa.

Ho_6 GDP and HDI have no significant effect on bond market development in Nigeria and South Africa.

Ho_7 Macro-economic variables do not granger cause bond market development in Nigeria and South Africa.

1.6 Significance of the Study

This study will be beneficial to the following:

Policy Makers

Policy maker and regulator would gain insight on bond markets performance from this study since they have a role in ensuring a sound and efficient bond market is in place. It will also serve as a guide to policy makers and government regulators by providing an opportunity of understanding the issues and constraints that affect the development of the bond market in the countries of study. This will help determine which of the factors should be given more focus in terms of developing the bond market and new policies can be formulated as a result of the findings.

Investors

This analysis will be of use to both individuals and institutional investors as well the general public. This study will be useful in guiding investors in understanding the factors playing around the development of the bond market which will enable them make informed decisions for their investments with regard to performance in bond markets.

Portfolio Managers

The results of this study will assist bond traders in making decisions on their portfolio strategies and also assist players in projecting the performance of bond instruments in the market.

Traders benefit from information on performance determinants since it allows them to buy and sell assets at a lower cost.

Researchers and Academicians

This study is a valuable addition to the few existing studies on the bonds market particularly in developing markets. It will serve as a guide to researchers and academicians who may wish to replicate the study in the other frontier markets due to shared market similarities.

1.7 Scope of the Study

The study will cover a period of 24 years from 1994 to 2016. The study examines bond market development with respect to structural, financial market related, and macroeconomic variables in Nigeria and South Africa. The extent of bond market development is measured by the bond market capitalization as a percentage of gross domestic product (GDP). Bond market size (capitalization), however, is only one aspect of bond market development. Nevertheless, the study will use this (bond market capitalization) as its primary variable, as it is easily available from the countries of study.

1.8 Limitations of the study

There are other factors that impact on bond market development which will not be examined in this study because of lack of comparable data on both countries of study. Of major concern is lack of data on the pension and insurance investment in the bond market which would have been used as institutional factor that determine bond market development. Nevertheless, the validity of the study was not affected.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Concept of bond market development

The bond market, also known as the debt, credit, or fixed income market, is a financial market where participants buy and sell debt securities usually in the form of bonds.

Bonds as an asset class generally exhibit lower risk than equities. As a bond holder you have the security of knowing that the bond will be repaid in full by the government or semi-government authorities at a specific time in the future. Corporate bonds are of higher risk as there is a possibility of default. The other major risk associated with bonds is interest rate risk. As market interest rates move, bonds experience price fluctuations. These fluctuations are inversely related to movements in market rates i.e. as market rates move up, bond prices are negatively affected.

A bond market refers to an arrangement where bonds are traded. This arrangement facilitates offer by the borrower, and acceptance, which must be backed by a consideration from the lender (Barmash, 2003). Trading in bonds therefore entails the exchange of bonds from one person or organization to another. This may involve initial public offerings of the bonds at the primary stage, and subsequently, secondary trading of such bonds. A bond is viewed as

certificate of indebtedness issued by a borrower to a lender (Onaolapo & Oluwafemi, 2010). It entails a debt instrument bearing a value, documenting and evidencing a commitment to redeem the debt at a particular coupon rate, upon maturity. A bond is non-collateralized debt issued by a government or corporate organization, which doubles as a legalized IOU bearing terms of repayment.

The bond market is a vital segment of financial system, and remains central to the development of an efficient economic system. Investment in bonds usually fills a major gap in the financial markets by generating returns that compensate for the cost of funds over the repayment period. The non- investment in bonds within the financial markets has a tendency of limiting investment options. This entails that the network of trading or investment activities in various bonds makes up a bond market.

Bond market liquidity is the ease as well as frequency at which bonds are sold at a controlled cost (minimal transaction cost). According to Mailafia (2013), Bond market liquidity also has tendency to boost bond market development in an economy. For both corporate and domestic bond instruments, bond liquidity entails transferability of bonds. A liquid bond market therefore entails an enhanced trading efficiency of the bond market. Rigidity, which could be measured by the bid-ask spread, which is a feature of bond liquidity provides an insight on the financial commitment of the market participants in executing transactions (Gaspar, Hartmann & Sleijpen, 2002). Depth and resilience are also considered by the trio to shape the nature of liquidity of the bond market. The depth of the market determines the extent to which the bond market could cope with huge transactions, while maintaining little or no variations in bond prices. Resilience on the other hand determines the rate of dissipation of price variations.

 Bond market development entails the transformations in bond market size within an economy, its access, stability, and efficiency or liquidity (Malafia, 2013). The prominent

aspect of bond market development is the bond market size, which is commonly considered as total value of outstanding bonds in the market as a ratio of Gross Domestic Product (GDP). Most studies on bond market development are actually hinged on the bond market size perspective. Bond market development involves the influence of a network of bond trading activities, stock capitalization, macroeconomic variables, bond spread, infrastructure, legal and regulatory as well as related governance issues, which add up to shape the bond market development fundamentals (indicators). The domestic debt market comprises both short and long term debt instruments raised by the various arms of government including the national, and the sub-national governments, which include treasury bills, treasury certificates, treasury bonds, development stocks, and Federal Government of Nigeria (FGN) Bonds. Bond market numbers reveal that FGN bonds have eventually phased out development stocks as at December, 2011. Although government bonds dominate the Nigerian bond market, there is the existence of corporate bonds, which emanate from private debt. They signify bonds issued by corporate organisations in the country. Thus bond market development is a highly essential ingredient in the strengthening of the financial systems of most economies. Onaolapo and Adebayo (2010) identify market infrastructures, institutional investors, active secondary bond market, and credit rating agencies as being factors necessary for the development of bond markets. The authors are of the view that the strength and extent of availability of these factors determine the extent of development of the Nigerian bond market. In a study based on Hong Kong, Adeleke (2006) review the BIRDS model for developing bond market in an economy, covering determinants in terms of Benchmark, Infrastructure, Risk assessment, Demand and Supply dimensions. Bond market development refers to a steady improvement in the market performance of bonds over time. A more developed bond market has the tendency to reduce the lopsidedness, overdependence and inefficiency of the financing structure on not just the banking sector but other sectors of the economy.

Developing a bond market would shift the focus of an economy away from foreign debt dependence thereby contributing in alleviating the challenges of having to repay such loan with foreign currency. Eichengreen and Hausmann (1999), Eichengreen, Hausmann, and Panizza (2002), Turner (2004), Bordo, Meissner and Redish (2003) in Kahn (2005), and Kahn (2005) all agree that a well-developed bond market will contribute to alleviating the problem of original sin, which emanates from currency mismatch. Original sin is a term coined by Eichengreen and Hausmann (1999) and refers to the inability of developing countries to borrow abroad in their own currencies, and involves denominating a country's external debt in foreign currency, resulting in a currency mismatch.

Currency crises, which emanate from currency mismatch are characterised by depreciating domestic currency as well as rollover challenges for short-term debt, which in turn lead to balance sheet problems, thereby constituting a key source of financial instability leading to default (Kahn, 2005). However, restructuring short term bonds to longer tenured bonds could sometimes be a beneficial repositioning strategy to the issuer.

2.1.2 The Nigerian Bond Market

Few countries in Sub-Saharan Africa have a mature domestic bond market, and existing ones are shallow and inefficient. This can be partly explained by the fact that during the last two decades many African countries relied on easy access to concessional finance – access which impeded the development of domestic bond markets and led to debt profiles dominated by foreign currency. To date, African domestic bond markets are mostly not major channels of capital, as issues are few and erratic and most have short-term maturities of less than a year (Blommestein & Horman, 2007). These characteristics have constrained the establishment of reliable yield curves and pricing benchmarks, and have also limited growth of the investor

base. The Debt Management Office (DMO) was established in year 2000 to centrally coordinate the management of Nigeria's sovereign debt.

The bond market in Nigeria has undergone a series of challenges over the years, with accompanying policy efforts by the Nigerian government towards its sustainability. Despite being only a subset of the capital market, bonds have continued to witness relative growth irrespective of the global economic meltdown and the subsequent Nigerian stock market crash of 2009.

The rapid growth of the Nigerian bond market after the year 2000 following the establishment of the Debt Management Office (DMO), its reforms and that of the Security and Exchange Commission (SEC) has accelerated the growth of the bond market, especially the government bonds. In spite of the immense potential of a domestic bond market, our market was largely an equities-dominated market unlike in other parts of the world where bond markets are typically larger than stock markets. For example in the United States of America (USA) the bond market is currently two times larger than the stock market. In the same vein a study by McKinsey & Co revealed that the global bond markets are three times the size of stock markets with the combined global bond markets worth $157 trillion out of the total $212 trillion of capital stock while stocks are worth $54 trillion. As a result, there has been a growing interest in the domestic bond market with State governments raising N421.5 billion and corporate bonds totaling N148.5 billion were raised since 2010 (Oteh, 2013).

The structural changes to Nigeria's domestic debt began in 2003, following the adoption by the Government of public debt management reforms. Apart from addressing the institutional weaknesses in the management of public debt, the reforms sought to improve domestic debt management. First, as part of these reforms, the Government brought back a sovereign bond

issuance Programme that had been discontinued in 1986. This resulted in the issuance of long-dated instruments of 3, 5, 7 and 10 years, structured as both fixed-rate instruments (3-year and 5-year bonds) and floating rate notes (7 and 10 years). This was a reflection of a debt-management strategy aimed at restructuring the country's debt portfolio to achieve the 75:25 ratio of long- to short-term domestic debt. Before this Programme went into effect, government borrowing from the domestic market was mainly through 91-day treasury bills; this meant that short-term instruments were inappropriately used to fund economic and social projects, which were essentially long-term assets.

Although the overall take-up fell short of expectations owing to a perceived default risk, market sentiments significantly changed following external debt relief in 2006, which enhanced the country's creditworthiness and increased portfolio flows In addition, its overall real GDP growth rate averaged 6.8 per cent per year between 2004 and 2014, putting it among the fastest growing emerging market economies during the period. Inflation remained stable and largely below 20 per cent. As a result, investors began to develop an interest in long-dated instruments, with tenders oversubscribed by between 60 per cent and 150 percent between 2006 and 2014. Whereas 91-day treasury bills accounted for 62 per cent of the total domestic debt portfolio in 2003, this had fallen to 36 per cent by the end of 2014.

Another major factor underlying the successful issuance of long-tenure bonds – now up to 20 years – relates to the introduction and progression of the secondary markets for government bonds, which have continued to grow. The effective functioning of the secondary market allowed investors to conveniently unwind their position in long-dated securities whenever the need for liquidity arose.

Second, a transformation in the holding structure of domestic debt took place. The Central Bank of Nigeria held about 46 per cent of the outstanding domestic debt in 2003, down from 87 per cent in 1995, while the non-banking sector held only 16 per cent, up from 9 per cent in

1995. By 2014, the Bank's holding had declined to a mere 2 per cent, while the holding of the non-banking sector rose to 45 per cent. The commercial banking sector's holding has also been rising at the same rate as non-banking sector participation. This shift has important implications for the Nigerian economy: first, monetary financing of the fiscal deficit is controlled, and the Bank is insulated from a possible conflict of interests, doubling as both a fiscal agent and monetary authority; second, the investor base for domestic debt is diversified. Christensen, (2004) highlight the benefits of a diverse investor base in terms of lowering borrowing costs and reducing market yield volatility and potential crowding-out effects. Since 2010, Nigeria has experienced rising funding costs on its domestic liabilities. At the same time, external costs have risen, owing to the issuance of Eurobonds on market terms.

Nigeria has also attracted non-resident investors in government securities. The increased participation of non-resident investors is attributable to renewed interest in emerging markets by foreign investors because of the attractive yields. The issuance of international sovereign bonds is part of a number of African countries' strategies to restructure their debt, finance infrastructure investments, and establish sovereign benchmarks to help develop the sub-sovereign and corporate bond market including Nigeria. The development of the domestic sovereign bond market in many countries has also help strengthen the technical capacity of finance ministries and debt management offices to issue international debt. In addition, the inclusion of the Government in the globally traded J.P. Morgan government bond index emerging markets series in 2012 represented independent external recognition that the Nigerian domestic debt market had been transformed, leading to foreign participation in domestic debt instruments. J.P. Morgan subsequently excluded Nigeria from its local-currency emerging-market bond indexes after restrictions on foreign-exchange transactions had prompted investor concerns about a shortage of liquidity; nonetheless, foreign investors

now have a much better perception of Nigeria's investment environment, compared with that of a decade ago. FGN bonds have phased out development stocks and become dominant with 61% of the total bonds, while treasury bills have been minimized to 34%, and treasury bonds, 5% of the total sovereign bonds (George, 2012). The reduction in the percentage holding of treasury bills suggests a great reduction in the financing mismatch challenges attributable to the use of treasury bills to support the financing of long term projects. Since treasury bonds are known to be illiquid and redeemable only to the Central Bank of Nigeria (CBN) upon maturity, the reduction in percentage holding of treasury bonds from 36% to 5% (from 2002 to 2012) implies an alteration in the modus operandi of the instruments traded in terms of liquidity situation of the government bond market. Before the end of year 2010, the Federal Government of Nigeria (FGN) had issued N4.0 trillion worth of bonds that were supplied to be traded in the Over-the-Counter (OTC) market and yet the bonds were not fully embraced (Adyorough, 2010). As at end of October, 2011, Nigeria's domestic debt had hit the N5.21 Trillion mark (17.53% of GDP), which is far below the 40% of GDP (The Nation, 2011). The pricing of such bonds issued is usually done at coupon rates based on prevailing interest rates, which is normally influenced by CBN's monetary activities. While a functional domestic bond market is necessary for capital investments, monetary authorities also use bonds to define the yield curve and to ensure stability of short term rates (Afrinvest, 2010).

The Nigerian bond market as at 2012 was dominated by FGN bonds to the tune of 86.0%, states 10.6% and corporate 3.4% (George, 2013).

The size of the Nigerian domestic bonds market, in terms of face value was N6, 515.62 billion as at the end of December, 2015, compared to N5,683.46 billion as at end of December, 2014,

which represented an increase of N832.16 billion or 14.64 percent. The increase was broken down as follows: FGN bonds – N5,808.14 billion, State Government bonds – N 457.24

billion and Corporate bonds – N 226.15 billion. There was no issuance by Supra-nationals during the year. The other developments in the domestic bonds market in 2015, included: (i) A new 5-year Benchmark Bond was introduced in 2015, with the issuance of 15.54% FGN FEB 2020, as the previously issued 5-year Benchmark Bond 16.00% FGN JUNE 2018 became a 3-year Benchmark bond. (ii)The FGN Securities comprising N4.847 trillion FGN Bonds and N2.804 trillion Nigerian Treasury Bills (NTBs) outstanding as at July 2015, were officially listed on the Financial Markets Dealers Quotation (FMDQ) OTC Plc platform in July, 2015. The listing is expected to support market initiatives that would promote visibility, transparency and price discovery in the FGN security.

Total Face Value of Transactions on the floor of the Exchange stood at N 240.15 million in 2015, indicating a decrease of 12.58 percent, compared to N274.89 million in 2014, the consideration declined from N295.05 million in 2014 to N245.15 million in 2015, representing a decrease of 16.91 percent. Number of Deals equally fell from 200 in 2014 to 128 deals in 2015.Generally, trading activities in Bonds and Equities on the Exchange were affected by high level of uncertainty in the macroeconomic environment arising from the fall in oil prices during the year. The combined OTC Market and Exchange Trades in 2015, in terms of Total Face Value of Transactions, Consideration and Number of Deals were N9.493 trillion, N9.581 trillion and 46,992, respectively. These figures recorded in 2015, were higher than the corresponding figures of N7.394 trillion, N8.068 trillion and 46,090 recorded as Total Face Value, Consideration and Number of Deals in 2014 (DMO, 2015).

In 2015, there were new initiatives and developments in the FGN Bonds Market; the DMO's PDMMs which were previously made up of Banks and Discount Houses, had the Discount House category completely phased out with the conversion of Associated Discount House Limited to Coronation Merchant Bank Ltd and Kakawa Discount House Limited to FBN

Merchant Bank Limited, following the adoption of universal banking licensing regime by the CBN.

A new 5-year Benchmark was introduced in 2015, with the Issuance of 15.54% FGN FEB 2020. The previous 5-year Benchmark (16.00% FGN JUNE 2019) became the 3-year Benchmark, while the 15.10% FGN APR 2017 which was the 3-year Benchmark is now the 2-year benchmark.

Few corporate entities in sub-Saharan Africa have also successfully issued eurobonds, including Guarantee Trust Bank in Nigeria, which sold a 5-year $500 million bond offering in 2011, and Ghana Telecom, which issued a $300 million in 5-year bond offering in 2007. According to 2016 Africa Capital Markets Watch, the Nigerian local bond market, FMDQ, in particular, recorded the highest issuance of domestic corporate bonds by naira value in five years, including the June 2016 issuance of Lafarge's NGN60 billion bond.

The Nigerian market has also seen several commercial paper issuances, including from Guinness Nigeria, Access Bank, FSDH Merchant Bank and local property developer UPDC, providing local investment opportunities for growing private pension funds and local fund managers.

Onaolapo and Adebayo (2010) identify market infrastructures, institutional investors, active secondary bond market, and credit rating agencies as being factors necessary for the development of bond markets. They noted that the present state of the bond market in Nigeria cannot produce the desired result or economic growth unless it is effectively developed and the strength and extent of availability of these factors determine the extent of development of the Nigerian bond market.

Although the Nigerian bond market appears to perform relatively well as earlier documented, it is faced with some challenges. Mailafia (2014) pointed that critical challenges of bond market development are centered on how to accelerate development in the bond market

through financial innovation, determination of the direction of innovation in the bond market, and maintaining a balance between risk minimization and market innovation. Some of the constraints as documented by most writers include illiquidity, budget delays, lack of a bond auction trading platform, high inter-bank rate, lack of a strong policy to facilitate the speedy growth of corporate bonds, amongst others. If most of the identified challenges of the Nigerian bond market are properly addressed, speedy development in the entire finance sector would be enhanced.

The bond steering committee, which was constituted by the Security and Exchange Commission (SEC) (2002) identifies the following impediments of a viable bond market: dearth of long term savings, low level of awareness (public and private sector), illiquidity, instability in government policies, unfriendly macroeconomic environment, inflation, absence of yield curve, high cost of transaction in the Nigerian financial market, legal bottlenecks, and inadequate technical knowledge.

The size of the market and economy can be appreciated by its level of economic activities, or its level of development in terms of whether it is under-developing, developing or developed. Nigeria tends to have a vibrant economy, but needs to be further developed to accommodate a vibrant market that would encourage more investors. Political stability and state of security of a nation can also be considered as another liquidity driving factor. The state of insecurity of a nation could serve as a disincentive to investment which may affect the level of liquidity of the bond market. There are little structures on ground to upscale the speedy growth of corporate bonds in Nigeria. Lack of incentives for companies to issue bonds, therefore, constitutes a major hindrance to the rapid development of corporate bonds in Nigeria (Jackson, Etti & Edu, 2007).

This scenario makes it almost impracticable for corporate bonds to thrive. This calls for an enabling policy that will enhance the accessibility of funds directly from the CBN at MRR, or

only slightly higher rate than the MRR so as to pave way for the corporate bonds to flourish. This should help address the crowding out of corporate bonds by government bonds as observed by many.

Ajayi (2013) noted the following challenges faced by the Nigerian bond market: Lack of Education & Awareness, Poor Transparency of Markets, lack of Depth in Issue Size, Ease of Raising Money from Equity Market, High Implied Cost of Borrowing, Regulatory Bottlenecks, Liquidity, Legal and Supervisory Framework.

Cenley (2011) affirms that investment in bonds are among the safest in the world nevertheless he identified seven types of risks associated with it, which include inflation risk, interest rate risk, default risk, downgrade risk, liquidity risk, reinvestment risk, and rip-off risk. Usually, sovereign bonds are less risky than corporate bonds. Despite the associated risks, investment in bonds tend to stand out over stocks because of high risk of relativity of stock prices and of their potentials of higher gravity of loses. The fluctuating and mostly high interest rates tend to frustrate bond investment in Nigeria. Bonds prices are inversely related with interest rate, which implies that an investor who wants to sell a bond before its maturity would not find it favourable with risen interest rates (Cenley, 2011). Thus to enhance an active secondary market, interest rates need to be reasonably low. In addition, trading in bonds entails the denomination of bonds in a country's currency with a substantial portion of the activity being domesticated. It also requires transaction of new bond issues through auction or related apparatus at a market based price. Furthermore, it promotes investment by identifying and locating viable business opportunities; helps in mobilizing savings; monitors the performance of managers thereby enabling trading, hedging and diversification of risk in order to facilitate the exchange of goods and services. These functions result in efficient allocation of resources and rapid accumulation of physical and human capital with faster technological process which in turn feed economic growth (Onaolapo & Adebayo, 2010).

The inability of firms or households to match the financing of long-term assets by long-term debt has a tendency of negatively influencing their long-term investment decision. Financing long-term investments with short-term debt exposes borrowers to balance sheet mismatches specifically with regard to their assets and liabilities. However, short term bonds have a way of boosting the domestic bond market in its entirety because of the possibility of recycling or even restructuring the bonds. In another dimension, if firms attempt to compensate for the lack of a domestic bond market by borrowing in international bond markets, they may expose themselves to excessive foreign exchange risk. In addition, as bond markets become more liquid, the hedging of maturity risks becomes cheaper and more reliable (Tuner, 2003).

It could be deduced that a correction of some of the key impediments of bond market development would free-up bond market liquidity and activities thereby enhancing its rapid development. This entails that a developed economy with a friendly macroeconomic environment; especially one with low rate of inflation, low cost of transaction, high level of awareness, liquid secondary market and good legal and regulatory structure. In addition to the aforementioned, the presence of technical experts in the market, and a well-developed yield curve, are likely to facilitate rapid development of bond markets in the Nigerian economy.

2.1.3 Bond market liquidity in Nigeria

Liquidity is a hallmark of an efficient and active market, and hence a useful indicator of market development. It is normally reflected in a high level of turnover relative to market size, and general price stability. The more liquid a market is, the more information-efficient are secondary-market prices likely to be.

Mohanty (2002), noted the following as the benefit of a liquid bond market, first, a liquid government bond market will facilitate pricing of other and riskier financial assets. Second, it

has a direct impact on the degree to which other segments of financial markets (forward and futures markets, including foreign exchange hedging) can be developed to support risk management functions. Third, the depth of money and bond markets has a decisive influence on the effectiveness of central banks' monetary policy. Finally, the yield curve in a liquid bond market carries important information for the conduct of monetary policy.

Liquidity is usually considered paramount in the government bond market, if the ensuing yield curve derived from benchmark issues is to be reflective of an efficient risk-free rate of return. However, given the diversity and lack of uniformity in corporate bond issues, liquidity of the entire market is thought to be less of an issue for corporate bond markets as a whole. Instead, liquidity may only be important for certain classes of bonds or specific issues, depending on the needs of investors in those particular market segments.

Liquidity has become an important element for the healthy functioning of the bond market. Larger and more liquid bond markets reduce uncertainty for investors by revealing more accurately the firm's financial condition in market prices and reduce the thresholds for entry by allowing the development of local underwriting and rating agencies to facilitate lower cost bond issuance for the issuer (Mizen & Tsoukas, 2010).

The market for government securities dominates the securities market in most African countries and thus plays an important role in providing a basis for a robust and efficient financial system as a whole. Illiquidity in this important market is likely to cause massive price volatility and complicate the open market operations of the central bank. This arises as the transmission mechanism of monetary policy which allows the central bank to infer inflation and interest rate expectations of market participants, and contribute to the promotion of economic growth, by facilitating more efficient pricing of borrowing and lending is obscured (Mminele 2009). In addition, the

Asian Development Bank, ADB (2005) suggests that outright purchases and repurchases of securities are important instruments of monetary policy. If market liquidity is not sufficient, central banks might not be able to provide or absorb the necessary amount of funds smoothly through their open market operations. This could produce unintended effects such as excessive price volatility. Chabchitrchaidol and Panyanukul (2005) looked at the key determinants of liquidity in the Thai bond market, measured by bid-ask spreads on government bonds. Empirical results using EGARCH estimation revealed that a rise in the volatility of bond yields leads to a larger bid-ask spread. Volatility is therefore negatively related to bond market liquidity. Nasser and He (2003) states that macroeconomic variables determine liquidity in bond markets. According to them, investors have become concerned with overall trends than with individual company fundamentals. Since both stocks and bonds are investment alternatives that compete for the investor's funds, the funds flow from one market to another due to a change in market situation and macroeconomic factors. They also pointed out that a number of studies have reported a negative relationship between long-term government bond rate and the stock prices in the US and UK. Therefore bond market liquidity provides encouragement to the tools of financial mediation, making these tools very essential as they are related to market pricing, effective borrowing and investment practices.

Over the years, the dearth of liquidity had been a common feature of the few functioning bond markets in Africa, including the Nigerian bond market. This is confirmed by Adyorough (2010), who posits that Nigeria's Capital Market lacks the Liquidity needed for a sustainable bond market that can fund growth and development in the public and private sectors. This assertion suggests that there is the need to improve the transaction volume of the predominantly active government bonds market in Nigeria. The introduction of a policy that would lengthen the yield curve has the tendency of enhancing the efficiency of the non-bank financial sector of the economy thereby reducing the possibility of maturity mismatch. This

proposition is elaborated by Adelegan and Radzewicz–Bak (2009) who posit that the underdevelopment of bond market is reflected by the compulsion of both pension funds and insurance companies in holding short-term securities, which exposes them to maturity mismatches. It is glaring that the development of an economy, especially the domestic financial markets has the potentials of alleviating problems of original sin and currency mismatch.

The challenge of illiquidity is reflected by the buy–hold attitude of investors. Part of the reasons for the illiquidity of the Nigerian bond market as adduced by Adyorough (2010) is the dearth of repos that are perceived to play a central role in producing liquidity for vibrant trading and financing of treasuring securities. Repos are expected to augment the PDMMs system which was introduced in 2006, to facilitate liquidity in the Nigerian bond market.

2.1.4 South African bond market

The Bond Exchange of South Africa (BESA) is the principal bond market of South Africa. It was founded in 1989 and is based in Johannesburg. As of April 2007, BESA lists over 375 fixed-income securities, or bonds.

 The South African bond market is the largest economy in the African countries. Due to the developments in the market, it is described by Ambrosi (2010) as one of the leading emerging bond markets in the world who indicates that the South African debt market when measured in terms of debt issued comprises but a fraction of the world's debt markets combined, yet it constitutes the lion's share of the African debt market. It boasts of a level of sophistication and efficiency that matches those of many of the bigger debt markets in the developed world. Developments in the market include the introduction of inflation-linked bonds, floating rate notes, a strip programme (an acronym for Separate Trading of Registered Interest and

Principal), retail bonds and municipal bonds. The corporate bond market has also grown substantially from net issuance of more than R10 billion in 2001 to net issuance of almost R70 billion in 2006. Before 2006, only South Africa had issued a foreign-currency denominated sovereign bond in sub-Saharan Africa. Amadou (2015) observed that although it is still an emerging market, the South African bond market is more developed than that of other African countries. In 2008, the total volume of bonds traded in South Africa was over R19 trillion. With 19% market capitalization to GDP ratio in 2011, the South African bond market is one of the biggest in emerging economies. Having a turnover of 9% of the global bond market turnover, the country's secondary bond market was ranked the third in the world in 2011 by the World Federation of Exchanges (Department of National Treasury, 2012)

According to Kapingura and Ikhide (2011), the South African bond market is relatively efficient compared to most African bond markets as indicated by the 2009 Fitch ratings. In addition, there are a number of factors which qualifies the South African bond market relative to other African bond markets.

Firstly, Hove (2008) argues that Bond Exchange of South Africa (BESA) has not had any liquidation default and no claims have been made on the Guarantee Fund in its history.

Secondly, Jones (2002) shows that BESA did not close its market during market disruptions such as the Russian and Asian problems in 1998 as well as the 11 September 2001 tragedy. Thirdly, the South African bond market has a turnover ratio equivalent to other mature markets. BESA's 2007 market performance report shows that turnover on the bond exchange reached a record R13.8 trillion, with R13 trillion occurring in government bonds.

Alongside the government's steps to improve the structure of the primary bond market, the South African Reserve Bank played an active role in developing the secondary bond market. In 1990, the Bank started to quote firm two-way prices in a number of benchmark government bonds, thereby acting as an informal market maker. This initiative was

specifically aimed at improving the turnover, liquidity and marketability of government bonds in the secondary market. In order to ensure that the SARB fulfilled its function as funding agent for the government by being a net seller of government bonds, even in adverse market conditions, the Bank also became a leading player in the trading of bond derivatives. (Mboweni, 2006)

The government issued bonds to dominate South Africa's domestic bond market, and there is a centralized exchange in place to monitor, regulate and modify the bond market in South Africa, known as the Bond Exchange of South Africa Limited (BESA).

 The Bond Exchange of South Africa (BESA) was a South African Bond exchange based in Johannesburg that was acquired by Johannesburg Stock Exchange (JSE) Limited in 2009. Prior to its acquisition it was constituted as a public company, and was responsible for operating and regulating the debt securities and interest ratederivatives markets in South Africa. South Africa has the most developed fixed income market in Africa Government securities yield curve extends out to 26 years. The bond market is worth (amount outstanding) approximately 181 billion US dollars, as of 2012. Government bonds account for the bulk of the market (approximately 116 billion), and are highly liquid, with total turnover exceeding two trillion US dollars in 2011.The National Treasury (NT) issues Treasury bills with tenors for 91, 182, 273 and 365 days (BESA, 2013). The Government Marketable Debt issued by the South African government comprises of both issued treasury bonds and treasury bills during the period 2010 and 2013. The value of issued treasury bonds is significantly higher at 85% of Government Marketable Debt. According to the 2015 Barclay's Guide, South Africa currently has 12 trading Eurobonds denominated mainly in USD (approximately USD 10.4 billion) but with some Euro ("EUR") (approximately EUR 1.25 billion) and Japanese Yen ("JPY") (approximately JPY 30 billion) exposure. According to African Financial Markets Initiative, and Debt Management Office of Nigeria, South

Africa's Government Marketable Debt as a percentage of GDP for 2013 is 37.6% while that of Nigeria is 9% and its total domestic government debt increased by 3% from 46% in 2013 to 47% in 2014. South Africa also has Sovereign Debt which needs to be considered when assessing the country's total debt position. According to Debt Management Report (2015/16), as a result of low interest rates in developed countries since the global financial crisis of 2008, foreign investors hold a relatively high volume of South African government debt. This has increased gradually from around 21.8 per cent in 2010 to around 34.0 per cent as at 31 March 2016. In nominal terms, foreign investors' holdings of local government bonds increased by an annual average of R50 billion between 2008 and 2014, increasing from R177 billion to R477 billion over that period.

Republic of South Africa (RSA) Government Bonds are issued primarily to support the fiscal budget. This is exclusively a wholesale market with more sophisticated investors and systems, hence only primary dealers may take part in primary auctions of RSA Government bonds. The RSA retail savings bonds are better suited to the retail investors. South Africa is included in Citigroup's world government bond index. Municipal Bonds are issued by city councils for development projects with tenors typically longer than one year. Municipal bond issues are not guaranteed by the central Government. Other key issuers are the commercial banks, mortgage houses and asset finance houses.

According to Mboweni (2013), South Africa is in the fortunate position, compared to many other emerging markets, in that all three components of its capital market are well developed. Following the licensing of the bond exchange, the shift in bond trading in 1996 from the JSE to the BESA led to a substantial rise in the annual turnover in the secondary bond market from approximately R2 trillion to over R11 trillion in 2002. In 2005, a total net amount of R23,8 billion was raised through the primary issuance of bonds on BESA (after repayments of redemptions)by 2008 the South African bond market was a leader among emerging-market

economies. Amadou (2015) pointed that before 2006, only South Africa had issued a foreign-currency denominated sovereign bond in sub-Saharan Africa. But from 2006, at least 14 other countries including Nigeria have issued a total of $15 billion or more in international sovereign bonds. Turnover reported on BESA in 2008 reached R19.2 trillion. Given listed debt securities of R825 billion nominal. The government and the South African Reserve Bank played key roles in the development of the South African bond market. However, it is interesting to note that as soon as a certain level of market depth was reached, the private sector started to play a much more active role. In recent years, the growth in corporate bond issuances has by far outstripped those of government bonds. In 1996, government bonds accounted for over 80 per cent of the total debt listed on BESA.

That ratio had declined to 66 per cent by mid-2006. The biggest amount raised in a single debt issuance to date was the R6,5 billion raised on 5 July 2006 by cellphone company MTN, to fund its acquisition of Dubai-based Investcom. This issuance illustrated the healthy demand for corporate bonds, as the book size exceeded R10 billion. The funds were raised at a yield of close to 8.80 percent for periods of four and eight years. Both Eskom's and MTN's recent bonds are included in the All-bond-index of BESA – a clear sign of corporate bonds becoming more liquid and thinning the representation of government bonds in the index. A number of recent developments in the corporate bond arena illustrate how the bond market facilitates the development of infrastructure and economic growth. However the local bond market was still dominated by securities issued by the South African government, with local government, public enterprises and major corporations accounting for the rest of the debt issuers active in the market. The number of borrowers and listed bonds as well as the market capitalization had all risen sharply, at December 2008 BESA had listed some 1,102 debt securities, issued by 100 sovereign and corporate borrowers, with a total market cap of R935 billion. In South Africa, the primary dealers/market makers were appointed by the

government in 1998 and they are involved in quoting firm prices (bid and offer) in certain government bonds improved transparency and overcame shortcomings which were inherent in the tap issue method, in which the Reserve Bank was issuing bonds on behalf of government, (Mboweni, 2013).

The South Africa Reserve Bank (SARB) play the following roles in the bond market:

Serve as a founding member of the bond market association (BMA). In 1990, it serves as a market maker, introduced two-way prices for some bonds. At its peak, SARB represented about 30% of total bond turnover in the secondary market. SARB maintained government bond market, even in adverse market conditions and was active trader of bond derivatives.

In the promotion of Secondary Market, SARB works with National Treasury in 1998 to develop a panel of 12 Primary Dealers (PDs). Selection criteria include:

•Capacity to deal with risks associated with market making.

•Capacity to comply with institutional requirements, capital requirements, auction procedures, participation on secondary market activity, surveillance procedures and reduces its involvement in secondary market.

The SARB also conducts weekly auctions of on behalf of the National Treasury, supervises Primary Dealers' compliance with primary dealer rules– as agent for National Treasury works with the National Treasury on debt management issues, chairs the Financial Markets Liaison Group, and manages money-market liquidity through repo transactions against eligible liquid assets.

The South African local bond market has benefited the economy in the following ways:

Expanded financing options for both public and private sector, increased range of savings instruments– e.g. retail bond, promotes modernization and efficiency of financial system, facilitates implementation of monetary policy, signaling to Government and SARB, improve government capacity to respond to shocks and promotes integration into global financial

system. Bradlow (2013) noted development of Market Infrastructure, managing non-resident bond investors, Competition from other Countries, Developing Corporate Bond Market Regulators Keeping Up with Financial Innovation, Appropriate Role of Central Bank, as challenges facing the South African bond market.

2.1.5 South African Bond Market Liquidity

The South African bond market is considered one of the most liquid bond markets in the world, especially the secondary domestic debt markets. The bond market is worth (amount outstanding) approximately 181 billion US dollars, as of 2012. (Hassan, 2013), providing scope for a rapid turnover of interest rate positions by international investors. More generally, the developed domestic bond market historically has enabled South Africa to maintain a low level of external (or foreign currency) public debt and to avoid the associated exposure to shock that have affected many developing countries (Kahn, 2005)

Government bonds account for the bulk of the market (approximately 116 billion), and are highly liquid, with total turnover exceeding two trillion US dollars in 2011 Over the past 10 years, the Turnover Velocity recorded by BESA accelerated from 17.7 to 28.5, indicated that one bond was traded 28.5 times in the secondary market per year (BESA 2008). The transactions executed by foreigners (with either one domestic or foreign party at the opposite ends of the transaction) through BESA accounted for 27% of the total secondary bond market turnover recorded in 2008.

In comparison, according to the African Securities Exchanges Association 2014 and 2013 year books, South Africa's Government Marketable Debt as a percentage of GDP for 2013 is 37.6% and its total domestic government debt increased by 3% from 46% in 2013 to 47% in 2014 while Nigeria's Government Marketable Debt as a percentage of GDP for 2013 is 8.6% of GDP. Government Marketable Debt amounted to approximately 8.1% for 2010, 8.4% for 2011, 9.1% for 2012 and 8.6% for 2013 of Nigeria's GDP. Nigeria's GDP has grown by 40%

over the same period Nigerian's total domestic government debt as a percentage of GDP amounted to 11% in 2013and 12% in 2014. South Africa also has Sovereign Debt which needs to be considered when assessing the country's total debt position. According to the 2015 African Economic Outlook Country Notes, South Africa's real GDP growth was estimated to be 1.5% in 2014, increasing to 2% in 2015. South Africa's economy has been affected by industrial action, inadequate energy supply, weak domestic demand and low investment rates and this, together with the weaker exchange rate indicate that South Africa should exercise caution in increasing its debt levels. According to the 2015 World Bank Ease of Doing Business Survey, South Africa's ability to provide electricity is only 16% while that of Nigeria is only 1%. This indicates that Nigeria could consider issuing additional Government Marketable Debt in order to fund infrastructure projects and encourage further investment, particularly in the non-oil sectors such as services, manufacturing and agriculture which are currently driving Nigerian growth. Decisions to fund infrastructure projects through increased domestic government debt or Sovereign Debt should be made after giving full consideration to the impact of the volatile oil price and exchange rate on the Nigerian economy and growth prospects. The value of the traded government bonds during 2013 is 387% that of the value of the traded equity securities during the same period despite the fact that the market capitalization of the JSE at 31 December 2013 is 801% that of the total value of domestic government marketable debt at the same date.

According to the 2015 World Bank Ease of Doing Business Survey, the Nigerian bond market is generally liquid. The value of government bonds traded on the NSE is minimal although the secondary market for bonds in Nigeria is fairly liquid. Investors can trade government bonds over the counter through Primary Dealers or Market Makers which are institutions authorized to deal directly with the Debt Management Office in bond issuances and which are involved in the issuance, sale and marketing of all government bonds.

The South African bond market stands out when compared with those of Nigeria and other sub-Saharan African countries. There are key factors, which are responsible for the rapid development of the South Africa's bond market as rated by Fitch Rating (2010). Such factors include advanced regulatory framework, macroeconomic and physical policies, healthy banking sector, and sound quality of infrastructure. It is not quite glaring whether or not such factors could be applicable to Nigeria. South African bond market appears to be uniquely different from the other African bond market, and seems to favourably compete both in size, access and liquidity with a good number of bond markets around the world. Review of the market in 2014 revealed that South African bond market compared to other emerging markets is developed with a substantial part of its debts held by private creditors in the form of bond while Nigeria is significantly lagging behind in terms of size, liquidity, depth, breadth and sophistication. (The Nigerian capital marketmaster plan: 2015 – 2025). Never the less, South African bond market is faced with the following challenges: Development of market infrastructure, Managing non-resident bond investors confidence (CRAs, Response to Events), competition from other countries international standards designed for advanced economy markets e.g. OTC Derivative, developing corporate bond market regulators keeping up with financial innovation (Bradlow, 2013).

2.1.6 Rationale for bond market development in an economy

2.1.6.1 Reduces over reliance on the banking sector

Witherell (2003) argued that bond markets reduces the over-reliance on bank lending for debt financing and that these markets also minimize the exposure of the economy to the risk of a failure in the banking system. This supports the statement of Grandes and Pinaud, (2004) the implication is that a banking crisis can therefore affect economic activity suddenly and adversely because companies would find themselves credit-constrained and be forced to

abandon investment spending, culminating in a reduction of aggregate demand through the multiplier effect. Harwood (2000) also argued that the existence of a successful and efficient bond market enables companies to have access to an alternative source of raising debt capital if banks were unable to do so; thus developing an efficient bond market can help the resolution of a banking crisis by allowing the banking system to recapitalize its balance sheets through securitization (i.e. the issuance of bonds backed by non-performing loans). Kim (2000) adds that bond market financing helps to diversify infrastructure financing. Before the Asian crisis such financing has been overly dependent on fiscal budget and banking institutions, involving a serious term mismatch between their short-term borrowing and long-term investments, inflexibility in financing methods and high risks at the time when banks are reluctant to lend. Also, in the midst of the Korean financial crisis of 1998, corporate bond markets provided almost all the funds raised by firms, with firms bypassing a troubled banking system. However, it is generally only large firms (Gormley, Johnson, & Rhee, 2006).

2.1.6.2 Lower cost of capital

Companies can incur greater financing costs through bank loans than through bond financing. Banks charge administrative costs that arise from arranging loans, in processing information about borrowers and monitoring them. IOSCO (2002) amongst others identified that corporate bond market help corporations reduce their financing costs in two ways. Firstly, it allows corporations to borrow directly from investors through bond issuance, bypassing the major intermediary role of commercial bank (a process known as disintermediation). Although corporations still go through underwriters, brokers and dealers to raise debt finance, competition among these intermediaries is more intense compared to that between commercial banks, pushing down their intermediation costs.

As a result, borrowing firms enjoy a lower cost of debt financing. Corporate bond markets can help borrowers reduce their financing costs in two ways. Firstly, they facilitate bank disintermediation by allowing direct access to investors, thus removing the "middlemen" and related costs. Secondly, by issuing corporate bonds, firms may tailor their asset and liability profiles to reduce the risk of maturity and currency mismatch on their balance sheets, thus reducing the overall cost of capital.

2.1.6.3 Broadens of capital markets and attracts foreign capital

Growth in debt market is a positive development for the capital markets and the economy at large. It helps to diversify the capital markets, reducing excessive dependence on banks and vulnerabilities within the banking system, while providing funding to large corporations looking for long term and diverse financing options. Akhtar, (2007) pointed that financial engineering of different types has facilitated the development of innovative debt products which have supplemented and complemented bank financing. In this regard IOSCO (2002) adds that without a well-functioning bond market, savers face a relatively limited array of asset choices and as a result they are likely to hold substitute assets such as bank deposits and, to a lesser extent, equity. In extreme circumstances, savers may also acquire more nonfinancial assets such as property that ultimately reduce the supply of savings that can be mobilized for productive investment. In the long run, this could result in a lower level of economic welfare."

A well-functioning bond market provides investors with freedom to invest across a wider range of instruments including bonds issued by governments, corporations and securitized obligations such as mortgage or other asset backed securities. The wider range of instruments allows for investors to make optimal asset allocation decisions. In addition, the presence of a viable bond market allows financial institutions to better manage the maturity structure of

their balance sheets, especially those with long-term liabilities such as life insurance companies and pension funds, which may otherwise be forced to charge their policyholders a higher premium to offset risks arising from maturity mismatches IOSCO, (2002). According to Pecc (2004), the bond market is one of the key components to establishing an efficient economic system. By developing the bond market, its benefits include adding value to the existing financial system, especially when foreign investors are attracted, diversification of benefits and offering more investment opportunities for both individual and institutional investors, thus helping deepen the financial markets associated with other instruments such as equity, derivatives etc.

Leaven (2014) states that the bond market improves the availability of long term financing, allowing households and firms to better manage interest rate and maturity risk associated with long-term investments (such as investments in equipment, machinery, land and buildings) by allowing for a better match between the duration of financial assets and liabilities. This benefit applies foremost to the development of a local bond market and the derivatives markets that support it, but the development of equity markets can also improve firms' access to long-term capital.

The bond markets, when opened to foreign investments, increase financial integration by attracting foreign capital, which can lower the cost of capital for local firms and household and improve risk sharing across countries and it is a useful tool for funding infrastructure projects by African governments. This could also improve market access and relieve credit constraints on small and medium-sized enterprises (Eichengreen, Borensztein, & Panizza, 2006). However, the liberalization of financial markets can also result in the migration of trading to international financial sectors, hampering domestic market development. For example, high-quality firms may try to escape local markets, lowering the average quality of local issuances (De la Torre, Gozzi, & Schmukler, 2006). Or local listing or disclosure

requirements may be relaxed to prevent trading activity from moving abroad, with negative implications for investor protection. The net effects of the internationalization of financial markets for the local development of markets in developing economies and emerging markets is therefore ambiguous.

2.1.6.4. Financing of budget deficit

The bond markets allow governments to finance large fiscal deficits without having to resort to financial repression or foreign borrowing. Indeed, the impetus for the development of local bond markets typically came from the government to facilitate the financing of large deficits (Turner, 2002). Financing deficits through financial repression by forcing local banks to hold government paper retards the development of the domestic banking sector and foreign borrowing in hard currency exposes countries to exchange rate risk. Under the highly regulated financial regimes prevalent before the 1980s, governments in many emerging markets could meet much of their borrowing needs by simply forcing local banks to hold government paper, usually to meet demanding reserve requirements. In many countries, inflation "financed" part of the government deficit. Foreign borrowing was also a possibility. The exchange rate risk of such borrowing appeared, in an earlier world of fixed exchange rates, relatively small. Such methods of financing have been undermined by the progressive liberalization of financial markets and of capital flows worldwide, the adoption of anti-inflationary policies and the adoption of flexible exchange rates. Governments were increasingly forced to borrow from domestic markets. In addition, several countries have faced the need to finance very large extraordinary expenditure (Turner, 2002).

2.1.6.5 Efficient pricing of credit risks

One of the reason for developing the bond market is to create cost-effective and competitive capital markets by generating market interest rates that reflect the opportunity cost of capital

at each maturity. This is essential for efficient investment and financing decisions. Herring and Chatusripitak (2000) substantiated this by stating that:

Without a well-functioning bond market, firms will lack a clear measure of the opportunity cost of funds. From society's perspective this may lead to overinvestment if the firm's internal rate is too low or underinvestment if the firm's internal rate is too high. Evidence from the late 1990s in several dynamic Asian economies suggests that the internal discount rate may have often been too low because returns on investment fell markedly.

IOSCO (2002) suggests that interest rates generated by banks are not always competitively determined and therefore will not reflect the true opportunity cost of funds.This is because banks could collude to either fix or set rates and banks might not be able to assess credit risks as well as bonds markets.

RBI (2007) concludes that the existence of a well-functioning bond market can lead to the efficient pricing of credit risk since expectations of all bond market participants are incorporated into bond prices. In other words, by promoting the use of price signals, a developed bond market ensures that firms are guided by an accurate cost of capital in making investment decisions, contributing to an efficient allocation of capital in the economy.

Local currency bond markets can offer local currency investors, such as retail and institutional investors, a way to borrow or invest in local currency and better manage inflation and exchange rate risk. They also provide a safe alternative investment to local currency bank deposits. And relative to foreign currency markets they can make the country less vulnerable to sudden stops and exchange rate shocks (Gormley et al., 2006). Governments are also major benefactors of local currency bond markets because it allows them to finance fiscal deficits by borrowing from domestic markets without exchange rate risk.

2.1.6.5 Promotion of financial stability and conduct of monetary policy.

One of the main reasons of bonds market development is to provide an alternative source of funds to both equity and bank financing. The alternate source of funding enhances the stability of financial markets and the efficient allocation of credit. The effect of bond market development on financial stability is best illustrated by the following example: after the Asian crisis the weak banking sector provided an impetus to the development of bond markets in most emerging markets. By diversifying their source of funds, companies can adjust their borrowing between the banks and debt markets (Hameed, 2007). He also stated that the complementary roles of bonds markets and banks can ensure financial stability even if one channel of financial intermediation is under stress. Lack of developed bond markets is often cited as a reason for severity of the Asian crisis. Well-functioning bond markets may have been able to pick up slack from the banking sector and provide much needed funds to the private sector as it did in the United States in 1990.

Bond markets also enhance financial stability by mitigating rollover risk and interest rate risk for issuers. This is because if rates rise, corporate with loans will pay higher debt servicing costs at rollover and may unable to borrow in case of a credit crunch. In contrast, firms which issue longer term securities have access to capital at more predictable rates (Hameed, 2007).

IOSCO (2002) added that in the absence of a corporate bond market, a significant proportion of debt funding for corporations would come from the banking sector. By extending loans to corporations, however, banking institutions assume a considerable amount of risk, mainly due to the maturity mismatch between liquid short-term assets (i.e. deposits, which can be withdrawn on demand) and relatively illiquid long-term assets (i.e. loans). Banks cannot transfer credit riskto depositors and this difficulty is further compounded by the highly idiosyncratic and asymmetric information banks possess about borrowers.

Herring and Chatusripitak (2000) concluded that in emerging markets, because a few banks account for the bulk of lending activity, there is a concentration of credit risk within the

banking sector, and this leads to an increased level of systematic risk in an economy that heavily relies on bank loan financing.

The development of bond markets supports the conduct of monetary policy. Money and bond markets provide instruments needed for the implementation of monetary policy and improve the transmission mechanism of monetary policy (IMF, 2004). Long term bonds also facilitate sterilization operations by the central bank because sterilization that relies exclusively on short-term instruments tends to drive up short-term interest rates and encourage further inflows into such instruments. And long-term bond markets give valuable information for the conduct of monetary policy, including expectations about macroeconomic developments and reactions to monetary policy changes, and thus help the operation of monetary policy.

In summary, the existence of a well-functioning bond market ensures the diversification and efficient distribution of risks within the financial and capital markets.

2.1.7 Nigeria's Bond Market Instruments

2.1.7 .1. The Federal Government of Nigeria (FGN) Development Stocks

These are stocks issued for development financing and are project-tied. They are securities on which interest rates are paid yearly and usually issued in tranches. They also have stable interest rate and maturity dates. They are usually issued in tranches and the interest is paid bi-annually. The history of the Nigerian bond market may be traced to the 1946 issue of N600,000.00Federal Government Stock of 7-25 years tenor, with the primary objective of promoting development finance for all tiers of government. Over the years, the share of government stocks in the capital market has declined, owing partly to the Federal Government recourse to other sources of financing outside the capital market (CBN, 2013).

2.1.7 .2. The Federal Government of Nigeria (FGN) Treasury Bonds

The Central Bank of Nigeria introduced the Federal Government Treasury Bonds in 1989, with the objective of minimizing debt service obligations of the Federal Government. The

bonds grew from the conversion of treasury certificates that had been used to finance the Federal Government deficits over the years. Thus, the instrument is used to finance the fiscal deficits of the government each year and held solely by the CBN. Over the years, the value of the bonds has grown relative to total debt instruments. The management of the debt was handled by the CBN before the creation of the Debt Management Office (CBN, 2013)

2.1.7. 3. The State and Local Governments Bonds

The inadequacy of bank financing has necessitated the lower tiers of government to seek funds from the bond market to augment their internally generated revenues and allocation from the Federation Account, with the aim of financing vital development projects. The first state bond was floated by the then Bendel State Government in 1978, and since then several other states and local governments have been patronizing the bond market (CBN, 2013).

2.1.5 .7. The Industrial Loan Stocks

These are project-tied loans, issued by companies on the stock exchange and carry fixed or floating rates, with a maturity date, and are backed by sinking fund arrangements for the retirement of the loans. Since the 1990s, industrial loan stocks have become popular as they provide cheaper sources of funds. Industrial loan stocks take the form of debenture stocks, preferred shares and corporate bonds. Firms in the banking sector (UBA, First Bank, GTBank, Diamond Bank and Access Bank) provided the lead in corporate bond offerings seeking to raise additional funds (CBN, 2013).

2.1.7 .5. The Unsecured Zero Coupon Redeemable Convertible Stock

Unsecured Zero Coupon Redeemable Convertible Stock was introduced in a bid to further diversify instruments/securities on the Stock Exchange. The security listing is unsecured and has no periodic interest payments obligation. It is redeemable at full face value at maturity,

and could be converted into ordinary shares after a specified period of moratorium (CBN, 2013).

2.1.7 .6. The AMCON Bonds

The Asset Management Corporation of Nigeria (AMCON) has played a vital role in distress resolution in the banking sector in Nigeria since its establishment. The AMCON bought a total of N1230.0 billion non-performing loans (NPL) of the banking system in December 2010. The company issued 2 three- year consideration bonds to 22 DMBs with the face value of N534.48 billion in the first half of 2011, in exchange for the DMBs eligible assts. This made the total face value of the bonds issued by AMCON to sum up to N1,764.48 billion, against the eligible assets of the banks valued at N2,827.0 billion, which was acquired by the company at end-June 2011. This represents 33.28 per cent of the entire outstanding bonds issued in the market (CBN, 2013).

2.1.8. South African debt instruments

The Government Marketable Debt issued by the South African government comprises of both issued treasury bonds and treasury bills. The value of issued treasury bonds is significantly higher at 85% of Government Marketable Debt. As at 2015, South Africa has 12 trading Eurobonds denominated mainly in USD (approximately USD 10.4 billion) but with some Euro ("EUR") (approximately EUR 1.25 billion) and Japanese Yen ("JPY") (approximately JPY 30 billion) exposure (Barclay's Guide, 2015).

2.1.9. Main Institutions in the Bond Market in Nigeria.

2.1.9.1. The Debt Management Office

The Debt Management Office (DMO) was set up in October 2000, and the Act establishing the Office was enacted in June 2003, for the purpose of providing a one-stop shop for clearing all Nigerian government debts at all levels. Prior to its establishment, Nigeria had a grossly underdeveloped domestic debt market as debt management responsibilities were split

among several agencies and departments of both the CBN and the Federal Ministry of Finance.

The DMO is in charge of coordinating and centralizing the debt activities and profile of the country, which include debt service forecasts and debt payment. It also has the responsibility of advising the government on debt negotiation and new borrowings. The DMO issues prospectuses in respect of bond issues and agrees with the CBN to draw up issue programmes on quarterly or half yearly basis, depending on government requirements. The DMO facilitates the listing of newly issued Federal Government of Nigeria (FGN) Bonds by paying listing fees to the Nigerian Stock Exchange annually (CBN, 2015).

The DMO in 2007 introduced the new Strategic Focus for Domestic Debt Management, which will facilitate with the following: Reduction in the cost of fund to the federal government by integrating cash management with the debt management operations; the use of financial derivatives instrument to deepen the domestic market; Ensuring access to cheapest available fund in the market by introducing foreign denominated FGN bonds in the domestic market as well as supporting the pricing of long term instrument; developing debt management unit (DMUs) using DMO platform in all 36 states in the federation integrating and introduction of educative programmes and aggressive public enlightenment on debt as a vehicle of economic development.

2.1.9. 2. The Central Bank of Nigeria

Central banks have multiple interests in the development of bond markets. At a fundamental level, the government bond markets help to fund budget deficits in a non-inflationary way and so enhance the effectiveness of monetary policy. In addition, many central banks use government bond markets for the conduct of monetary policy. They often act as agents for the government in various aspects of the management of government debt. They oversee

clearance and settlement systems, and they are responsible for the stability of the financial system, often directly supervising banks Turner, (2002).

The CBN performs the following roles in the Nigerian Bond market:

Acts as issuing house and registrar to all issues by

- Keeping a record of all bond holders;

- Warehousing the total volume of bonds issued;

- Effecting interest payments; and

- Redeeming bonds on redemption/maturity dates.

Maintains a link with the bond market by acting as settlement bank:

- Updates bondholders' portfolio positions; and

- Settles the fund aspect of OTC transactions.

Participates in the Bond Market Steering Committee to monitor the bond

- market and ensure its efficiency

2.1.9. 3. The Nigerian Stock Exchange (NSE)

Federal Government bonds are listed and traded on the Floors of the Nigerian Stock Exchange. NSE was founded in 1960 as the Lagos Stock Exchange and became fully operational in 1961. At the initial stage, 19 securities listed for trading in Lagos state and the name was changed to the Nigerian Stock Exchange in December 1977. It has branches established in some of the major commercial cities across the country, and its activities are regulated by the Securities and

Exchange Commission. The SEC has the mandate of Surveillance over the activities of the NSE to prevent breaches of market rules and detect and correct any unfair manipulations and trading practices. Since 1999, the NSE introduced an Automated Trading System (ATS) for the dealer to be able to trade through the network of computers connected to a server. The ATS has some important features that facilitate remote trading and surveillance (CBN, 2013).

2.1.9. 4. The Central Securities Clearing Systems Ltd (CSCS)

The CSCS was incorporated on as a subsidiary of The Nigerian Stock Exchange in July 29, 1992. The CSCS has the sole responsibility of settlement and clearing of securities transaction of the NSE as well as bond transaction on the OTC market. In 1997, the CSCS was commissioned and commenced operations same year. The CSCS enables easy delivery and settlement of securities transactions on the floor of the NSE by facilitating stock processing in electronic form, thereby reducing transaction time considerably (CBN, 2013).

2.1.9. 5. The Security and Exchange Commission (SEC)

The SEC is the main regulatory institution of the Nigerian capital market and is under the supervision of the Federal Ministry of Finance. The SEC has the mandate to supervise the Nigerian Stock Exchange in order to ensure orderly and equitable dealings in securities, and preventing the market against unwanted trading activities. The Commission has the responsibility to regulate the capital market and the activities of all operators to ensure that investors are protected CBN, 2013).

2.1.10. Determinants of Bond Market Development

Understanding the determinants of the size of bond markets is important because their depth has been related to both financial development and financial crises therefore, it is difficult to neglect macroeconomic factors when trying to understand the development of bond markets in the economy especially, emerging markets. In considering the usefulness of the domestic bond market, Kahn (2005) states that at the macroeconomic policy level, the bond markets usually send insightful signals for macroeconomic policy, while the financing of fiscal deficits could be difficult without the existence of an effective bond market. He stated further that a country will benefit from adeveloped bond market if it has a stable macroeconomic

policy, on both fiscal and monetary sides. In terms of macroeconomic policy, a well-developed bond market not only provides useful market signals for the policy makers, but it is also a tool of financing fiscal deficits (Kahn 2005). Fabella and Madhur (2003) also pointed out that a stable and predictable macroeconomic environment would promote the development of the bond markets and conversely, it would need large supports from government. Brazil for instance, reported that the high level of domestic interest rates resulted in higher corporate bond issuance costs as investors demanded yields to compensate them for the risk of holding corporate bonds. Turkey, on the other hand, cited an unstable macroeconomic environment characterized by high and volatile inflation rates as the main impediment to bond market development.

Virtually all sectors of an economy are generally influenced by many factors amongst which are statutory regulations and policies, and macroeconomic indices. Ringui (2012) observed that macroeconomic environment affects the flow of capital into and out of the country and therefore the level of market liquidity, and the incentives for investors and savers to purchase certain instruments. An efficient bond market is unlikely to evolve in a volatile macroeconomic environment characterized by volatile inflation and interest rates. Borensztein, Cowan, Eichengreen, and Panizza (2008) studied the role played by macroeconomic factors in the development of sovereign debt markets. According to them, in Brazil, the government bond market started growing when the government implemented the Real Plan and stopped monetizing fiscal deficits. Likewise, in Mexico falling inflation and greater macroeconomic stability played a key role in the growth of the stock of sovereign bonds. In Colombia, in contrast, large and persistent fiscal deficits, rather than stabilization, spurred growth in the stock of government bonds since the mid-1990s. Fitch ratings attribute the development of the bond market to stable and supportive macroeconomic and fiscal

policies; a healthy banking sector; and an advanced regulatory framework. These factors include the need for sufficiently strong economic growth that could generate appropriate issuers and investors, as well as a stable and sufficiently low interest rate environment that could facilitate investment, especially in fixed-income instruments.

Without doubt the size of the banking system, the state of economic development, and the GDP are essential elements in measuring bond market development for most countries. As such, it would not be advisable to ignore environmental factors, which are linked to governance and regulation. Institutions and structures like legal and regulatory framework as well as other socioeconomic factors need to be in place for a complete understanding of the bond market transformations in an economy.

Strong institutions and a well-functioning legal system are also critical for the development of local bond markets because they provide the basis for the protection of investor rights, including minority interests, to attract widespread interest from investors and ensure that creditors are repaid in an orderly fashion. Burger and Warnock (2006) and Burger, Warnock, and Warnock (2012) find that countries with creditor-friendly laws (i.e., strong creditor rights) and stable macroeconomic policies have more developed local bond markets. Similarly, Eichengreen and Luengnaruemitchai (2006) find that Asian capital markets, where creditor and investor rights tend to be stronger and contract enforcement less costly, tend to be more developed than those in Latin America. More generally, economies with investor-friendly laws tend to have deeper capital markets and the firms in such economies tend to obtain higher stock market valuations (LaPorta, Lopez-de-Silanes, Shleifer, & Vishny, 1997, 1998).

There are other aspects as reviewed in the literature, which are considered important in influencing bond market growth and development, but have not been properly and

empirically addressed by most of the reviewed studies. For instance, issues of governance and regulation otherwise called government participation. The Asian Development Bank (2010) believes that regulation and supervision of bond markets participants must include system and procedures to protect investors, to promote sound business practices, and to address systems risk issues. Claessens, Klingebriel, and Schmukler (2003), as well as Burger and Warnock (2005) provide evidence from literature that protection of creditor rights in a country contribute in determining the pace of bond market development.

Stable macroeconomic policies, improved regulation, enhanced transparency, and stronger investor protection are particularly expedient for bond market development (Adelegan & Radzewicz-Bac, 2009). Building market participation and securing government commitment are also necessary for the success of a bond market (Harwood, 2000). Disclosure and information system, a credit rating system, bankruptcy laws, intermediaries, institutional investors, trading system, and clearing and depositing system are crucial to both non-government (corporate) bond market with the first three being restricted to corporate bonds relevant to corporate and bond markets too. Bond markets require extensive infrastructure, including well-developed accounting, legal and regulatory systems, payment and settlement systems, rating agencies, networks of brokers (Bettlellino, 2004). Adeleke (2006) in Onaolapo and Oluwafemi (2010) identify a model developed in Hong Kong known as the BIRDS model for developing bonds infrastructure, which represents Benchmark, Infrastructure, Risk Assessment, Demand, and Supply. Eichengreen and Luengnaruemitchai (2004) documented that traditions of legal system, law and order, corporate governance, transparency, and regulatory enforcement have a positive direction with bond market size. A large economy is likely to have organized structures and transparent level of regulation and risk management. This appears to boost bond market development in a country. A reliable benchmark therefore entails setting up a standard for the country's yield curve, term

structure, and interest rate for the economy. The infrastructural aspect of the BIRDS model connotes the standardization and update trading, clearing and settlement system. For example, an enhanced and reliable bond trading platform is encouraged. Risk Assessment involving assessing the risk implications of the asset. Onaolapo and Oluwafemi (2010) identify the need for rating mechanism, full disclosure of information by the issuer as germane for an effective risk assessment. Another related study is that of LKhagvajav, Batnyam and Gan-Ochir (2008) involving development of an econometric model of bond market development, which was first initiated by Garcia (1999). The econometric model for bond market developments premised on Garcia's position that that there are institutional and macroeconomic approaches to assessing stock or bond capitalization. The institutional factors address regulatory related issues like transparency and insider information, taxation, inflation, property rights, clearance and settlement issues among others as identified by LKhagvajav *et al* (2008). The macroeconomic and related approaches have been discussed previously. Bond Exchange of South Africa (BESA) (2005) as cited in Hove (2008) identifies robust legal environment, appropriate regulatory and supervisory environment, market infrastructure, and diversified market participants, stable macro-economic policies, and stable political environment, as forming the basic framework for assessing bond market success. Further from the BESA study, a stable political environment is determined by political stability, absence of strong interest group activity, absence of corruption, reasonable level of government capacity. It was also revealed that a robust legal environment is determined by independent legal and judicial system, and protection of property and creditor rights. The BESA study also documents that market based framework, good corporate governance, and internationally accepted accounting standards contribute to appropriate regulatory and supervisory environment. Also, market infrastructure is sub-divided into efficient settlement

systems, and adequate information flows, while diversified market participants are comprised of diversified issuer base, and diversified investors.

Evidence provided by Claessens, Klin Gebiel, and Schmukler (2003), as well as Burger and Warnock (2005) established that the main determinant of the size of the bond market is the protection of creditor rights in a country. This implies that there is a strong need setting up institutional structures, as well as providing a framework for investors' protection.

Economic environment is persuaded by the more exigent financial, social, industrial vagaries e.g. macroeconomic indices. Phelps (1997) highlighted that the macroeconomic environment affects the competitiveness of the financial sector, the options financial institutions can present to the market and the relationships among financial institutions and between these institutions and the central government. They influence inflation rates, the term of financial instruments offered, interest rates and exchange rates. According to Asaolu and Ogunmakinwa, (2011), Macroeconomic indicators such as unemployment rate, exchange rate, inflation rate, capacity utilization, external debt and price stability etc. are systematic risk component of the economy which influence and affect every participant and sector within the economy. Eichengreen *et al.* (2003) play down the role of factors such as the level of development, macroeconomic credibility and quality of institutions as the sole explanations for original sin, although they concede that these factors may have some limited role. But they argue that even those emerging markets that have improved their policies and institutions have made relatively little inroads into solving the mismatch problem.

In analyzing determinants of bond market development, this study classified these factors under institutional, financial market related factors structural, developmental and macroeconomic variables in line with the works of Adelegan and Randzewicz-bak (2008), Eichengreen and Luengnaruemitchai (2004) and Thotho (2010). These determinants are discussed below:

2.1.10.1 GDP per capita.

The Gross Domestic Product (GDP) is a measure of the country's overall economic performance. It is the money value of total goods and services produced annually in a country using exclusively the resources of a country (Singh, 2013). It is a gauge of economic recession and recovery and an economy's general monetary ability to address externalities. Mwangi (2013) states that (GDP) is a most commonly used macroeconomic indicator to measure total economic activity within an economy, its growth rate reflects the state of the economic cycle Several studies on bond market development point to the fact that a huge economy could attract huge capital, hence greater bond financing, whereas a small economy has the tendency of attracting less bond financing. Standley (2010) states that financial market size is   strongly related to the size of the economy, a finding that is true for both equity and debt markets with the size and activity of most exchanges aligned with each country's level of economic development. This suggests that some countries may be too small to develop viable capital markets even with appropriate macroeconomic policies and institutions, leading to calls for regional equity markets and regional bond issues to help overcome scale constraints. According to Eichengreen and Luengnaruemitchai (2004), the size of an economy positively influences financing through the bond market, although such impact is weak. Eichengreen, Hausmann and Panizza (2002) provide evidence that small size is similarly the most robust determinant of the inability of emerging markets to borrow abroad in their own currencies ("original sin").The size or scale of an economy needs to reach a certain level to influence financial decisions of large economic entities investing in the bond market of an economy (Bhattacharyay, 2013). Adelegan and Randzewicz-bak, (2008) noted that Small countries may not have a deep and liquid bond market because they lack efficiency of scale for deep bond markets, the amount raised from issuance may be too small to attract multinationals and transnational companies, potential foreign issuers, portfolio managers, and

justify inclusion by leading investment banks in global bond markets indices and there is a wide disparity in the size of domestic debt to GDP across SSA countries with some countries still recently developing. A large sized economy is expected to move in a positive direction with the size of the bond market. However, an economy that is small in size may be positively insignificant or even be negatively correlated with size of the bond market, especially for an economy that is dwindling in size.

In their study on bond markets in Asian economies, Eichengreen and Luengnaruemitchai (2004) noted that even though some emerging Asian economies experienced high economic growth rates, they remained poor compared with advanced economies and lacked necessary institutions to promote financial markets hence the stage of development of an economy positively and significantly influences bond market development.

Bond market development is affected by degree of economic development. Braun and Briones (2006) establish that the level of economic development impacts greatly with significant variations on cross countries. Their study further established that Latin American countries and Chile exhibit small differences in the level of development of their bond markets. McCauley and Remolona (2000) provide evidence that a critical size of about $100-$200 billion is required to support a liquid bond market. On the other hand, Adelegan and Radzewicz-Back (2008) provide a conflicting evidence of a positive relationship between bond size and savings to GDP as against the findings of Jeanne and Guscina (2006).

While efficient capital market contributes to economic development, the development of capital markets proceeds in stages. Thus, the degree of economic development may dictate the need to develop a certain aspect of capital markets tailored to the individual country's economic and financial situation. For instance, a country in an early stage of economic development may not have immediate need for deep and liquid bond markets. It might focus more on developing its banking system and equity market. A country with few listed firms

will not likely need a corporate bond market, but rather concentrate on government bond market development instead. Eichengreen, Hausmann, and Panizza, (2002) noted that small economies lack the minimum capacity necessary for development of large and stable domestic bond markets resulting in discouragement for bond issuers such as multinational corporations which look for large financing volumes. Burger and Warnock (2002) also argue that there is a strong positive relationship between the level of economic development and depth of financial markets i.e. the size of a country's local-currency denominated bond market is related to GDP per capita rather than country size.

Beck, Demirguc-Kunt and Levine (1999) proved a positive relationship between the level of GDP per capita and a size of a bond market. Most sub-Saharan countries have a volatile investment environment, domination of government in commercial activities, weak creditors' rights, lack of transparency and poor corporate governance

Goldstein and Turner (2004) show that although emerging bond markets are smaller relative to the size of their respective economies, the size, liquidity and ability to hedge risk varies considerably, South Africa features strongly in these comparisons, but is the only African country to do so. They also argue that over time, most of the countries should develop to where South Africa is today, implying that there is scope for development.

2.1.10.2 Budget Deficit

Budget deficit is the difference between fiscal revenues and expenditures.Larger budget deficits are associated with larger government bond markets, because as public expenditures exceed public revenues, there is a need to finance this gap: public bonds are, usually, the way in non-inflationary and low-inflation economies. Thus, countries with worse fiscal performance tend to have larger public bond markets.

The need to finance large public sector budget deficits and the avoidance of monetary financing have generally been viewed as key macroeconomic forces underlying the development of debt markets. From a macroeconomic policy perspective, the lack of a bond market places constraints on the financing of budget deficits, while bond markets provide useful market signals for macroeconomic policy. With the development of active liquid and deep government bond market, countries that focus on a more market-oriented funding of government budget deficits would have less debt-service costs over the medium to long term.

Mihaljek, Scatigna and Villar (2002) noted that the cross-country relationship between fiscal deficits (as a percentage to GDP) accumulated since 1995 and the size of the public sector debt market confirms that countries with larger fiscal deficits have issued more public sector bonds in domestic and international markets. They pointed that Chile, Hong Kong and Malaysia have been issuing public sector bonds primarily for the purpose of debt market development, as all three economies accumulated large public sector surpluses during 1995–2000.

A country that runs budget deficits has greater need for selling government bonds to raise required funds than a country with a budget surplus. In Nigeria, budget deficit is commonly financed using government bonds. In South Africa, government bonds are also issued primarily to support the fiscal budget. It is therefore pertinent to examine the relationship between bond market development and budget deficit financing.

In Nigeria, government expenditure has consistently exceeded its revenue for most of the years beginning from 1980 except in 1995 and 1996 when surplus budget were recorded.

The rising rate of budget deficit in Nigeria has left the country with the only option of raising funds from the bond market as the available alternative. According to Nwankwo (2014: 24):

In 2003, the Nigerian fiscal deficit stood at N202.72 billion, representing 2.04% of the nation's

GDP; dropping in 2004, to N172.6 billion or 1.51 % of GDP. By 2005, national deficit level fell again to N161.86 billion or 1.11% of GDP; before beginning soaring to N341.86 or 2.35% of GDP and representing a 111.79% jump. The deficit level jumped again to N580.19 billion or 3.64%; and then N537.95 billion in 2008. In 2009, deficit was N836.6 billion, 3.02% GDP. The figure more than doubled once more as government's revenue obviously stagnated as needs mounted federal government's fiscal operations resulted in a 2010 deficit of N1.993 trillion, the highest within the 10 years period. It dropped to N1.136 trillion or 2.96% in the following year; and N1.135 trillion or 2.85% in 2012. The 2013 deficit was forecast to reduce bellow the trillion Naira mark at N887.06. He also noted that the current practice of financing part of the country's fiscal deficits by borrowing from the market has not only led to the development of the domestic debt market, it has brought other salutary benefits for monetary policy operations and the economy."

Some of the increases in the deficits have been associated with declining tax revenue resulting from the recession, others relate to the increase in debt service payments on public debt. While budget deficits are nothing new in Nigeria's history, the recent size of the deficit has been a cause of concern to many people including academics, policy makers and investors. The persistent government budget deficits and government debt have become major concern in both developed and developing countries. It is expected that lower budget deficits will lower real interest rates, increase investment, and thereby increase productivity growth and real income (Cebula, 2000).

2.1.10.3 Exchange rate.

Harvey (2012) describes exchange rate as the value of two currencies relative to each other. It is the price of one currency expressed in terms of another currency. It is the price at which the currency of one country can be converted to the currency of another. Although some

exchange rates are fixed by agreement, most fluctuate or float from day to day. Foreign exchange fluctuation exposes a country to foreign exchange risk. Plummer and Click (2005) noted that the benefit of a domestic bond can also be seen from the potential costs of foreign and domestic debts. They further stated that if the foreign debts are significantly cheaper than domestic debts, the foreign exchange requirement may be a risky element and foreign debts may be more difficult to roll over than domestic bonds. So the more reliance of the country on the foreign debt rather than domestic debt, the more vulnerable the country is to the foreign exchange crisis and cessation of the loans. Compared to other emerging markets, South Africa for instance, relies more on its domestic bond market than on international borrowing.

The currency volatility has effects on the stock returns. When currency appreciates, in a situation where the country is export-oriented, it is expected that there will be a reduction in the competitiveness of her exports, and would therefore have a negative impact on the domestic stock market. This is because the export-oriented companies quoted on the stock exchange market would be less profitable and this may in turn become less attractive to investors (Muthike & Sakwa, 2012).Mukherjee and Atsuyuki (1995) supports that there is a positive relationship between exchange rates and stock prices. Exchange rate fluctuation is regarded as a critical factor for the foreign investor in the security market. The secondary security market liquidity increases when foreign currency appreciates. However, exchange rate fluctuation increases the exchange rate risk of the investment when foreign investors transfer their investment back to their mother countries.

The increasing role of government bonds as a source of financing for developing countries has been associated with a surge of debt and currency crises. Khan (2005) pointed that

despite the expansion of domestic bond markets in emerging markets, it is argued that the fact that many bonds placements are linked to the exchange rate, they are indistinguishable from foreign-currency denominated issues from a currency risk point of view, while a large amount are indexed to the short-term interest rate, thereby providing little protection from interest rate increases. So despite the recent rapid development of domestic bond markets, which would have required compliance with a range of prerequisites for the development of domestic bond markets, Eichengreen *et al.* (2003) argue that they have made little progress in the capacity to borrow abroad in their own currencies, leading them to the conclusion that the problem relates to the structure of foreign demand for claims denominated in the local currency. The relationship, if any, between exchange rate policy and these crises remains unclear. Exchange rate volatility leads to uncertainty in the foreign exchange market.

The exchange rate is of importance in the case of Nigeria and South Africa since foreign buyers are active participants in the bond markets. Heavily relying on foreign-currency debt could be dangerous for the country because it is more difficult to roll over compared to the local-currency debt and also the foreign exchange rate is another risky element. For example, the Asian crisis during 1997-98 was caused by the mismatch between short-term foreign-currency debt and long-term domestic investment (these were mismatches of both maturity and currency), Asian economies held significant amounts of short-term foreign-currency denominated debts to fund their long-term domestic investments, and when the foreign loans could not be rolled over, this resulted in the value of the currencies declining substantially and impacting the Asian economies severely. (Eichengreen *et al.* 2003)

Greater exchange rate flexibility encourages the development of domestic bond market. Pegged exchange rates encourage foreign investors to underestimate the risk of lending to banks and corporations, and the resulting foreign competition may slow the development of domestic intermediation. Investors tend to prefer an investment environment where the

exchange rate is stable as they have to face low risk (in terms of exchange rate risk). Therefore, it is argued that a less volatile exchange rate will promote the development of the bond market (Bhattacharyay 2011).

Despite the fact that foreign investor participation is valuable to the development bond markets, high foreign exchange risk may discourage foreign participation. Goldstein, (1998) is of a contrary view that if fixed exchange rates encourage foreign lenders to underestimate the risks of lending to local banks and corporations, then the resulting foreign competition may slow development of the local financial intermediation market. This suggests that greater exchange rate volatility may be conducive to domestic bond market development. Exchange rate fluctuation is regarded as a critical factor for the foreign investor in the security market. The secondary security market liquidity increases when foreign currency appreciates. However, exchange rate fluctuation increases the exchange rate risk of the investment when foreign investors transfer their investment back to their mother countries. In South Africa, exchange rate fluctuation has a major impact on the secondary bond market liquidity considering that foreign investors play an active role in bond trading (Kapiingura & Ikhide, 2011).

2.1.10.4 External Debt

External debt is described as the financial obligation that ties ones party (debtor country) to another (lender country). It usually refers to incurred debt that is payable in currencies other than that of the debtor country. In principle, external debt includes short-term debts, such as trade debts which mature between one and two years or whose payment would be settled within a fiscal year in which the transaction is conducted.

External debt may be incurred through a number of transactions such as trade, contract or finance, supplies credit, private investment and public borrowing. Source of loan that make up external debt include banks, international financial market (euro money and capital

markets) international organization e.g. IMF and the World Bank international loans and multilateral private loans (Adepoju, Salau, & Obayelu, 2007).

Nwoke, (1990) describes it as organized international credit negotiated between two countries, on terms acceptable to them in today's world, the lender countries are usually the advanced industrialized countries of Europe, Asia (Japan) and North America while the borrowing countries are the poor under developed countries of the thirds word in Africa, Asia and Latin America, From the stand point of the latter, foreign loans are ostensibly for development purposes or to facilitate industrial progress ,or for improving the quality and quantity of food production. The ultimate objective is to increase the standard of living of the generality of the people. Siddique, Selvanathan and Selvanathan (2015) opined that external debt is an important source of finance mainly used to supplement the domestic sources of funds for supporting development and other needs of a country. Usually external debt is incurred by a country which suffers from shortages of domestic savings and foreign exchange needed to achieve its developmental and other national objectives.

Soludo (2003) asserted that countries borrow for two broad categories; macroeconomic reasons or to finance the transitory balance of payments deficits aimed at boosting economic growth and reduce poverty.

There appears to be a link between external debt and private debt. A positive sign is expected between external debt and private debt, provided the finance raised through external debt is channeled towards infrastructural development, which should spur economic activities, attract foreign investors, and facilitate the business growth. This will in turn facilitate the need for corporate organisations to raise more debt. It therefore implies that once external borrowing is not channeled to infrastructure, the translation of such financing towards productive business activities may not be achieved, and hence discourage private debt

financing. This later situation could generate a negative relationship between private debt and external debt. External debt has a way of impacting on bond market although there seems to be dearth of evidence to clarify this position. There is evidence of negative correlation between the ceiling of corporate credit ratings with the level of public debt (Borensztein, Cowan, & Valenzuela, 2007). It is essential to establish the link between external debt and corporate borrowing, especially corporate bonds. Mailafia, (2014) observed that since there is a link between the government bond rating and corporate borrowing limit, it tends to suggest that a higher rating might enhance corporate debt.

2.1.10.5 Domestic credit from banks.

Bond markets and bank finance are complementary rather than incompatible. While banks tend to be more adept at providing short-term (working) capital, bond markets enjoy a comparative advantage in financing government deficits and infrastructure investment, and providing longer-term capital to companies for growth.

The banking system competes with bond markets in supplying finance to an economy, so that well-developed banking systems can undercut the need for developing bond markets. At the same time, banks serve as dealers and market makers, whose presence is needed for the development of a liquid and well-functioning bond market. (Harwood, 2000, Hawkins, 2002). Panniza, (2008) noted that domestic banks often hold a large amount of government debt. In the case of India, for instance, more than 50 per cent of government bonds are held by local banks (Gopinath, 2007). In HIPC countries, domestic bank holdings of government debt average 61 per cent of total domestic debt and range between 33 (Bolivia) and 94 (Ethiopia) per cent of the total (Arnone & Presbitero, 2006).

Hawkins (2002) is of the view that a strongly capitalized and large banking system is necessary for the development of a liquid and well-functioning bond market because banks play the dealership and market makers role in financial markets, while an empirical test

conducted by Jiang, Tang and Law, (2001) finds that bond issuance and bank lending are usually positively correlated, in both OECD and emerging economies therefore, there is need to gauge the level and direction of contribution of the banking sector to the bond market in an economy. This would facilitate policy direction and decision making.

Emerging market economies are perceived to be over-dependent on their domestic banking systems for finance, which calls for the need for further development of their domestic bond markets (IOSCO, 2002). Bank loans attract higher intermediation costs as a result of branch networks and required capital as compared to cost advantages of debt securities (Diamond, 1994). Bolton and Freixas, (2000) pointed that the implication is that blue chip firms will have preference for debt market in order to attain efficient cost savings. Furthermore, less financially secure firms will opt for bank loans due to greater flexibility in rescheduling, while the larger, creditworthy firms seek to tap the bond markets. Paul and Fan (2005) support this by stating that firms with high credit quality prefer public debt, while firms with average credit ratings borrow from banks, and those with low credit rating borrow from nonbank private sources. They argued that such finding suggests competition between corporate bond markets and banks with a tendency to draw away good borrowers from banks. It is glaring that there is a link between banks and corporate bond market development although the direction and magnitude may not be quite clear, and may differ depending on the features of the banking sector.

 Jiang and Law (2001), in their study shows that bond issuance and bank lending are positively correlated both in countries of the Organisation for Economic Cooperation and Development (OECD) and the emerging economies.

2.1.10.6 Stock Market Capitalization

By providing alternative sources of external finance to companies the bond market can complement the development of the equity market. It is also possible that companies may favor to finance their investments from the equity market rather than bond market due to lesser regulations and ease of raising funds.

Since both stocks and bonds are investment alternatives that compete for the investor's funds, funds flow from one market to another due to a change in market situation and macroeconomic factors. A number of studies have reported a negative relationship between long-term government bond rate and the stock prices in the US and UK (Nasser & He, 2003). Raghavan and Sarwono (2012) also agreed with this fact that the equity and the bond markets could either play complementary roles through provision of alternative sources of external finance to companies, or compete with each other through companies' choice of financing investments from the equity market rather than the bond market. Claessens, Klingebiel, and Schmukler, (2006), Jeanne and Guscina (2006), and Adelegan and Radzwiczkbak (2009) all find out that a positive relationship exists between stock capitalization and government bond market development (share of the Debt to GDP).

2.1.10.7 Interest rate

Crowley (2007) defines interest rate as the price a borrower pays for the use of money they borrow from a lender or fee paid on borrowed assets. Ngugi (2001) describes interest rate as a price of money that reflects market information regarding expected change in the purchasing power of money or future inflation. Economists argue that the interest rate is the price of capital allocation over time ; monetarist use the interest rate as an important tool to attract more saving, as increases in the interest rates attract more savings and the decrease in interest rate will encourage investors to look for another investment that will generate more return accordingly.

Eichengreen, Panizza and Borensztein (2008) identified interest rate as a key determinant of bond market development because interest rates, being the cost of debt, are integrally linked to the willingness to borrow through debt issuance. Higher interest rates increase debt service costs for government and corporate issuers and tend to have a depressing impact on issuance and bond market development since few firms can service debts when interest rates are high. They are also of the opinion that where interest rates are variable, investors will have a little appetite for long-term fixed rate notes because there is high risk that the purchasing power of long-term fixed rate assets will be eroded. If an investor considers interest rate as cost of capital, an increase or a decrease in interest rate may affect the investment decision of the investors. For example, when there is a rise in interest rate and the opportunity cost goes up, individual investors would prefer to invest in non-fixed income securities such as bonds (Adam & Tweneboah, 2008). Investors' limited appetite for long-term bonds thus may limit the demand for securitized debt. In addition, high levels of interest-rate volatility may be an indication of inadequate market liquidity, insofar as returns are affected by the entrance or exit of a few buyers and sellers from the market

Davis (1999) is of the same opinion with Nasser and He (2003) and revealed movements of the economy and/or of interest rates as of overriding importance in the purchase of fixed-income securities. A rise in interest rates as a result of monetary policy tightening may lead to a financial crisis, with liquidity collapses in security markets. In addition, in the presence of uncertainty, adverse surprises may trigger shifts in confidence, affecting markets and institutions more than appears, thus introducing the potential for a liquidity crisis. Volatile interest rates would discourage investors from investing in long-term bonds since there is a risk that the purchasing power of long-term debt securities would be eroded in the presence of volatile interest rates (Bhattacharyay, 2013).

2.1.10.8 Inflation

Low inflation has been identified in the literature as an essential precondition for the development of debt markets. Like sound public finances, low inflation is deemed to be important for creating the right incentives for investors and for facilitating the development of markets in fixed income securities. Inflation can be defined as a persistent increase in general price levels in an economy over the time. Jhingan (2002) defines inflation as a persistent and appreciable rise in the general level of prices. Akers (2014) states inflation rate measures changes in the average price level based on a price index. The most commonly known index is the Consumer Price Index (CPI). The index measures average retail prices that consumers pay Low or medium levels of inflation in a country can have a positive effect on the business sector, in that it can act as an incentive to production. High levels of inflation however can harm company's profitability by affecting the cost of inputs as well as reducing final demand for its output. sogunle, (2011) noted that key challenge to long term investment in bonds is the threat of inflation which can result in capital erosion.

In terms of monetary policies, we find that lower inflation rates are associatedwith larger local currency government bond markets. Burger and Warnock (2006) find that countries with stable inflation rates (a proxy for creditor-friendly policies) have more developed local bond markets and rely less on foreign currency-denominated bonds This is to be expected since lowerinflation rates tend to be associated with lower volatilities of inflation and, consequently, a lower tendency for governments to inflate away the outstanding debt, thus making localcurrency debt less riskythe investors' expectation about the future inflation rate might also influence the demand for thefixed income securities like bonds, because the effects of rising inflation canerode the real value and purchasing power of interest payments, which aretypically fixed over the life of an investment. Countries with high inflation rates confront greater political risk, with the increased likelihood that government will introduce wage and price controls or tamper with indexes. Higher inflation rates can raise contracting

costs, making bond issuance difficult for firms. Bond holders are exposed to capital losses through inflation and therefore represent a potential anti-inflationary force, (Claessens, Klingebiel, & Schmukler, 2003).

In the 1980s and 1990s, inflation was the major factor driving down the share of long-term, fixed-rate local currency debt (Goldfajn 1998, Jeanne & Guscina 2006). Burger and Warnock (2003, 2004), for instance, find that foreign purchases of local currency bonds in emerging markets are negatively correlated with past inflation performance. This finding is supported by Ciarlone, Piselli and Trepeschi (2006), who find evidence that low volatility of inflation and low levels of public debt foster the demand for local currency bonds. But the abandonment of long-term local currency debt markets was not an inevitable consequence of higher inflation, however. During the inflationary period of the late 1970s, for instance, most industrial countries continued to issue long-dated debt with high nominal coupons. In some cases, the market signal sent by the steep rise in nominal long-term rates during that period often served to create a constituency that could exert meaningful political pressure against inflation. This "constituency creating" effect was particularly powerful when mortgage rates were driven by the market rate on government bonds (Sokoler 2002). In addition, financing government deficits at long maturities meant that central bank action to raise short-term interest rates was not inhibited by a significant impact on budget deficits. But such effects, while important, were not necessarily decisive, and many countries had significant long-term, fixed-rate local currency bond markets before experiencing episodes of high inflation.

According to Werner (2012) Inflation protection is one of the central goals of strategic asset allocation since the beginning of the hyper-expansive monetary policy witnessed during the financial crisis and thus, led to the development of inflation-linked bonds which has expanded around the globe in recent years and they have become integrated in many portfolios.

Inflation-linked bonds are securities that protect the purchasing power of the investment. The goal of inflation-linked bonds is to ensure purchasing power by directly linking returns to inflation for the bond's entire term. Linkers therefore contain two forms of payment: the real interest that is fixed at the beginning of the term, and compensation for the loss of purchasing power. In recent years, the linker market has also grown sharply in the emerging markets (particularly in Brazil, Mexico, Turkey, and South Africa). In addition, there are several issues of inflation-linked bonds by private issuers, mostly banks or pension funds. However, governments are by far the largest issuers of these securities. As of April 2012, the global market value of inflation-linked government bonds was approximately $2.0 trillion (Barclay's research 2012). Nasser and He (2003) suggested that inflationary pressures appear to play a key role in pushing up bond yields, however once inflation become more visible, the nominal risk-free rate was raised as interest rates rose. This affected the bond market negatively as bond prices fell due to a high yield required by the investors. The duo goes on to point that the fear of inflation has made many bond managers to shorten the duration of their portfolio and seek relative safety in the short to intermediate term sectors which in turn may also affect liquidity.

2.1.10.10 Human Development Index

Human development is measured by UNDP as a comprehensive index called human development index (HDI) – reflecting life expectancy, literacy and command over the resources to enjoy a decent standard of living". HDI is a composite index used to rank countries by level of human development and classify countries as developed, developing and underdeveloped countries. The key components of HDI include data on life expectancy, education and per capita GDP. This composite accounts for income, education and health. The human development index (HDI) of Nigeria, is 0.527 points in 2015, leaving it in 151th place in the table of 187 countries and South Africa ranked 0.666 points leaving it in 118th

place. Diamond (1994) noted that a well-developed financial system is an important complement to the development of human resource in the growth process. The relationship between financial development and human capital, although acknowledged in the theoretical literature remains less explored at the empirical level. The literature suggests that better educated people are less risk averse, have high information, and are high savers. Therefore, improving educational levels including adult education provides new opportunities to people empowerment.

Education also allows people to move from informal sector to formal sector opportunities enabling them access to formal financial services. Financial sector development through credit channels also enables human capital accumulation and influences economic growth. Thus, the effect is both ways.

Financial development and strong human capital endowment can foster an efficient use of borrowed funds better than savers acting individually. It can also improve managerial efficiency by promoting competition through effective takeover or threat of take over.

Demirguc-Kunt and Maksimvonic (2005) argue that financial development and human capital enable particular entrepreneurs to undertake innovative activity, which affects growth through productivity enhancement, and viewed financial and human capital climate as playing an important role in dampening the impact of external shocks on the domestic economy. They conclude that, financial systems without the necessary institutional development, human development, educational attainment has led to a poor handling or even magnification of risk rather than mitigation.

2.2 Theoretical Framework

Various theories have attempted to explain the phenomena of bond market development in the literature. Some include: financial intermediation theory; rational expectation theory, bondholders' theory; debt overhang theory, interest group theory. The theoretical framework

on bond market development for the study will focus on the Rational Expectations Hypothesis and the Debt Overhang Theory. This is because as macroeconomic announcements may contain new information regarding the state of the economy, bond market participants expect to react on the news release accordingly and thus move the market.

The Debt Over-Hang Theory

This phenomenon according to Myers (1977) assumes that debt overhang can lead to under-investment.That is where the debt stock of a nation exceeds its capacity to repay it, which could lead to a dwindling economy as a consequence of poor business environment, and dearth of investment. Reinhart, Reinhart and Rogoff (2012) call the deterioration of the economy due to an increase in public debts a public debt overhang. The process of hinging external debts on infrastructural projects, or conversion of such debts to project driven bond financing has great potentials for bond market development, and could be perceived as a debt enhancement strategy. This is so-called in view of the fact that the same debt, if mobilized and converted to project-driven bond   financing could correct the overhang tendency, and enhance the effectiveness of debt management (Mailafia, 2014).

The relationship between debt financing and bond market steadily improves for an economy that is properly utilizing the debt especially if project driven. In such situation, a debt could stir up business activities, but if it exceeds a sustainable threshold, it could lead to a dearth of liquidity within the economy. This is because the money that would ordinarily be spent for infrastructural development could be channeled towards servicing the debt, a situation that could make the economy to shrink, which could in turn adversely affect the bond market in the long run.

The Rational Expectations Theory

Established in 1961 by John Muth assumes that economic agents are rational optimizers in making forecasts and take actions based on such forecasts, implying that prices react only to the unexpected component of announcements. He forward his hypothesis, in contrast to Simon, that "expectations, since they are informed predictions of future events, are essentially the same as the predictions of the relevant economic theory." Muth continued, "At the risk of confusing this purely descriptive hypothesis with a pronouncement as to what firms ought to do, we call such expectations *rational*." In particular, the hypothesis asserts that the economy generally does not waste information, and that expectations depend specifically on the structure of the entire system.

The hypothesis asserts three things: (1) Information is scarce, and the economic system generally does not waste it. (2) The way expectations are formed depends specifically on the structure of the relevant system describing the economy. (3) A "public prediction," in the sense of Grunberg and Modigliani, will have no substantial effect on the operation of the economic system (unless it is based on inside information)

There is a general consensus in the literature that macroeconomic announcements have significant effects on financial markets, both in terms of asset returns and their volatility. However, markets appear to react not to data releases per se but to the unexpected component of these releases. Consistent with theoretical predictions, market reaction to an announcement is stronger if its surprise content is higher.

Das, Ericson and Kalimipalli(2003) suggest that there are three types of news shocks common to bond markets. These are intra-day calendar effects, public information effects and GARCH effects. Nevertheless, Das *et al.* points out that unlike stock and corporate bond markets, the government

bond market is driven mainly by public information or macroeconomic news events. Consistent with Das *et al.* (2003), Balduzzi,and Monneta (2001), Gurkay-nak, Sack and

Swanson (1998), Jones, Owen and Robbin (1998) and Nasser and He (2003) state that macroeconomic variables determine liquidity in bond markets and macroeconomic news affect strongly bond price volatility and the adjustment occurs within one minute after the announcement.

According to Nasser and He (2003), investors have become concerned with overall trends than with individual company fundamentals. Since both stocks and bonds are investment alternatives that compete for the investor's funds, the funds flow from one market to another due to a change in market situation and macroeconomic factors. They pointed out that a number of studies have reported a negative relationship between long-term government bond rate and the stock prices in the US and UK. Davis (1999) concurs with Nasser and He (2003) and revealed movements of the economy and/or of interest rates as of overriding importance in the purchase of fixed-income securities. A rise in interest rates, due for instance, to monetary policy tightening may lead to a financial crisis, with liquidity collapses in security markets. In addition, in the presence of uncertainty, adverse surprises may trigger shifts in confidence, affecting markets and institutions more than appears, thus introducing the potential for a liquidity crisis. In South Africa, exchange rate fluctuation has a major impact on the secondary bond market liquidity considering that foreign investors play an active role in bond trading.

Further, Nasser and He (2003), shows that economic prospects have increasingly affected the world's capital markets. It is suggested that inflationary pressures appear to play a key role in pushing up bond yields. Rutledge (1995) shows that growth in the world economy in the past caused intensive competition for capital, giving investors attractive alternatives to fixed income instruments. However once inflation become more visible, the nominal risk-free rate was raised as interest rates rose. This affected the bond market negatively as bond prices fell due to a high yield required by the investors. Nasser and He (2003) goes on to point that the

fear of inflation has made many bond managers to shorten the duration of their portfolio and seek relative safety in the short to intermediate term sectors which in turn may also affect liquidity.

The discussion above clearly shows that macroeconomic variables do have an impact on bond market liquidity. Thus in modelling our empirical regression, macroeconomic factors to be included in our model are interest rate, inflation rate, exchange rate, and budget deficit.

Furthermore,the level of economic development influences the bond market in one way or the other. This is confirmed by Jhingan (2007) who posits that there is a correlation between changes in bond market development and level of economic development. It could therefore be deduced that Bond Capitalization is a function of economic development. This is derived from Leibenstein's (1957) theory on shocks and stimulants as cited in Jhingan (2007), which could be explained by decrease or increase in per capita income.

It could therefore be deduced that bond market capitalization correlates with economic size. Blackburn and Hung (1998) documented a positive relationship between economic growth and financial activity. This is in line with the Domar model for economic growth, which delves on the relationship between capital accumulation and growth in output. The increase in bond market size is a form of capital accumulation, while transformation in GDP, which translates to economic size, could be perceived as growth in output (Mailafia, 2014).

2.3 Empirical Review

Empirical literature on the determinants of bond market development is limited, especially in emerging economies of Sub-Sahara Africa. However, vast literature has been done using various macroeconomic variables to examine the bond market development within and outside Sub-Sahara Africa emerging economies.

The empirical works on the bond market development and its major determinants has focused mainly on developed countries and the Asian economies. The few empirical works that

addressed this issue in sub-Saharan Africa focused on Kenya see Ogilo (2014), Nyongesa (2012), Ringui (2010), Ndida (2009), Adelegan & Radzewiczbak (2009). Hence, the need to look at the empirical studies relating to bond market determinants as they affect the economic growth of emerging Sub Sahara African economies like Nigeria and South Africa.

Review on Macroeconomic variables and bond market development

The study looked at the following macroeconomic variables: inflation, interest rate, exchange rate, external debt, budget deficit.

Mbugua (2003) examined the effects of macroeconomic variables on the corporate bond market which are seen to impede the development of a market that is required to boost economic growth. The study period spanned 1997-2004. The study identified and examined the relationship between macroeconomic variables notably exchange rate. The study adopted a short run time series linear econometric model to estimate effects and contribution of these variables as determinants of domestic bond market development. The study found that exchange rate, interest rate and bank credit variables negatively affected the development of the corporate bond market.

Ferrucci (2003) extended this study by identifying short-and long-term determinants of sovereign bond spreads. He concludes that the degree of openness, the ratio of amortizations to reserves, the external debt to GDP ratio, and the ratio of current account to GDP are all significantly correlated with sovereign bond spreads. He also found that global liquidity conditions and U.S. equity prices are also correlated with sovereign bond spreads.

Jahjah and Yue (2004) studiedthe impact ofExchange Rate Policy and Sovereign Bond Spreads in 51 Developing Countries and found that an overvalued real exchange rate significantly increases sovereign bond issue probability and generally raises bond spreads. They also noted that the magnitude of this effect depends on the exchange rate regime; i.e. different exchange rate regimes have different impacts on spreads and on the likelihood of issuing bonds, also in time of debt crises, the exchange rate policy still affects bond spreads, while most fundamentals lose their impact. They also performed a robustness test with different exchange rate misalignment measures and more macroeconomic variables, and we correct for potential endogeneity problem. Their results remained unchanged.

Hale (2005) Tested how macroeconomic fundamentals affect the composition of international debt instruments used by EM borrowers using the OLS regression. The analysis confirms that macroeconomic factors such as the debt service to exports ratio, the degree of the real exchange rate appreciation, the volatility of exports, and the history of sovereign debt rescheduling, among others, affect debt instrument composition in an expected direction.

The results also show that macroeconomic fundamentals explain a large share of variation in the ratio of bonds to loans for private borrowers: 26% of the cross-country variation and 4% of the time variation.

Njihia (2005) carried out a study on determinants of determinants of the corporate bond market in Kenya. The main objective of the study was to assess the effects of macroeconomic variables on the corporate bond market which are seen to impede the development of a market that is required to boost economic growth. The study found out that exchange rate, interest rate variables negatively affect the development of the corporate bond market which calls for implementation of sound policies. Inflation, equity and Treasury bond variables showed no significance despite the existence of theories explaining their roles and significance in bond market development.

Mihaljek, Scatigna and Villar (2002) noted that the cross-country relationship between fiscal deficits (as a percentage to GDP) accumulated since 1995 and the size of the public sector debt market confirms that countries with larger fiscal deficits have issued more public sector bonds in domestic and international markets. They pointed that Chile, Hong Kong and Malaysia have been issuing public sector bonds primarily for the purpose of debt market development, as all three economies accumulated large public sector surpluses during 1995–2000.

Eichengreen and Luengnaruemitchai (2004) identified, the interest rate variability, the level of interest rates and the exchange rate regime as determinants of bond market development. However, the research is limited to Asia. They regress several measures of domestic currency bond market capitalization on various explanatory variables, and estimate these equations using generalized least squares, with heteroskedasticity and panel-specific autocorrelation correction. For determinants of the stock of public bonds, they find that GDP at purchasing power parity, exports, English origin, distance from the equator, a positive investment profile, and an open capital account are positive and significant while GDP per capita at purchasing power parity, banking sector concentration, bureaucracy quality, the interest rate spread, exchange rate volatility, and the fiscal balance are negative and significant. For private bonds, they find that GDP at purchasing power parity, exports, Asia dummy, distance from the equator, corruption, accounting standards, domestic credit, and bureaucracy quality are positive and significant while English origin, the interest rate spread, and exchange rate volatility are negative and significant They conclude that market size matters; poor accounting standards hinder development of private debt markets, along with corruption and low bureaucratic quality. Stability of exchange rates encourages bond market development,

and an absence of need for public financing discourages public bond markets. Capital controls also discourage bond market development.

Claessens, Klingebiel, and Schmukler, (2006) analyzed which factors are related to government debt issuance in domestic and foreign currency. The study was conducted using the OLS regression analysis and found that institutional and macroeconomic factors are related to the depth and currency composition of government bond markets.

Burger and Warnock (2006) analyzed the development of 49 local bonds market. They found out that countries with stable inflation rates and strong creditors' rights have more developed local bond markets and rely less on foreign currency-denominated bonds. This suggested that "Original sin" is a misnomer and emerging economies were not inherently dependent on foreign currency debt. If they improved policy performance and strengthened institutions, they would develop local currency bond markets and reduce currency mismatch.

Ameer (2007) examined the impact of macroeconomic factors on the stock and bond market activities in two Asian countries using the vector autoregressive models (VARs) and found that there has been a two-way relationship between interest rate changes and bond issuance in the case of South Korea.

Özatay, Özmen and ġahinbeyoğlu (2007) examined the impact of global financial conditions, US macroeconomic news and domestic macroeconomic fundamentals on the evolution of EMBI spreads for a panel of 18 emerging market countries using daily data. They found that the long-run evolution of EMBI spreads depends on external factors such as changes in global liquidity conditions, risk appetite and crises contagion and domestic macroeconomic fundamentals proxied by sovereign country ratings are important in explaining the spreads and EMBI spreads respond substantially also to US macroeconomic news and changes in the Federal Reserve's target interest rates.

Guscina, (2008) analyzed the role of macroeconomic, political, and institutional factors in determining the structure of government debt in EM countries using the multivariate regression. Results show that unstable macroeconomic environment, poor quality institutions, and uncertain political climate hinder the development of domestic debt market.

There is evidence on bond market development from SSA, which advocates a regional approach with some exception to a number of determinants. Adelegan, and Radzewicz-Bak, (2009) analyzed the determinants of bond market development in a cross section of 23 sub-Saharan African (SSA) countries between 1990 and 2008 using multivariate regression analysis. The result show that confluence of factors matters for the development of domestic bond markets in SSA; these include structure of the economy, investment profile, law and order, size of the banking sector, the level of economic development, and various macroeconomic factors.Since their study has a regional approach, all the variables may not necessarily suffice if only a single country in the SSA is considered.

Gadanecz and Mehrotra (2011) examined the relationship between exchange rate flexibility and the development of financial markets using correlation. They found out that a multitude of different factors influence financial market development, and the credibility of the chosen foreign exchange rate regime also plays a non-trivial role. Besides, the relationship between exchange rate flexibility and financial market development may be subject to reverse causality.

Bhattacharyay, (2011) examined factors that promote effective development of bond markets in Asia using the multivariate Ordinary Least Squares (OLS), he noted that the exchange rate variability, and interest rate variability have a significant relationship with total bonds—the sum total of government and corporate bonds.

Nyongesa,(2012) used the multivariate OLS method to study the factors that influence bond liquidity in the secondary bond market in Kenya based on the internal characteristics of bonds and macro-economic factors. The result shows that bank lending interest rate, foreign exchange rate, savings interest rate and domestic debt are factors that influence the turnover of bonds and by extension its liquidity.

Bae (2012) examines the determinants of bond market development on 43 developing and developed countries over the 1990–2009 period, with a focus on China. This study distinguishes public, private, and financial bond markets. The main findings are that the degree of economic development, measured by GDP per capita, is the most important variable. In government bond markets, the fiscal balance is robust, with higher deficits leading to larger bond markets. In financial bond markets, no variable is robust, except GDP per capita. In corporate bond markets, low interest rates, a large banking sector, and well-developed government bond markets are conducive to market development, Institutional quality does not seem important.

Chowdhury,Bayar and Kilic (2013) examined the effects of major macroeconomic fundamentals on emerging market bond index using OLS and noted that there is a positive relationship between bond index spread and foreign direct investment, inflation and a negative relationship between bond index spread and GDP, reserve in total external debt.

Kolawole, S and Olalekan, M S (2013) investigates the effects of exchange rate volatility on the Nigeria stock markets through the Error Correction model. It was found that the exchange rate volatility generated via GARCH process exerts a stronger negative impact on the Nigeria stock markets. However the rate of inflation and interest rate did not have long run relationship with stock market capitalization since the major participant in the market is government.

Mailafia, (2014) examined the influence of bond market determinants on the development of the bond market in Nigeria using the Vector Error Correction Model (VECM). He found that bank size, external debt, money supply and size of the economy are most important significant determinants of corporate bond market development in Nigeria. Also, level of economic development, budget deficit and bank size are significant determinants of government bond market size in Nigeria.

Ogilo, (2014) examined the effect of selected macro-economic variables on bond market development in Kenya using the OLS regression and his findings were that exports and fiscal policy had no effect on bond market development while exchange rate, interest rate had a positive effect.

Andrew & Spiegel (2015) explored the relationship between inflation and the existence domestic-currency bond market. And discovered that the effect is economically and statistically significant. They concluded that bond markets constitute an effective bulwark in the defense of an inflation-targeting regime.

Dung, and Quang, (2015) Examined the effect of macro-determinants on the issuing of corporate bonds of firms in 90 developed and developing countries over the period of 1970-2013 using

GMM model (Generalized Method of Moments). The result show that exchange rate variability and the bond value in the previous year have positive influence on corporate bonds issuance.

Garcia, & Werner (2016) examined the power of macroeconomic factors to explain euro area bond risk premia using Least Angle Regression (LARS). Macroeconomic factors, in particular economic activity and sentiment indicators, explain 40% of the variability of risk

premia before the crisis, and up to 55% during the financial crisis, and both for core countries (from 40% to 60%) and periphery countries (from 35% to 44%).

Akinsokeji, Abidemi, Adegboye and Edafe, (2016) Examined the empirical impact of bonds market on aggregate investment and the Nigerian economy using the Vector Error Correction Method (VECM). It was found that savings tends to promote widening of the bonds market while fiscal financing increases the depth of the market.

Nkwede, Uguru, and Nkwegu, (2016) studied the macroeconomic determinants of corporate bond market development with respect to the Nigerian bond market using the OLS regression. The result shoes that macroeconomic factors such exchange rate, savings, inflation rate, interest rate, fiscal balance, bond yield and foreign direct investment are main drivers of corporate bond market development in Nigeria.

Review on Financial market variables and bond market development

Financial markets constitute part of portfolio of finance sources, which provide external finance just as bond markets. But their role cannot be taken in isolation. Although it is glaring that a combination of these financial sources is required for effective project financing, a research effort is necessary to examine the level and direction of contribution of these markets under study i.e. the stock market and the banking sector to the bond market in an economy. This would facilitate policy direction and decision making.

It is glaring that there is a link between banks and bond market development although the direction and magnitude may not be quite clear, and may differ depending on the features of the banking sector. Jiang and Law (2001), in their study shows that bond issuance and bank

lending are positively correlated both in countries of the Organisation for Economic Cooperation and Development (OECD) and the emerging economies.

Njihia (2005) studied determinants of the corporate bond market in Kenya and found out that bank credit negatively affect the development of the corporate bond market which calls for implementation of sound policies.

Ameer (2007) examined the impact of macroeconomic factors on the stock and bond market activities in two Asian countries using the vector autoregressive models (VARs) and found that stock returns have significantly influenced the bond issuance in Malaysia.

Yartey (2008) examined the institutional and macroeconomic determinants of stock market development using a panel data of 42 emerging economics for the period of 1990 to 2004 and found that, gross domestic investment banking sector development, private capital flows and stock market liquidity are important determinants of stock market.

Ringui (2012) examined the factors determining corporate bonds market development in Kenya. The study results suggest that political, macroeconomic and regulatory factors account fully in determining corporate bond market development in Kenya. Overall, the results show that a confluence of factors matters for the development of corporate bonds market in Kenya; these include political environment of the country, investor base, and regulatory framework, size of the banking sector, the cumbersome nature of issuance process, and various macroeconomic factors.

Kemboi and Tarus (2012) studied the macroeconomic determinants of stock market development in emerging markets, using quarterly secondary data for the period 2000 to 2009 by applying Johansen-Juselius Cointegration analysis. The results indicates that macro-

economic factors such as income level, banking sector development and stock market liquidity are all important determinants of the development of Nairobi stock market.

Kapingura and Ikhide (2011) Analysed the main determinants of liquidity of the South African bond market using the Vector Error Correction technique (VECM). The result show that innovations in repo rate, stock market index, volume of trading, foreign investor participation and volatility impact on bond market liquidity.

Ayunku and Etale (2015) examined the determinants of stock market development for the period of 1977-2010.The study further investigated the long run and short run relationship between the variables, using ex-post facto research design and the utilization of Johansen Co-integration and Error Correction Model (ECM) approach. The empirical result indicates that market capitalization, credit to private sector and exchange rates are all important determinants of stock market development both in the long run and short run in Nigeria as these variables have positive effect and thus stimulate economic growth in Nigeria.

Raghavan and Sarwono (2012) also agreed with the fact that the equity and the bond markets could either play complementary roles through provision of alternative sources of external finance to companies, or compete with each other through companies' choice of financing investments from the equity market rather than the bond market. Claessens, Klingebiel, and Schmukler, (2006), Jeanne and Guscina (2006), and Adelegan and Radzwiczkbak (2009) all find out that a positive relationship exists between stock capitalization and government bond market development (share of the Debt to GDP).

Eichengreen and Luengnaruemitchai (2004) examine the relationship between the banking sector and bond market development for 41 countries and documented that countries with competitive, well-capitalized banking systems have larger bond markets. These studies point to a 58 complementary relationship between banks and bond market development. The mixed

results suggest a need for further research to explore the relationship between banks and corporate bond market development. This means that deposit money banks could either play competitive or complementary roles.

Bhattacharyay, (2011) examined factors that promote effective development of bond markets in Asia using the multivariate Ordinary Least Squares (OLS). The study was conducted with a view to enhance corporate bond financing by examine factors that affected the effective development of bond markets in Asia. It also intended to provide policy recommendations for the further development of the Asian bond market. He noted that the size of the banking system, have a significant relationship with total bonds—the sum total of government and corporate bonds.

Kee-Hong (2012) explored which variables—macroeconomic, institutional, and capital controls—are most important in explaining cross-country differences in bond market development. It used the ratio of amount of local currency bonds outstanding over GDP as a measure of bond market development from 43 countries during 1990–2009 and found that a mature and well-developed banking sector is critically important to the further development of bond market, particularly to the corporate bond market.

Raghavan and Sarwono (2012) pioneered in India by conducting a research on determinants of corporate bond market in this country. Learning from experience of other countries where the corporate bond markets were well-developed, the authors identified and accessed the influences of: (i) the development stage of the economy, (ii) the natural openness, (iii) the size of the banking system, (iv) the size of the government bond market, (v) the development of the stock market and (vi) corruption index on the corporate bond market development. However, only the development of the government bond market and bank lending were found to be correlated with the growth of the corporate bond market.

Ogilo, (2014) examined the effect of selected macro-economic variables on bond market development in Kenya using the OLS regression and his findings were that bank size had no effect on bond market development.

Nkwede, Uguru, and Nkwegu, (2016) studied the macroeconomic determinants of corporate bond market development with respect to the Nigerian bond market using the OLS regression. The result shoes that banking sector development is among the main drivers of corporate bond market development in Nigeria.

Developmental variable and bond market development

The development of the economy is expected enhance bond market development. FSDI (2010) reveals that countries, which have less developed or non-existent domestic bond markets are generally small countries. Evidence provides that for most countries there is a direct correlation between bond market size and level of economic development.Diamond and Dybvig (1993) examined the impact of financial development on the rates of investment in physical and human capital. Financial development in their study leads to the accumulation of physical capital positively and significantly. The authors however, noted a weak relationship between the financial development and human capital. This could be due to the choice of particular variables (the authors also mention that different results may be possible if enrolment ratios instead of average years of schooling is considered and the rigours of the cross country exercise.

.Braun and Briones (2006) establish that the level of economic development impacts greatly with significant variations cross countries after controlling for the earlier (level of economic development). Their study further established that Latin American countries and Chile exhibit small differences in the level of development of their bond markets.

Sprcic and Wilson (2007) investigate the factors influencing the speed of development of corporate bond markets in Croatia and, within that, to investigate the factors that chief financial officers in large Croatian companies consider important in using corporate bonds as a financing method and the barriers they perceive as inhibiting issuing of corporate bonds. A survey was carried out of a sample of chief financial officers from the largest companies in Croatia. The study found that a range of macro level, industry level, market level and firm level factors influence the rate at which corporate bond markets develop and that, in Croatia, progress can be expected to be inexorable, but slow.

Standley (2010) states that financial market size is   strongly related to the size of the economy, a finding that is true for both equity and debt markets with the size and activity of most exchanges aligned with each country's level of economic development.

Hakeem (2010) employing augmented Solow model in a panel data framework examined the impact of financial development and human capital in facilitating economic growth in the East Asia region. The study found a complementary relationship of the financial development and human capital to economic growth in the region. However, it noted lower impact of the financial development on growth which could be due to the existence of financial repression, low institutional development, and poor infrastructure.

Bhattacharyay, (2011) examined factors that promote effective development of bond markets in Asia using the multivariate Ordinary Least Squares (OLS). The study was conducted with a view to enhance corporate bond financing by examine factors that affected the effective development of bond markets in Asia. It also intended to provide policy recommendations for the further development of the Asian bond market. He noted that the size of an economy, the stage of economic development, the openness of an economy, the exchange rate variability, the size of the banking system, and interest rate variability have a significant relationship with total bonds—the sum total of government and corporate bonds.

Ogilo, (2014) examined the effect of selected macro-economic variables on bond market development in Kenya using the OLS regression and his findings were that GDP per capita had a positive effect. However, economic size measured as GDP at purchasing power parity had a negative effect.

Dung, and Quang, (2015) Examined the effect of macro-determinants on the issuing of corporate bonds of firms in 90 developed and developing countries over the period of 1970-2013 using

GMM model (Generalized Method of Moments).The result shows that the impact of the openness of the economy is negative.

2.4   Summary of Literature Review

Authors	Date	Topic	Objective	Method	Variables	Findings	Recommendation
Galina Hale	2005	Bonds or Loans? The Effect of Macroeconomic Fundamentals	Tests how macroeconomic fundamentals affect the composition of international debt instruments used by EM borrowers	OLS regression	Dependent: bond yield, bank loan Independent: real GDP, domestic credit, inflation, interest rate.	Macroeconomic fundamentals explain a significant share of variation in the ratio of bonds to loans for private borrowers, but not for the sovereigns.	More rigorous study would require simultaneous analysis of both markets due to the possibility of substitution between the two instruments
Claessens, S Klingebiel, D Schmukler, S L		Government Bonds in Domestic and Foreign Currency: The Role of Institutional and Macroeconomic Factors	Analyzed which factors are related to government debt issuance in domestic and foreign currency in USA.	OLS regression	Dependent: Total bond market size Independent: Total deposit, inflation index, fiscal burden, GDP, exchange rate.	Finds that institutional and macroeconomic factors are related to the depth and currency composition of government bond markets.	A well-developed financial system with a relatively large pool of domestic investors may help to develop local currency debt markets, given that domestic investors are the ones that tend to demand domestic currency debt.
Kee-Hong Bae	2012	Determinants of Local Currency Bonds and Foreign Holdings: Implications for Bond Market Development in the People's Republic of China	Explores which variables—macroeconomic, institutional, and capital controls—are most important in explaining cross-country differences in bond market development.	Multiple correlation	Dependent: Bond market capitalization Independent: : Bank credit, fiscal balance, GDP, lending rate, Economic size, stock capitalization, export and institutional variables.	Mature and well-developed banking sector is critically important to the further development of bond market, particularly to the corporate bond market.	Domestic bank liberalization is also a complementary condition for corporate bond market development,
Chowdhury, S. L BAYAR, Y KILIÇ, C.	2013	Effects of major macroeconomic fundamentals on emerging market bond index	examines the effects of major macroeconomic fundamentals on emerging market bond index	OLS regression	Dependent: bond index spread Independent: FDI, net domestic credit, total revenue, expenses, external balance, GDP, unemployment, total reserve.	There is a positive relationship between bond index spread and foreign direct investment, inflation and a negative relationship between bond index spread and GDP, reserve in total external debt.	
Guscina, A.	2008	Impact of	analyzed the role of	multivariate	Dependent: domestic	Results show that	Macroeconomic and political stability,

		Macroeconomic, Political, and Institutional Factors on the Structure of Government Debt in Emerging Market Countries	macroeconomic, political, and institutional factors in determining the structure of government debt in EM countries	regressions	currency debt, foreign currency debt Independent: money supply, stock market, private credit, savings, trade.	unstable macroeconomic environment, poor quality institutions, and uncertain political climate hinder the development of domestic debt market.	soundness of institutions are crucial for the development of domestic debt market , increased securitization of both domestic and international government debt, and higher reliance on long-term debt denominated in local currency.
Dung, P, Quang, N T	2015	The Development of Corporate Bond Markets: A Cross-Country Analysis	Examines the effect of macro-determinants on the issuing of corporate bonds of firms in 90 developed and developing countries over the period of 1970-2013	GMM model (Generalized Method of Moments)	Dependent: corporate bond market size Independent: exchange rate, trade openness, bank size, economic size	Exchange rate variability and the bond value in the previous year have positive influence on corporate bonds issuance while the impact of the openness of the economy is negative.	Information about corporate bond issuances as well as their details should be make transparent. This requires the important role of credit rating agencies associated with dependent supervisors.
Garcia, J.A and Werner, S.E	2016	Bond risk premia, macroeconomic factors and financial crisis in the euro area.	To examine the power of macroeconomic factors to explain euro area bond risk premia	Least Angle Regression (LARS).	Dependent: bond risk Independent: economic size, trade, exchange rate, interest rate, stock market, consumer price,	Macroeconomic factors, in particular economic activity and sentiment indicators, explain 40% of the variability of risk premia before the crisis, and up to 55% during the financial crisis, and both for core countries (from 40% to 60%) and periphery countries (from 35% to 44%).	European policymakers as well as market practitioners could exploit the flexible modelling techniques introduced in this paper to measure such risks.
Ogilo, F	2014	The Effect of Selected Macro-Economic Variables On Bond Market Development In Kenya	investigate the effect of selected macro-economic variables on bond market development in Kenya	OLS regression	Dependent: bond market size Independent: Banksize, Budget, GDP, interest spread, Economic size, stock capitalization, exchange rate	Bank size, exports and fiscal policy had no effect on bond market development while exchange rate,	More focus should be given, on the four main variables identified, by the policy makers in order to spur more growth in the bond market.

						interest rate and GDP per capita had a positive effect. However, economic size measured as GDP at purchasing power parity had a negative effect.	
Nyongesa, N W	2012	factors influencing the liquidity of secondary bond market in Kenya"	Determine the factors that influence bond liquidity in the secondary bond market in Kenya based on the internal characteristics of bonds and macro-economic factors.	multivariate OLS model	Dependent: Bond turnover Independent: Bank credit, interest rate. Savings, foreign exchange, domestic debt, inflation, GDP	Bank lending interest rate, foreign exchange rate, savings interest rate and domestic debt arc factors that influence the turnover of bonds and by extension its liquidity.	The monetary authority should also create incentives to encourage investors to trade In the secondary market in debt instruments rather than buying and holding securities to maturity.
Ameer, R	2007	**What moves the primary stock and bond markets? Influence of macroeconomic factors on bond and equity issues in Malaysia and Korea**	examines the impact of macroeconomic factors on the stock and bond market activities in two Asian countries	vector autoregressive models (VARs)	Dependent: bond and stock market returns Independent: equity, interest rate, inflation	There has been a two-way relationship between interest rate changes and bond issuance in the case of South Korea, whereas, stock returns have significantly influenced the bond issuance (instead of equity issuance) in Malaysia.	Policymakers should not only design new policies to attract foreign investors such as tax incentives but also modernize functional aspect of the local bond markets.
Nkwede, F.E, Uguru, L.C, Nkwegu, L.C	2016	Corporate bond market development in Nigeria: does

Macroeconomic factors matter? | studies the macroeconomic determinants of corporate bond market development with respect to the Nigerian bond market | OLS regression | Dependent: Corp. bond capitalization/GDP Independent: Interest,Banksize, FDI, fiscal balance,Exchange rate, Inflation, Saving,Bond yield. | Macroeconomic factors such exchange rate, savings, inflation rate, banking sector development, interest rate, fiscal balance, bond yield and foreign direct investment are main | |

						drivers of corporate bond market development in Nigeria.	
Mailafia, L.	2014	Determinants of Bond Market Development in Nigeria	examines the influence of bond market determinants on the development of the bond market in Nigeria	Vector Error Correction Model (VECM)	Dependent:total bondmarket size Independent: Banksize, Budget, GDP, interest spread, money supply, stock capitalization, external debt, banksize	Bank size, external debt, money supply and size of the economy are most important significant determinants of corporate bond market development in Nigeria.	developing the capacity of the banking sector to provide more qualitative and productive credit, channeling a substantial part of the existing pension funds towards investing in bonds, balancing bank finance and bond markets, and restricting finance raised through external borrowing to infrastructural projects.
Akinsokeji, R.A, Abidemi C. Adegboye & Edafe, J.	2016	The bonds market, aggregate investment and economic growth in Nigeria	Examined the empirical impact of bonds market on aggregate investment and the Nigerian economy	Vector Error Correction Method (VECM)	Dependent: bond investment Independent: Fiscal deficit, savings, investment rate, GDP.	It is found that savings tends to promote widening of the bonds market while fiscal financing increases the depth of the market.	Information about the bond market should be more widely disseminated to encourage more private sector participation. In this direction, effort must be put in place to enhance confidence of the citizens in bonds market.
OGBOI , C. NJOGO ,B.O NWANKWO, E	2016	Bond Market Development and Economic Growth in Nigeria (1982-2014). A Gmm Approach	to analyze the impact of Bond market development on the economic growth of Nigeria	Generalized Method of Moment (GMM-IV)	Dependent: bond size Independent: Private sector credit , gross national income.	Bond market have positive but statistically insignificant effect on economic growth	Bond market be deepened by instituting incentives that can attract corporate patronage and institutional investors.
Bhattacharyay, B.N	2011	Bond Market Development in Asia: An Empirical Analysis of Major Determinants	To examine factors that promote effective development of bond markets.	multivariate Ordinary Least Squares (OLS),	Dependent: bond market size Independent: Economic size, developmental stage, openness, banking sector, interest rate spread.	It is to be noted that all the above five determinants have a significant relationship with total bonds—the sum total of government and corporate bonds.	To further strengthen bond financing in Asia, individual economies and the region as a whole need to enhance these key determinants.
Forget Kapingura, Sylvanus Ikhide	2011	Econometric Determinants of Liquidity of the Bond Market:	Analyses the main determinants of liquidity of the South African	Vector Error Correction technique (VECM).	Dependent: bond market liquidity Independent: stock market index, volume of trading,	Innovations in repo rate, stock market index, volume of trading, foreign	The creation of a vibrant derivative market which would allow effective hedging of interest rate risk as well as credit risk should be encouraged.

		Case Study of South Africa	bond market		foreign investor participation and volatility. .	investor participation and volatility impact on bond market liquidity.	
Adelegan,O J &Radzewicz -Bak, B.	2009	What Determines Bond Market Development in sub-Saharan Africa?	analyzes the determinants of bond market development in a cross section of 23 sub-Saharan African (SSA) countries between 1990 and 2008.	multivariate regression analysis	Dependent: bond market capitalization Independent: economic size, openness, banksize, interest rate	confluence of factors matters for the development of domestic bond markets in SSA;	Increased efforts to strengthen the investment environment and the need for a regional approach to bond market development.
Andrew K. R & Spiegel, M.M	2015	Domestic Bond Markets and Inflation	Explores the relationship between inflation and the existence domestic-currency bond market in USA.		Dependent: bond market size Independent: inflation rate	effect is economically and statistically significant	Recommended more structural approach to the issue of simultaneity might prove fruitful. Second, it might be possible to improve on our Measureof bond market presence.
	2015	Determinants of emerging market bond spread in 10 African countries.	Investigates the determinants of bond market spreads over the period 1991-2012 in 10 African countries.	linear regression model	Dependent: bond index spread Independent: inflation, import liquidity, real GDP, current account, political stability export.	Public debt to GDP ratio, political stability index and current account deficit are found to be the major determinants of spreads in most African countries.	Development Financial Institutions (DFIs) such as the African Development Bank, World Bank and International Monetary Fund, should support African governments to effectively use debt for investment purposes not for consumption.
Hong G.M		Determinants of emerging market bond spread: Do economic fundamentals matter?	Empirically analyzed the yield spread determination in emerging market bond issues.	Estimated correlation	Dependent: bond spread Independent: macroeconomic fundamentals	Volatility of bond spreads is systematically influenced by both liquidity and macro fundamentals.	Sound management of macroeconomic fundamentals, especially containing the domestic inflation rate, and keeping her liquidity, especially the international reserves -to-GDP ratio, at a relatively higher level
Kariuki1, N.W. Kagiri, A	2016	Effect of Inflation Rate on Aggregate Bond Performance in Nairobi Securities Exchange in Kenya	Examined the effects of inflation rate on aggregate bond performance in Nairobi securities exchange in Kenya.	Descriptive research design	Dependent: bond market size Independent: Inflation rate	Inflation rate was found to positively affect the aggregate bond performance in Nairobi Securities Exchange in Kenya	Government through its policy makers should come up with measures and policies that will help control and stabilize inflation rate fluctuation in the bond market

Raghavan, S.Sarwono, D.	2012	Development of the Corporate Bond market in India: an Empirical and Policy Analysis	Trace the development of corporate bond markets in India, identify factors which have influenced its development and suggest policy reforms to enhance its development	multivariate regression analysis	Dependent: corporate bond market size Independent: Economic size, bank lending, openness, stock market and corruption	Growth of the government bond market has been a major positive influence in the development of the corporate bond markets in India, bank lending in India may have slowed the development of the corporate bond market. Other factors such as the size of the economy, openness, size of the stock market and institutional factors like corruption have had little or no impact on the development of the corporate bond market.	Suggested policy reforms includes improving the retail investment markets through issue of Swadeshi or patriotic bonds, encouraging foreign participation by relaxing regulations and providing tax incentives, providing credit enhancements and introduction of new instruments such as credit default swaps and corporate repos.

The available literature show that there exist a strong relationship between macroeconomic factors and bond market development but the measure for bond market development vary. Burger and Warnock (2003, 2004) considered only long-term bonds.

Claessens, Klingebiel and Schmukler (2003) consider both domestic and foreign currency denominated issues, but they limit their analysis to government bonds, putting aside the determinants of corporate bond market growth.

Eichengreen, Hausmann and Panizza (2002) consider corporate as well as government issues, but they too are concerned with currency denomination, not market capitalization.

Several literature have been able to identify various key determinants of bond market development out of which the following were adopted for the research, they include Economic growth, budget deficit, inflation rate, interest rate, external debt, stock market capitalization, bank credit and exchange rate for the purpose of this study.

2.5 Research Gap

Context

Most of these studies reviewed focused on developed and Asian countries with few on the countries under study.

Time Frame

Most literature on the study for the countriesunder review do not extend beyond 2013 like the works of Malafia (1980-2011), Nkwede, Uguru and Nkwegu (1980-2013), Kapingura and Ikhide (2011) in South Africa, studied determinants of bond market liquidity. This study therefore extends the existing literature to 2016.

Variables

The existing empirical studies reviewed have shown the use of a vast range of macroeconomic variables to examine their influence on bond market returns but several

studies do not specify the type or the number of macroeconomic factors that should be incorporated and the findings from the literature are mixed given that they were sensitive to the choice of countries, and the time period studied. The study also included the Human Development Index to in analyzing major determinants of bond market development in the countries under study.

\

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study made use of Ex-post Facto research design because the variables used in the study cannot be controlled by the researcher simply because they have already occurred. The study also examined government and corporate bond markets separately, as the characteristics of these markets are substantially different and requires separate examination. The macroeconomic variables used in the study includes inflation, interest rate, exchange rate, budget deficit, external debt, the two financial market related variables include stock market capitalization and bank credits while GDP and HDI are the measure for developmental factor. The bond market capitalization basically formed the dependent variables of the study, while these determinants formed the independent variable of the study.

3.2 Sources of data

Annual time series data was collected from secondary sources which include the Debt Management Office (DMO), Central Bank of Nigeria (CBN) statistical bulletin, Bond Exchange of South Africa (BESA), South Africa Reserve Bank (SARB), African Security Exchange Association (ASEA) annual reports, online version of world economic development indicators and some empirical work variously sourced from audited annual reports. The data covered 24 year observations between1994 to 2016.

3.3 Description of Research Variables

The variables of the study were generally grouped into two, namely: the dependent and the independent variables. The dependent variable of the study is bond market capitalization used

to represent bond market development and the independent variables of the study include the following:

Inflation (INF): This represents monthly inflation as measured by the Consumer Price Index (*CPI*).

Exchange rate (Exrate): Thisrepresents exchange rate volatilitymeasured by the fixed exchange rate.

External debt (Exdebt): This is the value of external Debt.

Stock Market Capitalization (Stcap): this is the total value of all equity securities listed on a stock exchange and it is a function of the prevailing market price of quoted equities and the size of their issued and paid up capital. Stock market size is used as a measure of the overall degreeof capital market development.

GDP per Capita (GDP): The level of economic development proxied by per capita GDP

**Interest Rate (INT)*:* This is measured by the logarithm of interest rates, Real interest rate is the lending interest rate adjusted for inflation.

Bank Credit (BNK): This is measured by the total value of domestic credit provided by the banking sector to the private sector.

Budget deficit (Bdef): This is measured as the excess of expenditure over revenue.

Human Development Index (HDI): This is measured by the level of human development in a country

3.4 Model specification

The capital market comprises equity and bond market. Ewah Esang and Bassey (2009) posits that the efficiency of capital market in general is determined by a number of factors which include how financial assets are priced, such as interest rate and market price for risk, transactions in buying and selling of securities (liquidity), efficient information system, size

of the stock market, that is market capitalization, number of listed equities and the level of money supply in the economy.

The interrelationship of these factors ensures the efficiency of the capital market to mobilize and allocate resources for economic growth.

The model for this study assumes an underlying relationship between selected macroeconomic variables and bond market capitalization. This is backed up by the plethora of evidence given in various literatures and theoretical framework that underlies the determinants of bond market development. The research method adopted in this study is based on the modification of models used by Ogilo, (2014); Mailafia, (2014); Adelegan and Radzewicz-Bak, 2009; Bhattacharyay, (2013); Burger and Warnock (2006) in analyzing the determinants of bond market development. The model was used to examine the determinants of bond market development in sub-Saharan Africa:

$$BFit = a + bst\ Xit + Eit$$

Where,

BFit is bond market size in proportion to GDP of country i in year t,

Xit are the explanatory variables (namely, GDP of country, exports as a proportion of GDP, per capita GDP, interest rate spread, domestic credit provided by banking sector related to GDP, and exchange rate risk index or variability), and

Eit are error terms with normal distribution with mean zero.

For the purpose of this study, the bond market was disaggregated into the government bond market and the corporate bond market. The variables of interest include bond market (Govt. securities and corporate bond).

From eqn. (1), the equation was remodeled according to specific objectives of the study.

GOVT B= f (INT, INF, Bdef, Exdebt, Exrate)   (2)

CORPB = f (INT, INF, Bdef, Exdebt, Exrate)   (3)

GOVTB = f (Stcap, BNK)   (4)

CORPB = f (Stcap, BNK)   (5)

GOVT B = f (GDP, HDI)   (6)

CORPB = f (GDP, HDI)   (7)

Where:

1. GOVTB. = Government bond market capitalization i.e the total value of all bonds listed on

the stock exchange comprising FGN Bonds, NTB Treasury Bond, and Development Stocks.

2. CORPB = corporate bond market capitalization represented by industrial loans.

3. INT = Interest rate

 4. INF = Inflation

5. Budef = Budget deficit

6. Exrate = Exchange rate

7. Exdebt = External debt

8. Stcap = Stock market Capitalization

9. BNK = Bank Credit

10. GDP = GDP per capita

11. HDI = Human Development Index

 The Ordinary Least Square (OLS) multiple linear regression based on the above functional

relation is:

$logGOVTB = \beta_0 + \beta_{1\,log}INT + \beta_{2log}\,INF + \beta_{3log}\,Bdef + \beta_{4log}Exdebt + \beta_5\,logExrate + \mu$ (8)

$logCORPB = \beta_0 + \beta_{1\,log}INT + \beta_2\,logINF + \beta_{3\,log}Bdef + \beta_{4log}Exdebt + \beta_5\,logExrate + \mu$ (9)

$GOVTB = \beta_{0\,+}\,\beta_1\,Stcap + \beta_2\,BNK + \mu$ (10)

$CORPB = \beta_{0\,+}\,\beta_1\,Stcap + \beta_2\,BNK + \mu$ (11)

$$logGOVTB = \beta_0 + \beta_1 \ _{log}GDP + \beta_{2log} \ HDI + \mu$$

(12)

$$logCORPB = \beta_0 + \beta_1 \ _{log}GDP + \beta_{2log} \ HDI + \mu$$

(13)

Where;1. β and $\beta_{1...5}$ are regression parameters and are used to describe the relationship the relationship that exist between dependent variable and independent variables.

2. β = intercept parameter which is autonomous and = β the explanatory variable parameter.

3. μ is the error term. We introduced a random term in the model to account for those factors that cannot be stated explicitly in the model which also influences the independent variables.

3.5 Method of Analysis

The main tool employed in the course of this research is the ordinary least square (OLS) technique analyzed using the E view 9.0 computer software. In conducting a regression analysis, assumptions were made about the appropriateness of our model for capturing the relationship between the dependent and independent variables. This is to obtain the best linear unbiased estimates of our parameters (Gujarati 2003). The major test for the study include:

Coefficient of Determination (R^2) Test: measures the explanatory power of the independent variable on the dependent variable. It varies between 0.0 and 0.1.

F-Test: Measures the overall significance i.e. the extent to which the statistic of the coefficient of determination is statistically significant. At 5% level of significance, we reject null hypotheses for tests with probability estimate lower than 5% and conclude that they are statistically significant. Otherwise, we accept when probability estimates are above 5% and conclude that there is no overall statistical significance.

Diagnostic Tests

This is a test for the behavior of data when using them for the model estimation. This include basic or descriptive statistics like skewness, kurtosis, normality, mean, median, variance, standard deviation etc. the mean, median and mode would be used to test the aggregative tendencies of the data set while variance, standard deviation, minimum and maximum would test spread and variability of the data sets.

Test for Serial Correlation

This is correlation between the errors in different time periods carried out in a time series or panel data model,. A series is said to be serially correlated where the data are correlated across time and the errors arise from adjacent time periods. It could either be positive or negative serial correlation:

$$\text{Corr}(u, u_s) \neq 0$$

A suspicion of serial correlation may be corrected using;

The Durbin-Watson (DW) Statistics: A test for first order autocorrelation, i.e. a test for whether a (residual) series is related to its immediate proceedings values. One way to motivate the test and to interpret the test statistic would be in the context of a regression of the time t error on its previous value (Durbin & Watson, 1951).

$$U_t = pu_{t-1} + v_t$$

Where: u_t = Error term at time t; p = Probability values; v_t = Variable at time t.

The Breusch-Godfrey Statistics: This is a joint test for autocorrelation that will allow examination of the relationship between the mean of the error term and it's lagged values at the same time. The Breusch-Godfrey test is a more general test for autocorrelation up to the rth order (Godfrey 1978, Pagan and Godfrey 1979).

Test for Heteroscedasticity

This is when the assumption of homoscedasticity is violated by the variables in the model. It is a situation where the variance of the error term is not constant. The presence of this error will make the regression estimators not to be best linear unbiased estimators (BLUE) any longer. Ways to correct this will include use of White tests (1980) and log-linear models (Brooks, 2014).

Unit root test

The Unit root is a standard approach in co-integration analysis used for determining the stationarity of time series data. It can either by performed using the Augmented Dickey Fuller (ADF) or the Philip Perron test.

The problem of stationarity lies with the fact that spurious regression commonly arises where the non-stationary series are used. Analyses and decisions based on such assumption of correlation in the light of spuriousness would not be quite dependable. By stationarity, we mean that the 'mean' and 'variance' are constant over time and the value of the covariance between the two time periods depends only on the distance or lag between the two time periods and not the actual time at which the covariance is computed stationary variables are series presenting constant mean, variance and constant auto covariance for every given lag order, therefore using non-stationary series may cause spurious regressions. In other words regressing non-stationary variables under standard measures might produce valueless and biased results despite the appearance of coefficient estimates and the high value of the coefficient of correlation (R2). The unit root test helps to detect the existence or non-existence of unit roots in data series, hence enabling the researcher to know whether variables are stationary or not.

Ramsey Reset specification test

Ramsey Reset specification test is a stability diagnostic test and was proposed by Ramsey (1969) as a general functional form misspecification test i.e. Regression Specification Error

Test (RESET), which has proven to be useful. It is essentially a model stability tests and helps to give strong level of reliability to the results of the model. The Reset test is a general test for the following type of specification errors:

a) Omitted Variables

b) Incorrect Functional form

c) Correlation between variables which may be caused by measurement error, simultaneous equation combination, combination of lagged values and serially correlated disturbances.

The Reset test is a non-linearity test, or a misspecification of functional form that is a situation where the shape of the regression model estimated is incorrect – for instance, where the model estimated is linear but it should have been non-linear (Brooks, 2014).

The Null hypothesis holds that where the p-value of the test statistics is greater than the level of significance, the result is not significant and the regression model is linear, otherwise we reject the Null hypothesis and accept the Alternative hypothesis that the relationship is significant and the regression model is non-linear.

Granger Causality Test

The Granger Causality test is used to determine the causation that exists between two variables.

It proves the direction of influence. The test assumes that the information relevant to the prediction of the variable are contained solely in the time series data on these variables. Generally, since the future cannot predict the past, if variables x1, x2and x3 should precede y. Therefore, in a regression of y on the variables (including its own past values) if we include past or lagged values x and it significantly improves the predication of y, then we can say that x (Granger) causes y and vice-versa. This test is popularized by Granger, (1969) who assumed that the current values of a variable (Y) is conditioned on the past values of another

(X) or the other way round. This test shows whether a bidirectional or unidirectional causality exists between the variables of interest. In this study, this test shall be adopted to confirm whether macroeconomic variables ie interest rate, External Debt, Exchange Rate, inflation, stock market capitalization, bank credit, budget deficit and Gross Domestic Product (GDP) granger causes growth in bond market or bond market granger causes macroeconomic variables ie interest rate, External Debt, Exchange Rate, inflation, stock market capitalization, bank credit, budget deficit and Gross Domestic Product (GDP). It may also show whether the variables granger causes themselves. Specifically, it will show whether there is a causal relationship between the variables under consideration and if there exist a unidirectional or bidirectional relationship.

3.6 A Priori Expectations

A well-developed bond market is characterized by a large size relative to GDP in all market segments. Therefore it is expected that the GDP, will have a positive relationship with the bond market capitalization.

We also expect a negative relationship between the variability of interest rates, inflation, exchange rate, and bond market development.

The impact of the stock market and the banking sector is expected to be positive if they complement the bond market as a source of financing for the companies but the impact would be negative if they compete with the bond market. It is therefore expected that the banking sector and stock market will have a positive effect on bond market development.

variables	Expected sign	Expected relationship
Economic development	Positive +	positive with larger size economy
Interest rate	Negative -	Negative with high interest rates
Size of the banking system	Positive +	Positive with size and development of banking system
Exchange rate variability	Negative -	Negative with greater variability of exchange rates
Budget deficit	Positive +	Positive with budget deficit
inflation	Negative -	Negative with greater variability of inflation rates
Stock market capitalization	Positive +	Positive with size of stock market
External debt	Positive +	Positive with external debt

| Human Development Index | Positive + | Positive with HDI |

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

INTRODUCTION

This chapter presents the data sourced from the World Bank statistical database, International Monetary Fund (IMF), National Bureau of Statistics and the statistical bulletins of Central banks of Nigeria and South Africa for the periods under study (1994-2016).

The chapter also includes the results of various econometric and statistical methods of estimations adopted in line with the objectives and methodology of the study and the data were analyzed following a methodological approach that allows for short and long run relationships existing between the dependent variable and independent variables of the study.

4.1   Data Presentation

The data in tables in appendices ix and x shows that the stock market size is greater than the bond market size in both countries, nevertheless the government bond market is larger than the corporate bond market for both countries. The Naira has been of more value in terms of Dollars until 1999 when it began to depreciate at a higher rate than the South African rand which actually started appreciating at that stage.

South Africa has no budget deficit until 2000 while that of Nigeria has been on the increase. The value as at 2016 is \$8.7 billion (2.2 trillion Naira). South Africa has maintained a single digit inflation from 1990 to 2016 while that of Nigeria has been on a double digit.

Fig 4.1 Visual Plot of Time Series Data Nigeria
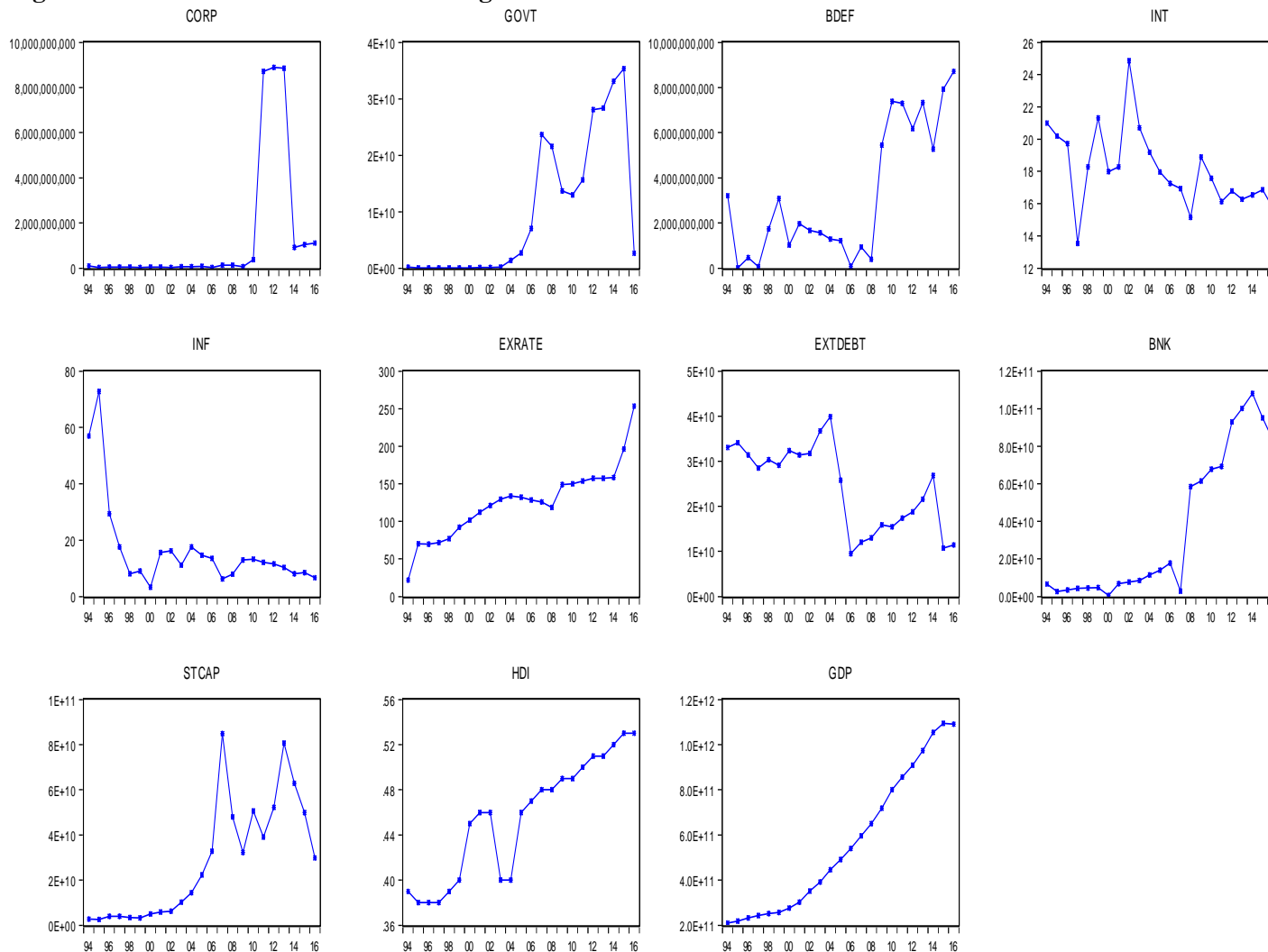
Source: computation by researcher using E-view 9.0

From figure 4.1, the graphical flow of the variables in GDP, EXRATE, HDI and BNK are in linear form as they appreciated from beginning of the study period to the end of the study period with slight

falls in EXRATE in 2009, while the fall in HDI was in 2003 before rising in 2015; BNK also fell in 2007 and 2015 respectively in Nigeria. However, the variables in INF, EXTDEBT and INT started on the high side and fell continuously till the end of the study period with sharp falls and rise at different intervals for different variables. For INT, the graph had sharp fall in 1997, 1999 and 2008 with following rise over the period but fell finally at the end of the period to below 18%. EXTDEBT started on a high and maintain a zigzag flow till 2004 when the debt structure fell drastically after the Paris club debt pardon of 2004/2005 before rising again in 2006 and continuously increase till 2014 before falling again in 2015 and in 2016 a sign of rise in the debt structure was also noticed at the end of the study period. The INF continuously fell and maintain a low rate of not more than 20% after its initial fall from over 60% in the early period of the study. Only CORP maintain a totally strange slope of graphical direction with its line maintain a single straight parallel line before a sharp two year increase and fall in 2011 and 2014 respectively to continue its flow of direction in the Nigerian economy. In like manner, the GOVT also showed a single line direction until 2005 before rising continuously and falling in 2008 continuously to 2010 before another continuous rise in 2011 till 2015 when a sharp fall marked the end of the study period in 2016 for GOVT bond.

Fig 4.2 Visual Plot of Time Series Data Nigeria
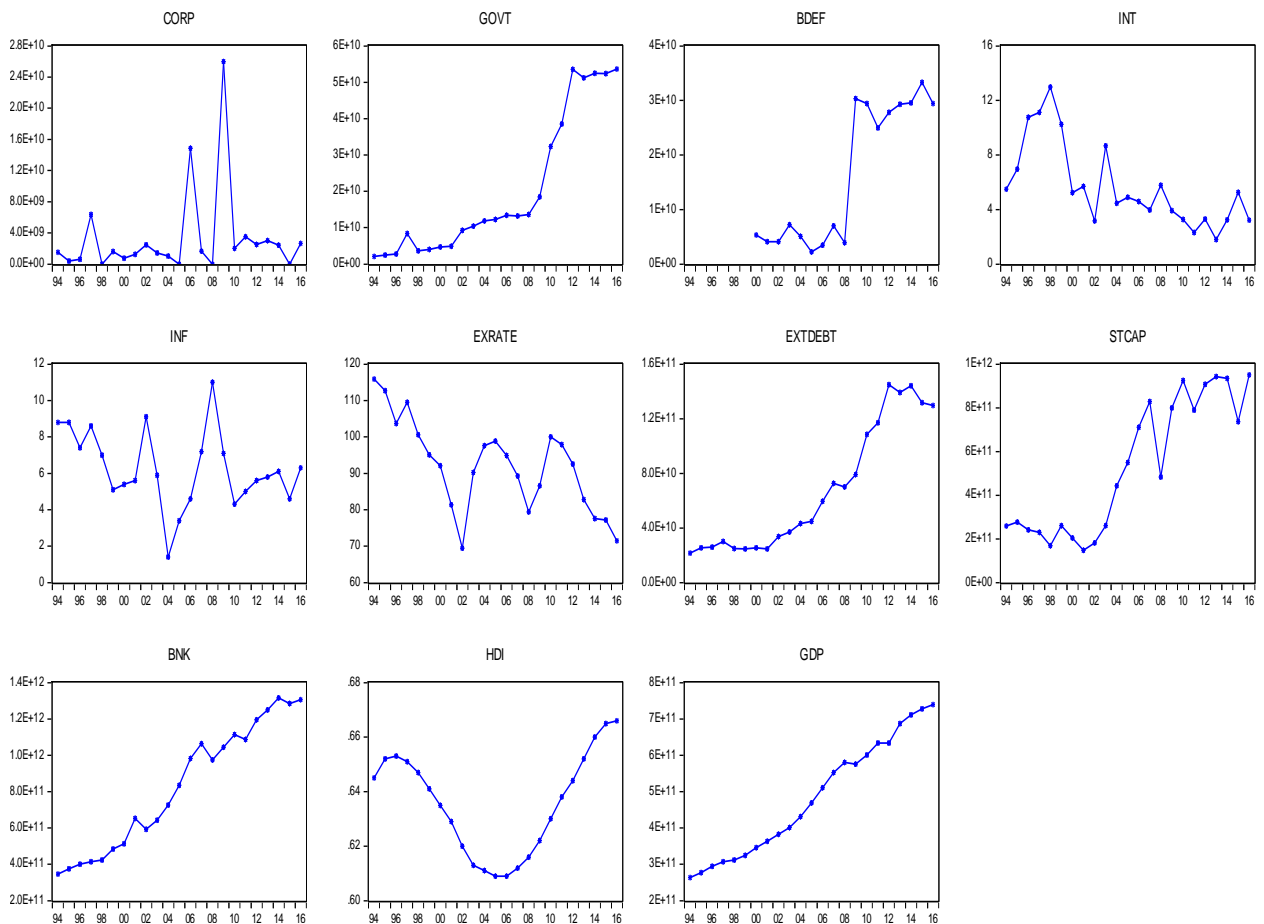
Source: computation by researcher using E-view 9.0

From figure 4.2, the graphical flow of the variables in GOVT, BDEF, GDP, EXTDEBT and BNK are

in linear form as they appreciated from beginning of the study period to the end of the study period

with slight falls in BDEF and EXTDEBT in 2011 and 2016 respectively. Similar to that of Nigeria, the fall in HDI was in 2005 before rising until 2016. However, the variables in INF, EXRATE and INT started on the high side and fell continuously till the end of the study period with sharp falls and rise at different intervals for different variables. CORP maintained a zigzag flow and rose to its highest point in 2009 and thereafter had a sharp decrease till the end of the period under study. STCAP increased until a sharp fall in 2007 and thereafter was fluctuating until the end of the period under study.

4.2 Descriptive Statistics

Table 4.2a Descriptive statistics for Nigeria data

	GOVTB	CORP	EXDEBT	INT	INF	EXRATE	BDEF	STCAP	BNK	HDI	GDP
Mean	7.601626	20.64266	18.84853	23.89002	2.914688	2.689549	4.118476	21.25655	23.17485	22.91904	0.850910
Median	7.601652	20.43564	18.39720	24.09185	2.897807	2.553276	4.746565	21.61430	22.69330	22.51294	0.857399
Maximum	7.608871	24.28808	22.90835	24.40959	3.394508	4.287716	5.535364	22.88784	25.40608	25.16468	0.634879
Minimum	7.593878	16.84367	17.11893	22.97627	2.351375	1.193922	0.703098	16.46964	20.07223	20.80123	1.139434
Std. Dev.	0.004428	2.556282	1.699945	0.414694	0.203796	0.795388	1.275140	1.500641	1.424126	1.475682	0.150303
Skewness	-0.027957	0.086238	1.353892	-0.890527	0.007711	0.573562	-1.243773	-1.591524	0.251123	0.117490	0.161755
Kurtosis	1.828728	1.555035	3.819130	2.434310	4.250865	2.515696	3.342106	5.344829	2.139517	1.475620	1.792099
Jarque-Bera	1.718756	2.647090	10.00384	4.365196	1.956127	1.938053	7.881157	19.53752	1.240851	2.973687	1.954637
Probability	0.423425	0.266190	0.006725	0.112748	0.376039	0.379452	0.019437	0.000057	0.537716	0.226085	0.376319
Sum	228.0488	619.2798	565.4558	716.7007	87.44063	80.68646	123.5543	637.6965	695.2454	687.5712	25.52730
Sum Sq. Dev.	0.000569	189.5027	83.80458	4.987158	1.204448	18.34664	47.15351	65.30579	58.81588	63.15146	0.655140
Observations	23	23	23	23	23	23	23	23	23	23	23

Source: Computation by researcher using E-view 9.0

Table 4.2b Descriptive statistics for South Africa data

	GOVT	CORP	EXRATE	INT	INF	EXTDEBT	BDEF	STCAP	BNK	HDI	GDP
Mean	2.58E+10	2.51E+09	87.99286	4.405000	5.557143	8.02E+10	1.72E+09	5.87E+11	9.40E+11	0.630786	5.34E+11
Median	1.35E+10	1.71E+09	91.15000	4.535000	5.500000	6.47E+10	1.89E+08	6.30E+11	9.79E+11	0.629500	5.45E+11
Maximum	5.35E+10	1.49E+10	100.0000	8.660000	11.00000	1.45E+11	1.58E+10	9.43E+11	1.32E+12	0.665000	7.28E+11
Minimum	4.75E+09	0.000000	69.40000	1.790000	1.400000	2.46E+10	1852591.	1.47E+11	5.14E+11	0.609000	3.46E+11
Std. Dev.	1.98E+10	3.74E+09	9.845144	1.753668	2.292702	4.79E+10	4.11E+09	3.02E+11	2.78E+11	0.019043	1.38E+11

Skewness	0.436384	2.801766	-0.375300	0.736749	0.795708	0.232681	3.177396	-0.213305 -0.120539	0.447873	-0.004299
Kurtosis	1.439127	9.989518	1.843342	3.575973	4.077049	1.355091	11.45414	1.533675 1.568143	1.952741	1.525299
Jarque-Bera	1.865527	46.81421	1.109068	1.460049	2.154039	1.704667	65.24928	1.360395 1.229862	1.107816	1.268643
Probability	0.393465	0.000000	0.574340	0.481897	0.340609	0.426419	0.000000	0.506517 0.540678	0.574700	0.530295
Sum	3.61E+11	3.52E+10	1231.900	61.67000	77.80000	1.12E+12	2.40E+10	8.21E+12 1.32E+13	8.831000	7.48E+12
Sum Sq. Dev.	5.11E+21	1.82E+20	1260.049	39.97955	68.33429	2.98E+22	2.20E+20	1.19E+24 1.01E+24	0.004714	2.39E+23
Observations	14	14	14	14	14	14	14	14 14	14	14

Source: Computation by researcher using E-view 9.0

The result on Table 4.2a & 4.2b showed that growth rate of the govtb and corp have a mean of 7.602 and 20.643 with standard deviation of 0.004 and 2.556 respectively for Nigeria. For South Africa, the mean is 2.5810 and 2.5109 with standard deviation of 1.9810 and 3.7409. For the independent variables i.e. exdebt, int, inf, exrate, bdef, stcap, bnk, HDI and GDP, the means and standard deviations are 18.849 and 1.670, 23.890 and 0.415, 2.915 and 0.204, 2.670 and 0.195 , 4.118 and 1.275, 21.257 and 1.501, 23.175 and 1.424, 22.919 and 1.476 , 0.8509 and 0.1503 respectively for Nigeria while the mean for South Africa independent variables i.e. exdebt, int, inf, exrate, bdef, stcap, bnk, HDI and GDP, are 87.9928, 4.40500, 5.5571, 1.7209, 5.8711, 9.4011, 0.63077 and 5.3411 respectively and standard deviations are 9.8451, 1.7537, 2.2927, 4.7910, 4.1109, 3.0211, 2.7811, 0.0190 and 1.3811 respectively. . The descriptive statistics indicates that about 60% of the variables show an average kurtosis ≥ 2, indicating that the distribution is peaked (leptokurtic) relative to the normal while the rest below 40% are below 2, showing platykurtic characteristics for both countries. The results also indicated that mean is greater than the standard deviation in each of the variables and this suggest that the variables meet the basic requirement for normal distribution.

4.3 Unit Root Test

In testing for stationarity, it is expected that the variables under study must be stationery at a given level and p-value must be significant at that level. Stationarity is attained where the test statistics is most negative and greater than the critical value of the chosen level of significance.

The ADF test was done with the following hypothesis:

- Null hypothesis (H0): Variable contains unit root and hence is non-stationary.

- Alternative hypothesis (H1): Variable does not contain unit root and hence is stationary

The decision rule was that: If the calculated ADF Test statistic is greater than the MacKinnon critical values, reject the null hypothesis of non-statonarity and accept the alternative of stationarity, otherwise accept the null hypothesis of nonstationarity. The results for the Augmented Dickey-Fuller Test for Unit Root is summarized as follows:

Table 4.3a: Unit Root Tests for Nigeria Data

variables	ADF test statistics	Critical value @ 10%	P -value	Order of integration
D(GOVT)	-2.718613	-2.622989	0.0831	1(1)
D(CORP)				1(1)
D(EXRATE)	-4.965365	-2.638752	0.0006	1(0)
D(BDEF)	-3.283896	-2.622989	0.0251	1(1)
D(EXDEBT)	-6.510623	-2.632604	0.0000	1(1)
D(STCAP)	-5.935352	-2.622989	0.0000	1(1)
D(GDP)	-3.895867	-2.627420	0.0063	1(1)
D(HDI)	-5.868641	-2.622989	0.0000	1(1)
D(INT)	-4.920725	-2.622989	0.0004	1(1)
D(INF)	-4.418383	-2.621007	0.0015	1(0)
D(BNK)	-5.919888	-2.629906	0.0000	1(1)

Source: Computation by author using E-view 9.0

Table 4.3b: Unit Root Tests for South Africa Data

variables	ADF test statistics	Critical value @ 10%	P -value	Order of integration
D(GOVT)	-4.6306	-2.622989	0.0047	1(1)
D(CORP)	-5.3275	-2.2651	0.0002	1(0)
D(EXRATE)	-4.8804	-2.622989	0.0004	1(1)
D(BDEF)	-21.2759	-2.6813	0.0001	1(0)
D(EXDEBT)	-4.7288	-2.622989	0.0007	1(1)
D(STCAP)	-6.9403	-2.622989	0.0000	1(1)

D(GDP)	-5.9437	-2.627420	0.0000	1(1)
D(HDI)	-4.7544	-2.6387	0.0010	1(1)
D(INT)	-4.920725	-2.622989	0.0004	1(1)
D(INF)	-7.9353	-2.622989	0.0000	1(2)
D(BNK)	-5.9787	-2.622989	0.0000	1(1)

Source: Computation by author using E-view 9.0

From the table 4.3a &4.3b, the empirical result of the unit root test for stationary of time series property of variables is shown. The criterion is that the Augmented Dickey Fuller results must be strictly greater than the critical at certain level of significance to confirm the presence of stationarity pattern of variables. The unit root values for the variables of understudy reveal that the variables INF and Exrate are stationary at level while others are stationary at first difference for Nigeria while for South Africa, corp and bdef are stationary at level while others are stationary at first difference except for INF which is stationary at second difference. This is because the ADF values of the variables are all greater than the critical value at 10% and P values were less than 0.05 or 0.10 chosen level of significance therefore, the Null Hypothesis of the presence of unit root in all the variables is rejected.

4.4: Test of Hypothesis

The hypotheses for the study has been stated in chapter one and modelled in chapter three.

4.4.1 Hypothesis One

Ho$_1$ Exchange rate, external debt, budget deficit, interest rate and inflation rate have no significant effect on government bond market development in Nigeria and South Africa.

Table 4.4.1a Regression result for Hypothesis One (Nigeria)

Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/10/18   Time: 00:35
Sample (adjusted): 1996 2014

Included observations: 19 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BDEF(2))	0.241325	0.219279	1.100535	0.2911
LOG(EXRATE)	9.603545	1.341154	7.160656	0.0000
LOG(EXTDEBT)	-2.392278	0.662860	-3.609024	0.0032
LOG(INT)	-1.040126	2.565672	-0.405401	0.0018
LOG(INF(-2))	1.315572	0.567679	2.317457	0.3374

111

C	26.38742	21.64458	1.219124	0.2445

R-squared	0.925723	Mean dependent var	20.92356
Adjusted R-squared	0.897155	S.D. dependent var	2.920983
S.E. of regression	0.936745	Akaike info criterion	2.959278
Sum squared resid	11.40739	Schwarz criterion	3.257522
Log likelihood	-22.11314	Hannan-Quinn criter.	3.009753
F-statistic	32.40401	Durbin-Watson stat	2.161719
Prob(F-statistic)	0.000001		

Source: Computation by researcher using E-view 9.0

4.4.1b Regression result for Hypothesis One (South Africa)

Dependent Variable: LOG(GOVT)

Method: Least Squares
Date: 02/09/18   Time: 23:16
Sample (adjusted): 2000 2016
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BDEF)	0.047689	0.071710	0.665028	0.0211
LOG(EXDEBT)	1.240931	0.118963	10.43125	0.0000
LOG(EXRATE)	-0.859429	0.422428	-2.034499	0.0693
LOG(INT)	-0.034761	0.130747	-0.265865	0.0057
LOG(INF)	-0.259447	0.110668	-2.344377	0.5410
C	-4.067635	2.891226	-1.406889	0.1898

R-squared	0.979054	Mean dependent var	23.70855
Adjusted R-squared	0.968580	S.D. dependent var	0.866486
S.E. of regression	0.153590	Akaike info criterion	-0.629067
Sum squared resid	0.235898	Schwarz criterion	-0.339346
Log likelihood	11.03254	Hannan-Quinn criter.	-0.614231
F-statistic	93.48169	Durbin-Watson stat	1.721015
Prob(F-statistic)	0.000000		

Source: Computation by researcher using E-view 9.0

In table 4.4.1a & 4.4.1b, the Adjusted R^2 is 89% for Nigeria and 96% for South Africa. This indicates that 89% and 96% of the changes in dependent variable (Govtb) was explained by the changes in independent variables in Nigeria and South Africa respectively. The result of the regression shows that the coefficient of INT is -1.0401, extdebt is -2.3922. Also, the result of the regression shows that bdef, inf and exr has a coefficient of 0.2413, 1.3155 and 9.3065.

The result implies that if extdebt and int are increased by 1% the dependent variable (govt) will decrease by -2.3922% and -1.0401% respectively and if bdef, inf and exrate are increased by 1%, govt will increase by 0.2413%, 1.3155% and 9.6035% respectively. F-statistics of 32.4040 is positive and significant. A Durbin-Watson of 2.16 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for extdebt, int, inf, exrate and bdef are -3.6090, -0.4054, 2.3174, 7.1606 and 1.1005 respectively while p-values are 0.0032, 0.0018, 0.0374, 0.0000 and 0.2911 respectively. This means that bdef has a positive and insignificant effect, inf has a positive and insignificant effect, extdebt has a negative and significant effect, int has a negative and significant effect and exrate has a positive and significant effect on government bond market within the period under review.

For South Africa, the result of the regression shows that the coefficient of INT is -0.03476, exrate is -0.8594 and INF is -0.2594. This means that they have insignificant negative effect on government bond market development. Also, the result of the regression shows that bdef, and extdebt has a coefficient of 0.04768 and 1.2409 respectively.

The result implies that if exrate, inf and int are increased by 1% the dependent variable (govt) will decrease by -0.8594%, -0.2594% and -0.03476% respectively and if bdef and extdebt are increased by 1%, govt will increase by 0.04768% and 1.2409% respectively. F-statistics of 93.48 is positive and significant. A Durbin-Watson of 1.72 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for extdebt, int, inf, exrate and bdef are 10.4312, -2.2658, -2.3414, -2.0349 and 0.6650 respectively while p-values are 0.0000, 0.7957, 0.0410, 0.0669 and 0.5211 respectively. This means that bdef has a positive and significant effect, inf has a negative and insignificant effect, extdebt has a positive and significant effect, int has a negative and significant

effect and exrate has a negative and significant effect on government bond market within the period under review.

4.4.2 Hypothesis Two

Exchange rate, external debt, budget deficit, interest rate and inflation rate have no significant effect on corporate bond market development in Nigeria and South Africa.

Table 4.4.2a Regression result for Hypothesis Two (Nigeria)

Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/10/18   Time: 00:16
Sample (adjusted): 1996 2014
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BDEF(2))	0.795588	0.272335	2.921354	0.0119
LOG(EXRATE)	7.095344	1.665654	4.259795	0.0009
LOG(EXTDEBT)	1.290243	0.823243	1.567269	0.1411
LOG(INT)	-0.955247	3.186450	-0.299784	0.7691
LOG(INF(-2))	1.424468	0.705032	2.020431	0.0644
C	-64.01162	26.88161	-2.381242	0.0332
R-squared	0.757146	Mean dependent var		18.84419
Adjusted R-squared	0.663741	S.D. dependent var		2.006274
S.E. of regression	1.163396	Akaike info criterion		3.392652
Sum squared resid	17.59536	Schwarz criterion		3.690896
Log likelihood	-26.23020	Hannan-Quinn criter.		3.443127
F-statistic	8.106021	Durbin-Watson stat		1.708868
Prob(F-statistic)	0.001150			

Source: Computation by researcher using E-view 9.0

Table 4.4.2b Regression result for Hypothesis Two (South Africa)
Dependent Variable: LOG(CORP)
Method: Least Squares

Date: 02/08/18   Time: 23:23
Sample(adjusted): 2000 2016
Included observations: 14
Excluded observations: 3 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXTDEBT)	0.804622	1.094092	0.735425	0.0031
LOG(INT)	0.040281	1.167887	0.034490	0.9733
LOG(INF)	0.819480	0.879399	0.931865	0.3787
LOG(EXRATE)	1.505918	3.310562	0.454883	0.6613
LOG(BDEF)	-0.264366	0.687419	-0.384577	0.7106
C	-0.406374	21.55719	-0.018851	0.9854
R-squared	0.218466	Mean dependent var		21.68547
Adjusted R-squared	-0.269992	S.D. dependent var		0.963814
S.E. of regression	1.086159	Akaike info criterion		3.300700
Sum squared resid	9.437938	Schwarz criterion		3.574582
Log likelihood	-17.10490	F-statistic		0.447257
Durbin-Watson stat	1.947088	Prob(F-statistic)		0.804610

Source: Computation by researcher using E-view 9.0

In table 4.4.2a & 4.4.2b, the Adjusted R^2 showed 60% for Nigeria and 26% for South Africa. This indicates that 60% and 26% of the changes in dependent variable (corp) was explained by the changes in independent variables in Nigeria and South Africa respectively. The result of the regression shows that the coefficient of INT is -0.9552, extdebt is 1.2902. Also, the result of the regression shows that bdef, inf and exr has a coefficient of 0.7955, 1.4244 and 7.0953respectively.

The result implies that if int is increased by 1% the dependent variable (corp) will decrease by -0.9552%.If extdebt, bdef, inf and exrate are increased by 1%, govt will increase by 1.2902%, 0.7955%, 1.4244% and 7.0953% respectively. F-statistics of 8 is positive and significant. A Durbin-Watson of 1.8 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for extdebt, int, inf, exrate and bdef are 1.5672, -0.2997, 2.0204, 4.2597, and 2.9213 respectively while p-values are 0.1411, 0.7691, 0.0644, 0.0009 and 0.0119 respectively. This means that bdef has a positive and significant effect, inf has a positive and insignificant effect, extdebt has a positive and insignificant effect, int has a negative and insignificant effect and exrate has a positive and significant effect on government bond market within the period under review.

For South Africa, the result of the regression shows that the coefficient of INT is 0.0403, exrate is 1.5059 inf is 0.8195, and extdebt is 0.0046 while bdef is -0.2643.

The result implies that if exrate, inf, int and extdebt are increased by 1% the dependent variable (corp) will increase by 1.5059%, 0.8195%, 0.0403% and 0.8046% respectively and if bdef is increased by 1%, corp will decrease by 0.2640%. F-statistics of 0.48 is positive and significant. A Durbin-Watson of 1.8 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for extdebt, int, inf, exrate and bdef are 0.7354, 0.0344, 0.9318, 0.4548 and -0.3845 respectively while p-values are 0.4831, 0.9733, 0.3787, 0.6613 and 0.7106 respectively. This means that bdef has a negative and insignificant effect, inf has a positive and insignificant effect, extdebt has a positive and significant effect, int has a positive and insignificant effect and exrate has a positive and insignificant effect on corporate bond market within the period under review.

4.4.3: Hypothesis three

Ho$_3$ Bank size and stock market capitalization have no significant effect on government bond market development in Nigeria and South Africa.

Table 4.4.3a: Regression result for Hypothesis Three (Nigeria)

Dependent Variable: GOVT
Method: Least Squares
Date: 02/09/18   Time: 23:39
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP	0.298739	0.056584	5.279582	0.0000
BNK	0.116213	0.037790	3.075234	0.0060
C	-2.75E+09	1.53E+09	-1.796083	0.0876
R-squared	0.859555	Mean dependent var		9.86E+09
Adjusted R-squared	0.845511	S.D. dependent var		1.24E+10
S.E. of regression	4.88E+09	Akaike info criterion		47.57523
Sum squared resid	4.76E+20	Schwarz criterion		47.72334
Log likelihood	-544.1151	Hannan-Quinn criter.		47.61248
F-statistic	61.20245	Durbin-Watson stat		2.125350
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.0

116

Table 4.4.3b: Regression result for Hypothesis Three (South Africa)

Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/09/18   Time: 23:22
Sample (adjusted): 1996 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(STCAP(-2))	2.017338	0.366739	5.500742	0.0000
LOG(BNK(-2))	0.049373	0.247470	0.199510	0.8442
C	-32.96480	5.337975	-6.175525	0.0000
R-squared	0.887567	Mean dependent var		23.40295
Adjusted R-squared	0.874340	S.D. dependent var		1.010910
S.E. of regression	0.358353	Akaike info criterion		0.922887
Sum squared resid	2.183093	Schwarz criterion		1.072247
Log likelihood	-6.228874	Hannan-Quinn criter.		0.952044
F-statistic	67.10056	Durbin-Watson stat		1.516396
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.0

In table 4.4.3a & 4.4.3b, Adjusted R^2 showed 85% for Nigeria and 87% for South Africa. This indicates that 85% and 87% of the changes in dependent variable (govt) was explained by the changes in independent variables in Nigeria and South Africa respectively.

For Nigeria, the result of the regression shows that the coefficient of stcap is 0.2987 and bnk is 0.1162.The result implies that if stcap and bnk are increased by 1% the dependent variable (govt) will increase by 0.2987% and 0.1162% respectively. F-statistics of 61.2 is positive and significant. A Durbin-Watson of 2.12 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for stcap and bnk are5.2799 and 3.0752 respectively while p-values are 0.0000 and 0.0060 respectively. This means that they both have a positive and significant effect on government bond market within the period under review. Thus, the null hypothesis that there is no significant effect of financial market variables on government bond market is rejected thereby accepting the alternative hypothesis.

For South Africa, the result of the regression shows that the coefficient of stcap is 2.0173 and bnk is 0.04937. The result implies that if stcap and bnk are increased by 1% the dependent variable (govt) will increase by 2.0173% and 0.04397% respectively. F-statistics of 67 is positive and significant. A

Durbin-Watson of 1.5 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for stcap and bnk are 5.5007 and 0.1995 respectively while p-values are 0.0000 and 0.8442 respectively. This means that stcap has a positive and significant effect while bnk has positive and insignificant on government bond market within the period under review.

4.4.4: Hypothesis Four

Ho$_4$ Bank size and stock market capitalization have no significant effect on corporate bond market development in Nigeria and South Africa.

Table 4.4.4a: Regression result for Hypothesis Four (Nigeria)

Dependent Variable: CORP
Method: Least Squares
Date: 02/10/18   Time: 00:10
Sample (adjusted): 1996 2014
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP(2)	0.032978	0.025096	1.314060	0.2074
BNK(-2)	0.061466	0.021970	2.797710	0.0129
C	-1.04E+09	9.12E+08	-1.136693	0.2724
R-squared	0.525573	Mean dependent var		1.51E+09
Adjusted R-squared	0.466269	S.D. dependent var		3.26E+09
S.E. of regression	2.38E+09	Akaike info criterion		46.16565
Sum squared resid	9.09E+19	Schwarz criterion		46.31477
Log likelihood	-435.5737	Hannan-Quinn criter.		46.19089
F-statistic	8.862429	Durbin-Watson stat		1.634418
Prob(F-statistic)	0.002567			

Source: Computation by researcher using E-view 9.0

4.4.4b: Regression result for Hypothesis Four (South Africa)

Dependent Variable: CORP
Method: Least Squares

118

Date: 02/08/18   Time: 23:35
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP	-0.008631	0.010336	-0.834987	0.4136
BNK	0.014267	0.011515	1.239004	0.2297
C	2.86E+09	3.73E+09	0.766364	0.4524
R-squared	0.107740	Mean dependent var		3.30E+09
Adjusted R-squared	0.018514	S.D. dependent var		5.84E+09
S.E. of regression	5.79E+09	Akaike info criterion		47.91634
Sum squared resid	6.70E+20	Schwarz criterion		48.06445
Log likelihood	-548.0379	F-statistic		1.207497
Durbin-Watson stat	2.420027	Prob(F-statistic)		0.319826

Source: Computation by researcher using E-view 9.0

In table 4.4.4a & 4.4.4b, Adjusted R^2 showed 46% for Nigeria and 2% for South Africa. This indicates that 46% and 2% of the changes in dependent variable (corp) was explained by the changes in independent variables in Nigeria and South Africa respectively.

For Nigeria, the result of the regression shows that the coefficient of stcap is 0.03297 and bnk is 0.06146.The result implies that if stcap and bnk are increased by 1% the dependent variable (govt) will increase by 0.3297% and 0.6146% respectively. F-statistics of 8.86 is positive and significant. A Durbin-Watson of 1.6 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for stcap and bnk are 1.3140 and 2.7977 respectively while p-values are 0.2074 and 0.0129 respectively. This means that stcap has a positive and insignificant effect while bnk has positive and significant on government bond market within the period under review.

For South Africa, the result of the regression shows that the coefficient of stcap is -0.0086 and bnk is 0.0142. The result implies that if stcap and bnk are increased by 1% the dependent variable (corp) will decrease by -0.0086% and increase by 0.0142% respectively. F-statistics of 10.1 is positive and significant. A Durbin-Watson of 2.4 considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for stcap and bnk are -0.8349 and 1.2390 respectively while p-values are 0.4136 and 0.2297 respectively. This means that stcap has negative and insignificant effect while bnk has positive and insignificant on corporate bond market within the period under review.

4.4.5: Hypothesis Five

Ho$_5$ GDP and HDI have no significant effect on bond market development in Nigeria and South Africa.

Table 4.4.5a: Regression result for Hypothesis Five (Nigeria)

Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/09/18   Time: 23:51
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	-3.398249	5.031359	-0.675414	0.5071
LOG(GDP)	5.138327	1.019398	5.040549	0.0001
C	-120.0438	31.11536	-3.858025	0.0010
R-squared	0.855732	Mean dependent var		20.86767
Adjusted R-squared	0.841306	S.D. dependent var		2.866341
S.E. of regression	1.141849	Akaike info criterion		3.224283
Sum squared resid	26.07639	Schwarz criterion		3.372391
Log likelihood	-34.07925	Hannan-Quinn criter.		3.261531
F-statistic	59.31559	Durbin-Watson stat		1.581724
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.0

Table 4.4.5b: Regression result for Hypothesis Five (South Africa)

Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/10/18   Time: 08:20
Sample: 1994 2016
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	2.705794	2.229993	1.213365	0.2399
LOG(GDP)	3.037420	0.185515	16.37292	0.0000
C	-57.07138	5.161926	-11.05622	0.0000
R-squared	0.935315	Mean dependent var		23.23303
Adjusted R-squared	0.928506	S.D. dependent var		1.108063
S.E. of regression	0.296279	Akaike info criterion		0.531092
Sum squared resid	1.667841	Schwarz criterion		0.679870
Log likelihood	-2.842007	Hannan-Quinn criter.		0.566139
F-statistic	137.3646	Durbin-Watson stat		1.621891
Prob(F-statistic)	0.000000			

Source: Computation by researcher using E-view 9.0

In table 4.4.5a & 4.4.5b, the Adjusted R^2 both showed 84% for Nigeria and 87% for South Africa. This indicates that 84% and 87% of the changes in dependent variable (corp) was explained by the changes in independent variables in Nigeria and South Africa respectively.

For Nigeria, the result of the regression shows that the coefficient of HDI is -3.3982 and GDP is 5.1383. The result implies that if HDI and GDP are increased by 1% the dependent variable (corp) will decrease by -3.3982% and increase by 5.1383% respectively. F-statistics of 59.3 is positive and significant. A Durbin-Watson of 1.58 is considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for HDI and GDP are -0.6754 and 5.0405 respectively while p-values are 0.5071 and 0.0001 respectively. This means that HDI has negative and insignificant effect while GDP has positive and significant effect on government bond market within the period under review.

For South Africa, the result of the regression shows that the coefficient of HDI is 2.7057 and GDP is 3.0374. The result implies that if HDI and GDP are increased by 1% the dependent variable (corp) will increase by 2.7075 and 3.0374% respectively. F-statistics of 137 is positive and significant. A Durbin-Watson of 1.6 is considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for HDI and GDP are 1.2133 and 16 3729 respectively while p-values are 0.2399 and 0.0000 respectively. This means that HDI has positive and insignificant effect while GDP has positive and significant effect on government bond market within the period under review.

4.4.6 Hypothesis Six

Ho$_6$ GDP and HDI have no significant effect on bond market development in Nigeria and South Africa.

Table 4.4.6a Regression result for Hypothesis Six (Nigeria)

Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/10/18   Time: 00:00
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	-1.727463	5.557693	-0.310824	0.7592

LOG(GDP)	2.910454	1.126038	2.584685	0.0177
C	-60.73552	34.37036	-1.767090	0.0925
R-squared	0.615864	Mean dependent var		18.92282
Adjusted R-squared	0.577450	S.D. dependent var		1.940346
S.E. of regression	1.261299	Akaike info criterion		3.423269
Sum squared resid	31.81749	Schwarz criterion		3.571377
Log likelihood	-36.36759	Hannan-Quinn criter.		3.460517
F-statistic	16.03245	Durbin-Watson stat		1.773342
Prob(F-statistic)	0.000070			

Source: Computation by researcher using E-view 9.0

Table 4.4.6b: Regression result for Hypothesis Six (South Africa)

Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/08/18   Time: 23:29
Sample: 1994 2016
Included observations: 19
Excluded observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	-8.234220	7.718519	-1.066813	0.3019
LOG(GDP)	1.377751	0.620228	2.221362	0.0411
C	-19.19364	17.09828	-1.122548	0.2782
R-squared	0.271035	Mean dependent var		21.50332
Adjusted R-squared	0.179914	S.D. dependent var		1.010887
S.E. of regression	0.915445	Akaike info criterion		2.805127
Sum squared resid	13.40864	Schwarz criterion		2.954249
Log likelihood	-23.64871	F-statistic		2.974461
Durbin-Watson stat	1.958495	Prob(F-statistic)		0.079736

Source: Computation by researcher using E-view 9.0

In table 4.4.6a & 4.4.6b, the Adjusted R^2 showed 57% for Nigeria and 17% for South Africa. This indicates that 57% and 17% of the changes in dependent variable (corp) was explained by the changes in independent variables in Nigeria and South Africa respectively.

For Nigeria, the result of the regression shows that the coefficient of HDI is -1.7274 and GDP is 2.9104.The result implies that if HDI and GDP are increased by 1% the dependent variable (corp) will decrease by -1.7274% and increase by 2.9104% respectively. F-statistics of 16 is positive and significant. A Durbin-Watson of 1.7 is considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for HDI and GDP are -3.3108 and 2.5846 respectively while p-values are 0.7592 and 0.0177 respectively. This means that HDI has negative and

insignificant effect while GDP has positive and significant effect on corporate bond market within the period under review.

For South Africa, the result of the regression shows that the coefficient of HDI is -8.2340 and GDP is 1.3775. The result implies that if HDI and GDP are increased by 1% the dependent variable (corp) will decrease by -8.2340% and increase by 1.3775% respectively. F-statistics of 2.9 is positive and significant. A Durbin-Watson of 1.9 is considered good as it shows little or no effect of autocorrelation on the chosen data. The T-statistics for HDI and GDP are -1.0668 and 2.2229 respectively while p-values are 0.3019 and 0.0411 respectively. This means that HDI has negative and insignificant effect while GDP has positive and significant effect on corporate bond market within the period under review.

4.4.7 Hypothesis Seven

Ho$_7$ Macro-economic variables do not granger cause bond market development in Nigeria and South

Africa.

The Granger Causality test will be used to determine the causation that exists between these variables.

Table 4.4.7a: Pairwise Granger Causality Tests for Nigeria

Pairwise Granger Causality Tests
Date: 02/13/18   Time: 00:19
Sample: 1994 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CORP does not Granger Cause GOVT	21	3.13768	0.0709
GOVT does not Granger Cause CORP		0.42894	0.6585
BDEF does not Granger Cause GOVT	21	1.04379	0.3749
GOVT does not Granger Cause BDEF		8.42405	0.0032
INT does not Granger Cause GOVT	21	0.33266	0.7219
GOVT does not Granger Cause INT		2.81223	0.0898
INF does not Granger Cause GOVT	21	0.04984	0.9515
GOVT does not Granger Cause INF		0.82954	0.4542
EXRATE does not Granger Cause GOVT	21	2.68424	0.0988
GOVT does not Granger Cause EXRATE		3.11542	0.0720

Null Hypothesis:	Obs	F-Statistic	Prob.
EXTDEBT does not Granger Cause GOVT	21	1.44841	0.2641
GOVT does not Granger Cause EXTDEBT		1.56192	0.2401
BDEF does not Granger Cause CORP	21	5.19668	0.0182
CORP does not Granger Cause BDEF		1.16467	0.3371
INT does not Granger Cause CORP	21	0.07238	0.9305
CORP does not Granger Cause INT		0.47339	0.6313
INF does not Granger Cause CORP	21	0.06421	0.9380
CORP does not Granger Cause INF		0.34246	0.7151
EXRATE does not Granger Cause CORP	21	0.80309	0.4652
CORP does not Granger Cause EXRATE		1.60376	0.2318
EXTDEBT does not Granger Cause CORP	21	0.87135	0.4373
CORP does not Granger Cause EXTDEBT		1.67402	0.2187
INT does not Granger Cause BDEF	21	3.16586	0.0694
BDEF does not Granger Cause INT		0.99975	0.3898
INF does not Granger Cause BDEF	21	0.36226	0.7017
BDEF does not Granger Cause INF		0.34682	0.7121
EXRATE does not Granger Cause BDEF	21	0.33233	0.7221
BDEF does not Granger Cause EXRATE		0.04139	0.9596
EXTDEBT does not Granger Cause BDEF	21	2.36248	0.1262
BDEF does not Granger Cause EXTDEBT		0.28713	0.7542
INF does not Granger Cause INT	21	3.01349	0.0775
INT does not Granger Cause INF		2.36330	0.1261
EXRATE does not Granger Cause INT	21	0.99523	0.3914
INT does not Granger Cause EXRATE		0.80143	0.4659
EXTDEBT does not Granger Cause INT	21	2.26752	0.1358
INT does not Granger Cause EXTDEBT		1.15408	0.3403
EXRATE does not Granger Cause INF	21	0.03745	0.9633
INF does not Granger Cause EXRATE		1.52441	0.2478
EXTDEBT does not Granger Cause INF	21	2.15441	0.1484
INF does not Granger Cause EXTDEBT		0.03881	0.9620
EXTDEBT does not Granger Cause EXRATE	21	0.12031	0.8874
EXRATE does not Granger Cause EXTDEBT		1.23168	0.3180

Source: Computation by researcher using E-view 9.0

Table 4.4.7b: Pairwise Granger Causality Tests for South Africa

Pairwise Granger Causality Tests
Date: 02/13/18   Time: 00:24
Sample: 1994 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
CORP does not Granger Cause GOVT	18	2.80679	0.0970

124

GOVT does not Granger Cause CORP		0.01050	0.9896
BDEF does not Granger Cause GOVT	12	4.72642	0.0502
GOVT does not Granger Cause BDEF		0.83203	0.4740
INT does not Granger Cause GOVT	18	1.06093	0.3743
GOVT does not Granger Cause INT		0.42985	0.6595
INF does not Granger Cause GOVT	18	0.57756	0.5750
GOVT does not Granger Cause INF		0.06943	0.9333
EXRATE does not Granger Cause GOVT	18	0.09519	0.9098
GOVT does not Granger Cause EXRATE		1.70053	0.2208
EXTDEBT does not Granger Cause GOVT	18	14.4095	0.0005
GOVT does not Granger Cause EXTDEBT		7.98683	0.0055
BDEF does not Granger Cause CORP	15	0.32123	0.7325
CORP does not Granger Cause BDEF		0.55395	0.5913
INT does not Granger Cause CORP	21	0.66068	0.5300
CORP does not Granger Cause INT		0.11351	0.8934
INF does not Granger Cause CORP	21	1.62094	0.2285
CORP does not Granger Cause INF		0.38324	0.6877
EXRATE does not Granger Cause CORP	21	0.23244	0.7952
CORP does not Granger Cause EXRATE		0.75220	0.4873
EXTDEBT does not Granger Cause CORP	21	0.08717	0.9170
CORP does not Granger Cause EXTDEBT		3.49259	0.0551
INT does not Granger Cause BDEF	15	0.68417	0.5266
BDEF does not Granger Cause INT		1.98706	0.1877
INF does not Granger Cause BDEF	15	5.75754	0.0217
BDEF does not Granger Cause INF		0.32763	0.7281
EXRATE does not Granger Cause BDEF	15	1.13424	0.3598
BDEF does not Granger Cause EXRATE		1.03583	0.3901
EXTDEBT does not Granger Cause BDEF	15	1.57344	0.2546
BDEF does not Granger Cause EXTDEBT		1.14086	0.3579
INF does not Granger Cause INT	21	2.94592	0.0814
INT does not Granger Cause INF		0.14800	0.8636
EXRATE does not Granger Cause INT	21	1.46269	0.2610
INT does not Granger Cause EXRATE		0.43667	0.6537
EXTDEBT does not Granger Cause INT	21	0.49078	0.6211
INT does not Granger Cause EXTDEBT		1.30152	0.2994
EXRATE does not Granger Cause INF	21	3.10070	0.0728
INF does not Granger Cause EXRATE		2.70965	0.0969
EXTDEBT does not Granger Cause INF	21	0.08519	0.9188
INF does not Granger Cause EXTDEBT		0.12484	0.8835
EXTDEBT does not Granger Cause EXRATE	21	1.40451	0.2742
EXRATE does not Granger Cause EXTDEBT		0.25437	0.7785

From the results of Table 4.4.7a the F-test is conducted on the null hypotheses in order to determine the direction of causality between each pair of variables. The rejection of each of the null hypothesis is based on the significance of the F-value for the particular relationship.

For budget deficit, the test shows that government bonds granger causes budget deficit but budget deficit do not granger cause government bonds. Budget deficit also granger causes corporate bond but not the other way around. The direction from these results could be that corporate bond have not provided enough effects on budget deficit.

For South Africa, The significant pairwise relationships in the results are those of external debt and government bonds. In particular, the F statistics for the causality between external debt and government bonds is significant under the two hypotheses. This result shows that external debt granger causes government bonds and government bonds also granger causes external debt. Another important aspect of the result is the causality running between interest rate and budget deficit. The significance of the F-statistic for interest rate Granger causing budget deficit reveals that interest rate responds quite well to rapid movements in budget deficit.

4.5 Test for Serial Autocorrelation:

H_0= There is no serial correlation in the model
H_1= There is serial correlation in the model
Decision rule: If the probability value is less than 0.10 reject the Ho and accept the H_1
Table 4.5a Summary of Breusch-Godfrey Serial Correlation Test for Nigeria

Models	F-statistics	Probability
Model 1	0.3032	0.7444
Model 2	2.3945	0.1252
Model 3	5.4608	0.1140
Model 4	3.4114	0.1554
Model 5	10.6812	0.7814
Model 6	4.8103	0.2212

Source: Extracted from Eviews Version 9.0

Table 4.5b Summary of Breusch-Godfrey Serial Correlation Test for South Africa

Models	F-statistics	Probability

Model 1	1.0873	0.9168
Model 2	0.6655	0.5484
Model 3	1.5404	0.2474
Model 4	0.9026	0.4230
Model 5	0.4084	0.6710
Model 6	1.8175	0.1987

Source: Extracted from Eviews Version 9.0

From table 4.5a & 4.5b the p-values for both countries are greater than the chosen level of significance of 10%, indicating the absence of autocorrelation in the model. The result of the serial correlation the models shows that the probability value for Nigeria and for South Africa which are greater than 0.10 implying that we accept H_0 and reject H_1. We then conclude that there is no serial autocorrelation in the model and that the model is appropriate.

4.6 Heteroskedasticity Test: Breusch-Pagan-Godfrey

H_0= There is no Heteroskedasticity in the model
H_1= There is Heteroskedasticity in the model
Decision rule: If the probability value is less than 0.10 reject the Ho and accept the H_1

Table 4.6a Summary of Heteroskedasticity Test for Nigeria

Models	F-statistics	Probability
Model 1	0.1585	0.7113
Model 2	1.7006	0.1884
Model 3	5.3122	0.1141
Model 4	11.2631	0.6155
Model 5	0.4197	0.6652
Model 6	1.8694	0.1802

Source: Extracted from E-views Version 9.0

Table 4.6b Summary of Heteroskedasticity Test for South Africa

Models	F-statistics	Probability
Model 1	1.9669	0.1696
Model 2	4.0318	0.1390

Model 3	0.1808	0.8360
Model 4	0.9297	0.4687
Model 5	0.2420	0.7874
Model 6	0.3331	0.8511

Source: Extracted from Eviews Version 9.0

Heteroskedasticity is a result where the variance of the errors is not constant while Homoskedastycity is the assumption of the classical linear regression that the variance of the errors is constant. This is addressed using the Autoregressive conditionally Heteroscedastic test known as ARCH. Table 4.6a & 4.6b results prove that we accept the Null hypothesis that there is no evidence of heteroskedasticity for both countries since F-statistics derived from the various tests are insignificant, which imply that we accept the null hypotheses since p-value are greater than 10% significance level.

4.7 Stability Test: Ramsey RESET Test

Ho = The regression model is linear
H1 = The regression model is non linear
Table 4.7a: Summary of Ramsey Reset test for Nigeria

Models	F-statistics	Probability
Model 1	0.1128	0.9587
Model 2	0.1317	0.8609
Model 3	0.3554	0.9472
Model 4	0.7378	0.4696
Model 5	2.7146	0.1159
Model 6	8.7203	0.1182

Source: Extracted from Eviews Version 9.0

Table 4.7b: Summary of Ramsey Reset test for South Africa

Models	F-statistics	Probability
Model 1	0.5835	0.4645
Model 2	2.3551	0.1758
Model 3	2.7510	0.1145
Model 4	0.5924	0.5633
Model 5	2.0837	0.1661
Model 6	1.0680	0.3701

Source: Extracted from Eviews Version 9.0

The Null hypothesis holds that where the p-value of the test statistics is greater than the level of significance, the result is not significant and the regression model is linear, otherwise we

reject the Null hypothesis and accept the Alternative hypothesis that the relationship is significant and the regression model is non-linear. The Ramsey reset result for both countries showed p-values in table 4.7a &4.7b and F-statistics to be greater than the 10% significance level indicating that the test statistics are not significant at the 10% level of significance.

4.8 Discussion of Findings

Hypothesis One: Macroeconomic variables have no significant effect on government bond market development in Nigeria and South Africa.

The macroeconomic variables considered in the study include interest rate, exchange rate, inflation, external debt and budget deficit and from the result in tables 4.4.1a and 4.4.1b we found that budget deficit has insignificant positive effect on bond market development for in Nigeria but significant for South Africa. This finding aligns with evidence provided by mailafia (2014) and Adelegan and Radzewiczback (2009),

Exchange rate and external debt and has a positive and significant effect on government bond market for Nigeria within the period under review this implies that a change in the exchange rate within Nigerian economy brings about corresponding decrease in the government bond market development in Nigeria. The signs are contrary to aprori expectation and the theoretical positions in the literature. For South Africa, there exist a negative significant effect of exchange rate on government bond market in line with Kapingura and Ikhide (2011), although a negative sign is expected, it is also expected to be statistically significant.

Inflation has a positive but statistically insignificant effect on government bond market for Nigeria but has a negative significant effect on South Africa. The result of Nigeria contradicts the result of Nkwede, Uguru and Nkwegu (2016) and the apriori expectation which suggests a negative effect but is in line with expectation for South Africa.

External debt has a negative and significant effect in Nigeria but positive significant effect on government bond market in South Africa. This explain the country specific differences in the variables that determine bond market development. The positive effect implies that if external debt is efficient, it leads to bond market development. This could be achieved if the financing raised from external sources are project driven towards infrastructural development, which should facilitate rapid growth of businesses as well as competitiveness, which leads to high tendency for firms to raise finance through bonds.

Interest rate has a negative and significant effect on government bond market in Nigeria but insignificant in South Africa according to expectation of the researcher and evidenced by Nkwede, Uguru and Nkwegu (2016) and Bhattacharyay (2011) in Asia.

Hypothesis Two: Macroeconomic variables have no significant effect on corporate bond market development in Nigeria and South Africa.

From the result in tables 4.4.2a and 4.4.2b we found that budget deficit has a significant positive effect on corporate bond market development except for South Africa corporate bond market where it has a negative effect.

Exchange rate has a positive and significant effect on corporate bond market for Nigeria within the period under review. The signs are contrary to appriori expectation which suggests a negative sign and the theoretical positions in the literature. For South Africa, there exist a positive insignificant effect of exchange rate on government bond market contrary to the findings of Kapingura and Ikhide (2011) and the appriori expectation.

Inflation has a positive and insignificant effect on corporate bond market for Nigeria for both countries. The result of Nigeria also contradicts the result of Nkwede, Uguru and Nkwegu (2016) and the apriori expectation which suggests a negative effect.

External debt has a positive and insignificant effect in Nigeria but positive significant effect on corporate bond market in South Africa. This confirms the relevance of external debt in facilitating bond market development in an economy, provided such debt is within its threshold.

Interest rate has a negative and insignificant effect on corporate bond market in both countries according to expectation of the researcher and evidenced by Nkwede, Uguru and Nkwegu (2016) and Bhattacharyay (2011) in Asia.

Hypothesis Three: financial market variables have no significant effect on government bond market development in Nigeria and South Africa.

The variables under study here are the stock market size and bank size. The result in table 4.4.3a and 4.4.3b shows that stock market size has positive and significant effect on government bond market in both countries. This means that the stock market complements the government bond market in both countries. This result is consistent with findings of mailafia (2014), Claessens et al (2003), and Jeanne and Guscina (2006).

Bank size has positive and significant effect on government bond market for Nigeria but insignificant for South Africa within the period under review. This is in line with the findings of Adelegan and Radzewiczbac (2009) and Bhattacharyay (2011) who documented an insignificant impact as well as positive sign on government bonds.

Hypothesis Four: financial market variables have no significant effect on corporate bond market development in Nigeria and South Africa.

The result in tables 4.4.4a and 4.4.4b show that Stock market size has positive and insignificant effect on corporate bond market in Nigeriabut has negative and insignificant effect on corporate bond market in South Africa. This means that it does not exert significant impact on corporate bond market development in South Africa. This is in consonance with the findings of Rhagavan (2012)

for India which confirms that the growth of equity stock capitalization may not matter much for improving the South African corporate bond market development.

Bank size has positive and significant effect on corporate bond market in Nigeria within the period under review. Though South Africa is positive it is not significant. This contradicts the findings of Mailafia (2014) and Nkwede, Uguru and Nkwegu (2016).

Hypothesis Five: Developmental variables have no significant effect on government bond market development in Nigeria and South Africa.

The variables considered are GDP and Human Development Index and tables 4.4.5a and 4.4.5b show that GDP has positive and significant effect on government bond market size for both countries in line with the findings of mailafia (2014), Adelegan and Radzewiczbac (2009), and Bhattacharyay (2011).

HDI has a negative and insignificant effect on bond market in Nigeria government bond market but has a positive significant effect on South Africa government bond market. This means that the level of Human Capital Development has not made significant effect on the Nigerian bond market.

Hypothesis Six: Developmental variables have no significant effect on corporate bond market development in Nigeria and South Africa.

GDP has positive and significant effect on corporate bond market size for both countries in line with the findings of mailafia (2014), Adelegan and Radzewiczbac (2009), and Bhattacharyay (2011) while HDI has a negative and insignificant effect on corporate bond market for both countries. This means that the level of Human Capital Development has not made significant effect on the market.

Hypothesis Seven

Ho$_7$ Macro-economic variables do not granger cause bond market development in Nigeria and South Africa.

From the results of Table 4.4.7a the F-test is conducted on the null hypotheses in order to determine the direction of causality between each pair of variables. The rejection of each of the null hypothesis is based on the significance of the F-value for the particular relationship.

The significant relationships in the results is that of budget deficit in relation to both government and corporate bonds. For budget deficit, the test shows that government bonds granger causes budget deficit but budget deficit do not granger cause government bonds. This is a unidirectional relationship that implies that while government bonds responds to budget deficit in Nigeria, budget deficit does not respond to the level of government bonds. The explanation for this outcome could lie in the fact that the main purpose of the budget deficit could be counterproductive, which may impede its effect on bond market development in the long run.

Budget deficit also granger causes corporate bond but not the other way around. The direction from these results could be that corporate bond have not provided enough effects on budget deficit.

For South Africa, from table 4.4.7b, the significant pairwise relationships in the results are those of external debt and government bonds. In particular, the F statistics for the causality between external debt and government bonds is significant under the two hypotheses. This result shows that external debt granger causes government bonds and government bonds also granger causes external debt. This indicates a feedback effect between the two variables provided the finance raised through external debt is channeled towards infrastructural development, which should spur economic activities, attract foreign investors, and facilitate the business growth.

Another important aspect of the result is the causality running between interest rate and budget deficit. The significance of the F-statistic for interest rate Granger causing budget deficit reveals that interest rate responds quite well to rapid movements in budget deficit.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1   Summary of Findings

The findings from the specific objectives of this study are as follows:

1. Interest rate, exchange rate and external debt determines government bond market development in Nigeria while budget deficit, exchange rate, inflation and interest rate are determinants of government bond market in South Africa.

2. Budget deficit and exchange rate are determinants of corporate bond market in Nigeria while external debt determines South African corporate bond market.

3. Stock market size drives Nigerian bond market while bank size and stock market size determine the development on government bond market of both countries.

4. Bank credit determines corporate bond market development in Nigeria.

5. GDP determines the development of government bond market in both countries while HDI determines that of South Africa.

6. GDP determines the development of corporate bond market for both countries.

7. There exists a unidirectional relationship between budget deficit and government bond and budget deficit and corporate bond in Nigeria while a bidirectional relationship exist between government bond and external debt in South Africa.

5.2 Conclusion

This study examined the determinants of bond market development in Nigeria and South Africa covering the period of 1994 to 2016. The study examined a number of macroeconomic variables because it is difficult to neglect macroeconomic factors when trying to understand the development of bond markets in the economy especially, emerging markets. Financial market and developmental variables were also considered in the study. The literature reviewed showed that there are various factors that determines bond market development and were mostly based on developed and Asian countries. The study chose Nigeria and South Africa as large countries in Africa to analyze and determine those variables that drive bond market positively. The result of the study showed that interest rate, exchange rate and external debt determine government bond market development in Nigeria while budget deficit, inflation rate, exchange rate and external debt are determinants of

government bond market in South Africa. Also, budget deficit and exchange rate are determinants of corporate bond market in Nigeria while external debt determines South African corporate bond market.Stock market size and bank size drives the bond market positively in both countries. GDP has positive and significant effect on government bond market size in both countries while HDI has positive and significant effect on corporate bond market size for South Africa but negative effect in Nigeria. The developed state of the South African bond market could account for the reason why more variables determine the bond market than that of Nigeria.

There exists a unidirectional relationship between budget deficit and government bond and budget deficit and corporate bond in Nigeria while a bidirectional relationship exist between government bond and external debt in South Africa. The results of this study are consistent with and anchored on Rational Expectation Theory which asserts that macroeconomic announcements have significant effects on financial markets, both in terms of asset returns and their volatility.

5.3 Recommendations

Based on the findings, the following recommendations were made:

1. The Government should maintain a stable macroeconomic environment, strengthen the regulatory framework of the bond market, and engage in aggressive sensitization programme on the available opportunities in the bonds market. These actions will help boost the confidence of investors and encourage border transactions/International participation in the market.

State and local governments should also desist from over reliance on monthly allocation and source fund from the bond market for developmental purposes.

2. Government policies should be directed towards increasing the size of the market especially the corporate bond market by way of deemphasizing the government bond market and a greater searchlight beamed on the corporate bonds also increasing the number of listed companies, reduction in the cost of public quotation, and making the requirement for listing less stringent. With the existence of a positive relationship between bond market and economic growth, there should be sustained effort to stimulate productivity in both the public and private sectors.

3 Government should improve basic market infrastructures such as communication and information network. This will enhance transactions between parties of the market (issuing house, stock brokers, investors etc).

4. The Federal Government of Nigeria through the DMO and SEC needs to initiate a policy of restructuring a reasonable percentage of the country's external debt to domestic through the bond market i.e should reduce their reliance on foreign currency borrowing, thereby making the bond market more resilient. Government should also implement measures to enhance the liquidity of its secondary markets,

5 All market stakeholders, including investors and asset managers, corporate issuers, banks and broker dealers, intermediaries and infrastructure providers, relevant market associations and representative bodies, as well as policy makers and regulators, need to work together in a formalized and structured forum to share views and ideas on market structure and development to grow a healthy and vibrant bond market in Nigeria.

6. There is need for government to increase its budgetary allocation on education, health and youth empowerment schemes. Efforts should be geared towards improving the level of Human Capital Development in Nigeria. Thus the provision for borrowing for human development should be critically examined with a view to restricting borrowing to only those projects that could be easily and transparently assessed.

7. There is also need to ensure effective governance and proper protection other financial sectors of the economy so that they can maintain the complementary role they play in the bond market.

5.4   Contributions to Knowledge

1. This work contributes to current literature on subject by extending number of years used by other researchers and making use of an up to date data for the study.

2. This study employed the Human Development Index which has not been employed by available literature as a measure for economic development.

5.5   Recommendations for Further Studies

This study recommends the following for further studies:

1. Future studies may be conducted to identify other variables which were not captured in this

study that significantly affect the bond market for instance, the employment of nonbank institutional factors like the pension fund and insurance companies' investment in the bond market as measures that determine bond market development.

2. A comparative study between developing and well developed economies where the bond market size is larger than the stock market.

3. Other indicators of bond market development like the bond market liquidity could be explored by researchers.

References

Adam, A. M., & Tweneboah, G. (2008). Do macroeconomic variables play any role in the stock market movement in Ghana*? MPRA Working Paper No. 9368.*

Adelegan, O.J. & Radzenwicz-Bak, B. (2009). What determines the bond market development in sub-Saharan Africa?International Monetary Fund (IMF) working paper.http://www.nber.org/papers/w10576.

Adeleke, B. (2006). Present state of corporate bond/debenture market in Nigeria*.* A paper presented at the corporate bond summit held in Lagos.

Adenuga, O.A. (2010). Stock market development indicators and economic growth in Nigeria (1990-2000) empirical investigations, *Central Bank of Nigeria Economic and Financial Review, 8 (1), 33-70.*

Adepoju, A. A., Salau, A. S. & Obayelu, A. E. (2007). The effects of external debt management on sustainable economic growth anddevelopment: Lessons from Nigeria. *Munich Personal RePEc Archive.*

Adyorough, T (2006). The mechanics of bond market in Nigeria. Retrieved from *Focus Nigeria.com/Nigerian-bond-market.htm.*

Africa Capital Markets Watch. (2016). Retrieved from www.pwc.co.za/en/assets/pdf/**africa-capital.**

Afrinvest (2010)*.* Nigerian bond market: leveraging sustainable economic development. *A Nigerian Bond Market Report.5-15*

Ajayi, O.I. (2013).The Nigerians bond market. *Understanding monetary policy series* No. 31, retrieved from www.cbn.gov.ng/out/2016/mpd/understanding%20monetary...

Ajeet, K. M & Onkar, N. M. (2016).The macro-economic determinants of corporate bond market in India. *Pacific Business Review International. 1(1), 163-177.*www.pbr.co.in.

Akers, H (2014). Key macroeconomic variables. www.ehow.com/contributor/helen_akers.

Akinsokeji, R.A, Abidemi, C. A & Edafe, J. (2016). The bonds market, aggregate investment and economic growth in Nigeria. JORIND 14(2), 1-15. www.transcampus.org/journal.

Alegre, M., Pernice, S., &Streb, J. M. (2007). Determinants of the development of corporate bond markets in. Argentina: www.ccsenet.org/journal/index.php/ijef/article/viewFile/5470...

Amadou, N.R. (2015). Trends and developments in African frontier bond markets. *Global Economy and Development Policy Paper 2015-01.*

Amaefule, E. (2011). Punch Newspapers, Wednesday, January 26, 2011. Posted via Punch on the Web- Retrieved from: http://siteresource.worlbank.org.INTTOPACCFINSER/Resources/

Ambrosi, M. (2010). David and Goliath: the South African debt market, [Online]. Available on <http//http://www.world-exchanges.org/news-views/views/david-and-goliath- south African-debt-market>.

Andrew, K. R. & Mark, M. S. (2015). Domestic bond markets and inflation. *Federal Reserve Bank of San Francisco working paper series,* 2015-05http://www.frbsf.org/economic-research/publications/working-papers/wp2015-05.pdf.

Aktar, S. (2007). Fixed income market development in emerging market economies, SBP Research Bulletin, 3(1), 2.

Arnone, M. and Presbitero, A. (2006). External debt sustainability and domestic debt in heavily indebted poor countries. Mimeo, Catholic University Milan and Universitá Politecnica delle Marche.

Asaolu, T.O & Ogunmuyiwa, M.S. (2011).An econometric analysis of the impact of macroeconomic variables on stock market movement in Nigeria.*Asian Journal of Business Management 3(1): 72-78.*

Asian Development Bank (2010). Domestic bond markets; regulatory framework. Available at: http://www.adb.org/projects/Apec/DBM/chapter1.asp

Ayogu, M. & Dezhbakhsh, H. (2005).International financial architecture,macroeconomic volatility and institutions:South Africa Experience Policy Paper Number 8.

Ayunku, P.A and Etale, L.M (2015). Determinants of stock market development in Nigeria: A cointegration approach. *Advances in Research 3(4): 366-373.*

Balduzzi, P. and Moneta, F. (2012). Economic risk premia in the fixed income markets: The intra-day evidence. Retrieved from https://repositorio.uam.es/bitstream/.../guillen_gomez_maria.pdf?

Bae, K. H. (2012). Determinants of local currency bonds and foreign holdings: Implications for bond market development in the People's Republic of China. *ADB Working Paper Series on Regional Economic Integration,* No 97.

Barclays African Markets Guide.(2015).Retrieved from www.africanbusinesscentral.com/**2015**/10/25/african-markets-gu

Barmash, I. (2003). The self-made man. Washington, DC: Beard Books, p.55. Available at: http://www.web-books.com/eLibrary/NC/B0/B65/76MB65.html#ftn.fwk-siegel-fn16_001.

Battellino, R. (2004). Recent development in Asian bond markets. Talk to the 17th Australasian Finance and Banking conference, http://www.rba.gov.au/speech/2004/sp-ag-151204.html.

Bellas, D, Papaioannou, M. G., & Petrova, I (2010). Determinants of emerging market sovereign bond spreads: fundamentals vs financial Stress, *IMF Working Paper*, No. 10/281, Washington: International Monetary Fund.1-23.

BESA (2001). The Development of the South African corporate bond market. Retrieved from www.oecd.org/**development**/pgd/29878705.pdf

BESA (2005). Developing a capital market and its implications for infrastructural development on the continent. 4-44. Available at: http://www.bondexchange.co.za/besa/ view/besa/en/page12950

Bhattacharyay, B. N. (2013). Determinants of bond market development in Asia. *Journal of Asian Economics*, 24, 124-137.

Bhattacharyay, B.N. (2011). Bond market development in Asia: AN empirical analysis of major determinants. *Asian Development Bank Institute (ADBI)Working Paper Series*. No. 300.

Blackburn, K. & Hung, V.T.Y. (1998). A theory of growth, financial development and trade*.* Economica new series, the London school of economics and political science, 65,107-124.

BIS (2007). Financial stability and local currency bond markets. *Committee on the Global Financial System Papers,* No 28. Retrieved from http://www.bis.org/forum/research.htm

Bolton, P. & Freixas, X. (2000). Equity, bonds, and bank debt: capital structure and financial market equilibrium under asymmetric information. *Journal of Political Economy*. 108, 324-351.

Bond Exchange of South Africa Limited, (2008).*The Annual Report 2008. Retrieved from* en.wikipedia.org/wiki/Bond.

Bonds _Exchange_of_South_Africa (2015).World Bank ease of doing business survey. Retrieved from www.kpmg.com/za/dealadvisory.

Bordo, M.D., Meissner, C. & Redish, A. (2003), How 'original sin' *w*as overcome: the evolution of external debt denominated indomestic currencies in the United States and the British dominions1800-2000, NBER Working Paper 9841, NBER, Cambridge MA,Online: http://www.jse.co.za/Documents-and-Presentations/BESA-Annual-reports.aspx.

Borensztein, E., Cowan, K., Eichengreen, B. & Panizza, U. (2008). Bond markets in Latin America: On the verge of a big bang? *London, the MIT Press Cambridge, Massachusetts*. Retrieved from mitpress.mit.edu/sites/default/files/titles/content.

Bradlow, D. (2013).Development of the South African local currency bond market G-24 Technical Group Meeting Washington DC. *International Economics Relations and Policy Department South African Reserve Bank.*

Braun, M. & Ignacio B. (2006).The development of bond markets around the world. Retrieved from www.iadb.org/res/laresnetwork/files/pr268finaldraft.pdf

Brooks, C. (2014). Introductory econometrics for finance. (New York) *Cambridge University Press 3rd Edition.*

Burger, J. D. & Warnock, F.E (2004). Foreign participation in local-currency bond market*. International Finance Discussion Papers No. 794*, Board of Governors of the Federal Reserve System.

Cebula, R. J. (2000). Impact of budget deficits on ex-post real long term interest rates. *Applied Economics Letters*. 7(3): 77-79.

Cenley, P. (2011). The risk of bond investing: Understanding dangers in fixed-income investing – there is no such thing as a sure thing, even in the bond world. Retrieved from http://bonds.about.com/od/bonds101/a/bondrisk.htm.

Chabchitrchaidol, A. & Panyanukul, S, (2005). Key determinants of liquidity in the Thai bond market, *Bank of Thailand*: Retrieved from http//www.journal.au.edu/abac_journal/dec99/wei_tareque_f.html

Chowdhury, S.M, Bayar, Y. & Kiliç, C. (2013). Effects of major macroeconomic indicators on emerging markets bond index. Afyon Kocatepe Üniversitesi, İİBF Dergisi (C. XV, S. II, 2013) Retrieved from search.ebscohost.com/login.aspx?direct=true&profile=ehos.

Christensen, J. (2004). Domestic debt markets in subs-Saharan Africa, *IMF Working Paper No*

  Wp04/46.

Chukwudum, Q. (2014). Impact of interest rates on stock prices: An analysis of the all share index international. *Journal of Finance and Accounting* 3(2), 96-101. Retrieved from DOI: 10.5923/j.ijfa.20140302.06

Ciarlone, A., Piselli, P. & Trebeschi, G. (2006). Demand and supply of local bonds: preliminary evidence from a new dataset, Bank of Italy.

Claessens, S, Klingebiel, D. & Schmukler, S.L. (2006). Government bonds in domestic and foreign currency: the role of institutional and macroeconomic factors. *Review of international economics. Retrieved from* ai2-s2pdfs.s3.amazonaws.com/2299/7381d400d6b6d47b4e.

Colombage, S. R. N. (2009). Financial markets and economic performances: empirical evidence from
Industrialized economy. *Economics Research in International Business and Finance,* 23, 339-348.

Crowley, J. (2007). Interest Rate Spreads in English- Speaking Africa. IMF Working paper. WP/07/101

Das, S. R, Ericsson, J & Kalimipalli, M, (2003). Liquidity and the bond markets. *Journal of Investment Management*, 1(4), 95-103.

Davis, E.P, (1999). Financial data needs for macro prudential surveillance-what are the key indicators of risks to domestic financial stability? *Bank of England.*

De la Torre, A., Juan C. G., and Sergio L. S., (2008). Capital market development: whither Latin America? in S. Edwards & M. P. Garcia (Eds), *Financial markets volatility and performance in emerging markets, (*pp. 121-153) Cambridge, NBER Books.

Demirguc-Kunt, A. (2005). Cross-country empirical studies of systemic bank distress. Retrieved from citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.599.1909&a.

Denis, D. J. & Mihov V. T. (2003). The choice among bank debt, non-bank private debt and public debt: evidence from new corporate borrowings. *Journal of Financial Economics*. 70, 3-28.

Department of National Treasury. (2012). Debt management report 2011/12. Pretoria: Department of National Treasury of South Africa.

Diamond, D. (1994). Corporate capital structure*: The* control roles of bank and public debt with taxes and costly bankruptcy. *Federal Reserve Bank of Richmond Economic Quarterly*. 80, 11-37.

Demirgüç-Kunt, A. & Maksimovic, V. (2005) Stock markets development and financing choices of firms,*World Bank Economic Review*, 3, 1, 341-70.

Dung, L.P, Nguyen, T. Q. (2015).The development of corporate bond markets: A cross-country analysis.*Proceedings of the Second Asia-Pacific Conference on Global Business, Economics, Finance and Social Sciences Vietnam Conference. Paper ID: VL567.* www.globalbizresearch.org.

Eichengreen, B & Luengnamemitchai, P. (2006). Bond market as Condit's for capital flows: How does Asia compare? *IMP Working Paper No. WP/06/238.*

Eichengreen, B., & Luengnaruemitchai, P. (2004). Why doesn't Asia have bigger bond market? *National Beureau of Economic Research*, 1076.1-44.

Eichengreen, B, Hausmann, R & Panizza, U. (2003). The pain of original sin. Retrieved from https://eml.berkely.edu>ospainaug21-03.

Eichengreen, B, Hausmann, R & Panizza, U. (2002). Original Sin:The Pain, the Mystery, and the Road to Redemption. Retrieved from *http://www.financialpolicy.org/financedev/hausmann2002.pdf*

Fabella, R.., & Madhur, S. (2003). Bond market development in East Asia: issues and challenges economic and research department, *ADB*, 35.

Fanta, A.B. & Makina, A. (2017). Equity, bonds, institutional debt and economic growth: evidence from South Africa. *South African Journal of Economics*. 85(1). 86-98.

Financial Sector Development Indicators (2006). A World Bank financial sector operations and policy document.

Fitch ratings, (2010). Fitch: South African bond market compares well to emergingmarket peers, [Online]. Available on <http//fitchratings.com>.

Gadanecz, B. & Mehrotra, A. (2011). The exchange rate, real economy and financial markets. Bank for International Settlements Paper No.73.

Garcia V.F. and Liu, L. (1999). Macroeconomic determinant of stock market development, *Journalof Applied Economics, II (1), 29-59.*

Gasper, V., Hartmann, P. & Sleijpen O. (2002). The transformation of the European financial system*.* Second ECB Central Banking Conference. Frankfurt, Germany. Available at: http://www.ecb.int/pub/pdf/other/transformationeuropeanfinancialsystemen.pdf

George, S. (2013). The Role of NSEFIMMs: An introduction to retail bond market. A Report prepared for the Nigerian stock exchange.

Githinji, G. W. (2011).The effect of selected macro-economic variables on bond market development in Kenya. Retrieved from journals.ounbi.ac.ke/damr/articles/download/1236/1051.

Goldfajn, I (1998). Public debt indexation and denomination: the case of Brazil. *IMFWorking Paper* 98/18.

Goldstein & Turner, (2004).Controlling currency mismatches in emerging economies**.** Washington, D.C. *Institute for International Economics*.

Gopinath, S. (2007). Development of local currency bond markets: The Indian experience. Mimeo, Federal Reserve Bank of India.

Gormley, T., Simon J., & Changyong R. (2008). Corporate bonds: A spare tire in emerging markets? Unpublished manuscript (Washington: International Monetary Fund).

Grandes, M. and Pinaud, N., (2004). Which policies can reduce the cost of capital in Southern Africa? OECD Policy Brief 25:6.

Grandes, M. & Peter, M. (2004). The determinants of corporate bond yield spreads in South Africa: firm-specific or driven by sovereign risk? Retrieved from www.oecd.org/dev/pgd/29863781.pdf.

Greenstone, M., Paul O., & Annette V. (2006). Mandated disclosure, stock returns, and the 1964 securities acts amendments. *Journal of Economics,* 121(2), 399-460.

Gujarati, N. D. & Porter, D. C. (2009).Basic econometrics.*(Bolton) McGraw Fifth Edition.*

Gurkaynak, R.S., Sack, B. & Swanson, E.T. (2013). Do actions speak louder than words? The response of asset prices to monetary policy actions and Statements*, International Journal of Central Banking 1, 55–93.*

Guscina, A. (2008). Impact of macroeconomic, political, and institutional factors on the structure of government debt in emerging market countries. *International Monetary Fund* WP/08/205.

Gwarzo, M. (2016). The Nigerian capital market master plan: 2015 – 2025. The challenges of the investments and securities act (2007) and other laws guiding capital market activities.

Hale, G. (2005). Bonds or loans? The effect of macroeconomic fundamentals. *Stanford center for international development. Working Paper No. 257.*

Hakeem, M. (2010), Banking development, human capital and economic growth. *Journal of Economic Growth.* 5, 3, 341-360.

Hameed, F. (2007). Fostering the corporate bond market in Pakistan, SBP ResearchBulletin. 3(1), 2.

Han, A. (2010). Efficient market hypothesis (EMH), Retrieved from http://www.alvinhan. Com/E-M-H.htm

Harvey, H. (2012). Exchange-rate volatility and money demand in selected south East Asian countries. *Economics and Finance Review*, 2(10), 1-7.

Harwood, A. (2000). Building local currency bond markets: An Asian perspectiveWashington: International Finance Corporation. pdfs.semanticscholar.org/65c1/5af7b9c618285842b658cc.

Hassan, S. (2013). South African capital markets: an overview. ERSA working paper 391.www.econrsa.org/system/files/publications/working_pa

Hawkins, J. (2002). The development of bond markets in emerging economies. Bank for International Settlements. BIS, Working Papers No. 11.

Herring, R., & Chatusripitak, N. (2000). The case of the missing market: the bond market and why it matters for financial development, *ADB Institute Working Paper 11*, ADB, Tokyo.http://ideas.repec.org/p/wop/pennin/01-08html.

Herring, R.J. & Chatusripitak, N.(2007).The case of the missing market: the bond market and why it matters for financial development. Recent Financial Crises: Analysis, Challenges and Implications, p. 148. *http://www.ccsenet.org/journal/index.php/ijef/article/viewFile/54706/29998*

Hove, T. (2008). Bond market development in emerging economies*.* A case study of the bond exchange of South Africa (BESA). A Thesis submitted in partial fulfilment of the requirements for the degree of Masters in Commerce (Financial Markets) of Rhodes University.

IMF (2000). International capital markets: developments, prospects, and key policy issues, *World Economic andFinancial Surveys*, (Washington D.C.).

IMF (2004). Monetary policy implementation at different stages of market development, IMF Board Paper available at: https://www.imf.org/external/np/mfd/2004/eng/102604.htm.

International Organization of Securities Commissions (IOSCO) (2011).The development of corporate bond markets in emerging markets. Online: http://www.iosco.org/library/pubdocs/pdf/IOSCOPD360.pdf.

Jackson, E. & Edu, (2007). The beginning of a viable Nigerian bond market*. An unpublished Survey of Bond Market Situation in Nigeria prepared Corporate Commercial Department*.

Jahjah, S. & Yue, V.Z. (2004). Exchange rate policy and sovereign bond spreads in developing countries.*International Monetary Fund Working Paper. WP*/04/210.

Janine,A.,Jonathan L. & Lynne, T. Foreign portfolio investment and capital markets in South Africa. Retrieved from citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.192.7199&a.

Jeanne, O. & A. Guscina (2006). Government debt in emerging market countries: a new data set*.* IMF Working Paper 06/98.

Jiang, G., Tang, N. & Law E. (2001). Cost and benefit analysis of developing debt markets. Hong Kong's experience. Retrieved from www.bis.org/publ/bppdf/bispap11h.pdf

Jhingan, M. L (2002) *"Macroeconomic Theory"*. 10th Edition, Vrinda Publications Ltd, New Delhi.

JP Morgan Securities Ltd (2007): "Emerging markets evolve as an asset class", *EmergingMarkets Research*.

Jochen, R. A., Geoffrey J. B. & Natalia T. T. (2005). The impact of macroeconomic announcements on emerging market bonds. *International Monetary Fund Working Paper*, WP/05/83.

Jones, C. M., Owen L, & Robin L. L. (1998). Macroeconomic news and bond market volatility. *Journal of Financial Economics*, 47, 315–37.

Kahn, B. (2005). Original sin and bond market development in sub-Saharan Africa: Africa in the world economy: *The National, Regional and International Challenges* 2, 67-87.

Kapingura, F. & Ikhide, S. (2011). Econometric determinants of liquidity of the bond market: Case study of South Africa. *P*aper Presented at the African Economic Conference, Addis Ababa, Ethiopia.

Kee-hong, B. (2012).Determinants of local currency bonds and foreign holdings: implications for bond market development in the People's Republic of China. ADB working paper series on regional economic integration No. 97.

Kemboi, JK, and Tarus, DK. (2012). Macroeconomic determinants of stock market development in emerging market: Evidence from Kenya. *Research Journal of Finance and Accounting*. 3(5), 57-68.

Kim, Y.H., (2000). Treasury securities and bond market development in developing member countries. Board Information Paper IN. 154-00, Asian Development Bank.

Kolawole, S. and Olalekan, M. S. (2013). Exchange rate volatility and the stock market: the Nigerianexperience

LaPorta, R., Florencio L., and Andrei S. (2002). Government ownership of banks, *Journal of Finance,* 57, 265–301.
Laeven, L. (2014). The development of local capital markets: rationale and challenges. *International Monetary Fund. IMF Working Paper WP/14/234.*

Leibenstein, H. (1957). Economic backwardness and economic growth. Studies in the theory of development. New York: Wiley.

Levine, R. & Sara Z. (1998). Stock markets, banks, and economic growth, *American Economic Review*, 88(3), 537–558.

Liu, G.J. (2013). The bond market in South Africa: efficiency and investment issues. A thesis submitted to the University of the Witwatersrand Johannesburg. core.ac.uk/download/pdf/39671848.pdf.

LKhagvajav, B., Batnyam,D.& Gan-Ochir, D. (2008). Monetary policy development: A case of Mongolia. A research paper conducted at the Bank of Mongolia.

Mailafia, L. (2014).Determinants of bond market development in Nigeria. Retreived from kubanni.abu.edu.ng:8080/jspui/bitstream/123456789/6263/1/Det.

Matías, B.& Ignacio, B. (2006). The development of bond markets around the world. http://www.iadb.org/res/laresnetwork/files/pr268finaldraft.pdf

Margolin, D. (2007). Financial stability and local currency bond markets. Report submitted by a Working Group established by the Committee on the Global Financial System. CGFS Papers No 2.

Mboweni, T.T. (2006). Deepening capital markets: The case of South Africa. Seminar on 'deepening financial sectors in Africa:experiences and policy options" IMF/AFR and DFID.www.resbank.co.za/Lists/Speeches/Attachments/124/IMF.

McCauley, R. & Eli, R. (2000). Size and liquidity of government bond markets. BIS Quarters Review, November.

Mihaljek, Scatigna and Villar (2002). Recent trends in the bond market. Retrieved from www.bis.org/publ/bppdf/bispap11c.pdf

Min, H. G. (1998) "Determinants of emerging market bond spread: Do economic fundamentals matter? *Working Paper in International Economics, Trade, and Capital Flows*, No. 1899, Washington: The World Bank, pp.1-31.

Mizen, P. & Tsoukas, S. (2010).What effect has bond market development in emerging Asia hadon the issuance of corporate bonds?Hong Kong institute for monetary research. *HKIMR* Working Paper No. 18/2010.

Mminele, A.D. (2009). Recent economic developments in South Africa, *Bank ofInternational Settlements.* Retrieved fromwww.bis.org/review/r160114j.htm.

Mohanty, M.S. (2002). Improving liquidity in government bond markets: what can be done? Bank for International Settlements. BIS, Working Papers No. 11. Retrieved from www.bis.org/publ/bppdf/bispap11h.pdf.

Monacelli, T., Lovino, L., & Pascucci, F. (2012). Financial development and human development Index. *Anno Accademico.*

Mu, Y., Phelps, P. & Stotsky, J.G. (2013). Bond markets in Africa. *International Monetary Fund IMF Working Paper,* WP/13.

Mukherjee K.T & Atsuyuki, N, 1995. Dynamic relations between macroeconomic variables and the Japanese stock market: An application of a vector error correction model, *Journal of Financial Research*, 18 (2), 223-37.

Muthike, S. W., & Sakwa, M. M. (2012). Can macroeconomic indicators be used as predictors of the stockexchange index trends? A look at the Nairobi stock exchange. In Scientific Conference Proceedings. Retrieved from http://elearning.jkuat.ac.ke/ journals/ojs/index. php/jscp/article/ view/731.

Mwangi, F. K (2013). The effect of macroeconomic variables on financial performance of Aviation Industry in Kenya. *Unpublished MSC project, University of Nairobi.*

Nasser, T. & He, W. (1999). An empirical study on the factors affecting bond liquidity in the Thai secondary bond market. Retrieved from http//www.bis.org/repofficepubl/arpresearch.

Ngugi, R. W., (2001). An empirical analysis of interest rate spread in Kenya. *African Economic Research Consortium, Research paper 106.*

Ngugi. R. W., & Agoti, J., (2009). Microstructure elements of the bonds market in Kenya. Prepared for African economic Conference on "Globalisation, institutions and Economic development in Africa". Nairobi: K1PPRA.

Nkwede, F.E, Uguru, L.C, & Nkwegu, L.C. (2016). Corporate bond market development in Nigeria: does macroeconomic factors matter? *Arabian Journal of Business and Management Review. 6(2), 23-45.*www.arabianjbmr.com.

Noumbissie, F.F. & Mongale, I. P. (2014). The impact of monetary policy on financial market in South Africa: A VAR Analysis. *Journal of Economics and Behavioral Studies*. 6(8), 636-646.

Nwankwo, A. (2014). The transformation of the Nigerian bond market in Oteh, A (2014).Can we bank on Nigerian bond market? thenationonlineng.net/can-we-bank-on-nigerian-bond-market.

Nwoke, C. (1990).The origins and dimension of Nigeria external debt: in Nigeria external debt crisis; its management. Edd by Adebayo O. Olukosi. Malthouse Press Ltd, 42 – 61.

Nyongesa, N. W. (2012). Factors influencing the liquidity of secondary bond market in Kenya. Retrieved from erepository.uonbi.ac.ke/handle/11295/96466.

Ogilo F. (2014).The effect of selected macro-economic variables on bond marketdevelopment in Kenya. *DBA Africa Management Review 4(2), 54-62.*

Oji, C.K. (2015). Bonds: A viable alternative for financing Africa's development. *South African Institute of International Affairs.* Occasional Paper 211, 1-24.

Okorie, C. E. (2012). History and prospect of the Nigeria government bonds market. Retrieved from repository.unn.edu.ng:8080/jspui/bitstream/123456789/1206/1.

Okpara, G. C. (2010). Monetary Policy and Stock Market Returns: Evidence from Nigeria, *Journal of Economics,* 1 (1), 13-21. Retrieved from http://www.krepublishers.com%2F02-Journals.

Onaolapo, A. A. & Adebayo, E. O. (2010). Effective development of the bond market and the Nigeria economy, *Journal of Management and Society, 1 (2)*, 38-43.

Onogbosele, D.O & Ben, M.D. (2016). The impact of domestic debt on economic growth of Nigeria. *Asian Research Journal of Arts & Social Sciences, 1(3): 1-13.*www.sciencedomain.org.

Osaze, E. B. (2014). The historical evolution of the Nigerian capital market. Available from: http://www.proshareng.com/articles/2349/The-Historical-Evolution-of-the-Nigerian-Capital-Market.

Oteh, A, (2013). Preserving our success and enabling our potential through managing emerging risks. www.nigerianregulators.com/articles/2603.html

Özatay, F, Özmen, E. & Ahinbeyoğlu, G. (2007). Emerging market sovereign spreads, global financial conditions and U.S. macroeconomic news, *Economic Research Center Working Papers in Economics*, 07/07, Ankara: Middle East Technical University, 1-29.

Panizza, U. (2008).Domestic and external public debtin developing countries. UNCTAD/osg/dp/2008/3. No. 188

PECC (2004). Developing bond markets in the APEC region: Need and agenda for public-private sector partnership. Issues at *PECC*. Singapore: PECC International Secretariat.

Phelps, E. S. (1997) Comment on Blanchard. *Brookings Papers on Economic Activity* 2/1997: 148-155.

Plummer, M.G. & Click, R.W. (2005), Bond market development and integration in ASEAN', *International Journal of Finance & Economics*, 10, (2), 133-42.

Raghavan, S. & Sarwono, D. (2012).Development of the corporate bond market in India: an empirical and policy analysis. *International Conference on Economics and Finance Research, 32, 49-53.*

Rajan, R.G. & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*. 69, 5–50.

Rashid, A. (2007). What moves the primary stock and bond markets? Influence of macroeconomic factors on bond and equity issues in Malaysia and Korea. A*sian Academy Management Journal of Accounting and Finance,*3(1), 93–116.

Reinhart, C.M., Reinhart, V. R. & Rogoff, K.S. (2012) Public debt overhangs: Advanced economy episodes Since 1800 Journal of Economic Perspectives, 26(3) 69–86.

RBI (2007). Development of financial markets and role of Central Banks. Being a Reporton Currency and Finance. Reserve Bank of India. Retrieved from repository.unn.edu.ng:8080/jspui/bitstream/123456789/1206/1/

Ringui, J.K. (2012). A survey of factors determining development of corporate bonds market in Kenya. Retrieved from erepository.uonbi.ac.ke/handle/11295/13301.

Hutledge, j. (1995). History lesson, F*orbes,* 155,118.

Siddique, A., Selvanathan¸ E. A. & Selvanathan¸ S. (2015). The impact of external debt on economic growth: empirical evidence from highly indebted poor countries. *University of Western Australia.*

Simon, C. (1989). The effect of the 1933 Securities Act on investor information and the performance of new issues. *American Economic Review,* 79, 295–318.

Sogunle, D. (2011). Pension funds and investment in bond. Presented at the bond training workshop for accountants and insurancecompanies organized by NAICOM and SECLagos. Retrieved from mpra.ub.uni-muenchen.de/73613/1/MPRA_paper_73613.pdf.

Sokoler, M. (2002): The importance of a well-developed bond market – an Israeli perspective, in *BIS Papers*, no 11, Bank for International Settlements.

Soludo, C. (2003). Debt poverty and inequality, in Okojo Iweala, Soludo, and Muntar (Eds). The debt trap in Nigeria, African World Press NJ. 23-74.

Standley, S. (2010). What are the determinants of financial market development in sub-Saharan Africa? *Private Sector & Development PROPARCO Magazine*.5, 17-19.

The African Debt Market. (2014). Insights into African capital markets. Retrieved fromwww.kpmg.com/za/dealadvisory.

The Thai bond market, *Bank of Thailand*: Retrieved from http//www.journal. au.edu/abac_ journal/dec99/wei_tareque_f.html.

Thotho, L. (2010). Key determinants of government bondmarket development in Mefmi region. Central Bank of Kenya. Retrieved from **mefmi**.org/mefmifellows/wp-content/uploads/2016/10/**Key**-Determ.

Turner, P. (2003). Bond market development: what are the policy issues?Paper prepared for a joint World Bank/IMF/Brookings Institution conference on the Future of Domestic Capital Markets in Developing Countries.

Turner, P. (2004).Bond markets in emerging economies: an overview of policy issues. *BIS Papers No 11*
Retrieved from http://www.bis.org/publ/bppdf/bispap11b.pdf

United Nations Conference on Trade and Development. (UNCTAD) Economic development in Africa report 2016.

Vetiva Capital Management Limited (2010). Fixed income Nigeria bond rush. Retrieved from www.bloomberg.com/research/stocks/private/snapshot.a

Werner, K. (2012). An introduction to inflation-linked bond. *Lazard Asset Management, Hintergrund.*
 Retrieved from www.lazardnet.com/docs/sp0/6034/AnIntroductionToInflation-Li.

Witherell, W. (2003). Global and local bond market: A financial stability perspective.Being a Paper Presented at the Fifth Annual OECD-World Bank Bond Market Forum in June 2-3, at World Bank Headquarters, Washington DC.

World Bank (2010). Public debt management in emerging market economies: has this time been different? *Policy Research Working Paper 5399.* Washington, D.C.: World Bank.

World Bank. World Development Indicators. http://data.worldbank.org/data-catalog/ world development-
Indicators.

Yartey, C.A. (2008). The institutional and macroeconomic determinants of stock market development in emerging economies. *Journal of Applied Financial Economics*. 20(2):1615-1625.

Yoshitomi, M. & Shirai, S. (2001). Designing a financial market structure in post-crisis Asia, ADB Institute Tokyo. Retrieved from www.adb.org/sites/default/files/publication/157198/a.

APPENDICES

APPENDIX 1: UNIT ROOT TEST (NIGERIA)

Null Hypothesis: D(GOVT,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.986484	0.0049
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVT,3)
Method: Least Squares
Date: 02/02/18   Time: 15:22
Sample (adjusted): 1994 2016
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVT(-1),2)	-1.186913	0.297734	-3.986484	0.0005
C	-1.15E+09	1.67E+09	-0.687101	0.4981

R-squared	0.379357	Mean dependent var	-1.26E+09
Adjusted R-squared	0.355486	S.D. dependent var	1.10E+10
S.E. of regression	8.85E+09	Akaike info criterion	48.71402
Sum squared resid	2.04E+21	Schwarz criterion	48.80917
Log likelihood	-679.9962	Hannan-Quinn criter.	48.74311
F-statistic	15.89205	Durbin-Watson stat	1.492217
Prob(F-statistic)	0.000484		

Null Hypothesis: D(EXTDEBT) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.510623	0.0000
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTDEBT,2)
Method: Least Squares
Date: 02/03/18   Time: 15:38
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT(-1))	-1.984777	0.304852	-6.510623	0.0000
D(EXTDEBT(-1),2)	0.989887	0.261706	3.782432	0.0011
D(EXTDEBT(-2),2)	0.998961	0.217941	4.583627	0.0002
C	3.89E+08	3.64E+08	1.068033	0.2976

R-squared	0.744246	Mean dependent var		1096004.
Adjusted R-squared	0.707710	S.D. dependent var		3.29E+09
S.E. of regression	1.78E+09	Akaike info criterion		45.58092
Sum squared resid	6.64E+19	Schwarz criterion		45.77594
Log likelihood	-565.7615	Hannan-Quinn criter.		45.63501
F-statistic	20.37004	Durbin-Watson stat		1.988075
Prob(F-statistic)	0.000002			

Null Hypothesis: D(CORP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.919888	0.0000
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CORP,2)
Method: Least Squares
Date: 02/03/18   Time: 15:43
Sample (adjusted): 1994 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CORP(-1))	-1.174215	0.198351	-5.919888	0.0000
C	3.38E+08	3.28E+08	1.030721	0.3129

R-squared	0.593531	Mean dependent var		30351571
Adjusted R-squared	0.576595	S.D. dependent var		2.54E+09
S.E. of regression	1.65E+09	Akaike info criterion		45.36245
Sum squared resid	6.55E+19	Schwarz criterion		45.45923
Log likelihood	-587.7118	Hannan-Quinn criter.		45.39032
F-statistic	35.04508	Durbin-Watson stat		2.007452
Prob(F-statistic)	0.000004			

Null Hypothesis: D(NHDI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.868641	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NHDI,2)
Method: Least Squares
Date: 02/03/18   Time: 15:45
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NHDI(-1))	-1.155890	0.196960	-5.868641	0.0000
C	1.25E+09	2.94E+09	0.425689	0.6737

R-squared	0.560554	Mean dependent var	-6.67E+08
Adjusted R-squared	0.544278	S.D. dependent var	2.33E+10
S.E. of regression	1.57E+10	Akaike info criterion	49.86300
Sum squared resid	6.69E+21	Schwarz criterion	49.95730
Log likelihood	-721.0135	Hannan-Quinn criter.	49.89253
F-statistic	34.44095	Durbin-Watson stat	2.002733
Prob(F-statistic)	0.000003		

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.895867	0.0063
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 02/03/18   Time: 16:00
Sample (adjusted): 1990 2016
Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.465465	0.376159	-3.895867	0.0007
D(GDP(-1),2)	0.401928	0.284869	1.410923	0.1717

154

D(GDP(-2),2)	0.198891	0.201686	0.986142	0.3343
C	0.007869	0.005202	1.512630	0.1440

R-squared	0.548127	Mean dependent var	-0.000370
Adjusted R-squared	0.489188	S.D. dependent var	0.035025
S.E. of regression	0.025033	Akaike info criterion	-4.401284
Sum squared resid	0.014413	Schwarz criterion	-4.209308
Log likelihood	63.41733	Hannan-Quinn criter.	-4.344199
F-statistic	9.299768	Durbin-Watson stat	1.755995
Prob(F-statistic)	0.000325		

Null Hypothesis: D(INT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.920725	0.0004
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 02/03/18   Time: 16:01
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-0.916829	0.186320	-4.920725	0.0000
C	-5.75E+08	1.06E+09	-0.542624	0.5918

R-squared	0.472796	Mean dependent var	-2.11E+08
Adjusted R-squared	0.453269	S.D. dependent var	7.70E+09
S.E. of regression	5.69E+09	Akaike info criterion	47.82824
Sum squared resid	8.74E+20	Schwarz criterion	47.92254
Log likelihood	-691.5095	Hannan-Quinn criter.	47.85778
F-statistic	24.21353	Durbin-Watson stat	1.960086
Prob(F-statistic)	0.000038		

Null Hypothesis: D(BDEF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.283896	0.0251
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BDEF,2)
Method: Least Squares
Date: 02/03/18   Time: 16:06
Sample (adjusted): 1994 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BDEF(-1))	-0.778692	0.237124	-3.283896	0.0028
C	7.118773	3.278786	2.171161	0.0389

R-squared	0.285411	Mean dependent var		1.897241
Adjusted R-squared	0.258945	S.D. dependent var		17.93775
S.E. of regression	15.44163	Akaike info criterion		8.378484
Sum squared resid	6437.989	Schwarz criterion		8.472780
Log likelihood	-119.4880	Hannan-Quinn criter.		8.408016
F-statistic	10.78397	Durbin-Watson stat		1.714220
Prob(F-statistic)	0.002834			

Null Hypothesis: D(STCAP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.935352	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STCAP,2)
Method: Least Squares
Date: 02/03/18   Time: 16:08
Sample (adjusted): 1994 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NSC(-1))	-1.155297	0.194647	-5.935352	0.0000
C	3.16E+09	2.38E+09	1.326258	0.1959

R-squared	0.566115	Mean dependent var		-3.32E+08
Adjusted R-squared	0.550045	S.D. dependent var		1.85E+10
S.E. of regression	1.24E+10	Akaike info criterion		49.38966
Sum squared resid	4.17E+21	Schwarz criterion		49.48396
Log likelihood	-714.1501	Hannan-Quinn criter.		49.41920
F-statistic	35.22841	Durbin-Watson stat		1.915370
Prob(F-statistic)	0.000003			

Null Hypothesis: exrate has a unit root
Exogenous: Constant
Lag Length: 7 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.965365	0.0006
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(exrate)
Method: Least Squares
Date: 02/03/18   Time: 15:41
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXRATE(-1)	-0.467369	0.094126	-4.965365	0.0002
D(EXRATE(-1))	-0.218200	0.130287	-1.674766	0.1162
D(EXRATE(-2))	0.354874	0.116732	3.040084	0.0088
D(EXRATE(-3))	0.223165	0.105523	2.114846	0.0529
D(EXRATE(-4))	-0.068634	0.094233	-0.728345	0.4784
D(EXRATE(-5))	-0.253916	0.091287	-2.781511	0.0147
D(EXRATE(-6))	0.083863	0.074212	1.130057	0.2774
D(EXRATE(-7))	0.243457	0.076059	3.200910	0.0064
C	5.636437	2.278229	2.474043	0.0268

R-squared	0.859514	Mean dependent var	-2.195652
Adjusted R-squared	0.779236	S.D. dependent var	10.89706
S.E. of regression	5.120045	Akaike info criterion	6.390375
Sum squared resid	367.0080	Schwarz criterion	6.834699
Log likelihood	-64.48931	Hannan-Quinn criter.	6.502121
F-statistic	10.70672	Durbin-Watson stat	1.685783
Prob(F-statistic)	0.000088		

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.418383	0.0015
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 02/03/18   Time: 16:02
Sample (adjusted): 1994 2016
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.744856	0.168581	-4.418383	0.0001
C	14.23521	3.247170	4.383882	0.0001

R-squared	0.410801	Mean dependent var		0.173333
Adjusted R-squared	0.389758	S.D. dependent var		4.518283
S.E. of regression	3.529593	Akaike info criterion		5.424583
Sum squared resid	348.8247	Schwarz criterion		5.517996
Log likelihood	-79.36874	Hannan-Quinn criter.		5.454466
F-statistic	19.52211	Durbin-Watson stat		2.068296
Prob(F-statistic)	0.000136			

APPENDIX 11: UNIT ROOT (SOUTH AFRICA)

Null Hypothesis: CORP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.327584	0.0002
Test critical values:	1% level	-3.689194	
	5% level	-2.971853	
	10% level	-2.625121	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CORP)
Method: Least Squares
Date: 02/08/18   Time: 11:04
Sample (adjusted): 1994 2016
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CORP(-1)	-1.045445	0.196232	-5.327584	0.0000
C	1.79E+09	6.62E+08	2.705901	0.0119

R-squared	0.521911	Mean dependent var		22571429
Adjusted R-squared	0.503523	S.D. dependent var		4.30E+09
S.E. of regression	3.03E+09	Akaike info criterion		46.57024
Sum squared resid	2.39E+20	Schwarz criterion		46.66540
Log likelihood	-649.9833	Hannan-Quinn criter.		46.59933
F-statistic	28.38315	Durbin-Watson stat		2.066854
Prob(F-statistic)	0.000014			

Null Hypothesis: BDEF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=3)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-21.27594	0.0001
Test critical values:	1% level	-3.959148	
	5% level	-3.081002	
	10% level	-2.681330	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
    and may not be accurate for a sample size of 15

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BDEF)
Method: Least Squares
Date: 02/08/18   Time: 10:58
Sample (adjusted): 2001 2015
Included observations: 15 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BDEF(-1)	-1.019017	0.047895	-21.27594	0.0000
C	6.99E+08	2.01E+08	3.482671	0.0040

R-squared	0.972083	Mean dependent var	-1.05E+09
Adjusted R-squared	0.969936	S.D. dependent var	4.09E+09
S.E. of regression	7.09E+08	Akaike info criterion	43.71963
Sum squared resid	6.53E+18	Schwarz criterion	43.81404
Log likelihood	-325.8972	Hannan-Quinn criter.	43.71862
F-statistic	452.6657	Durbin-Watson stat	0.782132
Prob(F-statistic)	0.000000		

Null Hypothesis: D(EXRATE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.990426	0.0004
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXRATE,2)
Method: Least Squares
Date: 02/08/18   Time: 11:05
Sample (adjusted): 1994 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXRATE(-1))	-0.901883	0.180723	-4.990426	0.0000
C	-1.501415	1.433731	-1.047208	0.3043

R-squared	0.479812	Mean dependent var	-0.658621
Adjusted R-squared	0.460546	S.D. dependent var	10.43892
S.E. of regression	7.667129	Akaike info criterion	6.978234
Sum squared resid	1587.192	Schwarz criterion	7.072530
Log likelihood	-99.18439	Hannan-Quinn criter.	7.007766
F-statistic	24.90435	Durbin-Watson stat	1.802378
Prob(F-statistic)	0.000031		

Null Hypothesis: D(GOVT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.030685	0.0047
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GOVT,2)
Method: Least Squares
Date: 02/08/18   Time: 11:03
Sample (adjusted): 1994 2016
Included observations: 26 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GOVT(-1))	-0.795197	0.197286	-4.030685	0.0005
C	1.46E+09	9.22E+08	1.588038	0.1254

R-squared	0.403674	Mean dependent var	-94777279
Adjusted R-squared	0.378827	S.D. dependent var	5.42E+09
S.E. of regression	4.27E+09	Akaike info criterion	47.26102
Sum squared resid	4.37E+20	Schwarz criterion	47.35780
Log likelihood	-612.3933	Hannan-Quinn criter.	47.28889
F-statistic	16.24643	Durbin-Watson stat	2.098992
Prob(F-statistic)	0.000488		

Null Hypothesis: D(BNK) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.978701	0.0000
Test critical values:	1% level	-3.679322	

5% level		-2.967767	
10% level		-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BNK,2)
Method: Least Squares
Date: 02/08/18   Time: 11:00
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BNK(-1))	-1.138661	0.190453	-5.978701	0.0000
C	4.81E+10	1.32E+10	3.652354	0.0011

R-squared	0.569686	Mean dependent var	93624828
Adjusted R-squared	0.553748	S.D. dependent var	8.42E+10
S.E. of regression	5.62E+10	Akaike info criterion	52.41033
Sum squared resid	8.54E+22	Schwarz criterion	52.50463
Log likelihood	-757.9498	Hannan-Quinn criter.	52.43987
F-statistic	35.74487	Durbin-Watson stat	2.037260
Prob(F-statistic)	0.000002		

Null Hypothesis: D(HDI) has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=7)

			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.754484	0.0010
Test critical values:	1% level		-3.752946	
	5% level		-2.998064	
	10% level		-2.638752	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HDI,2)
Method: Least Squares
Date: 02/08/18   Time: 11:06
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HDI(-1))	-0.370662	0.077961	-4.754484	0.0003
D(HDI(-1),2)	0.456078	0.159643	2.856859	0.0120
D(HDI(-2),2)	0.022005	0.184610	0.119200	0.9067
D(HDI(-3),2)	0.525468	0.180701	2.907938	0.0108
D(HDI(-4),2)	0.129869	0.110910	1.170940	0.2599
D(HDI(-5),2)	0.260959	0.074775	3.489902	0.0033
D(HDI(-6),2)	0.132064	0.058064	2.274444	0.0381
C	0.000278	0.000371	0.749615	0.4651

R-squared	0.728491	Mean dependent var	-0.000348
Adjusted R-squared	0.601787	S.D. dependent var	0.002587
S.E. of regression	0.001632	Akaike info criterion	-9.729327
Sum squared resid	4.00E-05	Schwarz criterion	-9.334372
Log likelihood	119.8873	Hannan-Quinn criter.	-9.629997
F-statistic	5.749554	Durbin-Watson stat	2.275707
Prob(F-statistic)	0.002229		

Null Hypothesis: D(EXTDEBT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.728824	0.0007
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EXTDEBT,2)
Method: Least Squares
Date: 02/08/18   Time: 11:07
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXTDEBT(-1))	-0.910471	0.192536	-4.728824	0.0001
C	4.07E+09	1.98E+09	2.052606	0.0499

R-squared	0.453018	Mean dependent var	-68965517
Adjusted R-squared	0.432760	S.D. dependent var	1.27E+10
S.E. of regression	9.57E+09	Akaike info criterion	48.86846
Sum squared resid	2.47E+21	Schwarz criterion	48.96275
Log likelihood	-706.5926	Hannan-Quinn criter.	48.89799
F-statistic	22.36178	Durbin-Watson stat	2.039386
Prob(F-statistic)	0.000063		

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.943577	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)

Method: Least Squares
Date: 02/08/18   Time: 11:08
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.136907	0.191283	-5.943577	0.0000
C	2.56E+10	6.52E+09	3.919895	0.0005

R-squared	0.566795	Mean dependent var		-3.33E+08
Adjusted R-squared	0.550750	S.D. dependent var		3.90E+10
S.E. of regression	2.61E+10	Akaike info criterion		50.87635
Sum squared resid	1.84E+22	Schwarz criterion		50.97065
Log likelihood	-735.7071	Hannan-Quinn criter.		50.90589
F-statistic	35.32611	Durbin-Watson stat		2.035325
Prob(F-statistic)	0.000002			

Null Hypothesis: D(INT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.411994	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 02/08/18   Time: 11:09
Sample (adjusted): 1994 2016
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-1.220102	0.190284	-6.411994	0.0000
C	0.228565	0.487304	0.469039	0.6428

R-squared	0.603604	Mean dependent var		-0.090345
Adjusted R-squared	0.588922	S.D. dependent var		4.071580
S.E. of regression	2.610507	Akaike info criterion		4.823438
Sum squared resid	183.9982	Schwarz criterion		4.917735
Log likelihood	-67.93986	Hannan-Quinn criter.		4.852971
F-statistic	41.11367	Durbin-Watson stat		1.887204
Prob(F-statistic)	0.000001			

Null Hypothesis: D(STCAP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.940300	0.0000
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(STCAP,2)
Method: Least Squares
Date: 02/08/18   Time: 11:12
Sample (adjusted): 1994 2016
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(STCAP(-1))	-1.323703	0.190727	-6.940300	0.0000
C	3.51E+10	2.32E+10	1.511683	0.1422

R-squared	0.640803	Mean dependent var	6.18E+09
Adjusted R-squared	0.627500	S.D. dependent var	2.01E+11
S.E. of regression	1.23E+11	Akaike info criterion	53.97468
Sum squared resid	4.08E+23	Schwarz criterion	54.06897
Log likelihood	-780.6328	Hannan-Quinn criter.	54.00421
F-statistic	48.16776	Durbin-Watson stat	2.131678
Prob(F-statistic)	0.000000		

Null Hypothesis: D(INF,2) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.935302	0.0000
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,3)
Method: Least Squares
Date: 02/08/18   Time: 11:11
Sample (adjusted): 1992 2016
Included observations: 25 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1),2)	-3.481268	0.438706	-7.935302	0.0000
D(INF(-1),3)	1.985871	0.362450	5.479016	0.0000
D(INF(-2),3)	1.141357	0.247921	4.603707	0.0002
D(INF(-3),3)	0.715887	0.139701	5.124443	0.0001
C	0.095862	0.389345	0.246214	0.8080

R-squared	0.874324	Mean dependent var	0.064000

Adjusted R-squared	0.849189	S.D. dependent var		5.001323
S.E. of regression	1.942234	Akaike info criterion		4.342412
Sum squared resid	75.44550	Schwarz criterion		4.586187
Log likelihood	-49.28015	Hannan-Quinn criter.		4.410025
F-statistic	34.78485	Durbin-Watson stat		2.105169
Prob(F-statistic)	0.000000			

Dependent Variable: LOG(CORP(1))
Method: Least Squares
Date: 02/06/18   Time: 10:46
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXTDEBT(2))	1.781104	0.921936	1.931918	0.0693
LOG(INT)	0.325557	1.596136	0.203965	0.8407
LOG(INF)	0.180411	0.379774	0.475048	0.6405
LOG(EXRATE)	-1.104785	0.500442	-2.207622	0.0405
LOG(BDEF)	0.106448	0.207749	0.512386	0.6146
LOG(STCAP)	0.275740	0.385544	0.715197	0.4837
LOG(BNK)	-0.376319	3.737345	-0.100692	0.9209
LOG(HDI)	0.402394	0.784722	0.512786	0.6143
LOG(GDP)	2.757263	1.951022	1.413241	0.1746
C	-112.0040	44.32494	-2.526884	0.0211

R-squared	0.719529	Mean dependent var		18.76865
Adjusted R-squared	0.579293	S.D. dependent var		1.717397
S.E. of regression	1.113937	Akaike info criterion		3.326130
Sum squared resid	22.33538	Schwarz criterion		3.801918
Log likelihood	-36.56582	Hannan-Quinn criter.		3.471583
F-statistic	5.130859	Durbin-Watson stat		1.807013
Prob(F-statistic)	0.001580			

Dependent Variable: GOVTB(4)
Method: Least Squares
Date: 02/06/18   Time: 12:29
Sample (adjusted): 1990 2012
Included observations: 23 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HDI(-4)	3.92E+10	6.77E+10	0.579410	0.5688

GDP	0.033328	0.013491	2.470449	0.0226
C	-1.96E+10	2.28E+10	-0.857016	0.4016

R-squared	0.602481	Mean dependent var	9.86E+09
Adjusted R-squared	0.562729	S.D. dependent var	1.24E+10
S.E. of regression	8.21E+09	Akaike info criterion	48.61566
Sum squared resid	1.35E+21	Schwarz criterion	48.76377
Log likelihood	-556.0801	Hannan-Quinn criter.	48.65291
F-statistic	15.15602	Durbin-Watson stat	1.284886
Prob(F-statistic)	0.000099		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.307252	Prob. F(2,1)	0.7870
Obs*R-squared	5.328611	Prob. Chi-Square(2)	0.0696

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/18   Time: 11:51
Sample: 2000 2015
Included observations: 14
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CORP	0.281043	0.796090	0.353029	0.7839
EXTDEBT	0.040200	0.246861	0.162845	0.8972
EXRATE	-2.22E+08	4.14E+08	-0.536219	0.6867
INT	6.34E+08	1.61E+09	0.392991	0.7616
INF	-3.83E+08	1.44E+09	-0.266816	0.8340
BNK	0.006286	0.054570	0.115201	0.9270
HDI	-9.45E+10	3.53E+11	-0.268082	0.8333
STCAP	0.004867	0.037525	0.129709	0.9179
GDP	-0.021969	0.107957	-0.203498	0.8722
BDEF	0.284502	0.756886	0.375885	0.7711
C	7.70E+10	2.39E+11	0.322858	0.8012
RESID(-1)	-1.615528	1.738052	-0.929505	0.5232
RESID(-2)	-0.329485	3.783108	-0.087094	0.9447

R-squared	0.380615	Mean dependent var	1.06E-06
Adjusted R-squared	-7.052005	S.D. dependent var	1.34E+09
S.E. of regression	3.81E+09	Akaike info criterion	46.17593
Sum squared resid	1.45E+19	Schwarz criterion	46.76934
Log likelihood	-310.2315	Hannan-Quinn criter.	46.12100
F-statistic	0.051209	Durbin-Watson stat	2.180285
Prob(F-statistic)	0.999163		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.143551	Prob. F(10,3)	0.2879
Obs*R-squared	12.28119	Prob. Chi-Square(10)	0.2667
Scaled explained SS	0.661187	Prob. Chi-Square(10)	1.0000

Test Equation:
Dependent Variable: RESID^2

Method: Least Squares
Date: 02/08/18   Time: 12:10
Sample: 2000 2015
Included observations: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.92E+19	1.14E+20	0.780051	0.4922
CORP	-6.46E+08	1.96E+08	-3.292824	0.0460
EXRATE	-1.15E+17	1.65E+17	-0.700168	0.5342
EXTDEBT	-82932366	98465074	-0.842252	0.4615
BDEF	1.20E+08	3.56E+08	0.337149	0.7582
INT	-3.56E+17	5.35E+17	-0.665747	0.5532
INF	-6.09E+17	5.91E+17	-1.031032	0.3784
BNK	20225034	25915908	0.780410	0.4921
STCAP	8175665.	18908863	0.432372	0.6947
HDI	-1.22E+20	1.71E+20	-0.713902	0.5268
GDP	-20534019	33883827	-0.606012	0.5873

R-squared	0.877228	Mean dependent var	1.67E+18
Adjusted R-squared	0.467987	S.D. dependent var	2.66E+18
S.E. of regression	1.94E+18	Akaike info criterion	87.08401
Sum squared resid	1.13E+37	Schwarz criterion	87.58613
Log likelihood	-598.5881	Hannan-Quinn criter.	87.03753
F-statistic	2.143551	Durbin-Watson stat	2.908904
Prob(F-statistic)	0.287906		

Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/09/18   Time: 08:09
Sample (adjusted): 2000 2016
Included observations: 16 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXDEBT)	1.240931	0.118963	10.43125	0.0000
LOG(INT)	-0.034761	0.130747	-0.265865	0.7957
LOG(INF)	-0.259447	0.110668	-2.344377	0.0410
LOG(EXRATE)	-0.859429	0.422428	-2.034499	0.0693
LOG(BDEF)	0.047689	0.071710	0.665028	0.5211
C	-4.067635	2.891226	-1.406889	0.1898

R-squared	0.979054	Mean dependent var	23.70855
Adjusted R-squared	0.968580	S.D. dependent var	0.866486
S.E. of regression	0.153590	Akaike info criterion	-0.629067
Sum squared resid	0.235898	Schwarz criterion	-0.339346
Log likelihood	11.03254	Hannan-Quinn criter.	-0.614231
F-statistic	93.48169	Durbin-Watson stat	1.721015
Prob(F-statistic)	0.000000		

APPENDIX 111: SERIAL AUTOCORELATION TEST (NIGERIA)

Breusch-Godfrey Serial Correlation LM Test:

	F-statistic	0.303272	Prob. F(2,11)	0.7444
	Obs*R-squared	0.992917	Prob. Chi-Square(2)	0.6087

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 21:52
Sample: 1996 2014
Included observations: 19
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXRATE)	-0.041932	1.424213	-0.029443	0.9770
LOG(EXTDEBT)	-0.302960	0.816891	-0.370870	0.7178
LOG(BDEF(2))	9.88E-05	0.243568	0.000406	0.9997
LOG(INT)	0.225732	2.740190	0.082378	0.9358
LOG(INF(-2))	0.111695	0.619028	0.180437	0.8601
C	6.458281	25.22272	0.256050	0.8026
RESID(-1)	-0.239871	0.346943	-0.691385	0.5037
RESID(-2)	-0.199693	0.361069	-0.553060	0.5913

R-squared	0.052259	Mean dependent var	2.99E-15
Adjusted R-squared	-0.550849	S.D. dependent var	0.796080
S.E. of regression	0.991383	Akaike info criterion	3.116131
Sum squared resid	10.81125	Schwarz criterion	3.513789
Log likelihood	-21.60324	Hannan-Quinn criter.	3.183430
F-statistic	0.086649	Durbin-Watson stat	1.981802
Prob(F-statistic)	0.998206		

APPENDIX 111: SERIAL AUTOCORELATION TEST (SOUTH AFRICA)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.187839	Prob. F(2,8)	0.9168
Obs*R-squared	0.343808	Prob. Chi-Square(2)	0.8421

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 13:43
Sample: 2000 2016
Included observations: 16
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BDEF)	0.010756	0.087587	0.122805	0.9053
LOG(EXRATE)	0.059759	0.532695	0.112182	0.9134
LOG(EXTDEBT)	-0.014320	0.139505	-0.102645	0.9208
LOG(INT)	-0.004430	0.145325	-0.030482	0.9764
LOG(INF)	0.030184	0.166172	0.181646	0.8604
C	-0.200929	3.398950	-0.059115	0.9543
RESID(-1)	0.132455	0.429987	0.308044	0.7659
RESID(-2)	0.062468	0.474250	0.131719	0.8985

R-squared	0.021488	Mean dependent var	-9.69E-15

Adjusted R-squared	-0.834710	S.D. dependent var	0.125405
S.E. of regression	0.169864	Akaike info criterion	-0.400789
Sum squared resid	0.230829	Schwarz criterion	-0.014495
Log likelihood	11.20631	Hannan-Quinn criter.	-0.381008
F-statistic	0.025097	Durbin-Watson stat	1.822105
Prob(F-statistic)	0.999963		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.408433	Prob. F(2,17)	0.6710
Obs*R-squared	1.008654	Prob. Chi-Square(2)	0.6039

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 13:51
Sample: 1994 2016
Included observations: 22
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP)	0.000191	0.192561	0.000992	0.9992
LOG(HDI)	0.053936	2.304424	0.023406	0.9816
C	0.018643	5.356461	0.003480	0.9973
RESID(-1)	0.126842	0.241954	0.524242	0.6069
RESID(-2)	-0.102071	0.241318	-0.422974	0.6776

R-squared	0.045848	Mean dependent var	2.03E-14
Adjusted R-squared	-0.178658	S.D. dependent var	0.281817
S.E. of regression	0.305958	Akaike info criterion	0.665978
Sum squared resid	1.591374	Schwarz criterion	0.913942
Log likelihood	-2.325753	Hannan-Quinn criter.	0.724390
F-statistic	0.204217	Durbin-Watson stat	1.922074
Prob(F-statistic)	0.932552		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.665081	Probability	0.548420
Obs*R-squared	2.540499	Probability	0.280762

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/18   Time: 23:25
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXTDEBT)	0.162961	1.170393	0.139236	0.8938
LOG(INT)	-0.353102	1.354823	-0.260626	0.8031
LOG(INF)	0.398482	0.986705	0.403851	0.7003
LOG(EXRATE)	4.030881	4.788680	0.841752	0.4322
LOG(BDEF)	-0.137190	0.726782	-0.188763	0.8565
C	-19.06329	27.58383	-0.691104	0.5153
RESID(-1)	-0.504365	0.486097	-1.037581	0.3395
RESID(-2)	-0.584407	0.599387	-0.975007	0.3672

R-squared	0.181464	Mean dependent var	-3.36E-15
Adjusted R-squared	-0.773494	S.D. dependent var	0.852054
S.E. of regression	1.134702	Akaike info criterion	3.386176
Sum squared resid	7.725290	Schwarz criterion	3.751352
Log likelihood	-15.70323	F-statistic	0.190023
Durbin-Watson stat	1.481275	Prob(F-statistic)	0.976731

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.817502	Probability	0.198732
Obs*R-squared	3.916363	Probability	0.141115

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/18   Time: 23:33
Presample and interior missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	0.585284	7.641295	0.076595	0.9400
LOG(GDP)	0.081569	0.610904	0.133522	0.8957
C	-1.919269	17.04863	-0.112576	0.9120
RESID(-1)	-0.373684	0.318991	-1.171455	0.2610
RESID(-2)	-0.437139	0.270804	-1.614222	0.1288

R-squared	0.206124	Mean dependent var	-1.16E-14
Adjusted R-squared	-0.020697	S.D. dependent var	0.863090
S.E. of regression	0.871976	Akaike info criterion	2.784825
Sum squared resid	10.64479	Schwarz criterion	3.033361
Log likelihood	-21.45584	F-statistic	0.908751
Durbin-Watson stat	1.548913	Prob(F-statistic)	0.485476

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.902678	Probability	0.423067
Obs*R-squared	2.096563	Probability	0.350540

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/18   Time: 23:37
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP	-0.001639	0.010732	-0.152684	0.8803
BNK	0.002317	0.012062	0.192058	0.8498
C	1.97E+08	3.77E+09	0.052314	0.9589
RESID(-1)	-0.280760	0.239786	-1.170879	0.2569
RESID(-2)	-0.206533	0.234156	-0.882030	0.3894

R-squared	0.091155	Mean dependent var	2.07E-06
Adjusted R-squared	-0.110811	S.D. dependent var	5.52E+09
S.E. of regression	5.81E+09	Akaike info criterion	47.99468
Sum squared resid	6.08E+20	Schwarz criterion	48.24152
Log likelihood	-546.9388	F-statistic	0.451339
Durbin-Watson stat	1.843139	Prob(F-statistic)	0.770148

APPENDIX 1V: SERIAL AUTOCORELATION TEST (NIGERIA)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.394574	Prob. F(2,15)	0.1252
Obs*R-squared	5.566202	Prob. Chi-Square(2)	0.0618

Test Equation:
Dependent Variable: RESID

Method: Least Squares
Date: 02/12/18   Time: 22:40
Sample: 1994 2016
Included observations: 23
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INT)	0.695202	2.413337	0.288067	0.7772
LOG(BDEF)	-0.022541	0.162032	-0.139114	0.8912
LOG(EXRATE)	-0.011692	0.684478	-0.017081	0.9866
LOG(EXTDEBT)	-0.247745	0.716600	-0.345723	0.7344
LOG(INF)	-7.60E-05	0.482460	-0.000158	0.9999
C	4.423141	16.93482	0.261186	0.7975
RESID(-1)	0.493251	0.258418	1.908731	0.0756
RESID(-2)	-0.363646	0.249986	-1.454666	0.1664

R-squared	0.242009	Mean dependent var		1.78E-15
Adjusted R-squared	-0.111720	S.D. dependent var		1.025200
S.E. of regression	1.080952	Akaike info criterion		3.261769
Sum squared resid	17.52686	Schwarz criterion		3.656724
Log likelihood	-29.51035	Hannan-Quinn criter.		3.361099
F-statistic	0.684164	Durbin-Watson stat		2.049978
Prob(F-statistic)	0.683976			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	10.68124	Prob. F(2,12)	0.0022
Obs*R-squared	10.88535	Prob. Chi-Square(2)	0.0043

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 22:02
Sample: 1997 2013
Included observations: 17
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP(-3))	0.542784	0.694893	0.781104	0.4499
LOG(HDI(3))	-5.434310	4.052997	-1.340813	0.2048
C	-18.53678	21.03182	-0.881368	0.3954
RESID(-1)	1.007190	0.264354	3.810005	0.0025
RESID(-2)	-0.157959	0.295683	-0.534217	0.6029

R-squared	0.640315	Mean dependent var		2.92E-14
Adjusted R-squared	0.520419	S.D. dependent var		0.975257
S.E. of regression	0.675382	Akaike info criterion		2.292853
Sum squared resid	5.473698	Schwarz criterion		2.537916
Log likelihood	-14.48925	Hannan-Quinn criter.		2.317213
F-statistic	5.340621	Durbin-Watson stat		1.680919
Prob(F-statistic)	0.010485			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.460851	Prob. F(2,18)	0.1140
Obs*R-squared	8.685490	Prob. Chi-Square(2)	0.0130

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 22:06
Sample: 1994 2016
Included observations: 23
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNK	0.029148	0.033285	0.875686	0.3927
STCAP	-0.072327	0.052022	-1.390310	0.1814
C	1.23E+09	1.33E+09	0.930309	0.3645
RESID(-1)	-0.362698	0.252266	-1.437760	0.1677
RESID(-2)	-0.986460	0.355151	-2.777577	0.0124

R-squared	0.377630	Mean dependent var	2.49E-07
Adjusted R-squared	0.239326	S.D. dependent var	4.65E+09
S.E. of regression	4.06E+09	Akaike info criterion	47.27492
Sum squared resid	2.96E+20	Schwarz criterion	47.52177
Log likelihood	-538.6616	Hannan-Quinn criter.	47.33700
F-statistic	2.730426	Durbin-Watson stat	1.323526
Prob(F-statistic)	0.061625		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.411492	Prob. F(2,18)	0.1554
Obs*R-squared	6.321908	Prob. Chi-Square(2)	0.0424

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 22:31
Sample: 1994 2016
Included observations: 23
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNK	-0.000319	0.017349	-0.018366	0.9855
STCAP	-0.001735	0.026330	-0.065890	0.9482
C	85003422	7.11E+08	0.119619	0.9061
RESID(-1)	0.567394	0.223525	2.538385	0.0206
RESID(-2)	-0.351247	0.236629	-1.484376	0.1550

R-squared	0.274866	Mean dependent var	8.29E-08
Adjusted R-squared	0.113725	S.D. dependent var	2.38E+09
S.E. of regression	2.24E+09	Akaike info criterion	46.08423
Sum squared resid	9.01E+19	Schwarz criterion	46.33108
Log likelihood	-524.9687	Hannan-Quinn criter.	46.14632
F-statistic	1.705746	Durbin-Watson stat	2.381310
Prob(F-statistic)	0.192562		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.810363	Prob. F(2,18)	0.2212
Obs*R-squared	8.011256	Prob. Chi-Square(2)	0.0182

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/12/18   Time: 22:35
Sample: 1994 2016
Included observations: 23
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	-0.106031	4.732296	-0.022406	0.9824
LOG(GDP)	0.029006	0.958649	0.030257	0.9762
C	-0.866770	29.26181	-0.029621	0.9767
RESID(-1)	0.673154	0.232094	2.900346	0.0095
RESID(-2)	-0.175856	0.232509	-0.756342	0.4592

R-squared	0.348315	Mean dependent var	5.18E-15
Adjusted R-squared	0.203497	S.D. dependent var	1.202601
S.E. of regression	1.073286	Akaike info criterion	3.168987
Sum squared resid	20.73497	Schwarz criterion	3.415834
Log likelihood	-31.44335	Hannan-Quinn criter.	3.231068
F-statistic	2.405182	Durbin-Watson stat	1.930149
Prob(F-statistic)	0.087659		

APPENDIX V: HETEROSKEDASTICITY TEST (NIGERA)

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.585280	Prob. F(5,13)	0.7113
Obs*R-squared	3.491160	Prob. Chi-Square(5)	0.6247
Scaled explained SS	0.470688	Prob. Chi-Square(5)	0.9932

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 21:54
Sample: 1996 2014
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.306614	11.49967	0.026663	0.9791
LOG(EXRATE)	0.250877	0.712549	0.352084	0.7304
LOG(EXTDEBT)	0.008964	0.352175	0.025452	0.9801

LOG(BDEF(2))	-0.131829	0.116502	-1.131557	0.2783
LOG(INT)	0.429057	1.363130	0.314759	0.7579
LOG(INF(-2))	0.182730	0.301605	0.605858	0.5550

R-squared	0.183745	Mean dependent var	0.600389
Adjusted R-squared	-0.130199	S.D. dependent var	0.468145
S.E. of regression	0.497689	Akaike info criterion	1.694405
Sum squared resid	3.220021	Schwarz criterion	1.992649
Log likelihood	-10.09685	Hannan-Quinn criter.	1.744880
F-statistic	0.585280	Durbin-Watson stat	2.371332
Prob(F-statistic)	0.711319		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.700695	Prob. F(5,17)	0.1884
Obs*R-squared	7.668756	Prob. Chi-Square(5)	0.1755
Scaled explained SS	3.277272	Prob. Chi-Square(5)	0.6573

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 22:42
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-18.91738	17.97950	-1.052164	0.3075
LOG(INT)	-4.103043	2.401847	-1.708287	0.1058
LOG(BDEF)	0.252884	0.174512	1.449091	0.1655
LOG(EXRATE)	1.260005	0.743681	1.694282	0.1085
LOG(EXTDEBT)	0.736939	0.739035	0.997165	0.3327
LOG(INF)	1.140998	0.516093	2.210839	0.0410

R-squared	0.333424	Mean dependent var	1.005338
Adjusted R-squared	0.137372	S.D. dependent var	1.285737
S.E. of regression	1.194164	Akaike info criterion	3.412228
Sum squared resid	24.24246	Schwarz criterion	3.708443
Log likelihood	-33.24062	Hannan-Quinn criter.	3.486725
F-statistic	1.700695	Durbin-Watson stat	1.584501
Prob(F-statistic)	0.188360		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	5.312233	Prob. F(2,20)	0.1141
Obs*R-squared	7.979329	Prob. Chi-Square(2)	0.0185
Scaled explained SS	14.14524	Prob. Chi-Square(2)	0.0008

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 22:08
Sample: 1994 2016

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.39E+18	1.22E+19	0.195970	0.8466
BNK	8.80E+08	3.01E+08	2.923808	0.0084
STCAP	-4.81E+08	4.50E+08	-1.067984	0.2982

R-squared	0.346927	Mean dependent var	2.07E+19
Adjusted R-squared	0.281620	S.D. dependent var	4.58E+19
S.E. of regression	3.88E+19	Akaike info criterion	93.17084
Sum squared resid	3.02E+40	Schwarz criterion	93.31895
Log likelihood	-1068.465	Hannan-Quinn criter.	93.20809
F-statistic	5.312233	Durbin-Watson stat	0.990571
Prob(F-statistic)	0.014113		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.419744	Prob. F(2,14)	0.6652
Obs*R-squared	0.961711	Prob. Chi-Square(2)	0.6183
Scaled explained SS	0.335410	Prob. Chi-Square(2)	0.8456

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 22:04
Sample: 1997 2013
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.900472	29.57772	0.131872	0.8970
LOG(GDP(-3))	-0.034628	0.983934	-0.035193	0.9724
LOG(HDI(3))	2.815881	5.306514	0.530646	0.6040

R-squared	0.056571	Mean dependent var	0.895177
Adjusted R-squared	-0.078204	S.D. dependent var	0.935782
S.E. of regression	0.971685	Akaike info criterion	2.939214
Sum squared resid	13.21839	Schwarz criterion	3.086252
Log likelihood	-21.98332	Hannan-Quinn criter.	2.953830
F-statistic	0.419744	Durbin-Watson stat	1.259464
Prob(F-statistic)	0.665218		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	11.26319	Prob. F(2,20)	0.1155
Obs*R-squared	12.18318	Prob. Chi-Square(2)	0.0023
Scaled explained SS	13.18396	Prob. Chi-Square(2)	0.0014

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 22:24
Sample: 1994 2016

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.07E+18	2.11E+18	-0.505841	0.6185
BNK	1.65E+08	52045662	3.171287	0.0048
STCAP	17517967	77929380	0.224793	0.8244

R-squared	0.529704	Mean dependent var	5.40E+18
Adjusted R-squared	0.482674	S.D. dependent var	9.34E+18
S.E. of regression	6.72E+18	Akaike info criterion	89.66192
Sum squared resid	9.03E+38	Schwarz criterion	89.81002
Log likelihood	-1028.112	Hannan-Quinn criter.	89.69917
F-statistic	11.26319	Durbin-Watson stat	1.306074
Prob(F-statistic)	0.000529		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.869470	Prob. F(2,20)	0.1802
Obs*R-squared	3.622554	Prob. Chi-Square(2)	0.1634
Scaled explained SS	2.660782	Prob. Chi-Square(2)	0.2644

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 22:37
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.03457	51.71868	-0.696742	0.4940
LOG(HDI)	-0.270554	8.362921	-0.032352	0.9745
LOG(GDP)	1.383108	1.694403	0.816280	0.4240

R-squared	0.157502	Mean dependent var	1.383369
Adjusted R-squared	0.073253	S.D. dependent var	1.971518
S.E. of regression	1.897935	Akaike info criterion	4.240518
Sum squared resid	72.04317	Schwarz criterion	4.388626
Log likelihood	-45.76596	Hannan-Quinn criter.	4.277767
F-statistic	1.869470	Durbin-Watson stat	1.517701
Prob(F-statistic)	0.180172		

APPENDIX V1: HETEROSKEDASTICITY TEST (SOUTH AFRICA)

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.966999	Prob. F(5,10)	0.1696
Obs*R-squared	7.933449	Prob. Chi-Square(5)	0.1599
Scaled explained SS	2.205861	Prob. Chi-Square(5)	0.8200

Test Equation:

Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 13:45
Sample: 2000 2016
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.222340	0.297414	-0.747577	0.4719
LOG(BDEF)	-4.29E-06	0.007377	-0.000581	0.9995
LOG(EXRATE)	0.042985	0.043454	0.989198	0.3459
LOG(EXTDEBT)	-0.000901	0.012237	-0.073651	0.9427
LOG(INT)	0.027538	0.013450	2.047490	0.0678
LOG(INF)	0.017941	0.011384	1.575984	0.1461

R-squared	0.495841	Mean dependent var		0.014744
Adjusted R-squared	0.243761	S.D. dependent var		0.018168
S.E. of regression	0.015799	Akaike info criterion		-5.177689
Sum squared resid	0.002496	Schwarz criterion		-4.887969
Log likelihood	47.42152	Hannan-Quinn criter.		-5.162853
F-statistic	1.966999	Durbin-Watson stat		1.315285
Prob(F-statistic)	0.169642			

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.242029	Prob. F(2,19)	0.7874
Obs*R-squared	0.546563	Prob. Chi-Square(2)	0.7609
Scaled explained SS	0.554807	Prob. Chi-Square(2)	0.7577

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 13:53
Sample: 1994 2016
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.572561	2.315527	0.679138	0.5052
LOG(GDP)	-0.056932	0.083218	-0.684135	0.5021
LOG(HDI)	-0.069408	1.000326	-0.069385	0.9454

R-squared	0.024844	Mean dependent var		0.075811
Adjusted R-squared	-0.077804	S.D. dependent var		0.128017
S.E. of regression	0.132904	Akaike info criterion		-1.072254
Sum squared resid	0.335607	Schwarz criterion		-0.923475
Log likelihood	14.79479	Hannan-Quinn criter.		-1.037206
F-statistic	0.242029	Durbin-Watson stat		2.056419
Prob(F-statistic)	0.787417			

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.180867	Prob. F(2,19)	0.8360
Obs*R-squared	0.411025	Prob. Chi-Square(2)	0.8142
Scaled explained SS	0.378938	Prob. Chi-Square(2)	0.8274

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/12/18   Time: 14:21
Sample: 1994 2016
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.418563	2.643394	0.536645	0.5977
LOG(BNK)	-0.031736	0.188195	-0.168633	0.8679
LOG(STCAP)	-0.016359	0.130918	-0.124956	0.9019

R-squared	0.018683	Mean dependent var	0.113144
Adjusted R-squared	-0.084614	S.D. dependent var	0.182083
S.E. of regression	0.189630	Akaike info criterion	-0.361361
Sum squared resid	0.683231	Schwarz criterion	-0.212582
Log likelihood	6.974969	Hannan-Quinn criter.	-0.326313
F-statistic	0.180867	Durbin-Watson stat	2.302308
Prob(F-statistic)	0.835966		

White Heteroskedasticity Test:

F-statistic	4.031801	Probability	0.139078
Obs*R-squared	13.03043	Probability	0.221976

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/08/18   Time: 23:26
Sample: 2000 2016
Included observations: 14
Excluded observations: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2027.617	1271.049	-1.595231	0.2089
LOG(EXTDEBT)	161.9820	60.90905	2.659407	0.0764
(LOG(EXTDEBT))^2	-3.293343	1.237532	-2.661218	0.0763
LOG(INT)	4.209697	3.087761	1.363349	0.2661
(LOG(INT))^2	-1.525462	1.247998	-1.222327	0.3089
LOG(INF)	-0.749521	4.171555	-0.179674	0.8689
(LOG(INF))^2	0.676269	1.892313	0.357377	0.7445
LOG(EXRATE)	537.0103	182.7501	2.938495	0.0606
(LOG(EXRATE))^2	-60.26700	20.77039	-2.901582	0.0624
LOG(BDEF)	-101.7931	46.86783	-2.171918	0.1182
(LOG(BDEF))^2	2.227961	1.011952	2.201647	0.1150

R-squared	0.930745	Mean dependent var	0.674138
Adjusted R-squared	0.699894	S.D. dependent var	1.342097
S.E. of regression	0.735227	Akaike info criterion	2.253708
Sum squared resid	1.621675	Schwarz criterion	2.755824
Log likelihood	-4.775954	F-statistic	4.031801
Durbin-Watson stat	2.874544	Prob(F-statistic)	0.139078

White Heteroskedasticity Test:

F-statistic	0.333111	Probability	0.851119
Obs*R-squared	1.651169	Probability	0.799568

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Date: 02/08/18   Time: 23:33
Sample: 1994 2016
Included observations: 19
Excluded observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-692.5630	5348.792	-0.129480	0.8988
LOG(HDI)	149.4811	426.0491	0.350854	0.7309
(LOG(HDI))^2	172.8504	461.8663	0.374243	0.7138
LOG(GDP)	54.44073	401.4610	0.135607	0.8941
(LOG(GDP))^2	-1.021245	7.485882	-0.136423	0.8934

R-squared	0.086904	Mean dependent var	0.705718
Adjusted R-squared	-0.173981	S.D. dependent var	1.105638
S.E. of regression	1.197964	Akaike info criterion	3.420058
Sum squared resid	20.09164	Schwarz criterion	3.668594
Log likelihood	-27.49055	F-statistic	0.333111
Durbin-Watson stat	1.419496	Prob(F-statistic)	0.851119

White Heteroskedasticity Test:

F-statistic	0.929792	Probability	0.468700
Obs*R-squared	3.938495	Probability	0.414394

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/08/18   Time: 23:37
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.71E+20	1.48E+20	-1.153860	0.2636
STCAP	3.60E+08	4.52E+08	0.795858	0.4365
STCAP^2	-0.000319	0.000285	-1.120064	0.2774
BNK	3.64E+08	4.82E+08	0.755261	0.4599
BNK^2	-0.000100	0.000426	-0.234828	0.8170

R-squared	0.171239	Mean dependent var	2.91E+19
Adjusted R-squared	-0.012930	S.D. dependent var	9.03E+19
S.E. of regression	9.08E+19	Akaike info criterion	94.93870
Sum squared resid	1.49E+41	Schwarz criterion	95.18554
Log likelihood	-1086.795	F-statistic	0.929792
Durbin-Watson stat	2.273247	Prob(F-statistic)	0.468700

APPENDIX V11: RAMSEY RESET TEST (SOUTH AFRICA)

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(GOVT) LOG(BDEF) LOG(EXRATE) LOG(EXTDEBT)
    LOG(INT) LOG(INF) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.763881	9	0.4645
F-statistic	0.583514	(1, 9)	0.4645
Likelihood ratio	1.005116	1	0.3161

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.014363	1	0.014363
Restricted SSR	0.235898	10	0.023590
Unrestricted SSR	0.221535	9	0.024615

LR test summary:

	Value	df
Restricted LogL	11.03254	10
Unrestricted LogL	11.53509	9

Unrestricted Test Equation:
Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/12/18   Time: 13:48
Sample: 2000 2016
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BDEF)	-0.145917	0.263824	-0.553084	0.5937
LOG(EXRATE)	2.204021	4.033524	0.546426	0.5981
LOG(EXTDEBT)	-2.956424	5.496121	-0.537911	0.6037
LOG(INT)	0.090544	0.211533	0.428040	0.6787
LOG(INF)	0.634662	1.175928	0.539712	0.6025
C	49.14628	69.72516	0.704857	0.4987
FITTED^2	0.072404	0.094785	0.763881	0.4645

R-squared	0.980329	Mean dependent var	23.70855
Adjusted R-squared	0.967215	S.D. dependent var	0.866486
S.E. of regression	0.156892	Akaike info criterion	-0.566887
Sum squared resid	0.221535	Schwarz criterion	-0.228879
Log likelihood	11.53509	Hannan-Quinn criter.	-0.549578
F-statistic	74.75417	Durbin-Watson stat	1.647556
Prob(F-statistic)	0.000000		

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(GOVT) LOG(BNK) LOG(STCAP) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.658617	18	0.1145
F-statistic	2.751012	(1, 18)	0.1145
Likelihood ratio	3.128912	1	0.0769

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.329996	1	0.329996
Restricted SSR	2.489178	19	0.131009
Unrestricted SSR	2.159181	18	0.119955

LR test summary:

	Value	df
Restricted LogL	-7.246657	19
Unrestricted LogL	-5.682201	18

Unrestricted Test Equation:
Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/12/18   Time: 14:24
Sample: 1994 2016

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(BNK)	-17.13800	11.51616	-1.488170	0.1540
LOG(STCAP)	-2.448395	1.640594	-1.492384	0.1529
C	440.9922	288.0512	1.530951	0.1432
FITTED^2	0.214860	0.129542	1.658617	0.1145

R-squared	0.916258	Mean dependent var		23.23303
Adjusted R-squared	0.902302	S.D. dependent var		1.108063
S.E. of regression	0.346345	Akaike info criterion		0.880200
Sum squared resid	2.159181	Schwarz criterion		1.078571
Log likelihood	-5.682201	Hannan-Quinn criter.		0.926930
F-statistic	65.64902	Durbin-Watson stat		1.654161
Prob(F-statistic)	0.000000			

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(GOVT) LOG(HDI) LOG(GDP) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.443511	18	0.1661
F-statistic	2.083723	(1, 18)	0.1661
Likelihood ratio	2.409834	1	0.1206

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.173041	1	0.173041
Restricted SSR	1.667841	19	0.087781
Unrestricted SSR	1.494799	18	0.083044

LR test summary:

	Value	df
Restricted LogL	-2.842007	19
Unrestricted LogL	-1.637090	18

Unrestricted Test Equation:
Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/12/18   Time: 21:32
Sample: 1994 2016
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	43.42267	28.29011	1.534906	0.1422
LOG(GDP)	40.72500	26.10890	1.559813	0.1362
C	-905.8006	587.9833	-1.540521	0.1408
FITTED^2	-0.267053	0.185002	-1.443511	0.1661

R-squared	0.942026	Mean dependent var		23.23303
Adjusted R-squared	0.932363	S.D. dependent var		1.108063
S.E. of regression	0.288174	Akaike info criterion		0.512463
Sum squared resid	1.494799	Schwarz criterion		0.710834
Log likelihood	-1.637090	Hannan-Quinn criter.		0.559193

F-statistic	97.49433	Durbin-Watson stat	1.718954
Prob(F-statistic)	0.000000		

Ramsey RESET Test:

F-statistic	2.355180	Probability	0.175809
Log likelihood ratio	8.112328	Probability	0.017315

Test Equation:
Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/08/18   Time: 23:26
Sample: 2000 2016
Included observations: 14
Excluded observations: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXTDEBT)	-10720.55	5651.543	-1.896925	0.1066
LOG(INT)	-536.5940	282.7968	-1.897454	0.1065
LOG(INF)	-10915.87	5753.910	-1.897122	0.1066
LOG(EXRATE)	-20060.47	10574.93	-1.896983	0.1066
LOG(BDEF)	3522.165	1856.842	1.896857	0.1066
C	100785.6	53302.25	1.890832	0.1075
FITTED^2	620.2804	325.8314	1.903685	0.1056
FITTED^3	-9.622618	5.037538	-1.910183	0.1047
R-squared	0.562181	Mean dependent var		21.68547
Adjusted R-squared	0.051392	S.D. dependent var		0.963814
S.E. of regression	0.938721	Akaike info criterion		3.006962
Sum squared resid	5.287183	Schwarz criterion		3.372138
Log likelihood	-13.04874	F-statistic		1.100612
Durbin-Watson stat	2.601960	Prob(F-statistic)		0.461543

Ramsey RESET Test:

F-statistic	1.068044	Probability	0.370091
Log likelihood ratio	2.698019	Probability	0.259497

Test Equation:
Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/08/18   Time: 23:34
Sample: 1994 2016
Included observations: 19
Excluded observations: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HDI)	-41658.68	37694.35	-1.105171	0.2877
LOG(GDP)	6970.838	6307.554	1.105157	0.2877
C	-132949.4	120464.9	-1.103636	0.2884
FITTED^2	-237.9313	214.2878	-1.110336	0.2856
FITTED^3	3.729275	3.342543	1.115700	0.2833
R-squared	0.367535	Mean dependent var		21.50332
Adjusted R-squared	0.186831	S.D. dependent var		1.010887
S.E. of regression	0.911577	Akaike info criterion		2.873652
Sum squared resid	11.63361	Schwarz criterion		3.122189
Log likelihood	-22.29970	F-statistic		2.033902
Durbin-Watson stat	2.320678	Prob(F-statistic)		0.144630

Ramsey RESET Test:

F-statistic	0.592464	Probability	0.563393

| Log likelihood ratio | 1.466323 | Probability | | 0.480388 |

Test Equation:
Dependent Variable: CORP
Method: Least Squares
Date: 02/08/18   Time: 23:38
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP	0.021214	0.030977	0.684831	0.5022
BNK	-0.036546	0.051827	-0.705156	0.4897
C	-5.95E+09	9.00E+09	-0.661661	0.5166
FITTED^2	1.63E-09	1.50E-09	1.088410	0.2908
FITTED^3	-1.79E-19	1.69E-19	-1.058479	0.3038

R-squared	0.162849	Mean dependent var	3.30E+09
Adjusted R-squared	-0.023184	S.D. dependent var	5.84E+09
S.E. of regression	5.91E+09	Akaike info criterion	48.02650
Sum squared resid	6.28E+20	Schwarz criterion	48.27335
Log likelihood	-547.3048	F-statistic	0.875375
Durbin-Watson stat	2.148041	Prob(F-statistic)	0.497925

APPENDIX V111: RAMSEY RESET TEST (NIGERIA)

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(GOVT) LOG(EXTDEBT) LOG(BDEF(2)) LOG(INT)
    LOG(INF(-2)) LOG(EXRATE) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.152940	12	0.9587
F-statistic	0.002803	(1, 12)	0.9587
Likelihood ratio	0.004437	1	0.9469

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.002664	1	0.002664
Restricted SSR	11.40739	13	0.877491
Unrestricted SSR	11.40472	12	0.950394

LR test summary:

	Value	df	
Restricted LogL	-22.11314	13	
Unrestricted LogL	-22.11092	12	

Unrestricted Test Equation:
Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/12/18   Time: 22:13
Sample: 1996 2014
Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.

LOG(EXTDEBT)	-2.069942	6.127671	-0.337802	0.7413
LOG(BDEF(2))	0.203787	0.744878	0.273584	0.7891
LOG(INT)	-0.945515	3.213001	-0.294278	0.7736
LOG(INF(-2))	1.134396	3.472919	0.326640	0.7496
LOG(EXRATE)	8.355799	23.61035	0.353904	0.7296
C	24.26897	45.92058	0.528499	0.6068
FITTED^2	0.003169	0.059860	0.052940	0.9587

R-squared	0.925740	Mean dependent var		20.92356
Adjusted R-squared	0.888610	S.D. dependent var		2.920983
S.E. of regression	0.974881	Akaike info criterion		3.064308
Sum squared resid	11.40472	Schwarz criterion		3.412259
Log likelihood	-22.11092	Hannan-Quinn criter.		3.123195
F-statistic	24.93245	Durbin-Watson stat		2.138990
Prob(F-statistic)	0.000004			

Ramsey RESET Test
Equation: UNTITLED
Specification: GOVT STCAP BNK C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.457139	27	0.1566
F-statistic	2.123254	(1, 27)	0.1566
Likelihood ratio	2.346703	1	0.1255

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	3.67E+19	1	3.67E+19
Restricted SSR	5.03E+20	28	1.80E+19
Unrestricted SSR	4.66E+20	27	1.73E+19

LR test summary:

	Value	df
Restricted LogL	-729.5930	28
Unrestricted LogL	-728.4197	27

Unrestricted Test Equation:
Dependent Variable: GOVT
Method: Least Squares
Date: 02/02/18   Time: 15:00
Sample: 1986 2016
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
STCAP	0.186150	0.079854	2.331128	0.0275
BNK	0.074730	0.042179	1.771758	0.0877
C	-8.72E+08	1.15E+09	-0.757356	0.4554
FITTED^2	1.39E-11	9.51E-12	1.457139	0.1566

R-squared	0.880361	Mean dependent var		7.48E+09
Adjusted R-squared	0.867068	S.D. dependent var		1.14E+10
S.E. of regression	4.15E+09	Akaike info criterion		47.25288
Sum squared resid	4.66E+20	Schwarz criterion		47.43791
Log likelihood	-728.4197	Hannan-Quinn criter.		47.31320
F-statistic	66.22659	Durbin-Watson stat		2.337738

Prob(F-statistic)   0.000000

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(CORP) LOG(INT(3)) LOG(INF(4)) LOG(BDEF(1))
  LOG(EXTDEBT)) LOG(EXRATE(1)) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.178303	15	0.8609
F-statistic	0.031792	(1, 15)	0.8609
Likelihood ratio	0.046579	1	0.8291

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.040343	1	0.040343
Restricted SSR	19.07482	16	1.192177
Unrestricted SSR	19.03448	15	1.268965

LR test summary:

	Value	df	
Restricted LogL	-29.64724	16	
Unrestricted LogL	-29.62395	15	

Unrestricted Test Equation:
Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/02/18   Time: 14:48
Sample: 1990 2012
Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INT(3))	1.177799	20.98911	0.056115	0.9560
LOG(INF(4))	0.073935	1.482109	0.049885	0.9609
LOG(BDEF(1))	-0.057566	1.049505	-0.054851	0.9570
LOG(EXTDEBT(-4))	1.722511	25.49016	0.067576	0.9470
LOG(EXRATE(1))	0.030557	1.056862	0.028913	0.9773
C	-39.37169	736.7401	-0.053440	0.9581
FITTED^2	0.040706	0.228297	0.178303	0.8609

R-squared	0.634818	Mean dependent var	18.46391
Adjusted R-squared	0.488745	S.D. dependent var	1.575455
S.E. of regression	1.126484	Akaike info criterion	3.329450
Sum squared resid	19.03448	Schwarz criterion	3.676600
Log likelihood	-29.62395	Hannan-Quinn criter.	3.411228
F-statistic	4.345896	Durbin-Watson stat	1.665005
Prob(F-statistic)	0.009738		

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(GOVT) LOG(GDP) LOG(HDI) C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.647611	19	0.1159
F-statistic	2.714622	(1, 19)	0.1159
Likelihood ratio	3.071578	1	0.0797

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	3.259902	1	3.259902
Restricted SSR	26.07639	20	1.303819
Unrestricted SSR	22.81649	19	1.200868

LR test summary:

	Value	df
Restricted LogL	-34.07925	20
Unrestricted LogL	-32.54346	19

Unrestricted Test Equation:
Dependent Variable: LOG(GOVT)
Method: Least Squares
Date: 02/12/18   Time: 22:18
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP)	22.30799	10.46676	2.131316	0.0463
LOG(HDI)	-14.28334	8.183077	-1.745473	0.0971
C	-554.9395	265.6391	-2.089073	0.0504
FITTED^2	-0.080475	0.048843	-1.647611	0.1159

R-squared	0.873768	Mean dependent var	20.86767
Adjusted R-squared	0.853836	S.D. dependent var	2.866341
S.E. of regression	1.095841	Akaike info criterion	3.177692
Sum squared resid	22.81649	Schwarz criterion	3.375170
Log likelihood	-32.54346	Hannan-Quinn criter.	3.227357
F-statistic	43.83873	Durbin-Watson stat	0.678724
Prob(F-statistic)	0.000000		

Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(CORP) LOG(GDP) LOG(HDI) C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	2.953026	19	0.1182
F-statistic	8.720360	(1, 19)	0.0082
Likelihood ratio	8.687749	1	0.0032

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	10.00925	1	10.00925

Restricted SSR	31.81749	20	1.590875	
Unrestricted SSR	21.80824	19	1.147802	

LR test summary:

	Value	df	
Restricted LogL	-36.36759	20	
Unrestricted LogL	-32.02372	19	

Unrestricted Test Equation:
Dependent Variable: LOG(CORP)
Method: Least Squares
Date: 02/12/18   Time: 22:21
Sample: 1994 2016
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP)	-43.90714	15.88294	-2.764422	0.0123
LOG(HDI)	25.38357	10.32336	2.458847	0.0237
C	1066.574	382.8621	2.785792	0.0118
FITTED^2	0.426148	0.144309	2.953026	0.0082

R-squared	0.736707	Mean dependent var	18.92282
Adjusted R-squared	0.695134	S.D. dependent var	1.940346
S.E. of regression	1.071355	Akaike info criterion	3.132497
Sum squared resid	21.80824	Schwarz criterion	3.329974
Log likelihood	-32.02372	Hannan-Quinn criter.	3.182162
F-statistic	17.72096	Durbin-Watson stat	1.106457
Prob(F-statistic)	0.000010		

Ramsey RESET Test

Equation: UNTITLED

Specification: CORP BNK STCAP C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.737818	19	0.4696
F-statistic	0.544375	(1, 19)	0.4696
Likelihood ratio	0.649717	1	0.4202

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	3.46E+18	1	3.46E+18
Restricted SSR	1.24E+20	20	6.21E+18
Unrestricted SSR	1.21E+20	19	6.36E+18

LR test summary:

	Value	df	
Restricted LogL	-528.6648	20	
Unrestricted LogL	-528.3399	19	

Unrestricted Test Equation:

Dependent Variable: CORP

Method: Least Squares

Date: 02/12/18   Time: 22:23

Sample: 1994 2016

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BNK	0.006424	0.047640	0.134852	0.8941
STCAP	0.008543	0.030394	0.281071	0.7817
C	-1.19E+08	9.17E+08	-0.129404	0.8984
FITTED^2	2.02E-10	2.73E-10	0.737818	0.4696

R-squared	0.382533	Mean dependent var		1.34E+09
Adjusted R-squared	0.285038	S.D. dependent var		2.98E+09
S.E. of regression	2.52E+09	Akaike info criterion		46.29043
Sum squared resid	1.21E+20	Schwarz criterion		46.48791
Log likelihood	-528.3399	Hannan-Quinn criter.		46.34009
F-statistic	3.923618	Durbin-Watson stat		1.215566
Prob(F-statistic)	0.024567			