INTEREST RATE MACROSTRUCTURE, CORPORATE BOND MARKET DEVELOPMENT AND INDUSTRIAL OUTPUT IN SELECTED AFRICAN ECONOMIES

BY

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A THESIS SUBMITTED TO THE DEPARTMENT OF BANKING AND FINANCE, COLLEGE OF BUSINESS AND SOCIAL SCIENCES, COVENANT UNIVERSITY, OTA, OGUN STATE, NIGERIA, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY (Ph.D) DEGREE IN FINANCE

DECEMBER, 2017

CERTIFICATION

We certify that this thesis titled **"Interest Rate Macrostructure, Corporate Bond Market Development and Industrial Output in Selected African Economies"** is an original research work carried out by **EKE, Patrick Omoruyi (CUGP 100295)** in the Department of Banking and Finance, College of Business and Social Sciences, Covenant University Ota, Ogun State, Nigeria, under the supervision of Prof. Esther O. Adegbite and Dr. Kehinde A. Adetiloye. We have examined and found the work acceptable for the award of a degree of Doctor of Philosophy in Finance.

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DECLARATION

I, EKE, OMORUYI PATRICK (CUGP100295), declare that this research work titled "Interest Rate Macrostructure, Corporate Bond Market Development and Industrial Output in Selected African Economies" was carried out by me under the supervision of Prof. Esther O. Adegbite and Dr. Kehinde A. Adetiloye of the Department of Finance, University of Lagos, Akoka and Department of Banking & Finance, Covenant University, Ota respectively. I attest that the thesis is an original work. The thesis has not been presented either wholly or partly for the award of any degree elsewhere. All sources of data and scholarly information used in this thesis are duly acknowledged.

Mr. PATRICK O. EKE

(Author of Thesis) Signature and Date

DEDICATION

This thesis is dedicated to God the Father, God the Son, and God the Holy Spirit, for His mercies, privilege of living and fountain of my knowledge and to my beloved Blessed Virgin Mary, the Mediatrix of all Graces.

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ABSTRACT

This study examines the effect of interest rate macrostructure and corporate bond market development on industrial output growth in some selected African economies from 1995-2014, namely Botswana, Cameroon, Cote d' Ivoire, Egypt, Ghana, Kenya, Mauritius, Morocco, Namibia, Nigeria, South Africa, Tanzania, and Tunisia. In the World industrial output statistics, African economies have consistently ranked least and its pace of industrial output growth has been the least. The lapse in industrial output and the growth rate appear related to the underdeveloped corporate bond market, as their financial system over-relies on short term funds to finance industrial output growth. The study also deduces that the oligopolistic structure of the economies' bank dominated intermediation system is linked to the drawback, as African commercial banks have been profiting from the perverted interest rate structure. The study introduces short run innovations to Toda-Yamamoto and Autoregressive Distributive lag methodologies, in an unbalanced panel data, sourced from World Bank Development and Worldwide governance indicators, Bank for International Settlements and the African Securities Exchanges from 1995-2014. The short run dynamic coefficients satisfy *a priori* expectations, which indicate joint influence flows and co-integration among industrial output, corporate bond issue, interest rate spread, technological development, and real per capita income. The long run results suggest that interest rate spread negatively influences industrial output. Corporate bond issue negatively influences interest rate spread, which suggests potency of the bond market to manage the spread. Corporate bond issue does not significantly impact industrial output; sovereign bond issue positively correlates with corporate bond issue. Corporate bond turnover does not link industrial output, while its nexus with corporate bond issue does not produce significant positive linkage, which suggests lack of signaling impact. Inflation expectation does not significantly influence interest rate spread, rather it is the spread that positively influence inflation, which suggests that inflation may be more of structural and institutional lapses than monetary phenomenon. Public debt positively links inflation expectation, but negatively influences bank competitiveness; and technological development negatively influences industrial output, which suggests poor human capital-industry linkage. The study recommends market-based economies; private investments in bond market Exchanges and investment banking institutions, full financial liberalization, with prudential regulation, and fiscal support for non-finance corporations to encourage bond issuing; tax and regulatory incentives for bank competitiveness towards interest rate reduction; review budgetary system on education for technological development; should encourage college-industry reorientation and interface. Overall, the study did not affirm the finance-led growth hypothesis of economic development in the selected economies.

Keywords: Interest rate, Corporate bond market, Industrial output, African economies

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

The African economy occupies a vantage position in the global economic community due to her diverse natural resources, the high population and other growth potentials. The World Bank Development Report (2015) indicates that Africa, occupied by about 1.17 billion people (16.4% of World Population of 7.3 bn.) in 54 countries, grew (in terms of output) by 4.1 per cent, third after South-Asia of 7.1 per cent, and East-Asia and Pacific region of 6.7 per cent in global ranking (World Bank, 2015a). African population is projected to rise by 2.6% (from 2014) to about 1.510 billion by 2025 (World Bank, 2014). With these advantages, it would be a greater force in development, for Africa to match these demographic and growth features with high level industrialisation like the developed economies and the High Performing Asia Economies (HPAE).

The United Nations Industrial Development Organization (UNIDO, 2013) reports that in terms of average regional contribution to World Manufacturing Value Added (MVA) from 2007-2011, East-Asia and Pacific contributed 16 per cent, South and Central-Asia gave 3 per cent, while except South Africa's 1 per cent contribution, the rest of Africa contributed virtually nothing. Moreover, Africa managed to achieve 0.13 per cent increase to Global MVA growth from1990-2011, rated as the lowest among global developing countries. In 2014, the region accounted for 1.6% of Global MVA (UNIDO, 2016), while among global developing and emerging industrial economies, the region's MVA has consistently declined from 9% in 1990 to 7% in 2000, and to 4% in 2014 (UNIDO, 2015).

Economic growth and development by industrialisation is the desire of every country. In particular, though African governments may have been making industrial growth a priority, however the ability to mobilize the right financial resources necessary to build the requisite industrial and infrastructural technologies to transform the continent's natural resources have been of great challenge to governments, financial development theorists and technocrats in Africa. Despite the resource potentials highlighted above, the low industrial output growth status and somewhat de-industrialisation policies of sub-Sahara Africa may have consistently made the

African economies to produce worst statistics in human living index, unemployment, per capita income; and ever increasing cost of living index relative to other regions (Bhorat, Naidoo and Pillay, 2016).

This research study focuses on interest rate macrostructure and corporate bond market for industrial production in Africa. Due to the obvious roles of industrialisation in human development, it is probable that the sharp distinction between developed, emerging and frontier economies is largely attributed to the level of their industrialisation. An economy's relative strength in the manufacturing / industrial sector defines its immunization from global economic shocks and advancement from economic backwardness (UNCTAD and UNIDO, 2011), while the deeper its financial system the higher it is insulated from macrofluctuations (World Bank, 2001).

In recent times, African economies may have been touted as world leading growth centers, with average of five per cent growth rate from 2003 to 2007 (Dahou, Omar, Pfister, 2009), perhaps due to increased returns from sale of primary / natural resources, but it appears to be the most impoverised region on earth (Deaton, 2015). The disappointments of the region's financial system for enhanced operational, allocational efficiency and sustainable industrial financing and its positive implication on the economic system may be the bases of the perverse state of the peoples poverty, such that Rousseau and D′Onofrio (2013)'s research outcome dismisses the post 2007 global economic crises's finance-led growth claim in sub-Sahara African economies; rather, the study otherwise suggests that it was monetization of primary commodity earnings rather than financial intermediation that was responsible for the real observed growth.

Modern development theorists advice that developing economies should be better concerned with the structure that bring forth growth, rather than the growth of the system. Rodrik (2015) regards contemporary developing economies as economies with no productive transformation base, hence no "coherent growth story". This taught appear to suggest employing right financial structure that would be more efficient to spur industrial led growth, rather than the contemporary service sector led growth common in many African and emerging economies. The continent's economic potential is unfortunately being tied to the growing young labour force and large consumer market base, devoid of the much required high value added activities such as industrial growth that should improve employment and income of the growing population (World Bank,

OECD, WEF, and AfDB, 2015). Relative differences in sizes and institutions are obvious among the individual countries, however, it is clear that the entire region's financial development performs less than other regions in the global financial system (Otchere, Senbet and Simbanegavi, 2017; Honohan and Beck, 2007).

It is also worth evaluating the reason why Africa seems yet to experience higher industrial output growth despite the ample industrial policies, because most of the very prosperous nations and regions today started from the brick of poverty, but soon identified their competencies, strengths and weaknesses, chose the part of technology through agricultural-industrial renaissance to development (UNIDO, 2014). The new United Nations Industrial Development Organization's Inclusive and Sustainable Industrial Development (ISID) (UNIDO, 2014) initiative reminds developing countries that in all newly developed countries like the High Performing Asian economies (HPAE) it is usually industrial development and trade that shapes their successes. Where and how is Africa getting it wrong?

The World Economic Forum (WEF, 2015) underscores the need to develop the corporate bond market to accelerate a stable industrial finance in African markets, as UNIDO (2013) opines that bank financing is not resource efficient for manufacturing. Most African bond markets, except for South Africa, are underdeveloped. The capital markets, due to weak operating laws substantially lack public confidence, and are relatively more volatile, and hence they are treated as frontier market by international investors (World Bank, 2015b). Significantly, the African corporate bond markets remain underdeveloped relative to the economies' current size and future potentials (WEF, 2015). It follows that African economies and markets largely operate poor finance-economic development nexus (poor linkage of the primary market to growth, and higher secondary market volatility), thereby spurring abysmal industrial growth. An appraisal of the structure and viability of African economies reveal that it is indeed skewed to primary produce development and export rather than diversified industrial / manufacturing sectors that would have added considerable employment opportunities. Weiss (2011) while counseling the global low income economies, particularly the sub-Sahara Africa on 'paths to industrialisation' says development is about structural change, the only antidote to sustainable growth.

Till date, the literature on growth-led finance versus finance-led growth debate in developing countries' economic development trajectory is unsettled (Adegbite, 2016; Somoye, 2011; Shan

and Jianhong, 2006). Aside from the World Bank concern for African industrial challenge, African governments since the 1970s have adopted several strategies to drive manufacturing and industrialisation, however, limited successes have been achieved (UNCTAD and UNIDO, 2011). Some of such policies include: the indigenization of multinationals; import substitution industrialisation (ISI) strategy of the structuralist school in the 1970s to the 1980s; Lagos Plan for Action of the 1980s, African Growth Opportunity Act (AGOA) of the 1990s, the New Partnership for Africa Development (NEPAD) in the 2000s, the Everything But Arm (EBM), the Import Restriction and Foreign Exchange Exclusion policies, and so on. A review of these programs and polices suggest, aside from structural and policy default issues, the existence of substantial industrial funding gap, as lack of industrialisation is largely a problem of development funding gap, not commercial funding gap. Ukwu (2004) reviews the "loopholes in NEPAD", and reveals various discordant tunes beyond implementations, claiming that contrary to its label the initiative is not "home-grown". Indeed, following the inaccessibilty of the traditional capital market institutions by indigenous enterprises for industrial finance in many African economies, the relevance of the much exaggerated formal capital market facilities has been subject of discussion, such that scholars claim that the institutions may have been ill-adapted and irrelevant, as it lacks provisions for much needed start-up and venture capital needs (Ojo, 2010).

The financial liberalization policies which succeeded in promoting bank intermediation-based finance for industrial output growth, may not have produced appreciable success at advancing the finance-led industrial growth thesis for African economies (Ousmanou, 2017; Ojo, 2010; Asogwa, 2005; Adebiyi, 2005; Emenuga, 1998). Consequently, the economies have long been encountering wide differentials in their saving-lending rates, with high profit takings by the banks (Ojo, 2010). Given the high prevalence of imperfect competitive market structure, and since the optimal level of reserve requirement often grows proportionately less than the deposit-taking rate, the larger monopoly banks may continue to dominate by earning "monopoly rent" being strengthened by the inherent advantage of their 'market power' (Ojo, 2010). It is revealed in the literature that contemporaneously, foreign banks with subsidiaries in Africa earn more returns than subsidiaries in other regions (Honohan and Beck, 2007) on the advantage of the wide margin.

The Mckinnon-Shaw (1973) liberalization theorem built on the financial development foundation of Gurley and Shaw (1955, 1960), and Goldsmith (1969)'s financial structure system development theory for countries' industrial financing process, might have been wrongly applied in Africa. Nevertheless, it is the belief in the investment world that liberalisation of financial markets encourage greater investment efficiency and better process of resource mobilization for financing investments (Odoko, Okafor, and Kama, 2004). Goldsmith (1969) opines that a country's financial interrelationship ratio would develop faster in favour of financial assets on the strength of liberalization.

The contentious debate of the market-based versus bank-based economies took a new turn recently at the instance of global want of an antidote for financial stability following the global stock market crash and subsequent wide spread economic depression. Despite the enormous impact of the crises on the United States (US), the persistent pre-eminence of the market-based system suggests that the US has "a strong bias that markets work", while to the rest of the world, this position may be a narrow view. Adelegan and Razewicz-Bak (2009) found that the sub-Saharan domestic debt finance is weak relative to the bank finance, and attribute the lapse in African finance deepening to savings constraint. Asogwa (2005) however appraises both bank and market-based financial systems in Nigeria and concludes that for long term industrial financing, the bank-market template seems unsuitable, claiming that if adequate strategies are in place among the borrowers, mediators and investors, the advantages of market-based finance and growth could be enormous even in information poor countries. Bank-based finance chiefly advances availability doctrine, increasing default credit risk levels, and exacerbates financial instability. On financial instability, literature argues that if finance is fragile, banking is the most fragile part of it (World Bank, 2001).

Contemporary finance theory suggests that firms actually decide their financing choices and capital structure policies on the basis of prevailing macroeconomic variables, such as extent of market imperfections, taxes, interest rate (Harris and Raviv, 1991). For instance, Demirquc-Kunt and Maksimovic (1996) examine the hypothesis that financial market developments influence the corporate financing decision of firms, with the empirical results suggesting that in thirty (30) industrially developed and developing economies, the debt-equity ratio of firms actually depend on the initial level of stock market development. Put more succinctly, Megginson, Smart, and

Gitman (2007) contend that corporations do care about the sources of capital formation, as though intermediate fund and direct market money are perfect commodity substitute, their sources do influence post financing ownership structure, financial flexibility, and repayment burden.

The Bond market is a time varying investment channel (Grishchenko, Zhaogang, and Hao, 2015). Its development depends on many factors, particularly the viability of the primary (new issue) market whose values transmit to liquidity of the secondary market (FMW, 2013; Andriansyah and Messani, 2014). The primary bond market helps in the performance of dual functions of improving savings culture and simultaneously investment. The secondary market in reverse provides foundation for price discovery for subsequent capital issues (Sorensen and Whitta-Jacobsen, 2010). Be that as it may, the primary bond market is a crucial variable for capital formation and industrial (investment) development.

In general, corporate bond finance option offers multiple benefits to the issuer, the investor, and serves the public interest, including mutual gains to global investors (Tendulkar, 2015). The development of an economy's new issue (bond) market however depends on available institutions and their efficiency such as regulators and the judiciary systems (Adegbite, 2015). The need to curtail the deterrents of 'information asymmetry', towards boosting the direct finance culture for industrial growth cannot be over emphasized. A clear advantage in favour of the direct financing is that no transaction cost affects the investor unlike in the indirect market where higher intermediation fee has to be paid.

The World Bank contends that finance spurs investment to growth, however in many developing economies, the financial sectors are in urgent need of reforms (Ojo, 2010; World Bank, 1989). The mode of mobilizing and extent of availability of finance determines an economy's growth path and can influence its economic development. Ojo (2010) also argues that the financial system, inclusive of its financing modes, constitute the architecture for the industrialisation process of most already advanced economies. Towards easing industrial financing, Chant (1992) argues that a financial system is expected to constantly explore new paradigms of transformation of financial resources, altering their risk and return towards the needs for long term industrial development. Potently, this research reasons that, this financial system that facilitates the

platform for saving and lending, borrowing and investing, and being put-up for urgent reform in Africa is all tied together significantly by the rate of interest (Rose, 2003).

In the modern economy, interest rate, although has microeconomic foundation, is a national parameter with profound economic and financial effects, hence conceptually a macrostructure- a price of multiple interconnected influences. Importantly, interest rate has future value, a potency to regulate the price system of the future. Moreover, it has its global perspective, in the international financial system, through the world interest rate (*wir)* structure, providing sensitive signals to borrowers, lenders, savers, and investors. Dillen (1995) opines that nominal interest rate's formation comprises world real interst rate, real exchange rate and domestic inflation. In the global context, trend in global real interest rate connotes the dynamics in international business cycle, which largely, is a function of global required return and investment opportunity (Dillen, 1995). In contemporary time, the mechanics of interest rate term structure is of major implications for the performance of the macroeconomy, and it has 'complete' forcasting influence (Salachas, Laopodis, and Kouretas, 2015). The mechanics of interest rate and its multiple layer of functionality stand it out as 'special' instrument in the financial service industry, with instant trigger reactions on other national parameters and aggregates (Okigbo, 1993). In specifics, its mechanics influences industrial outlook and financial service variables in the global markets, such as the US Fed rate does. When policies treat it in isolation its velocity effects on production, employment and prices have often resulted in egregious mistakes (Okigbo, 1993).

The increasing global linkages of economies and capital flows may impact more on domestic interest rate dynamics, as high real interest rate makes debt servicing more expensive. With respect to macroeconomic management, interest rate functions to restore equilibrium as a countercyclical business and policy instrument at firm and country levels respectively. Following studies on increasing integrated capital market economies, real interest rates are more externally determined, and hence are more than what the domestic economies can factor out (Bosworth, 2014). Though implanted through the economy's monetary policy (MP), the impact of real interest rates could be moderated by subsisting fiscal policies with the purpose of influencing macroeconomic outcomes. It is suggestive that the prevalence of high interest spread in many African economies perhaps provide more indication that tax instrument for macroeconomic

management is being underutilized (Spratt, 2009). Theory and literature suggest that nominal interest rate has multiple transmission channels such as the exchange rates, wealth and balance sheets, and inflation expectations, as the structure of yield curves conveys diverse set of information about the economy and its future directions (CBN, 2010).

From the preceeding discussion, it has been established that the macrostructure of interest rate and its links to bond market issuing can impact industrial output growth in the selected African economies.

1.1 Statement of the Research Problem

The African economy, except South Africa, is often described as a trading economy in basic commodities, due to the economy's weak industrial base (United Nations, 2010; UNIDO, 2013). As stated in the preceeding discussion, the macroeconomic impacts of industrialised economy are obvious; various policies to stimulate industrial output growth and its sustainability in African economies seem inadequate, as the problem of right funding gap is persistent. For instance, the Nigerian Economic Society (2005) reviewed Nigeria's industrial policy and suggested that Nigeria would become 'highly industrialized' by 2015; evidence however revealed that by 2015, the sector remained yet to significantly improve on its low capacity utilization, relative declining output growth rate, low employment generation, sub-optimal inter-sectoral linkages, *etc* (Chete, Adeoti, Adeyinka and Ogundele, 2016; WEF, 2016). Probably, the unrealized 'dream' may not be unrelated to the issue of financial 'underdevelopment', particularly of the corporate bond market.

The reason for this study is further deepened by the seemingly weak industrial output growth policy thoughts of African countries, evidenced in the continuous structural deficient pattern of her imports and exports. The doctrine of extroversion is evident in an economy that does not largely consume what it produces, and does not produce what it consumes. Ojo (2010) is consistent that the Nigerian banks seem to promote the deficiency, by financing foreign countries' growth, as the banks are deficient in the production of 'expected' industrial development finance; preferring to financing less productive commerce and final consumption imports. Recent literature on dependency and African renaissances suggest that the doctrine of extroversion is not abating (see Table **2.6,** Figure **2.5**), as this seeming structural deficiency gap

is on the rise, having attendant consequences on exchange rate volatility, unemployment, poverty, adverse terms of trade, *etc,* (Matunhu, 2011; Conway and Heymen, 2008; Ferraro, 2008). The prevalence of extroversion practice may be the non-addressing of long term capital deficiency of cross-sections of African economies.

Recently, numerous challenges of industrial competiveness of African economies were reviewed (WEF, 2013). The World economic forum found that the top three most important hindrances to doing business in the continent are in the order of access to finance, inefficient government bureaucracy, and corruption. In other words, dearth of long term capital is a potent factor that limits African transformation, for which Oni (2004) opines that Africa's financial markets are shallow, and cannot withstand international markets shocks. The risk associated with short term capital for long term industrial need is often beyond what the bank-based financial system can cope with, as inability to rollover results in operational losses, even to sudden default of larger corporations (World Bank, 2015d). Long term bond finance links investment to growth more, improves the peoples' welfare with shared prosperity.

In theory, the most appropriate form of industrial financing between bank-based and market-based finance led system is still in context (ICSA, 2015; Levine, 2004; Rajan and Zingales, 2003b). This study conjectures that to a large extent, African countries' economic policies and initiatives have over-promoted the bank-based financing option for long term industrial financing which however seems inappropriate and inefficient. WEF (2015) is uncomfortable with the relative slow growth of corporate bond market among emerging and frontier economies, citing that the current credit crunch environment calls for acceleration of the corporate bond financing as it will produce significant long term benefits, than bank financing. For instance, Asogwa (2005) appraises various Nigerian government long term industrialisation projects sponsored via bank-based funding schemes from 1971 to 2002, and concludes that the outcomes have been unsuccessful. The dominance of bank-based financing of industrial growth in the economies may be unconnected with their monopoly of deposit taking and controller of the payment system, coupled with the information asymentry problem more pronounced with the market based finance.

This study notes that though by precepts of liberalization, banks in selected African economies are strategically favoured in resource mobilization for financial intermediation, however the

uncompetitiveness of the saving/deposit rate suggests that depositors seem to be less favoured, unlike experience of the highly performing Asian economies (HPAE). The liberalisation policy though promotes bank-based model economy; however, overtime perversions are rife in interest rate structure, loan and deposit maturity structure, and inclusivity structure at expense of the long term industrial finance needs. Unfortunately, wide interest (lending and deposit) rate gap now pervades African economies- a model which financial economists claim is perpetuating 'financial failings' and furthers repression. Consequently, efforts at advancing credits over the years have been short-termist in nature (Asogwa, 2005), and at higher interest cost.

Moreover, this research study observes that banks as providers of intermediated funds assume to be 'owners' of the fund, as these deposits are largely of short term. This risk 'ownership' is, by default, being exploited by the banks to producing industrial loans, thus, inadvertently sponsoring business and market failures; at the detriment of the long term capital market, which hitherto is most appropriate for industrial financing. This financing behavior by the banks may have however made the long term capital market become seemingly unattractive. The long tenure financing by the bank is argued by the group interest theory of financial development; that it is undertaken to consolidate the banking sector dominance of financial intermediation process, and thus make the intermediation industry less competitive through oligopolistic behavior (Rajan and Zingales, 2003). The capital market funding of industrial output and growth however, has the benefit of matching assets and liabilities of firms, broader diversification of the intermediation industry, a better mechanism of deepening the intermediation process, which may help to augment financial stabilization, unlike the bank sourcing that is narrow, debt prone, that may push the economy towards financial fragility. Limited use of long term finance indicates market failure and policy distortions (World Bank, 2015d). The belief-based theories of asset bubbles perhaps have the bank assets in mind as potential source of asset bubble, often leads to banking crises by its loan production behavior, revenue recognition, over-valued assets, and asset-liability mismatch. This is a critical financial failings feature of many emerging and advanced bank-based economies that has significantly been responsible for these countries financial and economic development drawbacks (Knoop, 2013).

The IMF (2015) posits that systemic banking crises are related to the choice of bank assets, and that their choice of assets must be effectively regulated. Irrespective of intention to finance, since

their major funds are of short term, the banks should only assume ownership for the short term. Timing is a strategic variable in finance and money management. Long term fund sourcing needs long term planning. If a firm is non-strategic in timing its finance needs, it may operate a financial time (maturity) mismatch, at high production cost. This is the bane of many African industrial outfits as they fall prey to bank financing mode which is uneconomical. For instance, a seeming observation of finance sourcing characteristics among manufacturing outfits is that a 5-year time need of fund would not be sought till after the third year rather than today- a decision making model that Keynes regards as the animal spirit syndrome (World Bank, 2015c).

The World Bank has been worried about Africa's financial system being able to make its touted growth and development inclusiveness, wondering if Africa can claim the 21st century (World Bank, 2000; Ayogu, 2006). On this, the literature insists that the financing 'mode' is the most significant in any industrialisation process, particularly in African economies (WEF, 2013a); while urging that the banking credit system is poorly oriented and ill-adapted to the industrial needs of most African economies, particularly the preponderant Small and Medium Enterprises (SMEs) (Ojo, 2010). Adebiyi (2005) argues that though Nigerian banks are highly liquid, they hardly want to produce credit for manufacturers due to risks and cost. Despite the banking sector high state of liquidity, the lending rate is on average over 20 per cent for prime borrowers and above 30 per cent to other fund users. Though, their lending capacity is a function of savings/deposits, which on its part is a function of real interest rate (Doyle, 2005), the saving/deposit rate is however not dynamic. Real savings rate have been negative in many African economies, hence retail deposit is discouraging, and given low supply, demand for bank credit attracts higher price (Mathews and Thomson, 2014).

Following the group interest theory of financial development, this study therefore deduces that the challenge that may limit industrial output growth of African economies may be associated with the interest rate gap between bank lending and deposit rates. Despite complementary antidotes to stimulate financial liberalization's impactfulness on the bank interest spread, through concurrent encouragement of trade liberalization and product market liberalisation (Rajan and Zingales, 2003; Bircan, Hauner and Prati, 2012) the status quo of increasing interest gap remains in many African economies. The gap would have been stimulating oligopolistic incentive for the banks to raise bond at high coupon rate for onward credit to the industrial sector, at the high

interest cost. The banks' oligopolistic behavior limits the non-finance corporate (NFC) credit access, and may not help to stimulate growth of the corporate bonds market, and moderate investors' risk perception towards the consumption of industrial debt stocks. Despite that the capital market provides many noble roles (Ojo, 2010), among others, opportunity for corporate security's price discovery and the marketability of issued securities (secondary market window), bond and equity issuance are relatively poor in African economies compared to other regions.

In summary, the main motivation for this research study is the weak state of the corporate bond market for industrial finance, that may have made African economies to score least in global manufacturing output and annual growth rate, which this study associates with the perversed structure of interest rate. Indicative that, high interest rate spread, seemingly perpetuated by the bank-based industrial financing model and the bank lending behavior may limit the corporate bond market's capacity to blossom for industrial financing, partly by banks offering bond at high coupon cost. That is, the extent to which the corporate bond market can stimulate industrial output growth depends on the interest rate macrostructure, proxied by the magnitude of the banks' lending and deposit rate differential. A deduction from the group interest theory is that, increasing interest rate differential may stifle the corporate bonds market off the non-finance corporations (NFC), sufficiently de-motivate the economy's financial competitiveness, and therefore slack the speed of financial development. The continent's economies may not optimize industrial growth due to the 'perverted' interest rate structure. Lack of focus on this lapse would adversely and continuously affect long term capital formation potency of the primary bond market, and limit the industrial growth rate, with impulses transmitting to increasing unemployment, accentuating extroversion, stagflation, short term business cycles, and so on. The purpose of this research work is to investigate whether the proposition holds.

1.2 Research Questions

Following the above discussed problems, the research questions for this study are presented as follows:

1. Why would interest rate structure influence the primary corporate bond market development in the selected African economies?

2. To what extent does interest rate spread affect long-term industrial output growth in the selected African economies?
3. Why is there low primary corporate bond market issuing for industrial investments in the selected African economies?
4. To what extent is the secondary bond market active in the capital transmission process for industrial output growth in the selected African economies?
5. Why is there high interest rate spread in the selected African economies?

1.3 Objectives of the Study

The broad objective of this research it to examine the relative effects of interest rate structure and corporate bond market development on industrial output in some selected African economies from 1995-2014. The specific research objectives are as follows:

1. Investigate why interest rate structure would influence the primary corporate bond market in the selected African economies.
2. Assess the extent to which interest rate spread affects long-term industrial output growth.
3. To determine the underlying causes of low primary corporate bond market development for industrial output growth in the selected African economies.
4. Examine the extent to which the secondary bond market is active in the capital transmission process of industrial output growth in the selected African economies.
5. To establish a relationship that would aid in explaining the interest rate spread distortion in the selected Africa economies.

1.4 Research Hypotheses

The hypotheses, all stated in the null are as follows:

1. H_o. Interest rate structure does not significantly influence primary corporate bond market development.
2. H_o. There is no significant relationship between interest rate spread and long-run industrial output growth.
3. H_o. There are no significant causes of low primary corporate bond market issuing for industrial output growth in the selected African economies.

4. H_o. There is no significant relationship between the secondary corporate bond market and industrial output growth.
5. H_o. There is no significant relationship between inflation expectation and interest rate spread in the selected African economies.

1.5 Scope of Study

The study provides insight to the problems of high interest rate diffential that may have constrained corporate bond finance to improve industrial output growth in the thirteen African economies (Botswana, Cameroon, Cote d' Ivoire, Egypt, Ghana, Kenya, Mauritius, Morocco, Namibia, Nigeria, South Africa, Tanzania, and Tunisia), that are major African capital market economies as at 2014. Owing to the infant state and slow growth rate of corporate bond market in the region, only countries that are members of the African Stock Exchange Association (ASEA) and whose bonds were traded as at 2014 are included in the sample of study, as listed on the appendix page. The study period covers 1995-2014 (20 years panel data analysis). The sample procedure and size are detailed in chapter three.

1.6 Significance of the study

The purpose of this study is to provide more understanding to the probable economic and financial effects of corporate bond market on industrial output growth in particular and the entire real economy in general, in the selected African economics. First, the observed challenges posed by the relatively high banking interest rate spread, needs reawakening more awareness, which can be effectively managed by a deepened corporate bond market. Reliance on corporate bond market as main source of manufacturing and industrial growth finance could promote the economies' rapid industrialization, financial and macroeconomic stability, assist in arresting the growing incidence of dependency on foreign industrial production, promote financial development, and help to arrest incidence of stagflation, just as the High Performing Asian Economies (HPAE) had their breakthrough post 1997 crises upon embracing corporate bond market for industrial finance.

A country's primary capital market should be the stronghold of the economy's capital formation for industrial financing. The conundrum of inactivity of bond markets in Africa particularly, reveals how organized 'economic corruption' of inappropriate financing models may have

operated against the financial system, and against Africa's development, particulary in the non-finance corporates (NFCs) in the real sector. Lack of striving bond market may have put monetary policies on interest rate on false path, which more or less have retarded Africa's industrial output growth, and exacerbated her level of economic backwardness.

Stakeholders in the financial system that would benefit from a striving corporate bond market in the selected economies are the governments, foreign and local investors, the start-ups and existing entrepreneurs, industrialists, financial market regulators and operators (institutions) who are somewhat connected with the development of African economies; and the academic community in relations to deepening financial literature, in the long term saving-investment-output development nexus. Supporting institutions on global bond market development are the multilateral and bilateral development partners and institutions- UNIDO, UNCTAD, IFC, ADB, IOSCO, ASEA, and others, who may find the study useful for global financial deepening and inter-regional development initiatives.

For the government, a more developed corporate bond market can reduce the rate at which public bond issue crowds out the private sector. Besides, monetary and fiscal policies would find better accommodation in corporate bond market to regulate the economy, fighting inflation and unemployment, to soothe the peoples' vicious cycle of poverty, than through banking credit. Policy forcast on future interest rates would be better achieved via the bond market mechanism. Governments in developing countries strive for the existence of efficient economic and financial system, which the bond market can help to accomplish; so a robust domestic corporate bond market would reduce problems often regarded as "original sin" and currency and maturity mis-match. Governments are protected more under conditions of macroeconomic stability, which sustainable industrial output growth helps to guarantee, by a more stable financing system (Spratt, 2009).

For firms that source external finance through bank credit for industrial growth substantial negative consequences may have resulted, due to mis-matching characteristics of bank credit finance. Corporate bond provides better substitute in stable finance for working capital, research and development, and actual expansion. The outcome would lead to increased businesses, expansion of operations, generate more employment space, and make the firms more socially responsible.

The study has the potency to assist the bond market in the selected economies to improve long term investment mechanism and outlook by facilitating better economic functioning, through stable saving instruments, and hence encourages stable saving culture, which has been lacking in many of these economies. Investors in the instruments can be sure of income stability, particularly in inflation indexed bond instruments. Despite the increasing awareness of the bond market, in terms of size relative to the economy, it is still not comparable with the banking system. This study helps to create awareness of the natural role of the corporate bond market to finance industrial growth and the real sector economy, with a view to reversing the financial inter-relationship ratio in favour of market based finance.

The interest rate structure is a weighty variable in contemporary development economics, which the lack of robust bond market may have enabled to high bank interest rate spread, and hence confounded many African economies. International evidence suggests that advanced economies are more economically stable due to low discount rate structure, relative high industrial outputs, and inventions for sustenance. This study is significant for low interest margin, enroot the long term industrial transformations of African economies.

Furthermore, this research study is significant, as efforts at corporate bond market development produce mechanism for financial stability. Unless former efforts are made to increase industrial output growth, by improving the market driven financial structure, reducing investment cost processes, and attractive business environment to lowering transaction costs and obstacles to doing business, the pervasive import dependencies, poverty, and instability may continually be magnified in African economies.

In summary, this study has facilitated corporate bond market development mechanism as most appropriate for capital formation and investments in industrial output growth in the sampled countries, and may transmit the positive spillover effects to sub-regional and continental peers. The HPAE are currently speading their positive experience of corporate bond development after the 1990s financial crises to the rest of developing world.

1.7 Limitations of the study

The study is restricted to bond market development. Its findings and implications do not generalise other capital market instruments. The corporate bond market is a recent development in African economies; hence the domestic capital market institutions' are largely of government ownership and control discouraging rapid structural development. The study is limited to some selected African economies listed in the subsection on scope of studies above.

1.8 Structure of the Study

This thesis is structured as follows: Chapter one presents the broad introduction of the study-comprising the background of the study, statement of the research problem, the research questions, and the research hypotheses; then, the scope of study, the significance, the limitation, and definition of operational terms. Chapter two presents the theoretical literature made up of the conceptual reviews and their relationships, theoretical reviews, empirical reviews, the stylised facts, and a brief of the research gap. Next, is chapter three, the methodology, which comprises the research design, model specifications and techniques of estimations, and pre and post-estimation tests. Chapter four is on data presentation and analysis of the results. Chapter five presents the conclusion and recommendations.

1.9 Operational Definition of Terms

Asymmetric information: Economic and financial transactions in which parties do not operate on the bases of same information source.

Bond market: Markets for sale and purchase of long term fixed coupon debt.

Bond relative value analysis: A process of ranking individual bonds with respect to their expected return potentials

Capacity Utilization: This is the rate at which physical capital, such as industrial machines or plants operates in the production of goods and services relative to optimum installed capacity.

Capital market: A market where long term capital funds (Industrial debts, mortgage loans, equities, fixed income securities, and other alternative asset classes) are issued and traded.

Capital risks: It describes the losses incurred by an investor, of either all or part of the principal invested.

Capital formation: Mechanism by which the society directs part of current resources from desires of immediate consumption to the production of capital goods, of both human and material capital. Economic development depends largely on the rate of capital formation and accumulation.

Corporate Bond: A financial obligation of an entity that promises to pay a specified sum of money, first periodically called coupons and the principal at maturity.

Credit Rating Agency: An independent information source on the credit standing of debt security

Currency mismatch: Incidence arising from international bond issues that are serviced in foreign currency, such that the service cost varies with exchange rate

Economic corruption: In the context of this research, it is a state where acts are carried out against or that deviates from rational economic precepts; like inappropriate resource sourcing and allocation e.g. financing long term investments or projects from the short end (maturity) market, rather than the long term debt market; a hotbed of financial instability; time loss in public budget processing resulting in poor budget impact.

Effective rate of interest: This is the amount that one unit ($1) invested at beginning of a period will earn during the period of use of the capital, where interest is paid at the end of the period.

Emerging financial market: Market of developing countries, which is getting freed from government domination; the private sector is being encouraged to allocate capital resources.

Eurobond market: A market that offers bond outside the issuer's country of location and denominated in a different currency in which the security is established.

Financial deepening: Increased provision of financial services and its macro effects in terms of depth and breadth of financial opportunities on the larger economy. The more liquid money is available in an economy, the more opportunities exist for continued growth.

Financial development: Mechanisms by which short and long term capital are mobilised and employed in the growth and development process, which in reverse order would enhance the development of financial capital.

Financial Innovation: This is development of financial service to meet customer demand or when technology enables the creation of innovative financial products.

Financial liberalisation: This is a market which eliminates various forms of government intervention in financial markets, thereby allowing supply and demand forces to determine prices, i.e. interest rates, exchange rate.

Financial intermediation: A contractual process of transformation of the issued liabilities of surplus saving units (SSUs) to acquire the liabilities of deficit spending units (DSUs), that suits the preferences of both parties.

Financial Market: Where participants or operators gather and analyse information to make informed purchase and sales of financial claims. Financial market performs functions such as: providing information on past and present prices and trading volume; reducing search cost; providing for standardization of contracts; reducing (transferring) credit risks for buyers and sellers; reducing informational asymmetry; and trading financial and non-financial risks.

Financial Repression: An indiscriminate distortion of financial prices (i.e. interest rate and exchange rate), which reduces the economy's real rate of growth and the real size of the financial system (financial deepening) relative to non-financial magnitudes. It is measured as annual real interest rate lower than negative 5 per cent.

Financial Inter-relationship ratio: This is a quotient of the market value of a country's aggregate financial instruments in existence relative to the value of the tangible net national wealth. It defines the rate of growth of a country's financial superstructure.

Foreign Bond Market: A market in which bond is issued and denominated in a currency other than the issuer's local currency. It enhances international diversification in the sourcing of foreign capital.

Frontier Market economy: An economy that is characterized by low capital market activity in the primary market and highly volatile in the secondary market. Government intervention and dominance in prices and resources allocation and is relatively high.

Inflation rate: This is continous increase in general price levels overtime

Industrial sector: The sector of a nation's economy that comprises manufacturing, mining and construction.

Interest rate spread: The spread (gap) between the bank lending (interest) rate and deposit (savings) rate.

Macrostructure: The architectural formation of a subject matter or an economic instrument and applications. Macrostructure of interest rate means its formation, connections and the transmission effects on macroeconomic variables.

Manufacturing: This is the capacity to produce goods with labour, material and other inputs produced by others.

Natural rate of interest: Called the neutral rate, it is the real interest rate consistent with maintaining real GDP to equal its potential level, in the absence of transitory shocks in demand.

Nominal rate of interest: This is the price of credit agreed by a borrower and payable to the lender on an amount of a scarcely loanable fund for an agreed period relative to the amount actually borrowed, often expressed in annual per centage.

"Original Sin": In the context of financial development, the inability to raise credit in foreign markets in domestic currency.

Risk management: Proactive, anticipated and reactive process of an entity to risks, given clear understanding of the entity's objectives and constraints.

Term structure of interest rate: Relationship between interest rates and their maturities.

Wicksell Process or Cumulative Process: Wicksellian theory of cumulative process relates the interest rate gap between the natural rate and market (loanable) rate as responsible for investment, output, and income gaps and price level changes (inflation) in the economy.

Yield Curves: A graphical representation of yields across different maturity periods in the financial market. Additionally, it represents yield spreads across differences in maturities of different categories of fixed income securities.

CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

This chapter discusses the literature review. It starts with the conceptual review, which includes the interest rate macrostructure framework; and further, the theoretical and empirical reviews of economic and financial development literature, and ends with some stylized facts that precede the methodology of study.

2.1 Conceptual Review

The concept of the relationship between interest rate, corporate bond market development and industrial output growth is that the structure of interest rate and the extent of its misalignment may constitute a significant negation on corporate bond market to positively impact industrial output growth. For African economies' corporate bond market to develop and significantly impact industrial output growth, the level of bank interest rate spread may have to reduce competitively to attract industrial investment through the bond market. This section presents the macrostructure of interest rate in diagrammatic representation. It is the study's conceptual framework; the base of the research problem (Kumar, 1996), and then discusses the critical connections among related variables.

2.1.1 Macrostructure of Interest Rate

This *s*chematic structure presented below is the conceptual framework of interest rate structure. It attempts to enrich the channels of finance-led development transmission processes, capable of bringing to focus how the financial industry-led growth through domestic developed bond market can be enhanced. By studying the interest rate mechanics of the entire economy it could influence individual, firm, and public policy (monetary and fiscal) for a better understanding of how interest rate can drive long term capital accumulation, efficient allocation, and investment outcome, particularly in industrial investment and production. Musgrave and Musgrave (1989) also posit that the fiscal stance has important repercussion on the macro behavior of the economy. For its informational contents, behavioural influence on borrowers and its structural

effects on local and the global economy, interest rates are incomparable to conventional commodity prices (Stiglitz and Greenwald, 2003).

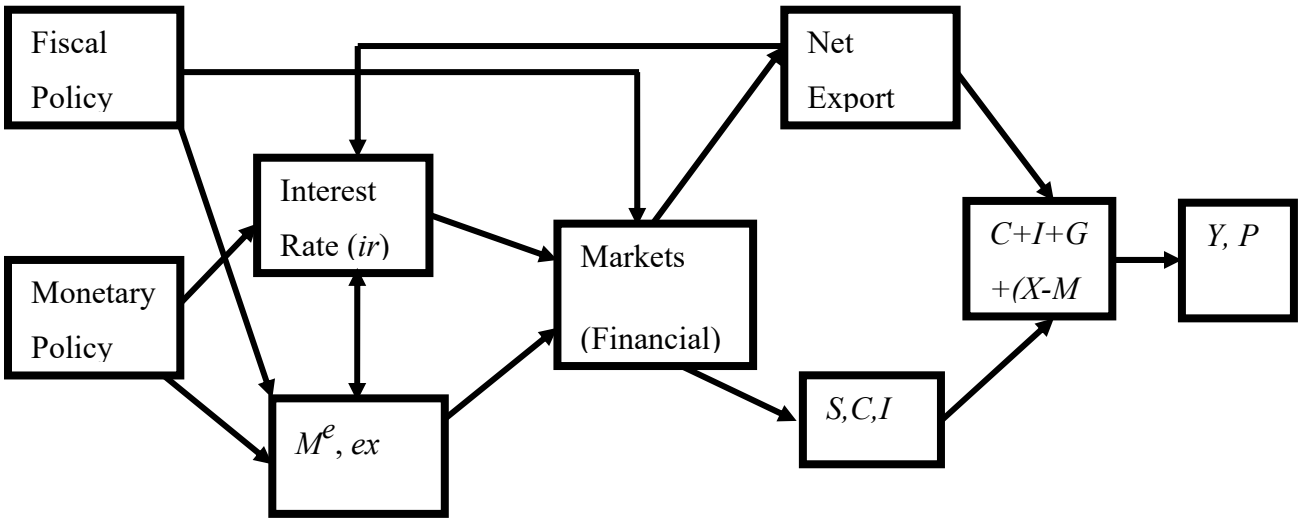


Figure 2.1: Conceptual framework of macrostructure of interest rate

Source: Adapted from Iyoha (2002) with modification by the Researcher

Where M^e represents stock of money in exponential form; *ex* represents exchange rate; *Wir* represents world interest rate; *S* is savings; *C* is consumption and *I* is investment, *G* is government expenditure; *X* is export, and *M* is import. *Y* is National output, and *P* is price level.

i. Interest Rate channel: The Keynesian interest rate transmission channel claims that a policy induced increase (decrease) in short term interest rate is expected to spur higher (lower) long term interest rate, which by *apriori* influences bond demand and supply thereof, and consequently, investors 'arbitrage' behavior, as revealed by the unbiased expectation hypothesis of the term structure of interest rate (CBN, 2010). In the process, investment is either accelerated or otherwise, while national output is ultimately impacted, as depicted below:

$$M \uparrow \Rightarrow ir \downarrow \Rightarrow \mathrm{I} \uparrow \Rightarrow Y \uparrow \qquad (2.1)$$

Where *M* is money supply; *ir* is interest rate; *I* is investment; and *Y* is national income

ii. Investment channel or the Bond *Q* framework: In the context of the bond market, the bond *Q* theory explains the relationship between the bond market and the economy (investment in firms' physical capital). The framework elicits the connection of how the monetary policy rate

(MPR) relates with the economy through the valuation of bond investments. It generalises the Tobin's standard investment theory that the firm's investment is guarded by the value of assets in the stock market (Semmler and Mateane, 2012). The theory proposes that the bond investment is an increasing function of marginal q regarded as the present value of marginal product of capital (Philippon, 2007). In schematic form, the monetary policy decision that spurs the process is as follows:

$$M \downarrow \Rightarrow ir \uparrow \Rightarrow Bp \downarrow \Rightarrow \mathrm{I} \uparrow \Rightarrow Y \uparrow \tag{2.2}$$

where, *Bp* is bond price. It illustrates that a tightened monetary policy rate induces an increase in interest rate, and by *apriori* market price of bond falls, firm's investment in physical assets via the primary bond market is induced, and hence increases productivity and national output. Using the US data, Semmler and Mateane (2012) find that the bond *Q* and average *Q* models have stronger power to financing investment projects both in the short and long run than the Tobin equity *Q*.

iii. Default Risk channels: By investing in corporate bond issue rather that government bond may elicit default risks. That is, the issuer may disappoint in the obligations of interest and capital repayments. The perceived default risk spread and its probable transmission effects are presented in schematic form below:

$$(Cr_c - Cr_g) \uparrow \Rightarrow invst.risk \uparrow \Rightarrow default\ risk\ \ premium \uparrow\ \Rightarrow ir \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow \tag{2.3}$$

Incidence of corporate bond default rate can increase investment risk outlook leading to high default risk premium demanded by investors. The transmission leads to high interest rate, then low investment and low output.

iv. International credit channel of monetary policy rate (MPR): Any economy is open to the world through trade and finance (Dornbusch, Fisher, and Startz, 2011). Evidence from a recent study (Morais, Jose-Luis and Claudia, 2015) suggests increasing 'risk taking channels of monetary policy' which reveal substantially how foreign countries' monetary policy rate *(MPR)* and quantitative easing (*QE*) decisions influence credit risk taking behavior of domestic banks in developing economies, and hence affect both monetary and real variables, as depicted below:

$$wir \downarrow \Rightarrow capital \inf low \uparrow \Rightarrow ir \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow \quad (2.4)$$

A relatively lower foreign (world) interest rate (wir) spurs domestic banks to borrow abroad and this is transmitted through the economy with increasing investment and income. However, the effect could be otherwise where foreign interest rate rises or when foreign portfolios are recalled, just as was recently experienced during the 2008 global financial crises in many developing economies. More specifically, Eichengreen, Hausmann, and Panizza (2007), argue the problems of "original sin", that is, inability of developing economies to obtain credit in foreign markets in domestic currency, and its currency mismatch consequence of exchange rate variability on international bond issues, can influence pressure on domestic interest rate. In general, this channel can be a source of financial development and financial fragility. On trade link, world interest rate (*wir)* shock is transmitted into domestic economy when there is balance of payment crises from excess import over export in the current account as explained in detail below.

v. Real Effective Exchange rate (Rexr) channel

$$M \uparrow \Rightarrow ir \downarrow \Rightarrow Ex \downarrow (depreciation) \Rightarrow Net \exp ort \uparrow \Rightarrow y \uparrow \quad (2.5)$$

An economy's real effective exchange rate *(Rexr)* is used to measure a country's competitiveness in international trade (Dornburch *et al*., 2011). The *Rexr* is a function of domestic productivity, price level and net export. Given that there is high productivity, if interest rate falls for monetary and quantitative easing policy, exchange rate falls relatively (holding other factors unchanged), net export will increase, while import becomes expensive, and national output increases. The purchasing power parity (*PPP*) (*i.e.* the law of one price) influences the nominal exchange rate to derive the effective real exchange rate. The *PPP* theory reveals that in competitive economies the rate of exchange between two currencies depends on the relative domestic inflation rate. Similarly, through trade and balance of payment mechanisms, exchange rate volatility, an important indicator of macroeconomic instability (Tennant and Folawewo, 2009) can be a source to transmit instability quotient into domestic inflation enroute interest rate, leading to low investments and output.

vi. Normalization of U.S. Federal Reserve (*FED*) Rate Channel: The need to spur inflationary growth for full employment and other economic reasons may have made the United States (U.S.)

to gradually align its neutral interest rate with the *FED* rate (Brainard, 2015), a policy called normalization, by doing away with Quantitative easing (*QE)* and zero interest rate (Labonte, 2016). Following the 2007 financial crises, the U.S. and major developed countries had adopted 'unconventional' monetary policy in form of Quantitative easing (*QE)* strategy and also purchasing and holding huge long term assets (United Nations, 2014), an effort to stabilize their financial markets, inject liquidity in banks, to induce recovery.

The policy of normalization however, may have spillovers effects, great risks and uncertainties on global financial markets and economies, including African economies, as trade partners; particularly countries whose foreign assets are being held in dollar. The United Nations (2014) lists the likely impacts to surge in global interest rates, sell-off in global equity markets, decline in capital inflow to emerging economies, and increased premia for external financing in emerging markets. For African economies, exiting the *QE* may have effects transmitted through the exchange rate and other financial market channels as depicted below:

$$US(ir)\uparrow \Rightarrow wir\uparrow \Rightarrow cap.outflow\uparrow \Rightarrow Ex\downarrow \Rightarrow ir\uparrow \Rightarrow I\downarrow \Rightarrow y\downarrow \tag{2.6}$$

Increase in the U.S. interest rate would transmit to world interest rate (*wir*) rising, and this phenomenon would attract capital and portfolio outflow for higher returns from emerging and developing economies. Pressure on domestic currency would lead to exchange rate depreciation, this transmit to higher interest rate, which then limits investment and output.

China, the world second largest economy and major trading partner of Africa has adopted normalization of her currency through devaluation, intended to boost export, among others. Broadly, China's exchange rate policies can have spillover effects on her African trading partners, just as the US rate policies. Nevertheless, very important is the global wave on normalization and monetary easing which many advanced economies have recently being lunching, partly to re-energize and attract domestic investment, production and consumption, and reduce capital outflow. All of these can have transmission influences that could have implications on capital accounts of developing countries.

vii. International Currency Exposure Channel: Macroeconomic phenomena such as the doctrine of "original sin" and currency mismatch, elicited by foreign currency denominated debt liabilities generate certain exchange rate crises and other financial destabilizing effects,

particularly in the event of a negative shock (like the collapse of oil price on Nigeria's external sector) precipitating currency devaluation, as specified in the framework below:

$$Ex\downarrow \Rightarrow foreign_{\ debt}\ obligations\uparrow \Rightarrow currencydeva.\downarrow \Rightarrow ir\uparrow \Rightarrow I\downarrow \Rightarrow y\downarrow \qquad (2.7)$$

The implications of these aforementioned mechanisms, including its transmissions are such that an unmanaged interest rate can distort the good intention of monetary and fiscal policies, and can exacerbate further macro-dynamic negative effects for domestic inflation and unemployment.

2.2 Theoretical Review of Economic and Financial Development Thoughts

2.2.1 The Smithian theory: The Smithian theory equates economic growth to "Wealth of Nations", achievable on policy of *laissez-faire,* which is advanced in the classical economics view of division of labour, leading to specialization; capital accumulation and interest rate (Jhingan, 2007). Smith (1776) work titled "An Enquiry into the causes of the Wealth of Nations" has the model of development centered on promoting capital accumulation and productivity (Clunies-Ross, Forsyth, and Hug, 2009). The theory opines that the 'wealth of a nation' is limited by the limit of division of labour (Diweldi, 2008). Theory of wealth creation is built on the doctrine of natural law (Jhingan, 2007)- the interpersonal forces of markets and free prices determination, working through individual 'self-interest' (by 'invisible hands') guarding the market mechanism in a free market system to allocate resources efficiently (Clunies-Ross *et al.,* 2009). Each individual seeks to maximize his wealth, and in the process aggregate national wealth is maximized. However, while Smith advances the doctrine of invisible hand for efficient resources allocation, contemporaneously, nations' market mechanisms (interest rate, exchange rate, and so on) are hardly subject to free market forces (full deregulation), particularly in developing economies, such as African economies, where despite the drive for liberalization, deregulations, and privatization of their economies since the 1980s, very little has been achieved, as evidenced in the low industrial output growth relative to global standards of African economies, as represented in the stylized facts sections below.

On the theory of capital, Smith describes is as stocks of goods of different kinds for essential purpose towards promoting division of labour that impacts labour productivity and output (Ghosh, 2005). Further doctrine on capital is that whatever part of stock a man employs as a

capital, he always expects it to be replaced with a profit, an expectation which leads to development of capital accumulation (Smith, 1776). Smith reveals that capital grows through practice of parsimony and decreases by prodigality and misconduct while dismissing industry as the catalyst to capital growth (Smith, 1776). In support of availability doctrine, Smith claim that as the quantity of stock to be loaned at interest rate increases, the interest (price) payable for the use of that stock must necessarily diminish. In the present time and in African economies in particular, savings and deposit rate are low, thus very low 'quantity of capital stock' is produceable in the system. Since the market mechanisms and instruments for producing long term 'quantity of capital stock' are poorly developed, African economies therefore rely on bank-based capital finance for her industrialisation efforts, with consequences of high lending rate and wider bank interest spread rate. This 'maladapted' and weak industrial financing culture produces preponderant consequences on the quality of economies and the human living condition in African region (Ojo, 2010).

2.2.2 Classical Theorists: Ricardo, Malthus and Mill Theories of economic growth post Smithian classical theorists represent economists who had the belief that an economy is capable of self-adjusting to guarantee full–employment level of income (Jones, 1975). They were however rather pessimistic in their vision of growth and development process in developing countries, due largely to rapid population, rising food prices and fall in rate of industrial profit attributed to diminishing returns (Thirlwall, 1999). Malthus's thoughts on 'effective demand' as responsible for increased industrial production and output, and that growth through this act could sustain the level of productivity, bringing forth profit for reinvestment is apt in modern economics. To him, industrial profitability is the stimulus to investment sustenance.

On population led food challenge, Malthus contends that while food production, with its attendant diminishing returns in agricultural output grows arithmetically, population grows geometrically. The growth imbalance leads to developing countries per capita income oscillating around the subsistence level, or caught in the lower-level equilibrium trap (Thirlwall, 1999). It is increase in capital accumulation that increases labour demand, which also encourages population growth. However, population growth could only transmit to wealth increases if it increases effective demand (Jhingan, 2007). Thus, many developing economies are technologically, agriculturally, and industrially deficient, currently trapped in the earlier facts of the classists like

Nigeria, Egypt, South Africa that rely on imported food to sustain is growing population by 24%, 24% and 3% respectively (NBS, 2014; CAPMS, 2014; SARS, 2014). Ricardo's industrial growth theory follows the landmark of Smith's that growth and development is a function of capital accumulation (Jhingan, 2007).

2.2.3 Keynesian Synthesis is a revolution of the classical macroeconomics towards solving problems of unemployment and economic depression, which the erstwhile classical thoughts may have overlooked. Among his revolutionary ideas, Keynes favours flexible monetary policy towards raising the level of employment. Keynes theorizes that the interest rate theory develops from monetary theory, that links the value theory and the output theory; and that its determinants are purely a monetary phenomenon, (Jhingan, 2014). Money is an asset whose short term demand is a phenomenon of speculative, transactionary, and precautionary motives. On capital formation, saving is regarded as a private virtue and of public vice, in order to boost public consumption, aggregate demand and tame unemployment. In general, amidst criticisms, Keynes macro-dynamism is a reorientation of thoughts on aggregate income, employment, output, consumption, demand, savings and investment (Jhingan, 2014).

2.2.4 Chenery's (1979) Structural Change Theory is more interested is 'transition' factors for sustained growth of an economy, from one stage to another, rather than dichotomizing between the developed and developing economies. The source of transition is in form of structural changes that inform growth in per capita income of nations, which is classified in three development processes; resources accumulation process; resources allocation process; and demographic and distributional process. These three main structural characteristics of development process is further broken down into ten basic dimension of the transformation process, which include critical factors such as saving-investments relative to GDP; structure of domestic demand and production; and transition in income distribution and urbanization.

2.2.5 Neoclassical Growth Theorists and the Cambridge School's Debate: The neoclassical theory represents the post-classical thoughts of Samuelson, Tobin, Solow, Swan, Meade, Phelps and Johnson towards economic development (Dwivedi, 2008). The scholars extend the growth literature beyond Harrod-Domar by postulating the relationship between capital accumulation, productivity and technological progress as the ingredient for long term growth (CBN, 2014; Todaro and Smith, 2011). The main arguments center on the views of papers of Solow (1956),

Swan (1956) and Tobin (1969). They stress the need for external technology led growth, and developed the doctrine of 'marginalist revolution' as the bases of deriving efficient and effective pricing of factor productivity in competitive markets, in a rational world of utility maximization. Reflectively, while the neoclassists presume perfect knowledge and factor mobility, current dispositions and realities of imperfect competition and asymmetric information suggest that contemporary markets are inherently deterred to realizing the potentials.

The traditional neoclassical free-market argues for liberalization of an economy which requires additional domestic capital and foreign investment inflow, raising domestic savings rate, thereby increasing the rate of capital formation, the capital-labour ratio and the per capita income. Growth beyond this short term adjustment is brought about by the Solow residual (Todaro and Smith, 2011). The most notable of growth models is the Solow-Swan growth model. This model describes under perfect competitive market condition, how the long-run evolutions of an economy's income and consumption per worker are affected by structural parameters of a country's rate of savings, investment, the growth rate of labour force, depreciation, and productivity (Sorensen and Whitta-Jacobsen, 2010). Given these parameters there is chance of conditional income convergence among economies (Todaro and Smith, 2011).

Tobin (1969) reveals earnestly that the real interest rate influences the capital asset market price of firms. Also, in his Tobin q investment theory, he proposes a link between the firm's quest for investment in plant and machinery and its market value of equity relative to the replacement cost of its plants and machinery, rated as q. If the result is $q > 1$, the firm is on good course to raising the capital it desires.

The modern English Cambridge school led by Kaldol, Robinson, and Pasinetti criticise the original MIT neoclassical view based on methodology, assumptions and philosophical differences on various neoclassical doctrines of growth and development. It suffices to state however that the debates and position of the literature on issues such as marginal productivity, theory of distribution, *etc.*, continue to rage in the intellectual world (Jones, 1975). An intuitive review of the neoclassical doctrines for African economies suggests weakness, particularly in prioritising, as their needs are as many as literature highlights. For instance, the UNCTAD (2014) survey of development pact in Africa sums up critical views. First, that the recent growth experiences never led to development of productive capacities, neither has it transformed their

economies structurally that could count for productive employment, and generate necessary reduction in poverty. Secondly, that contemporary growth models have not been able to reduce the share of agriculture output and employment to much needed corresponding increase in share of industrial output to GDP. UNIDO (2014) echoes that in the subsequent sustainable development agenda 2015-2030 it is in industrialisation that developing world can enjoy 'shared prosperity'.

2.2.6 Extroversion doctrine and Industrial Growth: Extroversion doctrine describes economies that unfortunately, by wrong policy design, encourage the production of what it does not consume, and consumes what it does not produce. UNIDO (2013) admonishes that developing countries should restructure to consume what it produces. The policy of exploiting and exporting natural resources with little or no value addition aptly underscores or describes Africa's economies, subjecting it to little control over its revenue streams thereof, and hence highly vulnerable to world commodity and input prices (Oni, 2004). As import-dependants that often have to accept the exporter's price, Africa's economies are naturally trapped in-between, with declining terms of trade and perpetual depression. The Prebisch-Singer thesis has been apt and consistent on African economies overreliance on primary product export, such that 'combinations of low income and price elasticities of demand' therefrom would continually subject the economies to "secular (long term) decline" in her primary-commodity terms of trade (Todaro and Smith, 2011).

This state of affairs (extroversion) is unrelated to dearth of long term development financing system in African economies, that have been largely bank based (Ojo, 2010). Despite the financial reforms and restructuring, Senbet and Otchere (2006) note that African banks lack capacity for corporate credit, instead their loan portfolios are largely in government securities. There is the needed for establishments of long term financing structure such as the corporate bond market for the real sectors of agriculture and manufacturing, due to their long gestation periods. Ojo (2016) sees long term financing as a partial insurance mechanism for the real sector investor, and opines that financing arrangement need be economic efficient to encourage borrowers to match their investment periods with the finance mode, bearing other prevailing economy's risks. Lack of long term finance is a major hindrance to African economic growth (World Economic Forum, 2013). Underdeveloped development finance negatively affects the

risk taken tendency of the average African entrepreneur, while the opportuned bank borrower prefers quick business of importation of final consumer goods. The World Economic Forum (2013) also reveals that a sound financial market that efficiently prices risk is a global competitive factor for national productivity and set the pace for its prosperity.

Sule (2015) remarks on the 2015 Nigeria Agriculture Sector's contribution to GDP, that three US manufacturing firms which had added value on raw cocoa seeds imported from West Africa realized fourty-four (44) billion dollar net sales in 2014, whereas the entire West African farmers could not realize much from the sale of the raw seeds. Streetens (2009) opines that in such context, development when measured in terms of aggregate growth rate may be a success, however in terms of employment, justice and poverty elimination it is only of failure or partial success. On access to export, Museveni (2004) argues that despite the 'everything but arms' (EBA) policy, African agricultural output are technologically locked out, due to many anti-trade strategies of advanced economies, including the agricultural subsidy which wanes on Africa's output uncompetitiveness.

These features of extroversion combined with the banking practice as exclaimed by the group interest theory adversely affects African industrial economies, making it lack behind other regions in comparative statistics such as per capita income, agricultural productivity, manufacturing value added (MVA), and other measure of economic development (Teitel, 2004). Only through endogenous momentum for growth, diversification and industrialisation would this doctrine ameliorate. UNIDO (2013) argues that structural change capable of generating new ideas of high value added in agriculture – industry nexus is obviously the much needed route to being a manufacturing economy that guarantees high productivity. The body bemoans developing economies' structure of direct transition from agriculture to service sector as responsible for low productivity, low income led growth, unsustainable to generate high value addition for job creation. While blaming the economies for undermining the manufacturing sector in their economic structure, the body seeks 'mechanized-manufacturing' nexus that employs light technology led high productivity at start while enjoying high economy of scale that would be more employment generating. Subsequently, heavy technology manufacturing would naturally spring up, amidst right quality education. In conclusion therefore, mechanisms must evolute to redirect the thinking and energy disposition of African citizens' entrepreneurial spirit

from primary-commodity trading, imports of fininshed goods (distributive sectors), and other less value additions towards industrial productivity.

2.2.7 Capital Formation and Economic Development Models

Harrod-Domar (1939; 1946): Following the great depression of the 1930s, Harrod and Domar explored and developed requirements and conditions necessary for *'steady state growth'* in output and employment, in a dynamic Keynesian world; and thus found explanations for an economy's aggregate steady state growth process capable of effecting Keynesian economies from instability. They emphasise the need to raise the rate of savings and investment in order to raise the rate of growth of the economy (Jhingan, 2007). They stressed the double role of capital accumulation *(i.e.* net investment) in economic growth process, first, in generating income, and secondly increase in production capacity of the economy. Economic growth is thus produced by the level of savings and capital productivity (*i.e.* the capital–output ratio).

Relying on the assumptions of a constant capital-output ratio, and savings-income ratio, these would be necessary to meet the needs of increased demand (or spending) created from "newly generated income" by the new firm's stakeholders- suppliers, workers, *etc*, which must be adequate to absorb the output from the new investment, otherwise the economy suffer from excess or idle production capacity (Dwivedi, 2008). This may result in the rate of growth of output being less than the warranted growth rate (G_W) in subsequent period. The formal requirements are the prerequisite to maintaining full employment and steady state growth year after year to long run. The second source is that as a result of the investment level (*i.e.* increased capital stock), the productive power of the economy is continually sustained. Reflectively thus, their theory is most admired for fitting into the 'capital fundamentalist' doctrine, which is central to current African economies growth challenge.

Lewis (1954) developed a two sector model of economic growth- the subsistence and the capitalist sectors. To him, in many underdeveloped countries an unlimited supply of labour is available at a subsistence wage transferrable to the industrial sector. Economic development occurs through capital accumulations as a result of the withdrawal of surplus labour from the subsistence sector to the capitalist sector. The capitalist sector is the part of the economy which uses reproductive capital and pays capitalist for the use thereof (Jhingan, 2007). The capitalist

employs labour for wages in mines, factories, and plantations to earn profit. The subsistence sector however does not use reproductive capital. Output per head is lower than in the capitalist sector. This theory encourages the industrialized and economically stable countries to help the LDCs through his unlimited surplus labour theory.

In his book Economic development with unlimited supplies of labour, Lewis (1954) remarks that capital formation is the way out to help poor countries to economic growth. Capital formation is the savings of the households and governments, transferred to the business sector, then employed in the production of increased output and economic expansion (Jhingan, 2007). Reflectively, to the African traditional agricultural sector thus, there could be more focus on mobilizing and transferring of its surplus labour to the modern industrial sector, thereby assisting in further mobilizing capital accumulation and sustainable development (Clunies-Ross *et al.,* 2009).

Rostow (1960) stage development theory analyses economic development theory in term of five stages which every economy must pass through, which are the traditional society; the pre-colonials for take-off; the take-off; the drive to maturity; and the age of mass consumption. The 'stages of economic growth' thesis has however received high comments from economists especially on doubting the authenticity and generalization of the division of economic history into five stages of growth. Reflectively, for African economies yearning for rapid industrial transformation, this growth trajectory may be rather rigid as newly industrials Asian economies testify, considering the growth transformation impact of innovations, technology, etc.

Gerschenkron (1962) theory of economic development or industrialisation identifies that all nations were backward at a time, such that, movement from that state to a modern industrial economy requires "sharp break" with the past, or a 'great spurt' of industrialisation. While it identifies the industrial potentials of a country to the relative degree of its backwardness, the theory encourages that a modern industrial economy requires a sharp break to industrialization, thinkered by critical economic institututions such as the State and the banks, which should reflect and influence their behavior and sacrifice (Ojo, 2010). Gerschenkron (1962) categorizes economies into three structural distinctions based on their level of economic backwardness. They are: advanced; moderately advanced; and very backward economies. In his structural hypothesis, he notes that the advanced nations' development trajectory started, with the capital needs been met from the private sources rather than the banks. The moderately backward nations required to

be financed by the banks, as there is need for some special institutions, such as the industrial banking type, to supply long-term funds for industrial capital for the economies (Ojo, 2010). The extremely backward economy is such that the process of capital formation is structurally weak, requiring the State to be instrumental to the provision of finance for capital formation. In summary, economic backwardness is synonymous with level of industrialisation, of which apparently most African economies are identified by their weak industrial finance base, perhaps accentuated by their weak institutions. It thus requires these economies taking "great spurt" decision for "sharp break" from the past.

Leibenstein (1957) theory of Economic Backwardness and Economic Growth points at the way out of vicious cycle of poverty as the need for critical minimum effort to stimulate income-raising or growth promoting factors in developing economies to some critical minimum (per capita income) level, without which such economies remain trapped in vicious circle of low income, slow growth and under developed. Reflectively, Leibenstein reviews the respective impacts of shocks and stimulants on per capita income of countries and since developing economies always experience shocks, African economies can consider using interest rate stimulant strategy for its long term capital accumulation and industrialisation.

Nurkse's theory of capital formation in Developing Countries: Most of the treatises of Lewis (1954), Fei and Ranis (1964) on unlimited surplus labour and economic development were originally expounded by Nurkse (1953) in his Problems of Capital Formation in Underdeveloped Countries (Todaro and Smith, 2011). Nurkse explains the 'vicious circles of poverty' that seem to perpetuate the low level of development of developing economies. He claims that certain circular forces tend to 'act and react' upon one another to keep the countries in perpetual state of poverty (Jhingan, 2007).

In developing countries, suffice for African countries, productivity is low because of deficiency of capital, market imperfections, economic backwardness and underdevelopment, of which its attendant 'vicious circle', which operates both on the demand and supply side of the economy accentuates. Thus, Nurkse asserts in the trite that "a country is poor because it is poor". Poverty may be a curse, but more of a curse because it is self-perpetuating (Bhattacharya, 1963). However, following rapid development in some underdeveloped societies, particularly in Asia, the treatise of vicious circle has been somewhat criticised for being too generalizing, as many

underdeveloped societies have since transformed from poverty to riches without appreciable external support (Bauer, 1976). Nevertheless, such is yet to be felt largely among African economies as evidence of pervasive poverty and insecurity may have been the major factor for current migration of Africans across the Mediterranean to Europe for employment and livelihood, which thus seem to suggest that the theory of vicious circle of poverty and capital formation holds. On similar note (Beck, Levine, and Loayza, 2000) find evidence that finance is more impactful beyond providing capital accumulation, rather through fostering productivity and resource allocation.

2.2.8 Endogenous growth Theory

Experience from modern economies suggests that the traditional neoclassical growth doctrines may not be suitable for developing countries, despite efforts at relaxing structural rigidities (Todaro and Smith, 2011). Though, some modern economies have experienced faster growth on the strength of neoclassical inspired technology, even superseding the per capita income (*PCI)* convergence condition (such as South Korea, Taiwan, Singapore), however, the endogenous growth version suggests that sustainable long run rate of growth in GDP per capita can be accomplished. The increasing wide gap between different economies of the Asian, Latin American, and Africa in the post war years could not be truly explained by the traditional neoclassical growth model which attributes growth to exogenous technological progress, and either do the economies' per capita income (*PCI*) converge (Agenor and Montiel, 2008).

The endogenous growth theory primarily holds that the long run growth rate of an economy depends on policy measures of economic agents. Developed by scholarly papers such as Arrow (1962), Romer (1986), Lucas (1988), Rebelo (1991), Romer (1990) and others, the theory points out that policy conceptions and executions by governments do not seem to matter in models with exogenous technical change and exogenous population growth. Importantly, the traditional neoclassical theory could not also explain factors responsible for the large differences in the 'residuals' across countries having similar technologies (Todaro and Smith, 2011). For many reasons of underperformance by developing countries, global development partners such as UNIDO admonishes developing African economies to rather explore other options, such as "endogenous light" technology rather than western "heavy" transferred technology in their current development efforts (AfDB, OECD and UNDP, 2017).

Sorensen and Whitta-Jacobsen (2010) say endogenous model's main prediction is the positive influence of the savings or investment rate on the long-run growth rate GDP per worker. The endogenous growth model thus mean the long run growth rate of technology depends on basic model parameters such as the investment rate in physical and human capital, the population growth rate and other fundamental characteristic of the economy.

The most significant difference between the two thoughts: traditional neoclassical and the endogenous theories, is the assumption of diminishing marginal returns to capital investments of the neo-classists. The new theorist foresees increasing returns to scale in aggregate production, focusing on the role of externalities, which stem from an assumption of investments in human capital with results capable of generating improved productivity and increasing external economies to competing industries, such that industry spillover effect offsets the natural tendency for diminishing return. The new growth model holds that the growth in gross national income (*GNI)* is a natural outcome of the long run equilibrium. It is a better model to explaining the growth observed overtime and the inter-country comparison, by determining the appropriate size of the Solow residual in the growth rate of GDP.

With just a slight improvement on the Solow's exogenous model, the endogenous (Romer) New growth version is presented next. Romer's version is unique for developing countries due to its innovative advantage of 'technological spillover', and agents optimally determining their consumption and saving; then optimizing resources allocation to research and development leading to technological progress (Todaro and Smith, 2011). Romer's model associates increasing returns to scale at the industry-wide level but constant returns to scale at firm level, leading to competitive equilibrium that is not optimal. A higher growth rate would be achieved if the investment from externality gains is internalized.

Unlike the Solow-Swan model, the $A(K)_t$ (New growth) is technological progress; a function of the particular economy's rate of capital formation, physical, human and research capital, and also the organizational and institutional structure of the economy. Such structure determines the economies capacity to effectively utilize the world pool of knowledge in production or adapt it by adding to that knowledge like Japan did in its breakthrough to industrialisation. Countries that

accumulate more capital stock, human capital stock, undertake more research and development may accelerate their growth capacity over time as depicted in Figure **2.2**.

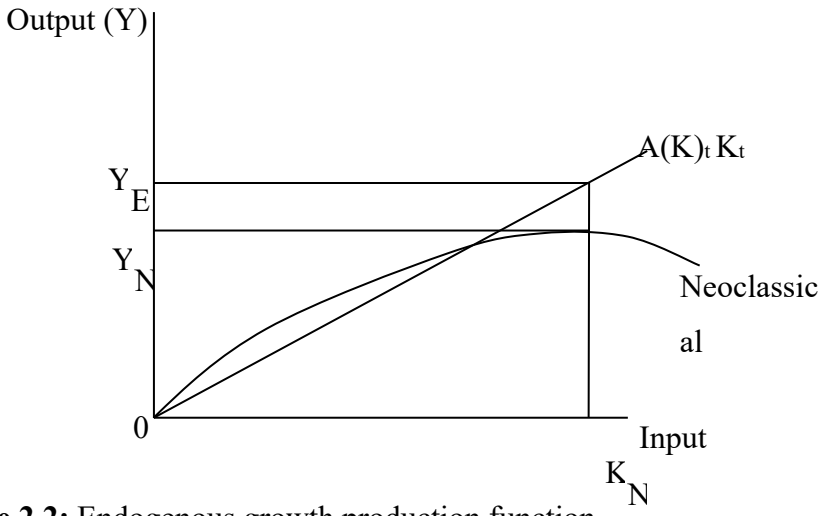


Figure 2.2: Endogenous growth production function

Source: Cypher and Duez (2004)

Figure **2.2** describes the development of the endogenous growth function, given in equation **2.47** compared to the typical Solow-type neoclassical production function that exhibits diminishing returns to *K*. The neoclassical production function shifts upwards in response to any change in exogenous technology, however, the function also exhibits diminishing to the variables of capital or labour along the input axis. On the endogenous growth function, $A(K)_t K_t$ there are no diminishing returns to reproducible factors of capital *K*, human capital *L*, or research and development *(R)*. Thus, given the assumption of diminishing returns, further investment under the neoclassical function cannot increase total output or output per person Y_N/L beyond Y_N, while under the endogenous growth, additional investment in *K, L* and *R* can increase output beyond Y_E along the *A(K)* production function- a constant returns to reproducible inputs to production along $A(K)_t K_t$.

Contemporanously, endogenous theory and policy may provide the base in explaining weakness of African legal institutions and pehalps the poor functioning of long-term finance theory in the region. Similarly, it goes to explain the bases of cross-regional economic divergence between African and global regional peers. Legal and finance theory provides that in countries with sound

legal system that promotes private contract enforcement, legal right of investors, *etc,* financial markets and institutions would flourish more, with greater guarantee for long term savers and of future long term financial development (Beck and Levine, 2003).

Despite these lofty ideals of the new growth theory, the endogenous theory has been severely criticized to be of little value to developing countries' genuine economic development, or for cross-country comparative development model, since it is partly based on the assumptions of the traditional neoclassical doctrines, with less functional importance to developing economies (Todaro and Smith, 2011). Put in more detail, its rigid assumptions of symmetry of all production sectors; non-recognition of impediments such as inefficiencies in governance, policy inconsistencies, lack of critical infrastructures, weak institutions, imperfect capital and goods market, which are common among developing economies, makes the theory less of value to developing economies (Todaro and Smith, 2011).

2.2.9 Finance and Development Nexus

Finance is important for development when examined from activities of its institutions, despite that it is less obvious (World Bank, 2001). While Gurley and Shaw (1955, 1960) provide theoretical foundation and framework that the financial sector and its real sector counterpart must co-evolve endogenously and dynamically, Patrick (1966) cited in Todaro and Smith (2011) provide "stages of development" argument, that the financial system would be a critical factor at start of modern development, thereafter, it evolves as a derivative or a derived demand of the real sector (Todaro and Smith, 2011). The financial market expedites innovation in a dynamic process that influences and is influenced by the developments in the real sector, with technological innovation been supportive. For Gurley and Shaw, in relatively poor society, capital formation developments take off from efforts of entrepreneurial savings. As growth evolves, lending institutions develop, such as banking finance, to assist in capital investment. Thereafter, upon growth in per capita income and wealth, market based institutional financing such as debt and equity emerge to compliment bank lending (Boyd and Smith, 1996).

The literature on 'finance and development' debate, however, consistently assumes conflicting thoughts from the diverse works of Schumpeter (1912), Robinson (1952), Patrick (1966), Lucas (1988), Stiglitz (1994), McKinnon (1973), Shaw (1973), King and Levine (1993), Levine and

Zervos (1996), Rajan and Zingales (1998), Levine (2004), Davis (2005), Acaravci, Ozturk, and Acaravci (2009), Todaro and Smith (2011), Liu, Lejot and Arner (2013) and lately Adegbite (2016) with the aid of diverse measurement variables, methods and techniques. The unabated theoretical arguments are on two levels. First, whether financial development ignites economic growth or otherwise? Secondly, what financing model is better for the nexus gains to be optimised? The first aspect of the theory can be summarized into four hypotheses: the conventional view of neoclassical 'supply leading' argument; the 'demand following' argument; the bi-directional relations, and the no relationship arguments (Acaravci *et al.,* 2009; Todaro and Smith, 2011). Adegbite (2016) argues that the financial system remains a necessary but not sufficient condition to propel real economic growth, due essentially to the nature and extent of the economy's regulatory governance structure and framework; a view associated with quality institutions; as effective financial intermediation may foster more stable financial system and encourages global integration through trade and finance (Liu *et al.* 2013).

On the financing model, the argument of whether bank based financial system or a market based be promoted in any hypothetical economy still ensue. For Davis (2005), what is obvious is that through the finance-growth relationship, banking system helps to manage and control the debt exposure in corporate financing, while the 'arm's length' market system promote better corporate governance and discipline through corporate takeovers, overall both the bank and market-based systems irrespective of their obvious comparative advantages, are important to growth. World Bank (2001) itself undermines the argument as unnecessary, that, irrespective of their relations or which is the lead variable, both are central and symbiotically necessary for modern development. In generalization however, there seem to be a wide spread perception in the literature that financial systems orders' of development is in phases of the bank bases system, to market-based, and thereafter the securitized phase, where derivative products are engineered from the bank and market-based products tradeable both in the formal and informal capital and money markets.

Haber (2008) opines that financial development spurs growth by helping to reduce cost of capital and ensuring its efficient allocation; and further states that African development challenge rest in the small financial system that allocates capital inefficiently. On the mode of financial intermediation, the role of information asymmetry is a major issue in financial development

frameworks, as it is a force in the choice of banking and allied finance mode over the securities market (Levine, 1996a, 1996b).

The McKinnon–Shaw Theory of Financial Repression: McKinnon (1973) and Shaw (1973) theorize the adverse effects of financial repression, particularly in developing economies, and advocate financial liberalization, with consistent reforms; which subsequently, developing economies bought into. According to Fry (1988), McKinnon and Shaw analyzed developing countries' financial systems, and argue that regulatory policies indiscriminately distort financial prices, hence reduce the potency of the financial system relative to the non-financial magnitude, which Goldsmith (1969) refers to as the nation's financial interrelationship ratio (Shaw, 1973).

Goldsmith sees 'finance and growth' as endogenous and simultaneously related variables- that growth in domestic financial market enhances the capital accumulation efficiency, *i.e.* increases in per capita income (growth) is due to the efficient use of capital (Choong and Chan, 2011). McKinnon and Shaw see government intervention and interference in the financial system as making developing economies suffer from poor performance of savings, investment, and growth due to financial control, regulation, and repression.

Fry (1995) presents three ways by which interest rate ceiling distorts the economy: that low interest rate produces bias in favour of current consumption and therefore reduces potential savings; secondly, potential lenders are forced to engage in low-yielding direct investment instead of lending to finance higher-yielding investments by depositing money with financial institutions; thirdly, bank borrowers that are able to obtain all funds they want at low interest rate will choose relatively capital intensive projects. It is important to remark that an economy experiencing low savings/deposit rate regime in the short-term market suggests that in line with finance theory the equity market and the long-term bond market would be the alternative attraction to investors, this unfortunately it not in context in African economies.

Bank-Based vs Market-Based financial system arguments: Beyond the well documented pros and cons of bank-based and market-based financial structure in the literature (Rajan and Zingales, 2003b), the financial system and the economic system often influence one another, and may either accelerate or if not well structured and oriented, could retard one another's growth potential (Ojo, 2010). Apparently, both systems have growth responsibility functions. The

economic system demands capital formation from the financial system for investments; such that the type, amount, efficiency and effectiveness of capital mobilisation potency depend on whether the financial system is bank-based or market-based. To this extent, financial structure type matters for accelerated economic development, such that, in order to address the financial service gap deficiency, policy options may be necessary, on the argument of the financial structure that could effectively promote better savings, capital mobilization, and allocation for rapid economic development (Rajan and Zingale, 2003b; Levine, 2002). Disappointingly, the 'finance gap' problem in many African economies becomes apparent as the financial system is inundated with deep gap between the financial expectations of the real sector producers (deficit units) and the fund supplies (surplus unit), that the largely bank-based system has been unable to reconcile. The African bank seems to lack 'relationship-based' banking doctrine, such as the German and Japan models (Rajan and Zingale, 2003b).

In examining the arguments of the 'finance gap' crises in the real sector of developing economies, the 'history of finance thought' trajectory may be critical. Following the World Bank buy-in to the neoclassical doctrine of growth convergency and perhaps the import-substitution industrial policy strategy for developing countries, financial liberalisation and deregulation policies substituted for government's control, regulations and direction of the credit industry towards preferred sectors (Ojo, 2010). Since then, many developing countries became bank dominated financial systems, however, deeply characterized by the oligopolistic banking type, with 'market power' over the entire intermediation industry. Consequently, economic and financial features that are socially suboptimal became evident, such as high lending rate, low saving/deposit rate, wide net interest margin, high bank return, high inflation, poor inclusive growth, and high non-performing loans leading to recurring financial system instability. Despite increasing deregulation and reformation regimes, financial system of these developing African economies are still under performing in meeting the desire of the real sector; a set back which Ojo (2010) opines may have been prompted by external shocks, institutional mismanagement, and financial system uncompetitiveness.

Rajan and Zingales (2003b) analyse the determinants of the successes of a 'relationship-based' and the 'arm-length' financing systems, and reveal that due to its uncompetitiveness, relationship bank-based model has no 'price signal' for independent assessment of borrowers unlike the

arms-length model, where lending decision is based on the 'intrinsic value' of the project that reflects the true risk-adjusted costs, as evaluated by vast number of lenders.

As earlier revealed, since the financial system has a 'responsibility function' to promote growth (Adegbite, 2016), ameliorating the poor financial system performance may require periodic reforms, which (Fitzgerald, 2006) opines should focus on deepening the financial intermediation, increased efficiency of financial intermediation, and diversification of the composition (that is financial structure) of financial intermediaries (Adegbite, 2015). Finance depth development would promote low transaction cost, among others; and a deeper financial market requires financial innovations and knowledge, product development, prudential regulations, enhanced financial competitiveness, particularly of the bond market, periodic reforms of the money market and effective supervision. These interventions may remedy the finance gap for the benefit of the real sector in developing countries.

2.2.10 Capital market-Growth Nexus

Many theories and exploding literatures have also espoused the capital market as engine of financial and economic development. In the 1970s-1980s when emerging markets started building their capital market infrastructure, Bekaert and Harvey (1997) explore the link between the financial market and economic growth, with special emphasis on the linkage of economic growth with the stock and capital markets, and found reasonable relevance. Though, in the corporate finance literature many scholars fail to accept significant link between the stock market and real economic activities (Stiglitz, 1989; Mayer, 1989). This observation may not be misplaced given issues that negate the classical assumptions of the capital market theory and its practice in modern corporate practice, such as issues of asymmetry of information, and conflict of interests between managers, investors and creditors prevails (Bekaert and Harvey, 1997).

Economic theory says that there are two factors that shape economic growth- the economic factors and non-economic factors (Jhingan, 2007). Virtually, all growth theories conclude that capital formation is a critical economic factor in growth process. Jhingan (2007) defines capital as the "stock of reproducible factors of production", whose formation and accumulation include three interrelated stages-viz: existence of real savings process and its rise overtime; existence of credit and financial institutions that intermediate in capital transmission; and the investment of

mobilized funds for capital goods production. World Bank (1993) identifies other economic rate of growth factors as physical and human capital, efficiency of resources use and the deployment of modern technology.

2.2.11 Capital Structure and Firm Value Controversy

The issue of whether the mix of the firm's capital structure influence the cost of capital, projects of different risk class, and hence related to the wealth of shareholders remain contemporaneous in financial literature. Modigliani and Miller (1958; 1963) are scholars who perhaps are the progenitor of capital structure theories following their critical question whether methods of financing corporate operations matter, but that only the project's net-present value. That, bearing taxation advantage and with perfect capital market assumptions, a firm's cost of capital, hence the present value, is not a function of its capital structure (Modigliani and Miller, 1958). The core of their view is that firms of same size with same operating risk will have same total value and hence WACC regardless of their gearing ratios (Lucy, 1996).

The Modigliani and Miller propositions I and II argues that the value of a firm's project will not alter merely by the way it is financed (mix of equity and debt); consequently if the project is profitable, on its own, then the addition of funding will only improve the return to shareholders (Brown and Matysiak, 2000). By implication, shareholders wealth can be easily increased through better investment decisions rather than through skillful financing decisions. For firms in the same risk class, the total market value is independent of capital structure and is given by capitalizing or discounting the expected net operating income at the rate appropriate to that risk class (Olowe, 2011). If not, there would be arbitrage that re-establishes the balance. Their 1963 reform however recognized that in the world of corporate income taxes, debt financing becomes an attractive option. The optimal capital structure thus includes maximized debt finance. The optimal value then becomes value of the unlevered aspect plus the savings generated by the tax shield (Verniemmen, Quiry, Dallocchio, Fur, and Salvi, 2011).

2.2.12 Term Structure Theory, Bond Market, and Inflation Management

The term structure theory (TST) is a fundamental evaluation tool in the bond market that describes the yield to maturity for all bonds of all maturities (Copeland and Weston, 1992). The theory, also called the yield curves is also referred to as maturity structure theory. It explains the

relations between interest rates of different maturities; otherwise regarded as a theory determining the short term to long term yields relations (Dornbusch, Fisher and Startz, 2011). The term structure reveals that the yield (return) derived from a particular financial instrument is a function of its length, even in hours, to maturity, and the risk of the security (Copeland and Weston, 1992), hence it is not a constant phenomenon, as it is also subject to the dynamism of interest rate (systematic) risk of the market. Any unexpected change in future market interest rate induces corresponding risk to the yield, as the market value of the bond (discussed in the secondary market section below) changes in response to change in interest rate expectation. As the terminal value is certain (established by contract) it has mild volatility towards maturity. The yield may be free from default risk but could be volatile, depending on the players and the markets they operate.

In a market driven economy, using the yields of current risk-free interest rate as benchmark, the historical (term) structure is determined, to help forecast the future outlook of the long term bonds market and the associated inflation pattern. Ackley (1978) says it is systematic relationship existing among yields, and among changes in yields along their term to maturity. The theory attempts to provide reason to why long-term bonds provide a different yield than short-term bond, and provide the pattern of how interest rates can evolve through time (Hull, 2009); hence a predictive tool for the economy.

An interest rate summarizes the promised repayment terms on a bond or loan, hence several rate runs concurrently, differing relatively by their associated characteristics, such as credit worthiness, tax treatments, maturities, and other macroeconomic forces (Dornbusch *et al.,* 2011). However, on term structure, the length of time is crucial. The behavior of the term structure theoretically influences bond pricing; hence the mechanics is vital to every successful and subsequent bond issue. Fundamentally, the price of a bond should be negatively related to market interest rate. Also, basically, the bond price varies inversely with the yield; as the required yield increases the present value of the bond's cash flow decrease, and vice versa (Chandra, 2005). It thus suffices that since securities' market assumes competitive structure, intuitively as interest rate fluctuates bondholders could experience capital losses and gains accordingly.

The structure deals with relationship between default free bond yields of different maturities, which conceptually uses the spot yield, since by convention pure discount government bond for

long maturities is non-existent (Cuthbertson and Nitzsche, 2001). The Term structure of interest rate thus evolves from zero-coupon interest rate (*i.e.* the spot rate's return). The spot rate (yield) is also somewhat more useful at pricing a coupon paying bond, as it applies to zero coupon bonds than the use of the yield to maturity (YTM) (Cuthbertson and Nitzsche, 2001).

Substantive theory reveals two items required towards establishing the bond price: the estimated cash flows and the estimated appropriate required yield (Fabozzi, 2008). In the primary market, the investment advisor would have to determine the terms and timing of the offering and establish the required yield in order to determine the fresh financial claim. Subsequently, trading becomes function of the prices, influenced by the yield, which is also useful for comparing different bonds.

The *TST* is important to investors because it lets them know what to expect of the future economy, significantly about the yield performance in the short, medium and longer term outlook, amidst either the normal, inverted or flat shapes of the curve. It should preempt the monetary policy direction about the future changes in interest rate. Modena (2008) reveals that the yield curve informative content is useful for monetary policy surprises. Potently, three common theories influencing the shape of the yield curve or the term structure are the unbiased expectation theory, liquidity premium theory, and market segmentation theory (Cornett, Adair, and Nofsinger, 2012); they however differ only in the treatment of their treatment of the term premium (Cuthbertson and Nitzsche, 2001). In remark, the structure forms the theoretical framework for forward interest rate; and aside from revealing that interest rate is a function of its maturity, it also does provide reason why an economy's spot rate that act as benchmark to estimating forward rates are always lower.

Understudying the historical or term structure of interest rate can help to manage inflation more appropriately. Though the cash flow from short term treasury bill may be certain but in real (purchasing power) term, the inflation factor cannot be mitigated except through a risk management (derivative) market. Investing in the long term bond market however carries more inflation uncertainty, as nobody know how it will turn in the distant future. Brealey, Myers and Allen (2006) note that since interest rate is expected to incorporate latest information investing successively in short term bond can reduce any uncertainty relative to investing in a straight long term bond. For the treasury bill investment, the reinvestment rate can be more certain than that of

straight longer term bond. This is why long term bond may offer higher risk premium as inflation uncertainty causes a higher sources of risk, hence the upward sloping term structure associated with uncertainty in inflation (Brealey, Myers and Allen, 2008).

Comparing the developed market economies where the long term bond market is more profound relative to short term bill market and the developing market economies, reveals that, despite the lower interest rate, short term bill market is relatively more attractive than long term bond investment market that offers higher rate in African economies, which imply that the long term bond prices are most sensitive to fluctuation in interest rate, via inflation expectation (Fischer effect). Thus, the mitigating factor to the dearth of long term bond market development in African economies is partly in developing mechanisms against inflation expectation and its management.

2.2.13 Financial Intermediation and Information Asymmetry Arguments

Financial intermediation is an agglomeration of the roles, mechanisms and process by which the economy's deficit finance units (*DFU*) borrow financial assistance from the surplus finance unit (*SFU)*, through independent financial institutions (the intermediators). Rather than deficit units dealing directly with the surplus unit, it is argued that intermediation could promote fund mobilization, and due to its expected duty on information production, could efficiently allocate capital funds, utilize the limited resources available both within and outside the economy, monitor managers, and transform risks with the purpose of enhancing economic growth and development (Greenwood and Javanovic, 1990; World Bank, 2001; Levine 2005). In virtually all economies, fundamental problem of investment gaps begging for financial interventions exist, although in different degrees. However, with diverse empirical evidence, Yao (2011) and World Bank (2001) opines that for purpose of long term growth, the intermediation role of finance may be more effective, if it targets improvement the economy's total factor productivity *(TFP)* rather than the rate of capital accumulation.

The theory is interventionist, hoping to tackling otherwise information asymmetric problem; risk management and reduction; and transaction costs in a direct finance system, in a financial world where savers are quite more risk averse than investor. Institutions such as banking, insurance, pension fund industries are sources of intermediations exploring and creating different values in

a value chain process for the financial industry. Bank intermediation however has distinguished features as they operate on fixed deposits unrelated to the performance of their portfolios; their deposits are also, often of shorter term than their assets (Matthews and Thompson, 2014).

Scholtens and Wensveen (2003) reveal the shift in the contemporary argument of financial intermediation in the light of development in information technology, deregulations, financial market deepening which ultimately has tend to reduce transaction cost and information asymmetries. The modern theory of competitive finance, in the Arrow-Debreu's view, is such that the financial system hopes to use the principles of 'complete market' to achieve optimality, arbitrage, and equilibrium, with no role for financial intermediaries, which are the pillars of the neoclassical financial system (Somoye, 2011). In such market savers and investors meets their respective preferences, costlessly, at perfectly exchange prices.

The Arrow-Debreu world of finance presumes homogenous expectations such that the future requirements of savers and investors are fulfilled with financially diversified instruments. While these are standards, in the real world, existence of imperfections seem to be the norm, hence interventionists exist to bridge the service-delegate monitoring, investment screening, *etc*, gaps at cost. Given that the Arrow-Debreu ideal remains a target being strived at, with innovations in economic and technological infrastructure, and social capital that would consequently reduce transaction costs and information asymmetry, Scholtens and Wensveen (2003) and Fukuyama (1995) suggest that financial intermediation process without, would be superfluous, hence it is a temporary interregnum. This contention may be right if the financial intermediation mechanism lacks due 'information capital' development.

Remarkably, despite the growth in financial globalization, particularly in African economies, the 'financial intermediation' mechanism may be assessed as yet to achieve market and trading optimality to the interest of investors and savers, as the financial systems seem to have perpetuated asymmetric information to further justify their existence, which previous studies seem to have settled with. Stiglitz and Greenwald (2003) reveal that making a loan is synonymous with making investment decision, such that 'information capital' of credit participants- specific information of borrowers, must be protected to improve credit culture and financial stability. To achieve crises free financial intermediation for development, Stiglitz stresses the peer pressure control to making information economics more meaningful,

particularly in the credit market. In tandem with Scholtens and Wensveem (2003) this review concludes that from the paradoxical existence of financial intermediation the theory seem to fail to provide satisfactory information for its existence.

2.2.14 Availability Doctrine, Credit Rationing and Cost of Capital

This sub-head review the theoretical premise of the low credit culture of many developing economies, which may be responsible for what is otherwise, referred to as financial failings, particularly in African economies. The theory of credit rationing and prevalence of available doctrine without due emphasis on cost doctrine are issues within the scope of financial failings in developing economies. Credit rationing is expressed when potential borrower cannot get its credit desires met. Matthews and Thompson (2014) state two variants. First, credit rationing can occur when the borrower is unable to borrow all the credit wanted at prevailing price. Secondly, it also occurs when out of collection of existing borrowers some individuals' credit request are satisfied while others fail to achieve theirs, irrespective of willingness to pay the existing credit price.

Several theories offer different arguments on the existence of credit rationing. One strand contends that banks deliberately restrict credit to borrowers in response to government monetary tightening policies. The government monetary tightening policy results in 'financial failing' through their indiscriminate reserve requirement policy. However, theory suggests that monetary policy of reserve requirement is a necessary financial stability strategic tool to control inflation, protect depositors and ensure stable growth, if well managed. Banks credit policies are expected to be limited by their nature of deposits and should not exposed the financial system to increasing default of high interest rate risks.

In many developing economies, banks oligopolistic market structure that seems to limit deposit interest rate and prevent competitiveness in savings deposit market is also a factor promoting 'financial failings', from supply perspective. Two other variants of the capital rationing theory available in the literature are that: the theory of credit rationing is viewed as an outcome of banks optimizing behavior. Keynes (1930) seems to oppose the policy of credit rationing outright for any profit maximizing bank as it contradict basic demand and supply analysis, which postulate the existence of an equilibrium rate that should rule between potential loan demanders and the

suppliers of loan-able funds. Secondly, the phenomenon also arises as a check to the risk of default. Accordingly, Matthews and Thompson (2014) states that the risk of default would be inevitable as long as increase in interest rate is adopted as compensation for increased risk. There is a limit to loan rate exposure by which the bank's risk exposure outweighs the rate of interest thus resulting in declining expected profit; that is, the concept of availability doctrine may be counterproductive such that expected profit for a bank declines relative to rise in interest rate.

Initially, expected profit for the bank increases as the rate of interest rises. A further rise in interest rate is expected to produces two opposing effects on the bank's revenue. Firstly, increase in interest rate is expected to increase expected revenue assuming that loan demand is price inelastic. Secondly, expected revenue falls as the risk of default rises. Subsequently, due to the increasing influence of the second effect, the first will be outweighed, and an optima point is reached in which total revenue/profit will decline. Thus, expected profit increases at a declining rate because the increase in the rate of interest also increases the risk of default. The optimal credit rationing induced interest rate is caped at a level of the maximum expected profit level. Beyond this point of interest rate, the risk of default may decline the profit with any increase in interest rate.

Interest rate can also rise uncontrollably in the presence of 'availability doctrine'. The doctrine, dated back to the post-World War II in Western economies, as there appear weak relationship between the rate of interest and aggregate loan demand (Matthews and Thompson, 2014), with the fiscal policy trust been taken as the driving force of economic stabilization, while monetary policy merely supported. It remains a common characteristic of developing economies, which contends loosely that the demand for credit is more a function of available credit than the price of credit. In other words, the demand for credit is a function of supply, in line with the classical theorist Say's Law of Market, summarized as "supply creates its own demand". If credits are produced at whatever price, there will automatically be a market for them. The government through the Central bank is able to effectively control flow of credit to commercial banks through issues like debt issuing, open market operation, and reserve requirement policies, otherwise regarded as qualitative restriction on bank lending (availability doctrine).

Exogenous credit rationing states how the rate of interest is unable to satisfy the aggregate demand for credit. Due to quantitative controls, banks are limited to make credit to the tune of

the economy's demand. As banks are underweighed on loans in their portfolio, the supply curve of loan is perfectly elastic at official lending rate causing an unsatisfied demand for loans. Matthews and Thompson (2014) stress that the combine forces of regulatory restriction (*i.e.* reserve requirements, *etc*), usury law (exogenous) and asset management schemes (endogenous) encourage availability doctrine. Thus, from microeconomic perspective of the firm, this doctrine highlights the role of non-price factors in the determination of a loan contract, and with exception to exogenous factor, the doctrine is inconsistent with profit maximizing behavior of a bank. Availability doctrine, through the reserve requirement policies that encourage it has the immediate consequence of high interest rate on loans, thereby widening the interest spread and the banks are profiting heavily from it at expense of the economy (see tables **2.3** and **2.5**). When related with the discouragement in low deposit rate, and lack of interest in the real sector investment, the whole exorbitant interest rate spread remain puzzling and confounding in African financial system (Senbet and Otchere, 2006).

Contemporaneously, what constitute bank's 'input' and 'output' is still not categorical in the literature (Mlima and Hjalmarsson, 2002), although research on the bank interest differential is vast. In a cross-sectional study of seventy-nine (79) countries, Gomez (1998) find a negative relationship between bank spread and per capita income, and that the factor that explains the wide gap in bank spread between the advanced and low income economies is the resource cost of producing financial intermediation. Conventionally, a bank invests its capital for the production of saving intermediation services between the household and the non-bank firm. The value of the output (savings intermediated) accounts for the rate differential. Jamaludin, Klyuev, and Serechetapongse (2015) find that economic size, inflation, quality of bank balance sheet, bank concentration, and institutional quality account for bank spread in the Pacific Island region. Tennant and Folawewo (2009) find that high public debt, inflation, high reserve requirement and high discount rate are responsible for the high differentials in developing countries. Interest rate has been acknowledged as crucial tool for transmitting monetary policy effects to the real sectors of the economy (Marshall and Swanson, 1974). As a major component of cost of capital, its changes and lag effects modify investments, and significantly modify consumption, thereby causing and impacting the rate of income growth.

2.2.15 Theoretical role of Money and Interest Rate

Money stock and interest rate operates simultaneously to shape economies and productivity. Their role and influence is vastly treated in economic theory. It should however be acknowledged that no single monetary theory is currently acceptable to all economists, particularly the monetary economists. In general, two strands are commonly shared: the Keynesian (or non-monetarist) view and the monetarist view. This sub-section reviews monetary economics, first examining the classical quantity theory of money; next, is the Milton Friedman monetarist school, and later the Keynesian liquidity preference, treated below under the interest rate determination; thereafter, the interest rate spread.

a. The Quantity theory of money: The classicists perceive that the workings of the economy do not require deep role for money, other than as medium of exchange, to facilitate the trading of goods and services produced. Using basic argument, precipitated on logic and rationality, they contend that money is a derived demand to serve as means of exchanging value (Olofin, 2001). Two schools of thought are on this line: the Irvin Fisher School and the Cambridge School. The Fisher (1930) theory treated in Marshall and Swanson (1974) contemplates prices as being a function of money supply, M; the goods and services being traded in all transactions, T; and the velocity of money, V. According to the theory, there is a direct proportional relation between quantity of money supplied within the economy and the general price level. A doubling of money supply would directly lead to a doubling of the price level.

b. Milton Friedman's monetarist theory: The monetarist theory developed on the earlier work of the classical quantity theory (Friedman, 1968), and was effectively built to correct or answer some objections of the Keynesians. The monetarist views money as a greater influence on aggregate income, and the better instrument to compliment self-regulatory in-built mechanism of the economy, which, aside from the case of any intervention through money supply, should be limited to 2-5% annually (Marshall and Swanson, 1974; Olofin, 2001). On policy rule, monetarists in general and some neo-classicists believe that inappropriate monetary policy is the major source of macroeconomic instability, and that enactment of right monetary policy rule is critical. McConnell and Brue (2008) contend that a requirement of the monetarist is that monetary authorities expand the money supply each year at the same annual rate as the growth rate of the economy's productive capacity.

c. Theories of pure interest rate determination

Standard economics argue four distinct theories of pure interest rate determination (Rose, 2003). They are the classical interest rate theory; the liquidity Preference theory; the loanable fund theory; and the rational expectation theory. The classical theory, amidst many limitations, is otherwise called the long term theory, which reveals that the rate of interest is determined by forces of supply, through households' savings/consumption relations, and the investment capital demand relations, through the business sector. In contemporary times however, the theory fails to account for the influence of financial institutions that 'create and destroy' money, which affects the interest rate in the financial system. Moreover the assumption that interest rate is the major determinant of saving, ignores influences from other influential market and behavioral forces, like the household income, inflation, habit, and so on. Additionally, that the theory ignores business firms and governments as major saving suppliers are part of its limitations.

The liquidity or money demand theory of the Keynesian interest rate determination is a short term theory for liquidity preference or cash balances (Rose, 2003). Keynes ascribes an important role to liquidity preference as it affects the aggregate economy. An attempt to understand the uncertainty of future interest rate as the times further into the future has helped to derive the liquidity premium theory (Copeland and Weston, 1992). The liquidity of money is a unique inclination to hold some aspect of one's asset in form of money. For Keynes, liquidity preference reflects the simultaneous influence of transactions, precautionary, and speculative motives for holding money. For Marshall and Swanson (1974), in contrast to the transactionary and precautionary role of money, the speculative motive of money is more volatile, given the expectations held by people about the future prices. Keynes's original thesis called the 'speculative demand for money' says that an individual either holds all wealth as money or as bonds. In the Keynesian monetary sector therefore, the price or opportunity cost of money is the interest rate. The equilibrium price (the ruling interest rate) is determined via the supply and demand for money process. James Tobin however extends this theory to setting in which individuals hold both money and bonds but adjust their wealth portfolio in the light of interest rate changes; hence the theory is now regarded as portfolio demand for money (Miller and VanHoose, 1993). It is however limited partly due to its short term approach to interest rate determination, having assumed that income remains stable (Rose, 2003). For interest rate to

assume equilibrium in reality, admits temporarily, all associated variable should be in equilibrium- income level, savings, and investment.

The loanable fund theory (*LFT)* credited to Robertson (1922) (cited in Stiglitz and Greenwald, 2003) accommodates more variables in the economy relative to the liquidity preference theory (*LPT*). The *LFT* sees the risk free interest rate determined by diverse domestic and foreign forces of demand and supply of credit (loanable funds), interacting to produce desired rate, *i.e.* a market determined interest rate, which is also influenced by the cyclical movements of the economy (Jhingan, 2014). On the part of households, literature sees income rather than savings interest rate as dominant forces of supply. Equally, important is that whatever equilibrium that holds in the market it is partial and indeed temporary. To have sustaining equilibrium, planned savings must equal investment, and that all other markets that feed on interest rates such as foreign exchange market, the money market including the economy must be in equilibrium simultaneously (Rose, 2003).

The neoclassical marginal productivity of capital theory argues that marginal productivity of capital increases simultaneously with marginal return on capital, hence real interest rate is determined by marginal productivity of capital (Stiglitz, 1999). Normally, capital stock is often limited in the short run, while increases in labour hours can increase marginal productivity of capital. During economic recession, if labour demand decreases, marginal productivity falls, and hence real interest rate would fall. The opposite order holds in a boom era, thereby indicating that real interest rate moves cyclically with productivity of the economy.

The rational expectation theory of Interest Rate reasons that 'rational' individuals and organizations use 'modeling' technique to 'think' and react to policy changes or events as it affects or influence interest rates and other asset prices. Perhaps, the latest economic school of thought, expectation theory is built upon the doctrine of efficient market hypothesis; the theory is about 'responding to expectations', which assumes that market agents are rational who form expectations, take positions, and appropriate unbiasedly the future asset prices and interest rate. In its simplest form, expectation theory contends that long-term interest rate should reflect expected future short-term interest rates (Hull, 2009).

The Lucas (1981) rational expectation thought furthers the Muth (1961)'s adaptation theory which assumes that agents look at the recent past to make expectations about the future. Though, the interest rate and asset prices view of the money and capital markets assume high information efficiency, implying a zero-sum game for market participants, however to rational expectants, agents are assumed to be more sophisticated and show evidence that monetary and fiscal policy could only have a limited impact- *i.e.* the Lucas critique. The combine theory brings to focus the adaptation-expectation-anticipation nexus of efficient resource management.

d. Monetary policy and economic stabilization instruments

Monetary policy involves measures and tergets designed to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieving some specified macroeconomic policy objectives, often towards changing the level of economic activity, and maintaining economic stability (Anyanwu, 1996). This main objective is to ensure that overtime, the expansion of money and credit are adequate for the long-run needs of the growing economy at stable prices (Akatu, 1993). It works on two principal economic variables: the level of interest rates and the aggregate supply of money in circulation. Both are symbiotic. Economic stability is a major objective of government of which monetary policy often targets (Marshall and Swanson, 1974). Other target variables subsumed under economic stabilization objectives are the following four sub-goals: generating high level employment; price level stability; maximum economic growth, and balance of payments equilibrium.

The interest rate macrostructure directly or indirectly impacts these target variables, as the interest rate is an instrument of money supply. Monetary instruments are initiated by Central Banks to control and regulate the amount of money supply in relation to the needs of the economy, in terms of both the short-run stability and long-run growth. For instance, a change in Central Bank of Nigeria (CBN) monetary policy rate (an attempt to alter its balance sheet size) can trigger off a chain of reactions affecting both short and long term interest rates, with spillover effect on foreign exchange rate price, value, and ultimately influence the economy's aggregate demand and supply.

Monetary theorists argue that the money supply is expected to be directly related to the level of economic activity such that greater money supply induces expanded economic activity and

stimulate higher purchase of more goods and services (Todaro and Smith, 2011). Besides, Keynesian economists also argue that expanded money supply increases loanable funds and if in excess of demand leads to lower interest rate; which boosts credits and investments in the economy. Increased level of investments in turn raises aggregate demand, leading to a higher employment and GDP. The reverse situation takes place under condition of excess demand and inflation- by reducing the growth of money supply, lowers supply of loanable funds, raising interest rates, thus curtailing the level of investment, and hopefully, less inflation.

Monetary policies of governments are plans of actions adopted to drive objectives of achieving stable prices (low and stable inflation), full employment, high and stable economic growth, a stable financial system, stable interest and exchange rates, mainly through the regulation of the supply of money and credit in the economy. They are measures designed to influence the availability, volume and direction of money and credit to achieving a desired economic objectives (Okpara, 2010).

The policy rate particularly influences the life of every one, as it is the cost of borrowing for anyone that needs resources and the reward for intending lender. Higher interest rate tends to restrict the growth of credit, making it harder for businesses to get financing and for individuals to find jobs (Cecchetti, 2008). The reactions are collectively referred to as monetary policy transmission mechanism. Stabilization instruments of monetary policy include reserve requirements, discount rates, and open market operations. Each is important through its ability to change excess reserve and hence affect banks' lending capacity.

Aside from the primary tools, the Central Banks has selective credit controls concerning sectors such as real estate, agriculture, consumer loan, purchase of securities with borrowed fund otherwise called margin loan requirement. An expansionary policy of money supply tends to increase liquidity, reduce interest rates, and therefore increase the level of aggregate demand. Mayo (2004) explains that if the monetary authorities seek to increase the supply of money and credit to expand the level of income and employment it is regarded as "ease" monetary policy. When it decides to contract the supply of money and credit to help fight inflation, it is referred to as a "tight" monetary policy.

Many studies have treated factors that influence interest rate spread (*Irs*) determination as having both macroeconomic and microeconomic contents (Tennant and Folawewo (2009). Macroeconomic risk factors are inflation rate, government budget deficits, low financial deepening, exchange rate policies, unfriendly business climate, and existence of multiple currencies. Micro level factors may include high personel costs, credit default risks.empirical literature on realinterest rate spread are presented in table **2.1** below.

2.2.16 Effectiveness of Interest Rate in African Economies

The controversy on the determinants of demand for money and the extent to which interest rate significantly influence liquidity preference is yet to abate. Ogiogio (1989) puts forth two reason in support of Ajayi (1977) on why it seems monetary policy somewhat do not tend to effectively influence economic activities relative to fiscal policy (Okigbo, 1981). These are the existence of negative or low real interest rate and secondly, the administrative management of interest rate, which suggests that monetary authorities' sub-optimal fixing of interest rate would not enable financial institutions' intermediation process to optimally reflect their risk and return profile, but tend to be correlated with that fixed by the monetary authority (Ogiogio,1989).

Studies have also argued that in developing economies, rather than encouraging free-market forces in interest rate determination, higher government role in the interest rate management may increase tendency for high correlation of interest rate in the economy among the financial intermediaries with monetary authorities rates (Ogiogio,1989). Such that, the financial intermediary's lending rate and the savings rate are not set at levels which tends to capture the true cost of loanable funds to both the surplus saving unit (SSU) and the deficit spending unit (DSU) while trying to maximize flow of funds between both units. In effect, the attendant high cost of funds consequently reflects on high price level for goods and services.

If as is been suggested that the high cost of loanable funds rate structure which results in the wide interest spread in African economies in the past decade (see Table **2.6** below) merely reflect their true scarcity, why is the cost of savings not reflecting their true real cost? In the Nigerian case, Soyibo and Olayiwola (2000) cited in Ojo (2010) reflect that aggregate savings propensity merely correlate the real deposit rate, such that both the savings rate and real demand for money do not significantly influence deposit rate. The disadvantage to potential savers has not increased

the quantity and quality of investment in Africa, with attendant damping of output growth (Ojo, 2010).

It is observed that even at the low saving-investment gap, at times, the economies often witness excess bank liquidity, particularly in Nigeria, while high lending gap prevails which is attributable to prevalence of mismanaged fiscal system. The lack of willingness for capacity to deplore these funds to lending particularly to the real sector may be unconnected with the risks. Paradoxically, the dwindling rate of capacity utilization of resources in the manufacturing sector is being blamed more on dearth of funds to procure inputs (Mailafia, 2016). However, perhaps saving culture needs to be increasingly promoted, because in situations where savings cannot be effectively mobilised, idle funds cannot assume 'life' for productivity (Adegbite, 2015). An equilibrium savings rate is required to prompt scarce capital formation for real investment, leading to growth and in reverse, help to stabilize the financial system.

The increasing danger of high interest rate regime to investment effort was recently reviewed. The access to loan statistics on a global scale of 144 economies by the World Bank, reveals poor financial development in some African economies, such as Nigeria (137) Egypt (129) and Cameroon (92) (World Bank *et al.,* 2015). Examining the banking structure in 81 developed and developing economies, Rashid (2015) finds that in economies where there is low competitive banking and where foreign banks dominate the financial system, interest rate spread is higher, and hence lowers financial deepening potency, such as, less credit to private sector and high bank loan volatility. In Namibia, Eita (2012) notes that increase in interest rate policy is a cost to banks which causes interest rate spread to rise, and is eventually passed-on to their customers. The outcome deters further borrowing and reduces financial development. Khan and Sattar (2014) study four banks in Pakistan, between 2008-2012 using Pearson correlation analysis to establish strong and positive relationship between interest rate changes and bank profitability. The correlation imply that increase interest rate as monetary policy tool can be used to moderate bank profitability and increase the rate of financial development.

2.2.17 Monetary Policy and Capital Asset Price

Monetary policy change such as interest rate movement affects stock/bond prices, and even real estate price. It is referred to as the Keynesian- monetarist macro-theories of the monetary

transmission mechanism (the "money view"). Specifically, the traditional 'interest-rate channel' claim that there is a relationship between the interest rate and the stock market (otherwise referred to as asset-price channel of monetary policy transmission). It says that a fall in the interest rate tends to push stock prices up and vice-versa; and through this channel influences the quality of aggregate output demanded (Cecchetti, 2008).

The fundamental value of a stock is the discounted value of the stream of its future dividends, coupon, *etc.* A lowered interest rate gives a higher present value, and higher stock price. In addition to this relationship, a monetary ease improves consumer and business confidence in the prospect for future growth, which would impact on the stock price. Thus, because current stock prices are based largely on expectations of future growth and future interest rates, they tend to move in anticipation of a cut in interest rate (Cecchetti, 2008). The mechanism continues as stock market booms with reduced target interest rate, leading to increase in wealth of shareholders. These wealth are transmitted to purchasing of real consumer and luxury goods and thus boost aggregate demand. Modiglianni (1971) and Mishkin (1977) reveal that lower interest rate motivates increase in business investment in an economy.

The transmission through stock price movement also impact on the aggregate investment. Cecchetti, (2008) contends further that this is achieved through the traditional interest-rate channel's influence on investment argument and consumer durable expenditure or alternatively, sizable wealth effect on consumption. Upon a fall in real interest rate, stock prices increase, financing becomes cheaper (since cost of the firm's marginal or new profitable investment would still be relatively constant and also its internal rate of return). Firms are then motivated to raise funds to expand their capacities by issuing new shares in the primary capital market. However, quite significant empirical investigations, listed as follows have questioned the significance of the interest rate channel to wealth effects arguments: see King (1986), Bernanke and Blinder (1988), Bernanke and Gertler (1990), Reichlin (2004).

The CBN Brief (1999) remarks that various view of economists exist on the exact channels of transmission of monetary policies. In their Nigerian and African economies study, Okpara (2010) and Neube (2009) respectively claim that the decontrol of interest rate and the use of indirect monetary policy are the crucial steps towards the development of the financial market, and in particularly, that a mutual relationship exists between the operations of the indirect monetary

control and existence of well-functioning capital market. Okpara (2010) remarks that from all indications three mechanisms are clearly acceptable in the transmission exercise from the monetary policy to the Nigerian economy: liquidity, credit and exchange rate channels. For instance, the liquidity channel works through money supply; its changes through its control variables influences the short and long term interest rate, igniting transmission of the monetary impulses to economies of firms and individuals (i.e. consumption and investment activities). Similarly, such interest rate influence affects the credit operations of bank through income and substitution effect, and thus portfolio adjustments evolve. Bank borrower who rely on loans for investments are crowded out, requiring a switch to the capital market. The opposite scenario occurs when the rediscount rate falls and rates paid to depositors increase -investor will go after bank assets while investment in the capital market drops. In the words of Ackley (1978), he contends that should wealth-holders increase their demand for money relative to other assets, security prices tend to decline and yield rises, leading to declining investment incentive.

2.2.18 Review of Development Paradigm of the African Bond Market

Akamiokhor (1996) states that the most important function of the primary securities market is its ability to act as source of capital supply by mobilizing and channeling savings into long term industrial investments and commercial concerns by issuing of and sale of new securities, while the secondary market performs indirect and complementary roles. In African context, both functions are operating below capacities of respective economies (World Economic Forum (WEF), (2015). However, the continent's bond market is of relative young age, except South Africa, most African markets are shallow and illiquid (Adelegan and Radzewicz-Bak, 2009). The growth of the bond markets evolved differently in Nigeria, South-African, Egypt, Mauritius, and Kenya and other economies in the study.

Corporate bond market would offer various advantages to the economy, if well developed. It provides an organized market platform for surplus fund investors to invest and make stable returns; by the same premise it helps in promoting efficient diversification and allocation of scarce capital funds into most productive sectors; it minimises cost of intermediation between investors and issuers; encourages corporate entities into long term investment decisions by providing appropriate pricing mechanism; provides both small and institutional investors with

predictable source of income to meeting stated liabilities (Osase, 2007). Provide the mechanism and platform for monetary policy management.

To the issuer, its longer maturity term enables better financial planning for project investments; coupon payables are tax deductible unlike dividend in the financial statement; offers flexible funding and re-funding opportunity based on market interest rate dynamism. To the investor, bondholding offers a creditor-debtor relationship with the firm. There is also opportunity for stable income stream or in a floating coupon arrangement, income may be deterministic; it offers better portfolio planning, diversification and risk management opportunities; given tough business environment it offers higher spread compared to bank deposits; given environment of investment uncertainties it offers higher return relative to equity return, and offers the bondholder prior claim (right of first charge) in case of default relative to the equity (common and preferred stock) holder, and to the foreign investor a better return.

It should however, be mentioned that unlike short term investments such as treasury bills that experience relative stability in earnings, bond investments are more susceptible to considerable variability in earnings due to investors (Sharpe, Alexander, and Bailey, 2004). Similarly, the security could be subject to reinvestment risk if the maturity period is shorter than the investor's holding period. In general, however, all securities are subject to interest rate risk, except the risk free investments, where the investor's holding period is similar to the security investment period (Sharpe *et al.,* 2004).

To the public and the economy, huge opportunity benefits can accrue via well developed bond market. Ncube (2006) informs that for African economies where monetary policy issues are confounding, a vibrant bond market can provide information linkage about the monetary sector, as noted below. The long term finance opportunity can relieve the banking system of undue pressure on mismatched funding problems, and hence help the banking system in their asset-liability risk management, and the economy becomes relatively stable, hence save the economy from crises initiated by domestic "original sin" *(*inability to raise long maturity funds in the domestic market) (Eichengreen and Hausmann, 1999). The economy's long term infrastructural finance difficulties can then be sourced via the bond market; financing through corporate bond issue reduces cost of bank intermediation, which may reduce inflation rate. In fact, by studying the pattern of the yield curve in a developed bond market, more accurate information on

expected inflation can be gotten and managed *ex-ante*. For instance, many economies forecast their expected inflation rate by using the difference between the treasury bond indexed rate or the treasury inflation protected securities (TIPS) rate and the nominal interest rate. The inflation knowledge benefit can assist the Central Bank in monetary policy management decision (Ncube, 2006).

Further on the public interest, though, the international corporate bond market offers the domestic economy opportunity for cross border foreign capital inflow, however its consequences on domestic economy is much, such that it promotes the international version of "original sin"- inability to raise foreign credit in domestic currency, and the currency, maturity mismatch effects, are potential sources of financial destabilization (Eichengreen *et al.,* 2007; Kahn, 2005; Goldstein and Turner, 2004). These are risks which developed domestic bond market could eliminate, and even strengthen macroeconomic stability (IMF, 2005). For sake of this financial stability, it is potent for developing economies' domestic bond markets to be developed. Aside from diversifying the financial system, it broadens credit risks to diverse investors unlike the more risky corporate loan finance through banks.

South Africa obviously has the most advanced corporate and government debt markets in Africa that have been built in many decades (Mu, Phelps, and Stotsky, 2013). Being an emerging market, it has a history of yield curve for more than thirty (30) years (Osase, 2007). The market is however dominated by the sovereign entities with corporate debt taken less position. The Nigeria bonds market evolved when the colonial Federal government issued a 7-25 years 600,000.00 Pound development stock in 1946 for promoting economic development finance (CBN, 2014). Following return to democracy, the Federal Government's Debt Management Office (DMO) was established in 2000 to revive the market. The DMO (2003) Act has the proviso to coordinate the management of the nation's debt stock, and aid the development of the bonds market (DMO, 2003). The Investment and Securities Act (ISA), (2007) provides enormous frameworks, powers and mandate to the Securities and Exchange Commission to regulate and develop the Nigerian capital market (ISA, 2007).

Many market institutions are being established towards rapid development of the market across the African economies. In Nigeria, the developments in the pensions industry via the Pension reform Acts of 2004 and 2014 have assisted in boosting the development of the bonds market

further as Pension Fund Administrators are compelled to commit higher per centage of pension fund in sovereign bonds. Recent development in the provision of financial infrastructures has been in the area of expanding the Over the Counter (OTC) platform. The encouragement of the SEC saw the establishment of non-statutory SROs- National Association of Securities Dealers (NASD) and the Financial Market Dealers Quotation (FMDQ) in 2013 (SEC, 2015). These institutions may expand access to bourgeoning unlisted securities trading and unlocked liquidity constraints in the market, however being OTC platforms, their prices and information discovery quality certainly falls below the standards of an open and apparent Exchange. Through these channels however, act of savings among Nigerian may improve in line with suggestions from Wai and Patrick (1973). Nevertheless, the corporate bond market in Africa is currently not operating to its potential due to several challenges discussed below, hence a context for this study.

2.2.19 A Review of constraints of African Capital Market Development

The potentials of African capital market are generally being limited by forces that limit their respective economic growth, typically of structural and non-structural constraints. Although, most of the restrictions as noted by Areago (1990) are being addressed by the different market authorities, the common challenges still prevalent across the continent include the poor macroeconomic environment (discussed below), political and investment risks, market manipulation which causes distortions to free market system and the market prices, weak legal and judicial system, weak corporate governance, limited presence of institutional investors, existence of few investment instruments and range of maturities and insufficiently developed benchmarks for yield curves (World Bank, 2005). Other constraints include insufficient tax incentives, complexity in security issuance process, high cost of issuance, and high transaction costs, issues of limited transparency, poor information disclosure and poor development of 'information capital' tradition (Stiglitz and Greenwald, 2003). Khan (2005) argues that developed domestic bond market requires friendly macroeconomic policies for efficient resources mobilization in savings; reduce default risks and tame high inflation. For developing economies, particularly the Sub-Sahara African countries, the lack of developed bond market have had negative impact on currency mismatch and reduce the efficacy of fiscal policies (Khan, 2005).

Low Public Awareness of capital market pervades African economies. There is still high level of ignorance and apathy by the citizenry of the activities of the capital market. Many are still not aware or the operating mechanism of the market. There is need to develop appropriate framework to disseminate financial education to the general people, even in their local languages.

The Nigerian capital market typifies African market, and therefore epitomizes the challenges inhibiting the effective competitiveness of Africa. For instance, it is noted that in both the primary and secondary market, the Nigeria market is regarded as one of the costliest globally (SEC, 2009). This may have been a limiting factor to the numbers of firms willing to raise equities/debt capital through the market.

For African market in general, specific reforms and development efforts may be required to address structural deficiencies that are germane to capital market development. Areas that comes to mind include structural fronts like privatization of inefficient economic institutions, judicial reforms; Governing Laws and regulatory reforms, reforming market institutions and infrastructure; reforms in accounting systems, auditing, transparency, and disclosure issues; improving the corporate governance practices, strengthen the framework for coordination among regulatory authorities in the economy (World Bank, 2005). Other areas of challenges requiring urgent reforms include:

Macroeconomic factors: The relative immaturity of the African capital markets appears to make it extremely sensitive to macroeconomic changes, and undermines financial sector stability. Inefficient fiscal and monetary policies accentuate mismanagement transmitting to price instability and high interest rate. African economies are highly dependent on primary commodities, which further expose the markets to global economic shocks.

Saving culture: It seems that a weak retail and institutional savings environment, as well as low income per capita level inhibit effective savings mobilization in Africa. This factor impacts negatively on the capital market especially as the market does not seem to develop products that attracts and enhance savings culture.

Liquidity Risk: The strength of a market is inherent on the extent of its liquidity, and this is a function of the turnover ratio. The African capital market, except South Africa and to an extent

Egypt, Mauritius and Nigeria, is still regarded as of with low depth, breath and width, hence of low liquidity and of small size in terms of capitalization, relative to emerging market counterparts.

Unavailability of Information and transparency: Every financial market and in the context of the efficient market hypothesis *(EMH)* require instantaneous and transparent information delivery system. Apart from South Africa, Mauritius, Nigeria, Kenya and Egypt, existing market infrastructure do not appear to support the provision of live trading prices to international investors. The SEC (2009) reports that in Nigeria, there is limited research on listed securities, industries and markets, and that there are frequent delays in the release of financial information. The information gap problem is such that in practice it is often the market that chases information from quoted firms, rather than the other way.

In summary, the contending challenges are insufficient liquidity in the secondary market arm; poor market infrastructure; bureaucratic delay and high issuance costs; poor investors confidence; high transaction costs plus low yield of bond instruments; default risks; low corporate bond patronage and high government dominance, hence an undiversified market (CBN, 2014). On these issues, Tendulkar (2015) reveals that while the corporate bond market is the largest growing source of capital for firms in advanced economies, with increasing issuance volume and wide investment opportunities for investors, the reverse is the case in African economies.

2.2.20 Fiscal Gap, Monetary Policy and Macroeconomic Instability

Governments in developing countries are facing challenge of a financial sector necessay to spur the private sector productive capacity to turn-on the levels of investments, production, economic growth and poverty reduction. African macroeconomic instability however remains a challenge for this ambition of financial sector development. Development finance literature reveals that macroeconomic policy instruments of fiscal, monetary and exchange rate operate to shapen financial sector and private sector investment outlook (Spratt, 2009), obviously through monetary policy content, *i.e* the interest rate. For instance, African governments' fiscal gap, with its adverse consequences is transmitted to the debt market in high coupon cost for domestic sovereign bonds, which also affects the money market through competitive interest rate in the

credit market. Of recent, following the global economic crises and decline in primary commodity prices across African region, pressures of fiscal deficits and expansions made policies to shift to monetary tightening. This untoward shift may be somewhat inevitable particularly when the macroeconomic instability is foreign sector induced. In the process, domestic credit expansion slows, foreign portfolio investors are attracted to arbitrage on high interest rate differentials, then pressure on exchange rate, and the short term outlook of economic agents leave the economies in state of short term pro-cyclicality.

The crises of 'fiscal dominance', a pervasive phenomenon in many African economies, is regarded as the 'fiscalisation' of monetary policies, as paucity of fiscal legislation, regulation, and policy implementations, as incentives that ought to spur private sector investment capital, leave these functions to the monetary policy for solution inadvertently (Spratt, 2009; Salami, 2017). On the foregoing, Ackley (1978) reveals that ideally, differential impact of the fiscal and monetary policies on an economy's aggregate wealth and interest rate suffice, contending that importantly, in the long run, while monetary policy merely alters the nation's wealth compositions, fiscal policy directly changes the aggregate public stock of wealth. However, in the context of this study, in a financial system of weak fiscal policy effectiveness, monetary policy altered wealth re-composition could affect interest rate which can indirectly change the value of bond portion of wealth.

2.2.21 Budgeting and Bond Market Development

Theoretical link exits between efficient and effective public budget system and bond market development, particularly as deficit budgeting constitute high level of public expenditure in both developed and less developed economies globally. To Bhatia (2008), the usefulness of fiscal policy lies in mobilizing the resources of the state and facilitates the achievement of socio-economic objective of the society. Its weapon is so diversely effective that it regulates the workings of market mechanism which other economic management weapons often by-pass. Bhatia (2008) among other reasons see the fiscal policy as an important and an effective tool in accelerating the process of capital accumulation and economic growth. Gurley and Shaw (1960) proclaim that the physical growth of an economy cannot be sustained without a healthy and strong financial sector, which constitute a foundation "for the superstructure of credit in the economy". Again, Bhatia (2008) sees public borrowing and spending as having profound

dynamic implications on various aspect of a country's economy- income and employment stability; thus a source of problem and tool of economic management.

Timely sovereign budget processing and implementation, particularly the capital infrastructure aspect, may spur economic activities more, help moderate production cost, and increase investors'confidence in public bond offers, which may help to properly shape the course of the yield curve to reflect the economy's potential, given its information content (Browne and Monasse, 1990). The common financial implication that has always attracts public debate is the extent of deficit budget's 'crowding out' effect on corporate financing. It has also stirred up debate due to its influence as source of 'income and substitution effect' for banking institutions that have consistently invested in government debt instruments rather than provide credit to private sector led productive sectors. Ojo (2010) cautions that high deficit budget constitutes a distortion as it makes banks to "loath to lend to the private sector borrowers".

One major concern of public borrowing is that increased and repeated government borrowing cause upward pressure on interest rate structure. Bhatia (2008) expressed this concern that unless restricted by some means a government may resort to excess borrowing and get into a 'debt trap', with sovereign insolvency consequence on bond market development, such as the experience in Greece and some advanced economies (Dabrowski, 2016). This condition eventually leads to high interest cost to unwieldy high proportions of its revenue receipt and expenditure; with other ill-effects on investment, economic stability and balance of payments, where foreign debts are elicited.

2.2.22 Public Debt and Economic Regulation

As earlier analyzed, the interest rate structure and volume of public debt affects the demand and supply flows, influencing the consumption and investment decisions in the economy. Empirically, it is proven that the coupon rate at which public debt is issued affects the market interest rate and other rates stability in the financial market, as the liquidity effect impacts on price level. Musgrave and Musgrave (1989) apt that fiscal expansion is less favourable to investment than monetary easy and in addition it crowds out private investment. There is phenomenon of interrelationship between market interest rate, coupon rate, prices of securities and maturity composition of securities. Bhatia (2008) contends that this interrelationships can be

used by government, if so desire, to influence market behavior. Similarly, the Radcliffe Committee (1959) advises that it is possible to regulate the economy's financial system through variations in the volume, composition and yield rates of public debt, as the public debt structure could restructure the economy's private sector credit. During economic boom, anti-cyclical debt policy requires that low liquidity regime be promoted, by limited supply of public debt, while in slack, depression period the opposite should be expected, possibly with lower priced and longer maturity debt issues.

Where a particular combination of fiscal and monetary policies indefinitely leads to insolvency, such policy initiatives would be unsustainable (Burnside, 2005). The tendency should be to promote debt policies which is anti-cyclical in effect, and will therefore, contribute towards economic stability. One critical role of fiscal sustainability analysis therefore is to develop an overview of its expenditures and income mix for long term development. These policies are often fine-tuned should future circumstances make them unsustainable.

Matthews and Thompson (2014) reveal the positive link between government budget deficit and banking lending rate, and has the consequence of weakening the level of competitive banking. Debt services crowds out critical public investments, hurting macroeconomic stability in developing countries (Blavy, 2006). Other channels that connects with domestic bank stability and competitiveness through which public debt stock negatively affects the economy include low private savings, increase in prices and low real interest rate, increased capital taxes, reduced private investment, high sovereign risk premium, and declined economic growth (Nauret and Meensel, 2011).

2.2.23 Theory of Financial Development

This sub-section reviews the relevance of "group interest" theory of financial development, associated with the bank-based financial structure, credited to Rajan and Zingale (2003). The theory reveals that following advances in bond financing strategy by the non-finance corporates (*NFCs*), which might weaken the banking industry's control of the financial intermediation process, the "group interest" of the banks could be employed to ensure that the banking sector hold-on the intermediation structure, and therefore effectively control the extent and type of competitiveness of the financial market, which could frustrate the course of bond market

development and even the financial system. A non-competitive finance market shrinks the intermediation industry, leading to high market interest cost, particularly in the developing economies' banking industry that is often characterised by institution with asset-liability mis-match.

Financial institutions, markets and instruments are elements of financial development for channeling funds to productive use. Goldsmith (1969) theorises that financial structure and its changes overtime effect economic growth. In most useful form, and depending on how structured, as either bank-based or market-based, financial development is expected to facilitate capital mobilization, risk sharing, monitoring risk and allocate scarce capital. African economies are more structured as bank-based, and the banks are consolidating this advantage in the bond market. Using the structure of bond issuers, Tendulkar (2015) provides evidence from the global industry sectors' main bond issuers between years 2000-2007 relative to 2008-2014, that reveals that bank issuers may have been in control. In the Americas the oil and gas industry issuers dominated from 2000-2007, while both oil and gas and the finance industries dominated in 2008-2014. In Asia and other emerging markets, the finance industry dominated in both periods. The report would suggest that the finance corporation issuers, largely dominated by the banks are in total control of the bond market in emerging economies. In African economies, the finance corporation issuers increasingly dominate the issue market, with the highest in Ethiopia (100%), Togo (100%), and Botswana (100%) (Tendulkar, 2015). This mechanism informs part of the process of high interest cost transmission to non-finance corporates (*NFCs)* through long term lending requests, and subsequently, the incidence transferred to the public in high cost of final goods and services.

2.2.24 Secondary Bond Market and Financial Development

This section reviews the argument on the potency of the secondary bond market to transmit values to the real sector, as it is expected to provide information for new issues, and in addition act more to sustain the financial stability of an economy better than the secondary equity market. These features of the bond market may have being prompting the wheel of financial development more. The information value transmission role is critical to developing an efficient capital market. The higher the level of efficiency of the market the higher it is close to being perfect capital market where the market becomes frictionless; perfectly competitive in securities and

products, informationally efficient, and all investors are completely rational thereof. An outcome of these fits is automatic transfer of these values in capital allocation efficiency and operational efficiency to the primary (issue) market and the real sector of the economy (Copeland and Weston, 1992).

Financial crises often arise from two major sources, the 'asset bubble' and 'banking crises', which usually are not associated with the bonds market unlike their counterparts in the "long-lived asset" markets, such as the equity, real estate, and mineral commodities markets whose transactions do not have expiring dates, hence subject to unlimited volatility. By the nature of the instruments, assets of no fixed maturity must always be evaluated, and therefore can be associated with longer speculative practices; such that 'bubbles' often occur in such assets since no eventual anchor or principal value exist that must be repaid (Knoop, 2013). A theory at the heart of this 'asset bubble' phenomenon is the 'belief-based' theory of Kindleberger (1989), and fundamentally assets with such features inherently have some uncertainty and speculations attached to them. The theory contends that in the short run, exuberant investor and traders often act irrationally, by engaging in psychological marketing, bandwagon trading effects, such that, equities and real estate's markets easily fall into that category. These assets are somehow often overvalued beyond their fundamentals, probably due to psychological marketing, the role of herding behavior of investors, often irrationally, or outright market speculations. Another theory that explains the asset bubble is the fundamental based theory or 'information-based' approach, since they are initiated by real shocks that proceed booms and bursts *ex-ante*. Financial liberalization and deregulation somewhat may provide freedom for banks to engage in risky behavior, putting aside morals in lending process, that can result in asset bubbles and banking crises.

On banking crises, by their nature, banks are less structured for stability, as Knoop (2013) contends that banks are inherently illiquid since they hold long-term assets as credit outstanding, against their largely short-term liabilities (borrowing in savings and deposits accounts). Should the bank witness disruption in the loan repayment plan, or any uncertainty in debt rollover, or should a weighty withdrawal occurs- a panic approach to financial crises, can prompt bank run leading to financial crises (Goldstein, 2013). At the root of these financial crises are the fundamental factors like poorly designed prudential regulations, poor lending culture, informed

by moral hazard and speculative behaviour (Knoop, 2013). It can be remarked that it worth evaluating the rots that 'asset bubbles' in the equity market and real estate market, and bank failures can cause the financial system in African economies, since public funds are enmarked for bailouts of every failed banking. Thus, acting broadly, promoting the corporate bond market would limit bank asset bubble and banking crises, eventually in the longer term.

On a concluding note, for the African financial system to draw close to perfection, the quality and easy at which the average entrepreneur accesses the desired project funds should be high, which can be better managed via a market mechanism. A developed financial market would be more benefiting if arranged on arms-length relationship, in a freer market; entrepreneurs should easily spread their risks, where the quality of the project speaks for itself, and investors should be confident to dispose their investment for reasonable return (Rajan and Zingale, 2003). From the working of this theory, bearing the lack of appropriate equitable policy framework and shortage of efficient institutional support, in more liberalised market system, the bank dominated intermediation characterized by oligopolistic structure would continue to consolidate their hold in the financial system of these economies, thereby strangle the expected competitiveness of finance and its development.

2.3 Empirical Reviews of Literature

Following the nascent growth of the corporate bond market in Africa, empirical research on the causal relations of interest rate structure, bond market development and industrial output are evolving. This section examines related empirical findings in the literature.

2.3.1 Endogenous Theory, Capital Market and Industrial Growth: this section discuses cross-country growth experiences by applying public policy instruments (a veritable endogenous tool) to drive capital market and economic growth and why different countries attain different growth rate. Levine (1997) and Levine and Zervos (1998) study capital market and GDP per capita growth and discovered that capital market liquidity is a good predictor of the gross domestic output per capita and of the physical and productivity growth, but found no relationship between predictors such as volatility, size and international integration with economic growth. Arestis, Demetriades, and Luintel (2001) use the autoregressive (AR) technique to test causal

relationship between capital market and economic growth in five economies, and conclude that indeed capital market affect economic growth, but that the bank based sector has stronger relationship.

Specifically, in a study on bond market development and real sector output in 15 EU economies, USA, Japan, Switzerland and Norway from 1950-2000 Fink, Haiss and Hristoforova (2003) find positive relationship between both variables. Additionally, Khan (2005) says the bond market serves as additional source of capital mobilization, which can free emerging markets from the burden of external funding, and also that financial deepening can aid the market development through appropriate institutions, low inflation regimes and appropriate macroeconomic policies. Furthermore, Montiel (2003) justifies the potency of the financial market that it improves, as per capita income increases (Khan, 2005).

The role of technological development in endogenous growth theory is stressed in this study. UNIDO (2015) on Structural change and Technological development, notes how technological structure has changed the face of manufacturing in Latin America and Asian economies relative to Africa in the last four decades, and concludes that the Asian high tech advancement ranks highest. Additionally, African technological structure in manufacturing as at 2012 merely compared with what existed in Asia and Latin America in 1972 (UNIDO, 2015). It can be argued that 'industrial' development is about modernization, while development in general is a process capable of transforming the average citizen's life and living conditions.

Minier (2003) studies the influence of stock market and economic development using regression technique in both developed and developing countries and found evidence that positively influence stock market development on economic growth for developed economies while it is negative influence for LDCs. Ergungor (2006) studies the financial structure and economic growth for period 1980-1995 and establish that countries with inflexible judicial system experience strong impact on economic growth by development of the banking system, whereas in countries with greater flexible judicial system the developed capital market had stronger influence.

On inter-country review, Nieuwerburgh, Buelens, and Cuyvers (2006) study the long run relationship between economic growth and stock market development in Belgium with strong

positive relationship. Barna and Mura (2010) examine capital market development and economic growth under the endogenous growth theorem in Romania from 2000 and 2009 using quarterly data. The regression result reveals that capital market development is positively influenced by economic growth with feedback effects which suggest that financial development follows economic growth, and economic growth determines financial institution to change and develop. Naceur and Glazounni (2007) examine the influence of stock market and bank based development on economic growth with a sample of eleven Arab countries, with conclusion that financial development negates economic growth in economies with underdeveloped financial system.

Graff (1999) identifies four possible relationships between financial development and economic growth. First, that financial development and economic growth are zero correlated, likened to the case of the 17th century economic growth in Europe, that economic growth was from real resources; secondly, that financial development is influenced by economic growth, in which both the credit market and financial institutions grows; third, that financial development influence economic growth evidenced in two perspectives: that financial development is a prerequisite for economic growth; and that financial development actually causes economic growth (Rousseau and Sylla, 2001); and Fourthly, that financial development impedes economic growth or negatively influences economic growth as per acting to destabilize the economy through unwholesome practices such as financial overtrading, excessive margin lending (Stiglitz, 2002).

Bencivenga and Smith (1991) and Levine (1991) examine endogenous growth and financial market and found long run relationship. They claim that the growth of the financial market can assist in diversifying agent's liquidity and investment risks, attract productive savings, and would forestall premature withdrawal of capital in long term project. Also, with more financial market, capital and productive investments can be made to raise economic growth. King and Levine (1993) examine the role of innovations in the channels of influence between finance and growth. As innovative projects are identified by markets, it could spur growth through investment, financial market help the function of efficient allocation of resources. Thus, as Demetriade and Hussein (1996) note, an economy with well-functioning financial market experiences high productivity growth rate.

Caporale, Howells, and Soliman (2003) use the VAR model to study hypothesis of endogenous growth and financial development with innovation through financial development on investment and productivity. The test covered a sample of four countries (Chile, Korea, Malaysia and India) and suggests that investment productivity is the channel through which stock market development enhances the growth rate in the long run. Endogenous growth theory's implication is that policies which embrace openness, competition, change and innovation will promote growth. Conversely, policies which have the effect of repressing, restricting or slowing change by protecting or favouring particular existing industries or firms, are likely over time to slow growth to the disadvantage of the community (Fadare, 2010). Thus, endogenous policies should be about moderation, by ensuring that these economies consume what they produce and are self-reliant.

Lack of endogenous inspired growth may be blamed for African industrial backwardness. Nzau (2010) blames the relative financial backwardness for industrialisation in Africa, saying contrary to endogenous doctrine, the insincere motive of foreign donor agencies use the guess for African industrialisation for employment of their foreign citizens in form of expatriates, and establishing market for their exports (imports into African countries). Adegbite and Adetiloye (2013)'s study on financial globalization and domestic investment in Nigeria reveals that through financial globalization Nigeria witnesses more capital outflows, thereby depleting available domestic resources. In a UNIDO panel section on Industrialisation and the MDGs, Sercovich (2004) admonishes developing economies to use the endogenous doctrine to achieve the MDGs as an instrument of structural change necessary for mobilizing domestic wealth creation capacity, and ignite the process to connect to international capital and technology flows.

The influence of the secondary (liquidity) market on the primary (issue) market and the corresponding real sector is apparent in some studies and of no relevance in some. Andriansyah and Messinis (2014) use dynamic panel regression technique to study the equity market in 54 OECD and non OECD economies and find that the secondary market liquidity influences capital issues of firms from 1995-2010. Using two sets of industrial firms as case study, Hoschi, Kashyap and Schafstein (1991) find that industrial investment is more sensitive to market liquidity in Japan. Harrison (2002) reveals that bond size is a function of market liquidity.

2.3.2 Bond Market and Financial Development

In a cross-regional context, Tendulkar (2015) examines sixty-two (62) emerging market economies (EME)'s domestic and international bonds market using multivariate fixed effect model as cited in the table below. The study produces mixed results in the three corporate bond development categorizations adopted- size, depth, and market activity. Of importance reflection to this study is that interest rate spread is found to have negative impact to international bond market under the markets size, depth and activity categories but positive to market activity in the domestic market. Bhattacharyay (2011) tests the major determinants of factors that influence the bond market across major Asia economies, and finds that bank interest rate spread negatively impacts the market growth in both the government and corporate categories.

Ayala, Nedeljkovic, and Saborowski (2015) review inherent factors that motivate the recent shift from other sources of debt finance to bond in non finance corporates (NFC) capital structure in emerging markets. The paper identifies improved domestic macroeconomic policy environments and quality institutions; while it discovers that from the experience of global business cycles, global cyclical factors account for the quantum of bond issue in total emerging market NFC debt. Moreover, the sensitivity of bond market size, measured by liquidity, and ease of entry to global fundamental factors differ across emerging markets. In contemporary time this result is intuitive as there is plausible reason why firms should rely on the use of bond financing relative to equities in their quest for external finance of projects as informed by the pecking order theory.

Mu, Phelps, and Stotsky (2013) examines growing bond market development in African economies using the generalized method of moment methodology (GMM) from 1980 to 2010. The study's outcome reveals that interest rate spread is negatively correlated with sovereign bond market development. On the corporate bond development, the study finds that, GDP, GDP per capita, land area, ratio of credit share in the economy have positive and significant effects on corporate bond, while trade openness has negative influence.

Djankov, McLiesh, and Shleifer (2007) investigate the workings of the creditor power and information sharing theories in financial development in 129 global cross-country economies from 1978 to 2003. The study reveals that creditor right protection and information sharing under the influence of appropriate legal system and information sharing institutions accounts for the

differences in ratio of private credit to gross domestic product among countries. The paper highlights that because credit and legal institutions among countries have diverse origin and structures, the functional convergence hypothesis rule does not hold. Very related to Africa's corporate bond market development is the study on complementary reforms towards enhancing financial liberalization (FI)-growth nexus in 45 sub-Sahara African economies (Ousmanou, 2017). The result of the empirical study, in a sample period 1970-2010, confirms that the FI policies did not impact growth in the region. The study however finds that FI would be growth-enhancing if accompanied with complementary reforms on human capital development, macroeconomic stability, and overall effective governance in the region.

Following interest rate liberalisation policies of the 1980 to 1990s regimes in Nigeria, Omole and Falokun (1999) examine interest cost and corporate leverage strategies on firms' productivity and profit during the pre and post-liberalisation periods, with missed outcome. The study found that majority of the quoted firms relied more on debt finance before the 1987 liberalisation, while in the post-liberalisation period 1988-1996, equity finance cum internal funds formed the finance mix. The outcome underscored that production variables are affected by interest rate variations, in the post liberalization period.

Other literatures and their gaps are presented in **Table 2.1** following. These literatures (empirical and non-empirical) are arranged in the order of time of study, including experiences of all levels: developed economies, developing economies, and some country level experiences of some of the sampled economies, Nigeria, South Africa, Botswana, Egypt, Kenya and Mauritius. Variables tested include firm, country and global specific factors.

Table 2.1: Additional Empirical Review

Author(s) & Title	Objective & Scope	Methods & Measurements	Main findings	Gap(s) identified & Remark
1. Tendulkar (2015): "Corporate Bond market: an emerging market perspective vol. 2"	Examines the corporate bond market (CBM) relative to economic, financial, and institutional indicators including bank interest rate spread, and others in 62 countries(units) and 10 periods (2004-2013)	Correlation analysis by Kendall Tau test and Panel fixed Regression analysis	Bank spread influences as follows: negatively and significantly CBM development; positively but insignificantly CBM depth; positively but insignificantly CBM activity	Study ignored our main dependent variable- industrial output growth rate. Kenya and nine other Africa's CBM economies not sampled. Non-disaggregated study; Study on Africa needed
2. Bosworth (2014), "Interest Rates and Economic Growth: Are they Related?"	Studies long term determinants of interest rate, and explores relationship between interest rate and economic growth among G7 and 19 OECD countries and 43 periods (1970-2012)	Fixed effect Panel data regression	Weak relationship exists between RIR and economic growth; ratio of public debt to Gdp significantly influences RIR; higher saving to investment ratio redirects domestic interest rate; importantly: in a globalised capital market RIR is more determined by global influence than national economy can forecast. It makes little sense to act otherwise.	Opens up the need to generalise global factor: Openness- RIR nexus findings to African economies
3. Mu *et al*. (2013) "Bond Markets in Africa"	Studies bond markets in 36 African economies from 1980-2010	Pooled OLS; Fixed and Random effects; and GMM	Corporate debt capitalization is directly linked to institutional quality but inverse to interest rate spread and openness.	Our study extends this work by including the real sector (industrial output) as dependent variable
4. Afful and Asiedu (2013), "Fiscal Policy,	Study examines the influence of fiscal policy and stock	Cochrane Orcutt regression for	Except for SA, the study finds that fiscal variables	Study did not examine uni-directional

Interest Rate Spreads (IRS) and Stock Markets in Sub-Saharan Africa"	market activities on IRS in Four SSA economies-Botswana, Ghana, Mauritius and South Africa: 1980-2010	each country and pooled regression	influence IRS in other SSA, while stock market had no influence on spread.	relations from IRS to Stock market. Real sector impact ignored
5. Poghosyan (2012):"Financial Intermediation Costs in Low-Income Countries: The Role of Regulatory, Institutional, and Macroeconomic Factors"	The paper examines level of market concentration, bank regulation, and institutional development on intermediation cost (high interest margin), while controlling for bank specific factors. Developing economies (low income & emerging): 1996-2010.	Augmented dealership model; fixed effect panel study	Provides evidence that bank- specific factors (credit portfolio, low bank capitalization; small bank size; concentrated bank structure; lack of competition) were responsible for high interest margins	The study's scope is limited to causal factors of high interest margin. Real sector impact ignored
6. Akinlo and Owoyemi (2012) "The Determinants of Interest rate spread in Nigeria: an empirical investigation"	Examines factors that determine interest rate spread (IRS) among 12 commercial banks in Nigeria from 1986-2007	Pooled, Fixed & Random Panel regression models	IRS is influenced by Cash reserve ratio, loan to total deposits, loan to average total assets, and remuneration to total asset, GDP; while development stocks and treasury certificate are inversely related to IRS	Need to generalise study to examine relationship from IRS to corporate bond, and Real sector which weren't studied
7.Ujunwa, Salami, Nwakobi, and Umar (2012) "Financial Structure and Economic Growth: Theory and Evidence".	Examines competing financial structure theories on growth from 1979-2008 in Nigeria	Ordinary least square (OLS)	Bank base and legal base indicators had positive influence on growth, market and financial services indicators were negative	Need for a wider scope and measure to see a market determined African growth.
8. Norma and Uddin (2011), "Remittances and banking sector development in South Asia"	Investigates the interrelationship between remittances, banking development and GDP from 1976-2005 in Bangladesh, India, Pakistan and Sri Lanka	Multivariate Panel VAR Granger based on Error correction model	Remittances and bank development were found to influence per capita income in the four countries and among themselves	The methodology adopted replicates this study
9. Tennant and Folawewo (2009)	Investigates the macroeconomic and	Panel data framework and	Public sector debt, discount rate, and	Substantive study examines

"Macroeconomic and Market Determinants of Interest Rate Spreads (IRS) in Low and Middle Income Countries"	market determinants of bank spreads in 33 diverse developing economies from 1988-2005	method	inflation rate were found significant while treasury bill rate, exchange rate volatility, scale economics, real GDP and bank development were found insignificant	the influence of IRS spread on bond market development, beyond the IRS determinants; study is more recent.
10. Adelegan and Radzewicz-Bak (2009) "Determinants of corporate bond markets in sub-Sahara Africa economies"	Examine determinants of Corporate bond market in 23 sub-Sahara Africa economies: 1990-2008	Fixed and Random effect framework	Savings and financial deepening, Gdp per capita, bank size, interest rate volatility, spread, capital control and fiscal balance are factors that determines corporate bond growth in SSA	Role of interest rate spread as competing influence against bond finance of the real sector (industrial output) is not considered
11. Acaravci, Ozturk, and Acaravci (2006) "Financial Development & Economic Growth: Literature Survey & empirical evidence"	Reviews Finance-Growth debate literature and tested the direction of causality among 24 SSAs: 1975-2005	Pedroni Panel Cointegration Test and Panel GMM causality test	No evidence of long run relationship, however bidirectional causal relation between real GDP growth and domestic credit exists	Study is limited to Bank based. Need to examine corporate bond market–growth nexus
12.Adebiyi (2005) "Financial sector reforms, interest rate policy and the Nigerian manufacturing subsector"	Investigate impacts of interest rates and other macroeconomic variables on the manufacturing sector in Nigeria:1986-2002	VAR and ECM techniques	The real deposit rate and inflation rate significantly impact the growth of the manufacturing sector in Nigeria	There is need to examine more sustaining market based strategy
13. Asogwa (2005) "Challenges of Industrialisation Finance in Nigeria: Implementing Market-Based Financing options"	The paper appraises both the bank and market base financing policy options for industrial growth in Nigeria: 1971-2004	Non-parametric; Historical and stylized facts from 1971-1991; 2000-2004	Finds that the bank-based option fails because they are largely government inspired and sponsored	Need to generalise the bonds market option for African economies
14. Adeoye (2005) "Industrial Development in	Industrial and trade performance in the context of globalization in	Historical analysis	Nigerian export – import structure has remain same over the years, except the	Method gap: need to apply empirical test and examine it

Nigeria in the context of Globalization"	Nigeria from 1972 to 2002		substitution from agro- industry based exports to mining industry-based exports	from regional perspective
15. Ackerman (1994) "The natural interest rate of the forest: Macroeconomic requirements for sustainable development"	The study examines how the interest rate connects the forest economy with the Unites State's market economy, since the forest has long run regenerative and conservative effects.	Non-parametric	A regenerative asset becomes unprofitable when the asset's discount factor exceeds the forest natural growth rate. Thus, a threshold forest natural interest rate must be known always.	The concept can be generalised to all regenerative assets and in different economies such as the SSA.

Source: Compiled by the Researcher(2016)

2.4 Theoretical Framework

The diverse states of the study's research questions influence the study to be underlyinged by seven theoretical frameworks. However, by eclectic approach two would be adopted in chapter three: the Bond Price mechanics and Romer's endogenous neoclassical growth frameworks.

2.4.1 Fisher's Interest Rate Framework: Fisher's theory portends that there is a positive relationship between market interest rate and expected inflation rate; as expectation can be better formed either by adaptation and or by rationalisation (Pressman, 2006). The link from income to capital and to wealth requires knowledge of concepts of stocks and flows. Interest rate in nominal terms effectively equals the inflation expectations; a process that has its root in the level of unemployment and output gaps in the macroeconomic dynamics. Macroeconomic theory reveals that the natural rate of unemployment translates to output and price changes gap; hence the natural rate of unemployment should be rather low to hold the natural rate of inflation from rising.

In the Open Fisher version otherwise called the 'International Fisher' theory, the difference between the interest rate on identical bond in different currencies is attributed to market estimation of expected differences in exchange rates over the period of the bond (Omolehinwa, 1998). By implication, all countries are expected to operate same real interest rate (rir), since their respective inflation rate becomes the common denominator.

In principle, Jones (2010) traces the foundation of market interest rate to the individual's opportunity cost (referred to as the saver's time preference) to forego current consumption. This, in general, is the Real risk-free rate (*Rrr)* of interest, that is, the interest rate unaffected by price change or risks. The short-term (Treasury bill) rate (Rf) then consists of real risk-free rate (Rrr) plus an adjustment for expected inflation $E(\pi)$ as presented below:

$$Rf = Rrr + E(\pi) \tag{2.8}$$

This is the simple version of the Fisher hypothesis, which implies that the nominal short term interest rate rises sparingly with the expected inflation, thereby making the real interest rate to remain constant. Its framework is presented below:

$$(1+i) = 1+ \rho)(1+E(\pi)) \tag{2.9}$$

Where i is the nominal short term rate, ρ is expected real interest rate, and $E(\pi)$ is expected inflation. Inflation cost on economic transaction would have different impacts depending on whether inflation is perfectly anticipated or unexpected (Dornbush *et al.,* 2011). For the former, all contracts involving passage of time would account for gap in inflation, such that inflation would have no real cost other than two qualifications. Firstly, the cost of holding currency rises with the inflation rate, and could hurt when not substituted for an interest bearing asset. Secondly, people have to earmark more resources for possible price hike. For the unexpected deal, the possibility could introduce an extra element of risk depending on the individual being a debtor or creditor.

2.4.2 Friedman's Monetary Framework: Friedman's monetary theory on money supply and wealth reveals that wealth can be held in whatever form: from money, to equities, or to bonds, to physical assets, or in human wealth. The implication of Friedman's monetary equilibrium framework is that the amount of real money balances (money supply), M/P desirable by the individual (demand for money (M_d)) would be a function of the return of money, r_m; return on bond, r_b; return on equities, r_e; changes in price level overtime, $(1/P)(dP/dt)$; total amount of one's wealth, W (present value of permanent income); the ratio of human to non-human wealth, n, and one's taste and preferences, u. In equilibrium the functional relation is as follows:

$$\frac{M}{P} = f(W, r_m, r_b, r_e, \frac{1}{P}\frac{dp}{dt}, n, u) \tag{2.10}$$

This implies that with an increase in money supply, the increase may or may not be held in money form. It depends upon the rates of return on the alternative classes of wealth, which is a derived demand.

An alternative version of money supply policy through target interest rate is the popular Taylor rule (Taylor, 1993), which proposes an interest rate policy based on current 'judgment' of the state of the economy. Specifically, an economy's short term policy rate should be that which reacts positively to the observed deviation from its output gap and the inflation rate from its target. Taylor's monetary policy framework is as follows:

$$i_t = r^* + \pi_t + \phi(\pi_t - \pi^*) + \beta\left(100 \times \frac{Y_t - Y_t^*}{Y_t^*}\right) \qquad \phi > 0,\ \beta > 0 \tag{2.11}$$

Where r^* is the real 'natural' rate of interest, π^* *and* Y^* are target inflation and 'full employment' output rate respectively. ϕ and β are coefficients of inflation and output gaps respectively. Expectedly in practice, particularly with respect to African economies, the extent of optimality of the Taylor rate depends on the monetary authority's management of expectations, seemingly dysfunctional fiscal policies, as regards economic shocks and inflation.

2.4.3 Bond Price Mechanics: The price of a bond is the present value of all future contractual cash flows payable overtime (Megginson *et al.,* 2007). The issuer requires knowledge of both the future benefits and appropriate discount rate. In principle, the uncertainty associated with the expected benefits is undertaken in the discount rate; as correlation suffice between the level of uncertainty (risk) and the discount rate. In a simpler form the coupon rate may reflect the interest rate earnable on a risk-free instrument plus the perceived risk associated with the issue (Fabozzi, 2007). The framework that links the bond's risk and return (benefits) to determine its price is as follows:

$$\text{Price} = \sum_{t=1}^{n} \frac{C}{(1+r)^t} + \frac{M}{(1+r)^n} \tag{2.12}$$

Where n = number of years; C = annual coupon payments; r = periodic required rate of return; M = maturity value; t = time period when payment is received.

A fundamental convention of bond market is that the price of a bond fluctuates with changes in market interest rate; such that its price varies inversely with the yield. As market interest rate (or market required yield) increases, the present value of its cash flows (the price) declines. This is often referred to as interest rate risk or price risk. This operates irrespective of the initial price that the investor pays for the bond. The bond interest rate risk or price sensitivity also depends on various features of the issue, like the maturity, coupon rate, and embedded options (Fabozzi, 2007).

Further to the bond price mechanics is the behavior of the market required yield otherwise called yield to maturity (YTM), assuming no default in contractual obligations. Shapiro and Balbirer

(2000) say that the bond's YTM approximates the "going" market interest rate for comparable bonds, hence it is expected that the price would change relative to changes in market conditions. Shapiro presents a model for an approximate bond's YTM as follows:

$$YTM = \frac{\left[C + (M - P)/N\right]}{M + P/2} \tag{2.13}$$

Where C is annual coupon payment; M is maturity value of the bond; P is current market price and N the number of years to maturity. However, strictly, the YTM only approximates the market required yield given three conditions: the bond being held to maturity; no default risk; coupons earned thereof are re-invested at the current market interest rate.

The bond investment is assumed less risky in the short term than equities, while in the longer term it is hard to conclude (Megginson *et al.,* 2007). For risky bond, the market in principle "require" higher rate of return. Implying that riskier investment must offer higher premium, as every investor is assumed to be risk–averse; and hence should be compensated for taking higher risks (Megginson *et al.,* 2007). Dimson, Mersh, and Staunton (2002) cited in Brealey *et al.*(2008) and Megginson *et al.* (2007) carry out a risk-return analysis of classes of securities- equities, bonds, and treasury bills in the US and UK between 1900 and 2004. The results reveal that in both economies, stocks offered greater real return than bonds and bills, but stocks are more volatile than bond and treasury bills. The reason is not unrelated to the nature of the investments and their return characteristics. While equity is issued for perpetuity, with investment returns that are uncertain, highly volatile, and hence may be susceptible to longer inflation risks, bond and bill are of relative shorter life, less volatile due to their fixed returns, and can enjoy both redeemable and convertibles features. Therefore, the risk-return convention suggests that the longer the investment horizon, the higher the chances of volatilities in earnings, particularly for equities, and hence a higher compensation in returns is required (Brealey *et al.,* 2008; Ross, Westerfield, Jaffe and Jordan, 2009). However, in general, considering all risks in the longer term context, that equity risk premium offers highest premium among financial investments is still an unsettled debate in the investment literature (Megginson *et al.,* 2007).

A broader examination of alternative financial instruments reveals that none (equity, bond, and treasury bill) is completely immune of all investment risks. On inflation, no investor can be

certain to lock in a real rate of return, since the uncertainty of inflation is a constant, except for inflation protected securities. On bond, as it is explained earlier, after issue the price subsequently becomes susceptible to market interest rates. Again, switching to equity, such investment puts the investor to total submission to the ups and downs of the firm's fortune, which the bond holder is however immune from. Thus, all investment performance is largely a function of the investor's intuition on risk ranking (Brealey *et al.,* 2008).

Benefits of corporate bond issue rob off on the firm in various ways, particularly in helping the firm maximize the wealth of shareholders. Verniemmen, Quiry, Dallocchio, Fur, and Salvi (2011) argue that the true measure of an investment policy is the effect it has on the value of capital employed. Investment policies recognize the trade-off between risk and return. Returns in form of cash flows and the associated risks are the main factors influencing firm's share price (Chandra, 2012; Brealey *et al.,* 2006). Returns should be of much high enough to overshadow all investment risks. Government macroeconomic policies are major issues in a firm's market risk dilemma such as government's monetary policy rate (MPR), treasury bill rates, foreign exchange regimes, money supply, tax and tariff rates, local and foreign trade regulations, and so on.

For Olowe (2011) if the objective of the firm is the maximisation of its value, it also implies maximising the wealth of shareholders, which to Sorensen and Whitta-Jacobsen (2010) implies maximization of the owners' consumption possibilities. The wealth of the shareholder will be maximised if the market price of the firm rises, which is a reflection of public valuation, and thus a reflection of the company's investment, financing and dividend decisions, given the operating macroeconomic environment.

A plausible remark from the above bond asset fundamental framework is that when a firm maximises its 'decisions' on financing technique/model it may also maximise its market value.

2.4.4 Interest Rate Term Structure Framework: The Term structure of interest rate has theoretical framework in the unbiased expectation, liquidity premium and market segmentation theories, for establishing the forward and future interest rates.

Where many zero coupon bond of different maturities are in existence, their observed prices would be useful in estimating the yields to derive the term structure. Several spot rates (r) can

be so calculated as returns on zero coupon bonds that operate "one off" payouts at time n as specified below:

$$P = \frac{M}{(1+r_n)^n} \tag{2.14}$$

Where M is the "one off" payment at time n. The spot rate then represents the outcome of demand and supply forces for zero-coupon bonds in the market. Such short term interest rates affect long term interest rates on government bonds towards deriving the yield curve relationship.

Term Structure models using zero-coupon interest rate can also be built up using interest rate derivatives. The model illustrates the behavior of the short-term interest rate in an infinitesimally short period of time t (Hull, 2009). Bond prices are assumed to depend on a process followed by r in a risk-neutral world, where in a short period of time the investor earns $r(t)\,\Delta t$ between t and $t + \Delta t$. Hull (2009) provides the valuation process of an interest rate derivative at time t whose pay-off f_T at time T is

$$\hat{E}\left[e^{-\bar{r}(T-t)} f_T\right] \tag{2.15}$$

where in a risk neutral world $\bar{r}$ is the average value of r in the interval between t and T, and $\hat{E}$ represents the expected value. Given that the $R(T,t)$ is the continuously compounded interest rate at time t for a term $T-t$, then the price of a zero-coupon bond that pay off an amount, *e.g.* \$1 at time T presented from equation (2.15) is:

$$P(t,T) = \hat{E}\left[e^{-\bar{r}(T-t)}\right] \tag{2.16}$$

Incorporating the continuously compounded interest rate $R(t,T)$ at time t for period T-t, then produces this price:

$$P(t,T) = \left[e^{-R(t,T)(T-t)}\right] \tag{2.17}$$

Thus,
$$R(t,T) = -\frac{1}{T-t} \mathrm{In} P(t,T) \tag{2.18}$$

From equations 2.17 and 2.18, we derive at any given time in a risk neutral process the term structure of interest rate obtainable from value of *r* as follows:

$$R(t,T) = -\frac{1}{T-t} \text{In } \hat{E}\left[e^{-\bar{r}(T-t)} \right] \tag{2.19}$$

Bonds with embedded options

Often bonds other than the plain vanillas are issues with sweetening features attractive to investors. Valuation of such contractual bond with embedded options in the secondary market more generally is better treated using the binomial and Monte Carlo simulation frameworks. While the former models valuation of callable bonds, putable bonds, floating rate notes, and structured notes, since their coupon formulae are interest rate based; the later models mortgage–backed securities and some asset backed securities as they are interest rate path dependent securities (Fabozzi, 2007).

2.4.5 Capital Asset Pricing Model (CAPM): The CAPM has its breakthrough in the finance pioneered work of Markowitz (1952), then further developed by Sharpe (1964), Lintner (1965), and Mossin (1966) as the most potent tool to measure expected (or required) returns of risky assets. The theory contends that average return on risky asset comprises the risk free rate and a risk premium, or the expected (average) excess market return, of which these two risks (risk free rate and the asset premium) are the bases of CAPM's investment theory, and should inform the investor's decision to invest (Kusairi, Sanusi and Ismail, 2012). It assumes that the premium compensates for the particular (systematic, non-diversifiable or market) risk level in a given security. Macroeconomic policies constitute sources of market risks, which in the CAPM framework affect the returns of firm as follows:

$$E(R_j) = R_f + \phi_j [E(R_m) - R_f] \tag{2.20}$$

where ϕ denote information (risk) parameter of fiscal and monetary policies which measures the sensitivity of capital asset returns to expectations about the future path of policy rates (Belke and Polliet, 2004; Okpara, 2010).

Importantly, both monetary and fiscal policies have objectives of real interest rate and inflation rate targets, which impact the market portfolio. Thus, all long term capital asset returns contain

'compensatory premium' for macroeconomic risks. All securities must have elements of ϕ. Hence, for security j, ϕ_j is otherwise called the asset beta, it strongly measures the asset's sensitivity to the market portfolio. The higher the beta of the security, the greater the exposure to systematic risk and the higher the expected return, that is, higher risk premium, it must offer the investor. The item on the extreme right is the 'market risk premium', when combined with ϕ_j it is security's risk premium. Analyst regards the CAPM as a single factor model because only beta (ϕ_j) changes from one security to the other in the model.

In the foreign portfolio context, the home country's systematic risks, the currency and political risks can be eliminated by investing in internationally diversified portfolio (Foulkslynch, 2002). If the law of one price- the purchasing power parity (PPP) is assumed, any financial asset with same risk should bear same price accross countries (Kusairi, Sanusi and Ismail, 2012). The international CAPM counterpart frmework is stated below:

$$E(R_j) = R_f + \phi_w[E(R_w) - R_f] \tag{2.21}$$

Where: R_j is the expected return from security j; R_f is the risk free rate of return; R_w is the expected return from the whole world portfolio; ϕ_w is a measure of world systematic risk, i.e. how returns on the security correlate with returns on the world market.

2.4.6 Arbitrage Pricing Theory: The single factor model of the CAPM is limited hence the APT multiple index factor, was developed. It a more generalized model, developed by Ross (1976, 1977) which intuitively works on the notion that the financial markets are frictionless, with possibility that asset returns are effectively driving by a group of different systematic risk factors such as unexpected fluctuations in oil prices, interest rates, inflation, exchange rate, economic growth, or even fluctuation in the market portfolio of the case in CAPM. Each asset can be affected by each risk factor, such that each firm has its own set of "factor betas" just as each stock has its own beta (risk index) in the CAPM. Thus, to every investor, returns on specific asset follow this simply relationship:

$$R_i = \alpha + \beta_1(risk\ \ factor\ 1) + \beta_2(risk\ \ factor\ 2) + \beta_3(risk\ \ factor\ 3) + ... + random\ \ error \tag{2.22}$$

Just as in the CAPM, each risk factor is associated with a risk premium, implying that if fluctuation in say oil price is a source of systematic risk to an asset/stock, then such stock that is sensitive to that factor must pay investors higher return as compensation. The relationship is presented as follows:

$$R_i - R_f = \beta_{i1}(R_1 - R_f) + \beta_{i2}(R_2 - R_f) + \beta_{i3}(R_3 - R_f) + ... + \beta_{in}(R_n - R_f) \quad (2.23)$$

where the item on the left represents the risk premium on a particular asset while the betas reflects that particular assets sensitivity to each factor and those in parenthesis stand in for each factor's risk premium. However, the limitation of non-specific factors in the APT framework has been severally criticized as its bane. The inter-temporal CAPM (I-CAPM) theory of Merton (1973) only suggest that the premium on any risky asset is related to the market risk premium as well as the risk premia on additional 'state variables'. The Chen, Roll, and Ross (1986) APT's macroeconomic risks framework also attracts widespread attention and generated a large body of empirical work. Chen *et al*. (1986) argue that in selecting relevant factors one should consider forces or variables that influence the discount rate applicable for discounting the expected cash flows and the influencers of the cash flows themselves (Robotti, 2002). Their intuitive investigation arrived at five-factor model of maturity premium, expected and unanticipated inflation, industrial production growth, and a default premium, while it claim that even if market portfolio of the CAPM is significant in the time series variability of stock returns, it has an insignificant influence on expected returns compared to economic risk variables.

Accordingly, the I-CAPM uses a time series multiple regression to measure the exposure of asset i to the set of risk factors F_M, F_A, F_B, and so on:

$$R_{it} - R_{f,t-1} = \alpha_i + \beta_{iM}(F_{Mt} - R_{f,t-1}) + \beta_{iA}F_{At} + \beta_{iB}F_{Bi} + ... + \varepsilon_{it} \quad (2.24)$$

for $t = 1, 2, ..., T$ and $i = 1, 2, ..., N,$ where F_M, F_A, F_B, *etc* represents multiple risk factors and the βs represent the factor loadings. The risk premium on asset i is given by:

$$E_{t-1}(R_{it}) - R_{f,t-1} = \beta_{im}\lambda_{M,t-1} + \beta_{iA}\lambda_{A,t-1} + \beta_{iB}\lambda_{B,t-1} + ... \quad (2.25)$$

For $i = 1, 2, \ldots, N$, where $\lambda_{M,t-1}$, $\lambda_{A,t-1}$, $\lambda_{B,t-1}, \ldots,$represent the conditional market risk premium and the conditional premiums on the additional sources of economic (state) risks, respectively.

2.4.7 The framework of Information Value: In the course of market efficiency, information obtained either from adaptive or rational source is a critical tool (Daniel and VanHoose, 2011) for investments and development. This reveals that efficient capital market depends on the precise definition and valuation of "information" (Hirshleifer and Railey, 1979). Copeland and Weston (1992) note that for all efficient markets prices absorb and reflect instantaneously all available and relevant information, which imply that capital assets traded are accurate signal for capital allocation. Copeland and Weston (1992) further reveal that an "information structure" may be regarded as a message about various anticipated events which may happen. The message may be of different values to different people, depending on: whether they can take any action thereof and; what net benefits (gain in utility) could result from their actions. Copeland and Weston (1992) express formally investor's value of an information structure, $V(\eta)$ as follows:

$$V(\eta) \equiv \sum_{m} q(m) M \underset{a}{A} X \sum_{e} p(e \setminus m) U(a,e) - V(\eta_0) \tag{2.26}$$

Where:

$q(m)$ = the marginal propensity of receiving a message *m*;

$p(e \setminus m)$ = the conditional probability of an event *e*, given a message *m*;

$U(a,e)$ = the utility resulting from an action a if an event e occurs; called the 'benefit function'

$V(\eta_0)$ = the expected utility of the decision maker without the information.

Equation (2.26) portends that a decision marker will evaluate an information structure (set of messages) by choosing an action capable of maximizing the individual's expected utility as messages arrive. Thus, from equation (2.26), for each possible message an "optimal action" that produces a solution is determined as follows:

$$M \underset{a}{A} X \sum_{e} p(e \setminus m) U(a,e) \tag{2.27}$$

By weighing the expected utility of each optimal action by the probability, $q(m)$, the decision maker knows the expected utility of the entire set of information called the utility value or the expected utility of an information set $V(\eta_0)$.

2.4.8 Solow-Swan Growth Framework: The Solow (1956), Swan (1956) long run dynamic GDP per capita growth model is explicitly a process of 'evolution in capital accumulation': labour, technology, by steady exogenously inspired technological change and financial capital of new savings and investment flows. The framework produces an outcome that overtime continuous build-up in 'stock of capital' of all forms, net investments in capital stock, lower population growth rate, the long run growth converges on a steady state with balanced economic growth. Developed from the basics of Cobb-Douglas production function, the general feature of the Solow-Swan model is that total factor productivity (TFP) grows overtime on the strength of exogenous capital and technology. Given the roles of growth in capital (*K*), labour (*L*) and the exogenous augmenting sequence (*A*), productivity or output growth by Solow-Swan's complete seven equations, typical of 'dynamic evolution of an economy' assumes the following form (Sorensen and Whitta-Jacobsen, 2010):

$$Y_t = A_t k_t^{\alpha} L_t^{1-\alpha}, \quad \text{(Supply-determined output)} \tag{2.28}$$

$$r_t = \alpha\left(\frac{K_t}{A_t L_t}\right)^{\alpha-1}, \text{ (rental rate of capital)} \tag{2.29}$$

$$w_t = (1-\alpha)\left(\frac{K_t}{A_t L_t}\right)^{\alpha} A_t, \text{ (wage rate)} \tag{2.30}$$

$$S_t = sY_t, \qquad 0 < s < 1 \text{ (gross savings)} \tag{2.31}$$

$$K_{t+1} - K_t = S_t - \delta K_t, \quad K_0 \text{ given} \tag{2.32}$$

$$L_{t+1} = (1+n)L_t, \qquad n > -1., \ L_0 \text{ given} \tag{2.33}$$

$$A_{t+1} = (1+g)A_t, \qquad g > -1., A_0 \text{ given} \tag{2.34}$$

where: $r_t, w_t, Y_t, S_t, K_t, L_t$ are rental rate, wage rate, supply-determined output, total savings, capital stock and labour respectively; parameters $\alpha, A, s, n,$ and δ are factor share, total factor productivity (TFP) (or state of technology), savings propensity factor, growth rate of population or labour force, rate of depreciation of physical capital respectively. Given that K_0, L_0 are initial

(predetermined) input combination, equation (2.32) is the inter-temporal budget constraint representing the aggregate capital accumulation equation, stating that new capital originates from net savings; and equation (2.33) represents 'biological' behavior of the households at an exogenous growth rate, n of the economy's labour capital.

From equation (2.28), output per worker is $y = Y / L$, which thus becomes:

$$y = A\kappa^{\alpha}, \text{ where } \kappa \text{ denote capital-output ratio} \tag{2.35}$$

By combining equation (2.31)-(2.34) and (2.35) the capital accumulation equation becomes

$$\dot{\kappa} = sy - (n + \delta)\kappa, \qquad 0 < s, \delta < 1, \tag{2.36}$$

equation (2.36) incorporates the equilibrium in the goods market or equality of investment I and savings: $I = sy$

If A is assumed constant overtime, substituting (2.35) in (2.36) and dividing through by κ yields the growth rate of capital-labour stock, g_k :

$$g_k = \dot{\kappa} / \kappa = sA\kappa^{\alpha-1} - (n + \delta), \tag{2.37}$$

and the growth rate of output per worker can also be derived:

$$g_y = \dot{y} / y = \alpha \kappa A \dot{\kappa}^{\alpha-1} / A\kappa^{\alpha} = \alpha g_k \tag{2.38}$$

In appraisal, the assumption on golden rule on savings/investment, lower population growth rate and the silence on factors determining technological progress may deter African economies from full benefit of the framework for long term growth.

2.4.9 Romer's Endogenous Growth Structure: The model treats knowledge (like A under Solow's model stated above) as important element of the firm's capital stock that is essentially a 'public good' spilled over to other firms in the economy. That is, the model treats growth as "learning by investing" i.e. a function of investment in knowledge. More formally, assumption

that the economy's wide capital, $\overline{K}$, positively affects output at the industry level and symmetry across industries, so that the national economy witnesses increasing returns to scale as follows:

$$Y_i = AK_i^{\alpha} L_i^{1-\alpha} \overline{K^{\beta}} \tag{2.39}$$

and at the aggregate economy, production function level is:

$$Y = AK^{\alpha+\beta} L^{1-\alpha} \tag{2.40}$$

Under the endogenous growth all reproducible factors A, K, and L, are assumed constant or increasing. Applying calculus *(i.e.* chain rule and exponential rule), three resultant equations from the total differential process $\dot{Y}$ becomes:

$$\dot{Y} = dY/dt = [AK^{\alpha+\beta} L^{1-\alpha}] \left[(\alpha+\beta)\frac{\dot{K}}{K} + (1-\alpha)\frac{\dot{L}}{L} \right] \tag{2.41}$$

Since the first expression in bracket represents output, Y, in a steady state $\dot{K}/K, \dot{L}/L, and\ \dot{Y}/Y$ are all constant. From equation 2.31 and 2.32 in the Solow's model above, we have:

$$\dot{K} = I - \delta K = sY - \delta K \tag{2.42}$$

Dividing through equation 2.42 by K, where δ is depreciation rate, we have:

$$\frac{\dot{K}}{K} = \frac{sY}{K} - \delta \tag{2.43}$$

As $\dot{K}/K$ is constant in equation 2.43, we would have Y/K constant. Therefore, we have:

$$\frac{\dot{K}}{K} = \frac{\dot{Y}}{Y} = g, \text{ a constant growth rate} \tag{2.44}$$

From the expression derived in equation 2.44, and given that $\dot{L}/L = n,$ population growth rate, also constant, and with Romer's assumption of a positive capital externality, $(\beta > 0)$, we have:

$$g - n = \frac{\beta n}{1 - \alpha - \beta} \tag{2.45}$$

$g - n > 0$ and Y/L is growing, g is the output growth rate as follows:

$$g = \frac{n(1 - \alpha)}{1 - \alpha - \beta} \tag{2.46}$$

By geometric illustration in a less complex form that captures the "endogeneity" of government policies, the aggregate production function is stated thus:

$$Y_t = A(K)_t K_t \tag{2.47}$$

Where $A(K)_t$ represents the 'induced or endogenous technological change' derived from the stock of the 'physical, human and research capital' particular to that economy; depending on the feedback mechanism affecting technological adaptation and technological change specific to that economy; reflecting differences in human capital accumulation, micro and macro policies of business and government organizations, physical and infrastructural capacity, *etc* (Cypher and Dietz, 2004).

2.5 Stylized Facts: Interest Rate and Industrial Output Growth in African Economies

Interest rates and the macrostructure are generic, influenced by domestic inter-industry and pervasive investment and consumption variables. Functionally, the interest rate, its behavior, and its structure formally determine the savings, capital movement, investments and consumptions decisions in any economy across time and space (Ojo, 2010; Ukeje, Essien, Yakub, and Akinboyo, 2004). It is the bases of industrial cost of capital. Every firm aims at the least cost of capital (financing decision) to maximize wealth for the shareholder and other stakeholders.

A high point on the industrial growth constraints in African economies is the high interest rate regime better presented in the case of Nigera in Tables **2.3** below, which many stakeholders have been uncomfortable with, and has made the WEF (2013) to complaint that finance is on the top of three constraints to doing business in Africa, as evidenced in figure **2.3** below. Keynes (1930) opines that the banks and the global monetary system have been preventing the rate of interest from falling as equilibrium requires.

Specifically, an economy's interest rate structure affects investment decisions not only in new issue market, but also in the decision to switch investments between the money and long term capital market. For instance, the Nigerian experience makes study such as Ojo (2010) to regard the interest structure as 'perverted' regime-*i.e.* seemingly operating contrary to basic economic principles. Its features are as follows: Importantly, the savings rate by deposit money banks is extremely low (with 3-5 per cent) see Table **2.3**. The short term interest rate proxied by the government treasury bill rate is in the second digit since 1990s, also is the monetary policy rate since 2009 (see Table **2.3**). It has succeeded in diverting large private and corporate savings from the long term capital market. In most years since the 1990s, there has been negative real interest rate in the economy, as inflation rate has been high in the second digit.

Similar but worse experience of wide interest rate margin is the case of other Africa countries presented in Table **2.5**. Zimbabwe recorded average of 70% between 2001 and 2004; and between 2005 and 2008 the average gap was 295% (annualized interest gap rate of 74.5%). Other African economies with consistent (double digit) interest margin from 2001 to 2011 include Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, Gambia, Liberia, Madagascar, Malawi, Zambia, Uganda, Sierra Leone, Sao tome and Principe, Mauritania, and Mozambique. The wide margin create disincentive to both borrowers and savers in the credit and deposit markets. Tendulkar (2015) opines that though general financial development and improvement in financial infrastructure are positive determinants of corporate bond market development, the paper however uses the fixed effect methodology to establish that bank margin (profit) constitute a negative effect to corporate bond development (by market size and depth criteria) but positive effect by market activity in emerging markets.

The unfortunate development in high bank margin in-turn adversely affects investments in the primary (agriculture and industrial) sectors of the economy (see Table **2.6)**, but attract investment in the tertiary (distributive and service) sectors (Ukeje *et al.*, 2004). The distributive sector which has lower economic multiplier, operating at short turnaround, would afford to borrow at the effective interest rate at the expense of the primary sector that would have to contend with longer gestation periods in their investment encounter. Thus, an implication of the African interest rate macrostructure is that it encourages investment in commerce, but

detrimental to the productive sector that could be more impactful to the economy. This observation may be responsible for the relative poor record of African real per capita income presented in Table **2.2** column **8**. Apart from Botswana, Mauritius, South Africa, and Morocco, all other African economies citizen earn below African (standard) average in real term.

This study proposes that the high spread (interest rate differential) is a problem in the credit industry, having spillover effect on the bond market. Adebiyi (2005) contends that both the term and availability of credit is important to growth of the manufacturing sector, especially the bourgeoning small and medium scale enterprises. The relative inactivity in the respective African countries' corporate bond markets is presented in Table **2.2** column **7** (total bond issue) and column **2** (no of listed bonds). Data from the Bank for International Settlement (BIS) reveal that only four countries- Mauritius, South Africa, Morocco and Tunisia issued corporate bond in 2014, while thirteen countries have corporate bonds in issue. Normatively, the fixed income market should be the hallmark of industrial patronage for capital finance. For instance, the bond market that debut in 2003 in Nigeria has been mainly patronised by the public sector, due largely to higher coupon offers (average 15-18 per cent) (CBN, 2014) rendering most private sector firms uncompetitive in the long term bond market. The negative impact has been to accentuate the private sector's "crowding out". An investor on the fixed income and treasury bond markets however, is also subject to interest rate risk (Price risk), as their future values are uncertain.

All these financial constraints influence declining industrial outputs and growth. Rodrik (2015) compares the success of the South Korea and Taiwan to new emerging markets experience and reveals that 'fundamentally' the rapid industrialisation that graduated South Korea and Taiwan's economies to advanced status, is incomparable to recent experiences in dwindling emerging and developing countries of Brazil, Russia, Turkey and India, bemoaning them of de-industrializing prematurely. Growth level in many emerging and developing economies are not sustaining because the process is not driven by productive transformation but by domestic demand, in turn fueled by temporary commodity booms (Rodrik, 2015).

The nature and structure of commodity export by product group in selected African economies is presented in Table **2.4**, and the global scenario is depicted in Figure **2.5** as presented below. The location of individual economy studied within the map of Africa is presented in Figure **2.6**. Primary product export economies in Africa espouse the manifestation of the practice of the

extroversion theory and provide further evidence for the Prebisch-Singer's (1950) commodity terms of trade argument/thesis earlier discussed under extroversion doctrine. The sample statistics for 2010, 2013, 2015 and 2016 reveals that oil producing economies of Angola, Nigeria, and Ghana operate the highest commodity export dependent economies above Africa's average of 81, 83, 80 and 79 per cents in respective years, as over 90 per cent of these aforementioned economies are highly concentrated (above 80%) primary product exports based, uniquely regarded as 'strongly commodity export dependent' developing countries by UNCTAD (UNCTAD, 2017). Kenya, South Africa, Egypt, Tunisia, Morocco and Mauritius are relatively better-off since they are below Africa's average, with fairly diversified export sources. This tables' record corresponds with the relative industrial stake and manufacturing base of the economies, which correspondingly reflect the economies high reliance on imports of finished goods and commodities, such as basics like food, clothings, *etc*.

The UNCTAD (2014) regards an economy as 'commodity dependant' if its primary export commodity constitutes over 60 per cent of total export revenue. Apart from Kenya, South Africa, Egypt, Tunisia, Morocco, Mauritius, Egypt, and to some extent South Africa, other African countries on Table **2.4** are primary product export economies, otherwise called 'commodity dependent developing countries' (CDDC). Data on Nigeria on average from 1970-2000 is 79 per cent, indicating that the country has consistently being a primary product export dependent economy. The unhealthy export sector underlies the periodic short term economic shocks often witnessed by these economies from global price vagaries. The consequences also extend to accentuating human poverty and loss of human dignity as the extrovertion policy constitutes periodic 'exportation' of potential sources of employment. Evidence from the poor record of human development index (HDI) of many of the economies in Africa suggests linkage of the extreme poverty of the people to the annual extrovertion statistics, as UNCTAD (2017) warns that many of the economies may not achieve the targets of sustainable development goals in 2030.

Another feature of the structure of commodity dependency is the structure of commodity export. Most of the economies are highly non-diversified commodity exporting countries. This structural weakness of Africa's product export may have developed severe implications and complications on these economies' fortune in multidimensional ways. The export structure may have influences

on key public and private sector policies such as investments, employments, and other macroeconomic decisions. This situation in Africa reveals the poor state of industrial orientation, poor value-chain addition economics, and seemingly state of extreme poverty of the people.

Figure **2.4** describes five year summary statistics of industrial value added (IVA) performance from 1981-2015. All African countries withnessed relative improved performance from 1981-1995, but declined henceforth, with Botswana been the most declined from about 62% to about 38%, while however, as at 2015 all the studied economies' IVA fall between the range 20%-38%. Nigeria had a drastic drop from highest record of 45% in 1991 to below 38% in 2006, and thereon to below 30% from 2011-2015. South Africa had undulating performance from 1981 but later became stable from 2001 at about 30%. It is important to mention that Egypt appears as the most improved IVA economy in Africa from modest growth of 32% in 1991, and of consistent growth to about 38% in 205. Overall the performance of the sub-Sahara African (SSA) countries on average fall below the average World standard from 2008, while South Korea maintains relative stable IVA growth of about 38% among the economies analysed through 1981-2015.

Due to the data paucity in African bond markets, this research work examines thirteen African bond markets relative to their industrial growth impact listed as South Africa, Egypt, Nigeria, Mauritius, Kenya, Ghana, Botswana, Tunisia, Namibia, Cote d' Ivoire, Tanzania, Cameroon, and Morocco whose market capitalization is ninety-seven (97) per cent of African total as at 2014 (see Table **2.2**).

Table 2.2: Key Macroeconomic and capital market variables 2011-2014 for selected African economies and some global peers

Stock Exchanges	No of Listed Corporate Bonds 2014[a]	M. Cap. ($Bn) 2014[a]	M. Cap. % of GDP 2014[ab]	Average Interest Rate Spread 2011-2014[b]	Average Industrial Value Added as % GDP 2011-2014[b]	Domestic Corporate Bond Issue $'bn: 2014[c]	Average Real Per Capita Income($) 2011-2014[b]	Ave. Unem. Rate 2011-2014[b]
Cameroon	4	0.3	-	-	29.95	-	483.3	4.2
Botswana	27	4.4	31.8	6.7	37.5	-	1,061.4	17.8
Egypt	8	70.02	25.0	4.5	38.97	-	251.5	12.7
Cote d'Ivoire (BRVM)	11	11.7	13.31	-	22.47	-	598.5	4.1
Ghana	2	20.11	184.5	-	28.35	-	105.7	3.1
Kenya	17	25.57	39.5	8.7	20.3	-	146.7	9.2
Malawi	-	15.74	26.14	24.9	18.25	-	16.3	7.6
Mauritius	8	8.66	72.0	1.9	24.4	2.3	3,081.4	8.1
Namibia	2	148.5	1312.	4.4	32.67	-	660.6	18.6
Nigeria	13	61.72	11.81	8.7	22.8	-	389	7.5
South Africa	1,452	1,150.5	159.3	3.3	29.75	64.9	1,210.3	24.8
Swaziland	-	-	N.A	6.4	47.7	-	259.8	22.5
Tanzania	27	12.8	6.4	6.6	24.2	-	99.2	3.2
Uganda	7	9.4	36.7	10.3	-	-	82.1	4.1
Rwanda	-	1.9	-	-	-	-	-	-
Zambia	-	-	14.5	5.9	34.7	-	909.6	13.2
Zimbabwe	-	4.33	109.3	-	31.25	-	295	5.4
Morocco	-	53.44	63.56	-	29.25	1.9	8,803.1	9.3
Tunisia	189	9.32	20.9	-	30.9	3.7	869.5	14.7
Average Africa	1767	94.61	40.7	12.5	28.34	18.2	1073.5	10.8
Average S.A*	26	28.62	32.8	13.3	28.25	2.6	994.3	10.0
Emerg. Market Peers:[b]Brazil	-	843.9	54.6	25.8	25.1	16.6	1,611.7	6.5
[b]India (Bombay)	-	1,558.3	68.6	-	31.45	8.1	256.8	3.6
[b]Malaysia	-	459.0	156.9	1.7	40.55	6.5	4,732.9	2.8
Global Peers: [b]NYSE/US	-	26,330.0	119.9	-	20.56	530.3	30,712.8	7.7
[b]LSE/UK	-	-	124	-	20.35	971.3	23,737.1	7.4

Sources: [a]ASEA (2014) African Stock Exchange Association Annual Report and Statistics, 2014; [b]World Bank's Financial Sector Development Indicators database; *www.data.worldbankindicators*; Real GDP per capita was computed by Author using World Bank Indicators-Economic and Growth Statistics; [c]Domestic corporate debt security is sourced from Bank for International Settlement, *www.bis.org* ; - indicates not available; * excluding South Africa; M. Cap. indicate Market Capitalization. Sampled countries represent 97.6% of total market capitalization of African economies provided by the African Stock Exchanges Association Annual Report and Statistics, 2014, *www.african-exchanges.org*.

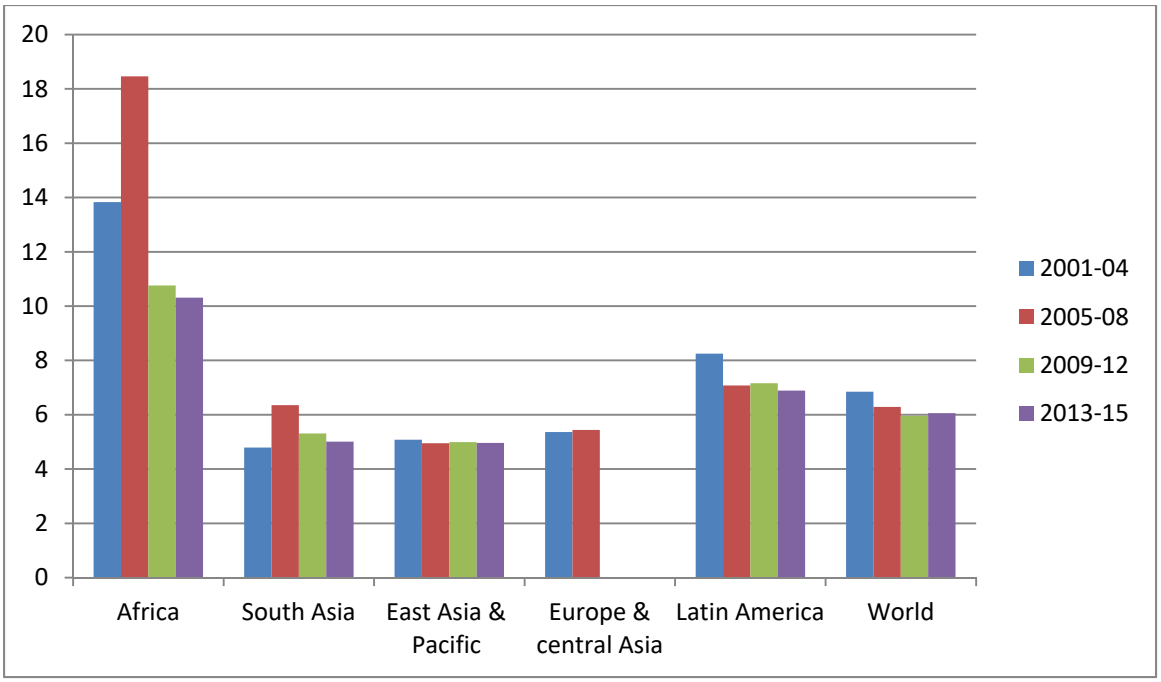


Figure 2.3: Average interest rate spread of African economies relative to regional peers 2001–2015

Source: Prepared by the Researcherfrom data obtained from World Bank Financial Sector Development.World Development Indicator database, *www.data.worldbank.org*

Table 2.3: Nigeria's interest rate macrostructure (selected years), as a reflection of Africa

Year	MPR %	T.Bill	SAS/D	SALR	Spread	ACSB	ACCB	IVA (%of GDP)	MCU	IPI
1980	6.0	5.0	6	10	4	-	-	39.9	70.1	119.0
1985	10.0	8.50	9.5	11.75	2.25	8.8	9.7	29.86	38.3	100.0
1990	18.5	17.5	18.8	27.7	8.9	11.6	14.6	43.59	40.3	130.6
1995	13.5	12.5	12.61	20.79	8.18	11.5	18.4	46.01	29.29	128.8
2000	13.5	12.0	5.29	21.55	16.26	10.8	10.7	52.2	36.1	138.9
2005	13.0	7.0	3.83	19.49	15.66	10.7	18.0	43.51	54.8	158.8
2010	6.08	3.84	2.21	22.62	20.41	11.5	11.8	25.32	56.22	-
2014	12.15	10.50	3.38	25.74	22.36	15.25	15.09	24.95	-	-
2015	13.00	9.40	3.58	26.71	23.13	16.78	16.02	20.38	-	-
2016	12.83	10.11	4.14	27.29	23.15	16.50	17.18	18.37	-	-

Sources: Central Bank of Nigeria statistical bulletin (2010-2016)- for simple average deposits & lending rates; Securities and Exchange Commission: Nigerian capital Market statistical Bulletin, 2010; Securities and Exchange Commission (SEC) Annual Report & Accounts (SEC,2015b); IVA is industrial value added (% of GDP) (World Bank, 2018 b)*;* Spread is computed by the Researcher. T.Bill is Treasury bill rate; SAS/D means Simple average savings/deposit rate; SALR is Simple average lending rate; ACSB is Average coupon of sovereign listed bonds; ACCB is Average coupon of corporate listed bonds; MCU is Manufacturer Capacity Utilization; IPI is Industrial Production Index: 1985:=100 ; - indicates data not available

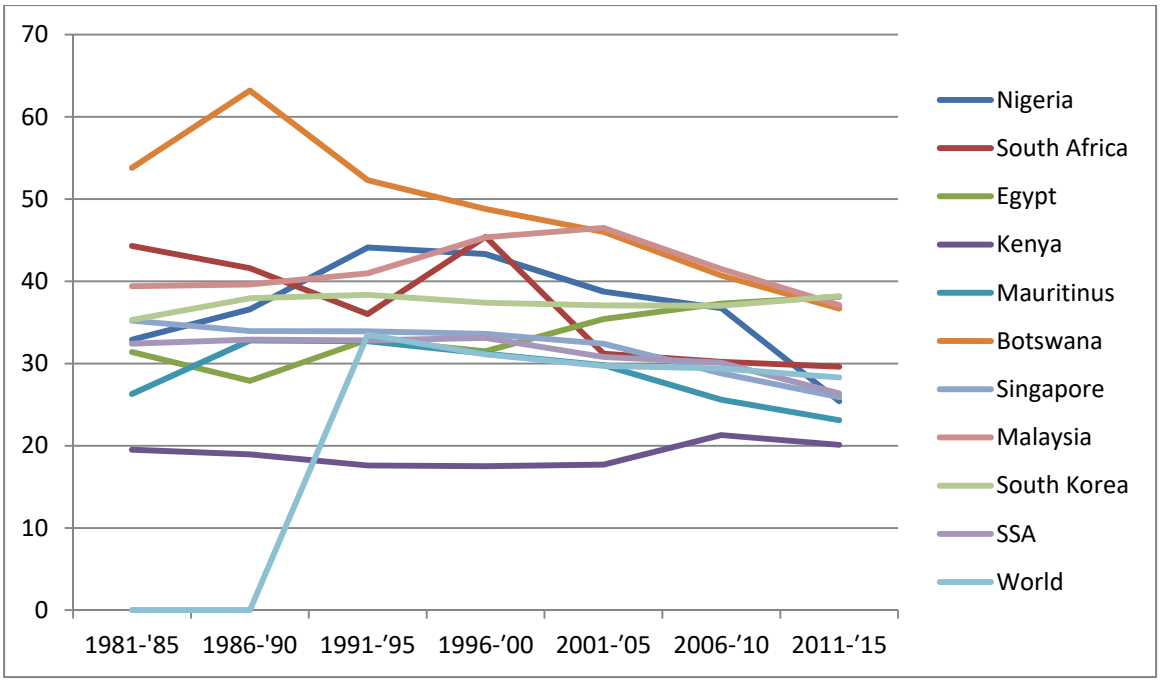


Figure 2.4: Five year average of Industry value added (IVA) as per cent of GDP 1981-2015 of some African selected economies and some global peers.

Source: Designed by the Researcher(2017) from World Bank's Economy & Growth Sector database, World Bank Indicators: *data.worldbank.org*: 1981-2015

Table 2.4: Extroversion in selected African economies (commodity dependant developing countries): Trends in Export Structure (% of Primary Commodity Export/Total Export): 1970-2016

Countries/Year	1970-2000	2009-2010	2012-2013	2014-2015	2016
Nigeria	79.0	97.0	98.0	97.0	99
South Africa	-	54.0	60.0	55.0	54
Botswana	-	83.0	93.0	94.0	95
Cameroon	-	89.0	88.0	92.0	93
Cote d' Ivoire	-	84.0	86.0	96.0	85
Morocco	-	37.0	36.0	33.0	29
Tunisia	-	24.0	28.0	23.0	18
Tanzania	-	83.0	83.0	85.0	87
Egypt	-	59.0	58.0	52.0	54
Kenya	-	66.0	65.0	64.0	64
Mauritius	-	36.0	43.0	37.0	43
Namibia	-	69.0	77.0	75.0	83
Ghana	-	90.0	93.0	94.0	94
Angola	-	99.0	100.0	100.0	100
Africa's average	-	81.0	83.0	80.0	79.0

Sources: Edo and Ikelegbe (2014) for Nigeria (1970-2000); Nigerian Bureau of Statistics-foreign trade statistics 2014; UNCTAD (2016): State of Commodity Dependence-Special unit on commodity, United Nations, New York and Geneva, 2017, retrieved from - *unctadstat.unctad.org/countryprofile/generalprofile,* accessed Jan.27, 2018; - indicates not available; African average represents the mean value of fifty-four (54) countries, computed by the Researcher.

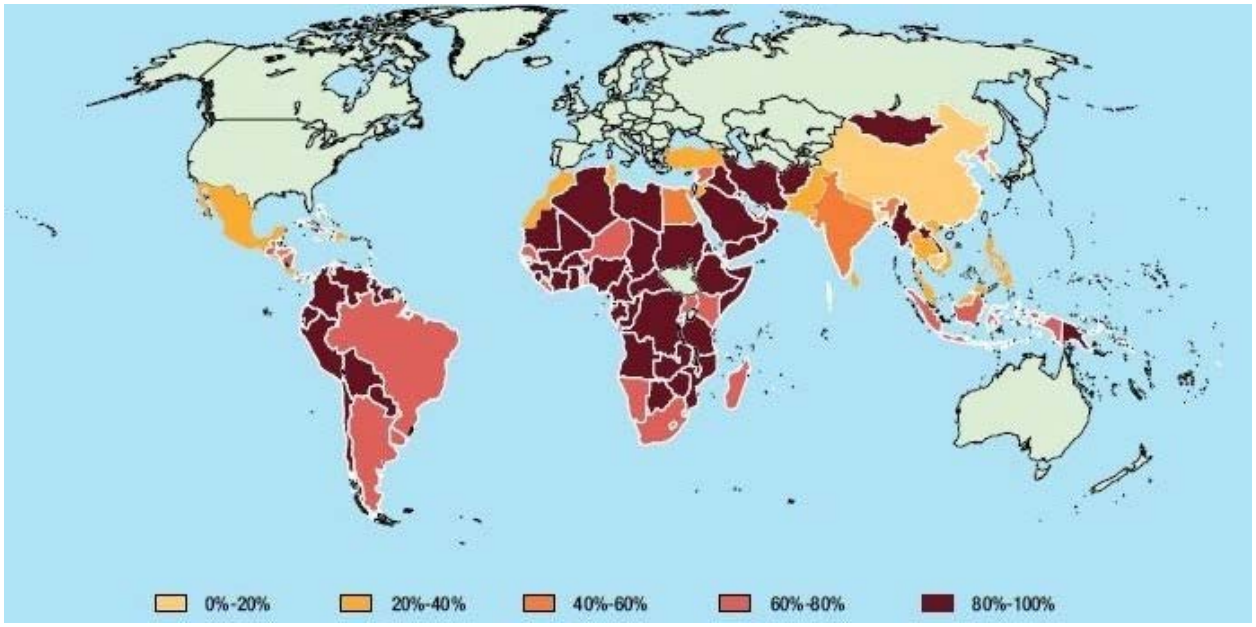
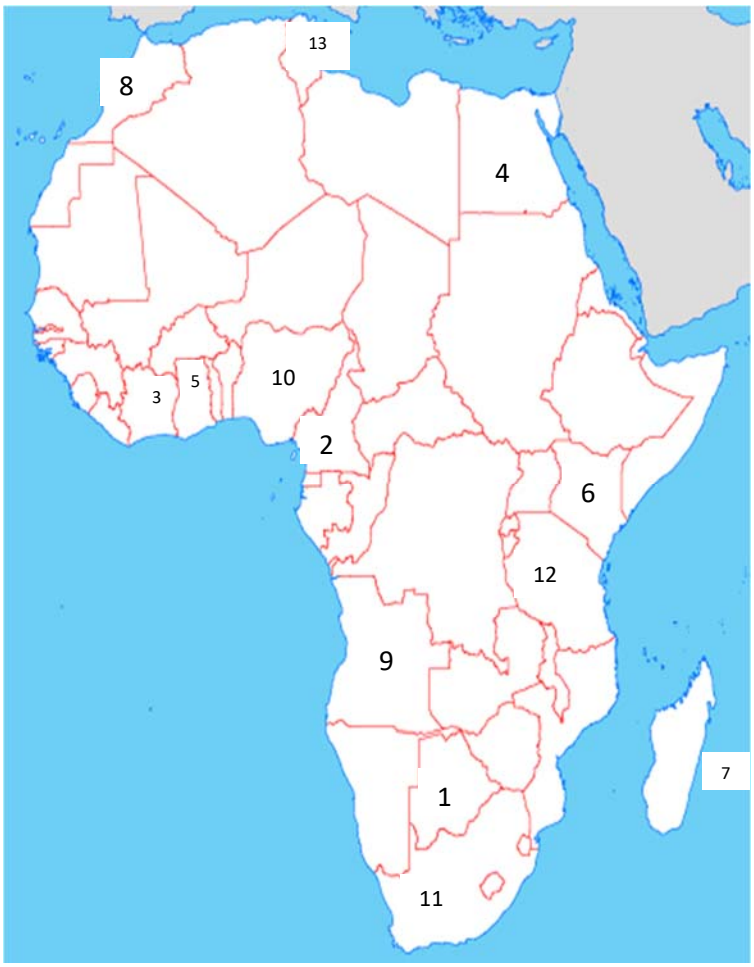


Figure 2.5: Developing Economies Dependency on Primary Commodities Export, 2012-2013

Source: UNCTAD, obtained from UNCTADSTAT, Special unit on Commodities (UNCTAD, 2014).



Economies Studied

1. Botswana
2. Cameroon
3. Cote d'Ivoire
4. Egypt
5. Ghana
6. Kenya
7. Mauritius
8. Morocco
9. Namibia
10. Nigeria
11. South Africa
12. Tanzania
13. Tunisia

Figure 2.6: Map of Africa, showing location of studied economies

Source: Mapsopensource (2018).retrieved from *http://www.mapsopensource.com/images/africa-countries-outline-map.gif.* and modified by the Researcher

Table 2.5: Interest rate spread in African Economies 2001–2016

Countries	2001–2004	2005–2008	2009–2012	2013-2016
Algeria	3.43	6.20	6.25	6.25
Angola	58.39	21.57	10.85	12.31
Botswana	5.94	7.38	6.026	5.82
Cameroon	13.67	11.50	─	─
Cape Verde	8.63	6.94	7.147	7.067
Central African Republic	13.67	11.50	─	─
Chad	13.67	11.50	─	─
Comoros	8.42	8.00	8.78	8.75
Congo	13.67	11.50	─	─
Democratic Republic of Congo	─	33.99	35.05	15.172
Djibouti	9.91	9.26	9.611	10.37
Egypt	4.81	6.16	4.727	4.965
Equatorial Guinea	13.67	11.50	─	─
Ethiopia	4.25	3.42	─	─
Gabon	13.67	11.50	─	─
Gambia	12.55	15.96	14.1	13.27
Kenya	12.13	8.30	9.055	7.895
Lesotho	10.66	7.90	6.73	8.352
Liberia	14.05	11.83	10.35	9.56
Libya	4.00	3.71	3.50	3.50
Madagascar	12.39	19.36	37.95	46.71
Malawi	22.64	21.73	20.915	31.012
Mauritius	11.69	9.22	1.39	2.291
Mauritania	13.38	14.73	10.17	─
Mozambique	10.29	8.71	6.05	7.37
Morocco	8.37	7.98	─	─
Namibia	6.19	4.99	4.62	4.39
Niger	─	-3.48	-2.337	-2.52
Nigeria	7.07	6.18	8.708	8.26
Sao Tome and Principe	20.70	19.20	16.205	14.08
Seychelles	6.11	7.33	8.35	9.06
Sierra Leone	12.63	13.44	11.38	13.138
South Africa	4.83	4.03	3.295	3.305
Swaziland	7.01	6.41	6.076	6.747
Uganda	12.42	10.02	10.383	10.606
Tanzania	12.44	8.39	7.294	5.999
Togo	─	-3.49	-3.088	-1.685
Zambia	20.63	13.01	11.363	3.925
Zimbabwe	69.82	298.38	─	─
Africa's simple average	13.55	17.14	9.69	9.85

Source: Computed by the Researcher from World Bank Financial Sector Development.World Development Indicator database, *www.data.worldbank.org*: 2001-2016 (WBI, 2018); UNCTAD (2014); ─ indicates not available**.** Countries not reported had no data.

Table 2.6: Regional share of manufacturing value added (MVA) in World Manufacturing Value Added (MVA), 2007–2013 (in per cent). Sub-Sahara Africa adds 1% (excluding South-Africa) is 0 % **.**

Group	2007	2008	2009	2010	2011	2012	2013
World	100	100	100	100	100	100	100
Industrialized economies	73	71	67	68	66	65	65
Industrializing economies	27	29	33	32	34	35	35
By industrialisation level							
Emerging industrial economies	24	26	29	29	31	31	32
Other developing economies	2	3	3	3	3	3	3
Least developed economies	0	0	0	0	0	0	0
By region							
Sub-Saharan Africa	1	1	1	1	1	1	1
Excluding South Africa	0	0	0	0	0	0	0
By income group (Industrializing)							
High income	2	2	2	2	2	2	2
Upper middle income	21	22	25	24	25	26	27
Lower middle income	5	5	5	5	5	5	5
Low income	0	0	0	0	0	0	0

Source: Excerpts from table A6.3, UNIDO (2013); table B3.4, UNIDO (2015)

2.6 The Research Gap

2.6.1: A Synthesis of the theories

Lack of access to long term development finance has been a long-term fundamental impediment to industrial output growth in many African economies (WEF, 2013; Spratt, 2009). This study is carried out within the context of endogenous growth model. Being a multivariate study it is further underlied by the following relevant theories: the Smithian, Classical, and Keynsian theories of economic growth; Extroversion and Neoclassical growth theories; Capital formation and financial development theories, Capital market theory; Capital structure theory; Availability doctrine and credit rationing; Term structure theory; Money and interest rate theories; Capital asset theory; and Public debt theory. Thoughts on these theories were deduced, which informed the study gap.

The weak state of African economies' industrial and technological capacities may have made the countries to remain extrovertic, specialists in the production of primary commodities, which Prebisch (1950) and Singer (1950) had theorized in the 'structuralist school of thought' as poor characteristics of developing contries. While Solow and Swan's neoclassical growth theory stressed the need for exogenous technology augmented production, Romer's new growth theory stresses endogenous policies on production factors for growth. Nevertheless, limited opportunities exist for productive industrial firms to take on risks and manage them in economies where there are no well functional financial sector, comprising well aligned financial institutions, markets and instruments.

Capital formation and accumulation underscores all growth theories. The Smithian, Classical, Keynesian and Neoclassical growth theories all hinge on the primacy of domestic savings mobilisation and accumulation overtime, as productive factor for economic growth and its sustainance. Bi-directional relationship is noted to exist between a well functioning financial system development and economic performance, measured by per capita income (Goldsmith, 1969). Higher level of industrial investment requires, longer term capital formation, and the financial sector development strategy itself requires effective and efficient intermediation. Well functional financial intermediation system would be an effective transformation agent of risk, duration, and liquidity of monetaty resources (Liu, Lejot and Arner, 2013). Information

asymmetry is a challenge for financial sector development, however with effective intermediation, issues of adverse selection and moral harzard may be minimized, to advancement in efficient capital mobilization and allocation.

Although overtime, African economies' financial structure has been predominantly bank-oriented, potently, the "group interest" theory of financial development reveals that bank-based system promotes uncompetitiveness of financial system. Despite liberalization of trade and openness of the external sector that ought to aid financial liberalization, restrictions from banks' interest group could limit the development of the long term (bond) market, as the oligopolistic nature of the bank group makes developing countries' financial market uncompetitive (Bircan, Hauner and Prati, 2012).

In the classical, keyensian, neoclassical and endogenous investment theories, capital investment is sensitive to interest rate dynamics. Capital investments in the industrial goods production process require long-term finance at high cost (interest rate). The neoclassical doctrine of 'durability of capital and irreversibility of investment' suggests that industrial investment has implication for future production and profit; hence the optimal source of financing is the bond market. The bond market is a long term capital source that exposes both savers and borrowers to longer tenured instruments, and hence offers long term funding for industrial output growth. However, the interest rate term structure for bond investment by convention offers longer term returns (higher interest rate) for the long risk investor.

2.6.2 The gap

In the World industrial output statistics, African economies have consistently ranked least and its pace of industrial output growth has been the least. The lapse in industrial output and the growth rate may have funding gap complications, that may be related to the underdeveloped corporate bond market, of which this study links the dearth of corporate bond market to the preponderance of the banking system's high lending to low deposit interest rate spread. Generally, financial intermediation seems to be poorly executed in many African economies, as the largely bank-oriented financial structure often do not mobilize, and neither do they engage in much needed fund transmutation and transformation to suit the preferences of the deficit units (Ojo, 2010). Likewise, from global statistics, African economies' production and consumption pattern has

remained largely extrovertic for over fifty years, despite the Prebish-Singer thesis, as Africa remains net-exporter of economic capital due to the poor state of her manufacturing sector.

Complimentary to primary commodity exporting problem, is the contemporaneous observation in the financial development path, that the 'politics' of financial intermediation may be operating in practice (Rajan and Zingales, 2003). In bank-based developing countries, commercial banks tend to dominate, by oligopolistic precepts the financial intermediation industry by issuing bonds at high coupon cost, enroute credit offer to non-finance corporate (NFC), and thence profiting from its uncompetitiveness, through high interest rate spread (see figure **2.3)**. This funding mechanism may have made the long term corporate bond market remain uncompetitive, relative to the bank finance model for non-finance corporate inequitably in many African economies. The region's high bank interest-rate spread, an evidence of 'perversed' financial system structure, may have adversely affected the direct finance model of non-finance corporates (NFC) of the industrial/manufacturing sector (see tables **2.2** and **2.5**). The observation stated above informs the inducement and the bases for investigation by this study. This phenomemon forms the inquisions for the following research questions: why would interest rate structure influence the primary corporate bond market development in the selected African economies? to what extent does interest rate spread affect long-term industrial output growth in the selected African economies? why is there low primary corporate bond market issuing for industrial investments in the selected African economies? to what extent is the secondary bond market active in the capital transmission process for industrial output growth in the selected African economies? why is there high interest rate spread in the selected African economies?

Attaining rapid and sustaining economic development and poverty reduction remain a daunting task for many African economies, such that the fortune of these economies rest with the future of their manufacturing sector, particularly the small and medium scale (SMEs) that hitherto cannot access the corporate bond market currently. In the immediate chapter, the panel data system of research analysis is applied for the group of thirteen African economies studied. The method of study to analyse the research questions are the augmented Toda-Yamamoto and the autoregressive distributive lag techniques, using the specification of the generalized method of moment (GMM) to unveil the dynamic behavior of the variables studied. Chapters four and five present the research findings; discuss the results, conclusion and recommendations.

CHAPTER THREE

METHODOLOGY

3.0. Introduction

This chapter presents the research design, comprising the population of study, the sampling techniques and processes, data and data sources, software, and of model assumption. Next, is a restatement of the hypotheses tested, then the empirical model specifications and techniques used in the study are described; thereafter, the pre-estimation tests and post-estimation diagnostics are stated. It is recalled that the underlying concept and theoretical argument of the study is that over time the industrial output growth challenge of African economies may have been associated with the structure of interest rate, reflected in the differential bank interest rate.

3.1 Research Design

This stage of the research process effectively describes how normal solutions to the research questions would be validly answered. The study design is conceptualized from three perspectives: the study population; the reference period; and the nature of investigation (Kumar, 1999). It is a panel study, which examines the phenomenon of weak industrial output and growth rate across selected African economies from 1995-2014. Moreover, it is a 'retrospective-prospective' study, as it focuses on the past trends, with a view to examining the future outlook. The 'nature of investigation' is experimental, as many exogenous variables are introduced to investigate the behavior of the principal dependent variables. The experimental investigation involves the underlying assumptions of the research techniques, the techniques adopted, and the software technology used to produce the empirical results.

3.1.1 Population of Study: There are fifty-four (54) countries in Africa, out of which twenty-five (25) have corporate bond markets in operation. This study is guided by the population of the African capital markets comprising the twenty-five (25) countries that are registered members of African Securities Exchange Association (ASEA) in 2015: Botswana, Cameroon, Cape Verde, Cote d'Ivoire, Egypt, Ghana, Kenya, Libya, Malawi, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania,

Tunisia, Uganda, Zambia, and Zimbabwe (ASEA, 2015). See the list of the Exchanges in the appendix.

3.1.2 Sample Technique, Sample Frame and Sample Size: The period of study is from 1995-2014. Following the dearth of corporate bond market development and the existence of observation omissions, the study is limited to sixteen African countries that have corporate bond issues and were traded on their Exchanges as at 2014 (ASEA, 2014). The summed size of the selected African capital markets is approximately 97.6% (see Table **2.2**) of African Stock Market Capitalization as at 2014 (ASEA, 2014). They are Botswana, Cameroon, Cote d' Ivoire, Egypt, Ghana, Kenya, Malawi, Mauritius, Morocco, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Tunisia and Uganda. However, due to large paucity of data observation from Malawi, Rwanda and Uganda, they were dropped, thereby reducing the sample size to thirteen (13).

3.1.3 Data and Data Sources: The study adopted a panel data set from secondary sources. A panel data is a series of observations across entities (countries), studied over time. The period of study is from 1995-2014 (20 years), in thirteen (13) countries, the data point is 260 (20 by 13). An observation is studied in pair of entities and time such that in variables x_{it}, y_{it}, i and t subscripts denote individual country and time respectively. It is however, an unbalanced panel data set as some countries have omitted observations in some years, that is:

$$\{x_{it}, y_{it}\} : for \;\; i = 1..., N \;\; ; \; t = \underline{t_i}, ..., \overline{t_i} \tag{3.1}$$

The data were sourced from World Bank Development Indicators (WDI, 2015), World Bank Group's Worldwide Governance Indicators (WGI, 2015), International Finance Corporation (IFC), Bank for International Settlement (BIS), International Organization of Securities Commissions (IOSCO), African Securities Exchanges Association (ASEA), United Nations Development Programme Statistics, Central Bank of Nigeria's Statistical bulletin, National Bureau of Statistics. The arrangement of source of each variable is presented in Table **3.1** below.

Table 3.1 Description of Variables, Data Sources, Measurements, Justification and their *Apriori*s

Variable description	Type/Source/Measurement	Literature justification	Parameter's *Apriori*
Io= Ind. output value added	Secondary/World Bank/ Industry, value added (annual % growth)	UNIDO(2014), WEF(2013), Adebiyi (2005)	>0
Irs= Interest rate spread	Secondary/ World Bank/ Difference between bank lending and deposit rates	Tendulkar (2015), Adelegan and Radzewicz-Bak (2009), Bosworth (2014), Mu *et al.* (2013)	<0
Cbi= Corporate bond issued	Secondary/ BIS*/BM**	Tendulkar (2015), Asogwa (2005)	>0
Rpi= Real Gdp per capita	Secondary/ World Bank	Akinlo and Owoyemi (2012)	>0
Opn= Openness/Real Gdp	Secondary/ World Bank/Trades as per cent of GDP	Bosworth (2014)	>0
Pdr= Public debt/Gdp ratio	Secondary/ IMF Survey data.imf.org/ Central govt. debt as % of GDP	Bosworth (2014), Akinlo and Owoyemi (2012)	<0
Tdv.=Technological development	Secondary/ World Bank/Expenditure on education as % of total government expenditure	Grossman and Helpman (1994), Pack (1994), Heng (2015).	>0
Iqx= Institutions' quality index	Secondary/ computed from Worldwide Governance Indicators/Composite of regulatory quality, rule of law, govt. effectiveness (2015):www.govindicators.org	Ayala *et al.*(2015), Djankor *et al.* (2007)	>0
Svr= Saving rate	Secondary/World Bank/ Savings to GDP	Adelegan and Radzewicz-Bak (2009)	>0
Cbt= Corporate bond turnover	Secondary/ BIS*/BM**/***ASEA	Tendulkar (2015)	>0
Sbi= Sovereign bond issue	Secondary/BIS*/BM**/ ***ASEA	Tendulkar (2015), Mu *et al.* (2013)	>0
Elc=Electricity consumption	Secondary/ World Bank/ Electric power consumption (Kwh per capita)	Hye and Riaz (2008)	>0
Bc= Bank competitiveness	Secondary/World Bank/Commercial bank branch per 100,000 adults	Ojo (2010)	>0
Fdv=Financial development(M2/GDP)	Secondary/World Bank/Annual broad money growth to GDP	Levine (2005), Abida, Sghaier and Zghidi (2015)	>0
* BIS: Bank for International Settlement; **BM: Bond markets of sampled countries obtained from ASEA annual reports (ASEA, 2014).***ASEA: African Securities Exchanges Association; Industrial, value added (annual % growth) (World Bank, 2016): *https://data.worldbank.org/indicator/NV.IND.TOTL.KD.ZG?view*			

Source: Compiled by the Researcher (2016).

3.1.4 Software and Data Analysis: The study adopts multivariate Panel data for the combined thirteen countries representing the continent's interest. Econometric package employed is the electronic view (*E-view*) version 9 for the panel analysis. First, the time series characteristics and properties of the secondary data were studied. Next, descriptive statistics was carried out on both the untransformed and the transformed data to establish the quality of moments and correlation statistics. Thereafter, other relevant econometric computations were done.

3.1.5 (a) Underlying Objectives and Assumptions: In line with standard regression mechanism three objectives underlie the regression analyses. They are: to estimate the unknown parameters in each equation; to validate if the functional form of the model is consistent with the hypothesized model that was derived from theory, and finally, to use the models as forecasting tool for the future value of the response variable (Ajmani, 2009). However, five key assumptions necessarily underlie the achievement of these objectives. They are summarized as follows: that the equations are non-linear and full rank, thirdly that the explanatory variables are exogenous, fourthly that the errors are random and uncorrelated, and fifthly that the random errors are normally distribution.

3.1.5 (b) Other Model Assumptions:

1. It is assumed that there is a direct relationship between capital issues and investment and industrial output.
2. It is assumed that industrial investments positively impact industrial output. Industrial investment includes engagement in manufacturing production, apart from the large scale manufacturing. It includes such outfits as the small and medium scale enterprises (SMEs) like bakeries, block making, black-smithing, oil processing, soap making, and so on.
3. Capital investment variables and decisions are subject to the assumptions of the capital assets pricing model (CAPM)
4. It is also assumed that Debt and Equity are complementary sources for industrial investment and output.
5. The study does not treat the risk on returns of fixed income securities, *i.e* sensitivity of bond prices to interest rates (derivatives).

3.1.6 Re-statement of Research Hypotheses

The hypotheses, all stated in the null to be tested are as follows:

1. H_o. Interest rate structure does not significantly influence primary corporate bond market development.
2. H_o.There is no significant relationship between interest rate spread and long run industrial output growth.
3. H_o.There are no significant causes of low primary corporate bond market issuing for industrial output growth in the selected African economies.
4. H_o. There is no significant relationship between the secondary corporate bond market and industrial output growth.
5. H_o.There is no significant relationship between inflation expectation and interest rate spread in the selected African economies.

3.2 Model Specification

The methodology developed and adopted is an augmented Toda-Yamamoto (ATY) model in a Panel framework for hypotheses two, three, four and five for selected African economies, following the outcome of some variables' unit root test results that are integrated at second difference. For the sake of unit root outcome for variables in hypothesis one (1), the fully modified OLS in an Autoregressive Distributive Lag model (ARDL) or Bound testing framework is adopted. Indeed, the two techniques are favored for their cares of possible endogeneity problems. For robustness of research outcome relevant diagnostic tests are employed.

3.2.1 Dynamic Panel Specification

The dynamic panel model version can help to account for probable dynamic changes or adjustments across the selected African countries. Its specification (Arellano and Bond, 1991) can be stated as follows:

$$y_{it} = \phi y_{i,t-1} + x_{it}^{'}\beta + u_{it} \qquad i = 1,...,N \qquad t = 1,...,T \tag{3.2}$$

Where *i* is the country and *t* is time, x_{it} is explanatory vaariable. Moreover, ϕ is a scalar, $x_{it}^{'}$ is 1 $\times K$ and β is K by 1, and further assuming that the u_{it} is of the one-way error component model, that is:

$$u_{it} = \mu_i + \nu_{it} \tag{3.3}$$

where: $\mu_i \sim IID(0, \sigma_\mu^2)$ and $\nu_{it} \sim IID(0, \sigma_\nu^2)$ are independent of each other and among themselves. However, where strict exogeniety assumption may be violated, there is tendency for dynamic panels to generate errors from two sources overtime (Arellano and Bond, 1991; Baltagi, 2008), namely through autocorrelation problem, as a result of lagged regressands among the regressors, and problem of heterogeneous characteristics or interaction effects among individual countries. Arellano and Bond (1991) propose differencing the dynamic model to eliminate the effect of bias and inconsistent estimator such that equation 3.2 becomes:

$$y_{it} - y_{i,t-1} = \phi(y_{i,t-1} - y_{i,t-2}) + (x_{it}^{'} - x_{i,t-1}^{'})\beta + (\varepsilon_{it} - \varepsilon_{i,t-1}) \tag{3.4}$$

with the assumption that $(\varepsilon_{it} - \varepsilon_{i,t-1})$ complies with first order moving average (MA(1)) process with unit roots.

From equation 3.2, where $x_{it} = (y_{i(t-1)} - x_{it}^{'}\beta^{'})^{'}$ is K x 1 and the v_{it} are not serially correlated. The behavior of x_{it} depends on the assumption of its being a predetermined variable and strictly exogenous. If predetermined, then:

$$E(x_{it}v_{it}) \neq 0 \tag{3.5}$$

Arellano and Bond (1991) reveal that in case where x_{it} takes the form of predetermined or strictly exogenous, the generalised method of moment (GMM) estimator of the Kx1 coefficient vector ϕ becomes:

$$\hat{\phi} = (\bar{X}'ZA_NZ'\bar{X})^{-1}\bar{X}'ZA_NZ'\bar{y} \tag{3.6}$$

Where: $\bar{X}$ is a stacked (T-2) N x K matrix of observation on $\bar{x}_{it}$ and $\bar{y}$ and Z are instrumental matrix for x_{it} while A_N produces either one-step or two-step estimator. Empirical literature

suggests the application of Arellano and Bond (1991)'s GMM as an attempts to overcome endogeniety problems, among others, inherent in use of the ordinary least square (OLS), fixed effect (FE) or least square dummy variable (LSDV) and random effect (RE) or the generalized least square (GLS). Furthermore, literature suggests that, strictly, where heteroscedasticity is present the GMM estimator is more efficient than the simple instrumental variable (IV) estimator by Anderson and Hsiao (1981), while if otherwise, where heteroscadasticity is absent, the GMM estimator is not less bad than the IV method (Oyinlola (2012).

3.2.2 Unbalanced Panel specification

An unbalance panel multiple regression framework for this study is of the form provided by Green (2003), Amjani (2009).

$$y_{it} = X_{i\underline{t}}^{\bar{t}}\beta + z_i^{\bar{t}}\alpha + \varepsilon_{it} \tag{3.7}$$

y_{it} is the dependent variable. The matrix $X_{i\underline{t}}^{\bar{t}}$ contains K sets of regressors, $z_i^{\bar{t}}\alpha$ stands for the heterogeneity or individual effects, z_i contain a constant term, group specific effects, and individual effects which may be observable or unobservable. Where $i=1,...,n$ (here $n=13$ countries); $t=1,...,T$ $(1995-2014)$. The number of time periods for each i differs, hence we are estimating unbalance panel. Where z_i is observed, the ordinary least square model is applicable. This research study adopts an interaction model for the main research study (hypothesis1). It is a multiple regression model where the effect of the main explanatory variable is modified by another. The underlying functional form of the conceptual and theoretical arguments presented in chapter 2 can be presented implicitly in linear model form as follows:

$$Y_{it} = f(\alpha_1, X_{1it}^{\beta_1}, X_{2it}^{\beta_2}, (X_{1it}X_{2it})^{\beta_3}, ..., \varepsilon_{it}) \tag{3.8}$$

Where the third right hand variable is the interaction term $(X_{1it}X_{2it})^{\beta_3}$. Should the influence of the interaction term be omitted, the impact of change in the dependent variable X_{1it} would be measured by β_1 (Pindyck and Rubinfeld, 1998). In explicit form, and by applying the log transformation process, the model becomes:

$$\log Y_{it} = \alpha_1 + \beta_1 \log X_{1it} + \beta_2 \log X_{2it} + \beta_3 \log(X_{1it} X_{2it}) + ... + \varepsilon_{it}) \quad (3.9)$$

The model for this study therefore considers an interaction of two variables:

$$Industrial\ output_{it} = f(corporate\ Bond\ Market_{it} * Interest\ Rate\ Spread_{it}, ...) \quad (3.10)$$

Incorporating other control variables, model 3.10 becomes.

$$Io_{it} = \alpha_i + \beta_1 Cbi_{i\underline{t}}^{\bar{t}} + \beta_2 Irs_{i\underline{t}}^{\bar{t}} + \beta_3 (Cbi_{i\underline{t}}^{\bar{t}} * Irs_{i\underline{t}}^{\bar{t}}) + \sum_{1}^{n} X_{i\underline{t}}^{\bar{t}} \beta_n + \varepsilon_{it} \quad (3.11)$$

Where Io is industrial output, Cbi is corporate bond issue, Irs is interest rate spread, the sum Xit represent other explanatory variables in the model, such as economic openness (Opn), Public debt ratio *(Pdr)*, Technological development *(Tdv)* measured by per cent of annual total budget on education, Financial deepening *(Fdp)* and others. With the interaction term, the effect of Cbi on Io depends on the level of Irs. Should β_3 be negative, the effect of Cbi on Io will increase as the value of Irs reduces. The variables' *apiori* expectation signs are presented in table 3.1 above. The outcome of interaction variable may be vital, such that in practice, interest rate behavior influences bond issue prices significantly.

Hypotheses 2, 3, 4 and 5

For the study of hypotheses 2, 3, 4 and 5, this work generalises Norma and Uddin (2011) Panel Granger-VAR framework. Norma and Uddin (2011) use the multivariate granger causality based on the error correction mechanism (ECM) to investigate the interrelationship between remittances inflow, bank development and GDP in four South-East Asian economies of Bangladesh, India, Pakistan and Sri Lanka.

Though for time series data that are stationary, the series have a mean reverting process (Engle and Granger, 1987). This condition is however rear as most time series, particularly in developing economies are largely *I*(1). In this circumstance and in particular for the case of long run relationship, the error correction framework needs to be incorporated. A generalised Panel Granger-VAR framework model augmented with ECM terms, and sooner augmented to Toda Yamamoto (TY) model is stated below:

$$\begin{bmatrix} Io_{it} \\ Cbi_{it} \\ Irs_{it} \\ Opn_{it} \\ Pdr_{it} \\ Tdv_{it} \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \\ \alpha_6 \end{bmatrix} + \begin{bmatrix} \Phi_{11}(L)\Phi_{12}(L)\Phi_{13}(L)\Phi_{14}(L)\Phi_{15}(L)\Phi_{16}\ \Psi_{1t-1} \\ \Phi_{21}(L)\Phi_{22}(L)\Phi_{23}(L)\Phi_{24}(L)\Phi_{25}(L)\Phi_{26}\ \Psi_{2t-1} \\ \Phi_{31}(L)\Phi_{32}(L)\Phi_{33}(L)\Phi_{34}(L)\Phi_{35}(L)\Phi_{36}\ \Psi_{3t-1} \\ \Phi_{41}(L)\Phi_{42}(L)\Phi_{43}(L)\Phi_{44}(L)\Phi_{45}(L)\Phi_{46}\ \Psi_{4t-1} \\ \Phi_{51}(L)\Phi_{52}(L)\Phi_{53}(L)\Phi_{54}(L)\Phi_{55}(L)\Phi_{56}\ \Psi_{5t-1} \\ \Phi_{61}(L)\Phi_{62}(L)\Phi_{63}(L)\Phi_{64}(L)\Phi_{65}(L)\Phi_{66}\ \Psi_{6t-1} \end{bmatrix} \begin{bmatrix} Io_{it} \\ Cbi_{it} \\ Irs_{it} \\ Opn_{it} \\ Pdr_{it} \\ Tdv_{it} \end{bmatrix} + \begin{bmatrix} \nu_{1it} \\ \nu_{2it} \\ \nu_{3it} \\ \nu_{4it} \\ \nu_{5it} \\ \nu_{6it} \end{bmatrix} \tag{3.12}$$

where: $\nu_{it} = \mu_i + \varepsilon_{it}$ (3.13)

ν_{it} is a one-way error component model. The κ variables Io, Cbi, Irs, Opn, Pdr and Tdv represent Industrial output, corporate bond issue, interest rate spread, degree of openness, public debt ratio, and endogenous technology development a proxy for total expenditure on education respectively . other variables are aslisted in table 3.1. α_{1-6} are constant terms; L is the lag operator; Ψ_{t-1} is the vector error correction model (VECM) for the long run co-integrating relationship between the variables, a dynamic term that reflects how the current "error" in the model achieves long-run equilibrium (Engle and Granger,1987; Kennedy, 2008). Other variables studied include institutional quality index (*Iqx)*, Real gross domestic product per capita *(Rpi),* savings rate *(Svr)* and corporate bond turnover (*Cbt)*.

Panel Granger-VAR model

In standard explicit form, the dynamic multivariate Panel Granger-VAR system is as follows equations (3.14) to (3.18):

$$\Delta Io_{it} = \alpha_1 + \sum_{j=1}^{P} \theta_{1j} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{1j} \Delta Irs_{it-j} + \sum_{j=1}^{P} \varphi_{1j} \Delta Opn_{it-j} + \sum_{j=1}^{P} \psi_{1j} \Delta Pdr_{it-j} + \sum_{j=1}^{P} \xi_{1j} \Delta Io_{it-j} + \varepsilon_{it}, \tag{3.14}$$

$$\Delta Cbi_{it} = \alpha_2 + \sum_{j=1}^{P} \theta_{2j} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{2j} \Delta Irs_{it-j} + \sum_{j=1}^{P} \varphi_{2j} \Delta Opn_{it-j} + \sum_{j=1}^{P} \psi_{2j} \Delta Pdr_{it-j} + \sum_{j=1}^{P} \xi_{2j} \Delta Io_{it-j} + \varepsilon_{it}, \tag{3.15}$$

$$\Delta Irs_{it} = \alpha_3 + \sum_{j=1}^{P} \theta_{3j} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{3j} \Delta Irs_{it-j} + \sum_{j=1}^{P} \varphi_{3j} \Delta Opn_{it-j} + \sum_{j=1}^{P} \psi_{3j} \Delta Pdr_{it-j} + \sum_{j=1}^{P} \xi_{3j} \Delta Io_{it-j} + \varepsilon_{it}, \tag{3.16}$$

$$\Delta Opn_{it} = \alpha_4 + \sum_{j=1}^{P} \theta_{4j} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{4j} \Delta Irs_{it-j} + \sum_{j=1}^{P} \varphi_{4j} \Delta Opn_{it-j} + \sum_{j=1}^{P} \psi_{4j} \Delta Pdr_{it-j} + \sum_{j=1}^{P} \xi_{4j} \Delta Io_{it-j} + \varepsilon_{it}, \tag{3.17}$$

$$\Delta Pdr_{it} = \alpha_5 + \sum_{j=1}^{P} \theta_{5j} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{5j} \Delta Irs_{it-j} + \sum_{j=1}^{P} \varphi_{5j} \Delta Opn_{it-j} + \sum_{j=1}^{P} \psi_{5j} \Delta Pdr_{it-j} + \sum_{j=1}^{P} \xi_{5j} \Delta Io_{it-j} + \varepsilon_{it}, \quad (3.18)$$

Where: $\theta, \delta, \varphi, \psi, and \xi$ are unknown parameters; α_{1-5} are constant terms; the individual country effects are captured in μ_{1-5}; ε_{it} is the residual, white noise (idiosyncratic) compliant for each equation. Alternatively, the VECM framework that allows for multiple co-integrating vectors, with each explanatory variable bearing its *speed-of-adjustment* parameter can be represented as:

$$\Delta Y_t = \alpha + \sum_{1=i}^{p} \Gamma_i \Delta Y_{t-i} + \Pi e_{t-i} + \varepsilon_t \quad (3.19)$$

$$\Gamma = \tau \beta' \quad (3.20)$$

Where Y represents vector of variables listed in 3.14-3.18; τ represents a matrix of speed of adjustment parameters, β represents matrix of co-integrating vectors, ε is vector of error terms.

Augmented Toda-Yamamoto Causality Approach for Models 2, 3, 4 & 5

Toda and Yamamoto (TY) (1995) develop an augmented granger causality methodology to treat causal relation models in a VAR environment involving non-uniform level of stationarity among time series data set. Engle and Granger (1987) point out that inference from non-stationary and co-integrated variables' coefficients with the standard granger causality test results thereof may be invalid. TYapproach developed on the standard VAR modeling by introducing a modified Wald test statistics. The summarized specification of the TY framework (Toda and Yamamoto, 1995) for *Yt* and *Xt* series is provided below:

$$Yt = a + \sum_{i=1}^{m+d} \phi_i Y_{t-i} + \sum_{j=1}^{n+d} \varpi_j X_{t-j} + \varepsilon_{Yt} \quad (3.21)$$

$$X_t = a + \sum_{i=1}^{m+d} \varphi_i X_{t-1} + \sum_{j=1}^{n+d} \delta_j Y_{t-1} + \varepsilon_{Xt} \quad (3.22)$$

Where d represents maximum order of integration of the variable in the system, m and n are optimal lag of *Yt* and *Xt*. The random error ε is assumed white noised.

With respect to this study, the procedures adopted for the augmented Toda Yamamoto (ATY) approach are as follows: The optimum lag length P from the VAR structure was obtained, and

the maximum order of integration *M* thereof. Next, the study ensured that the VAR system that produces the *P* lag length is stable, by carrying out stability test of the VAR. Thereafter, the Langrage multiplier (LM) serial correlation test was carried out. Additional diagnostic test is applied on the VAR residuals, *i.e.* the residual diagnostics test; and the co-integration long run test.

Next, the TY model (*P*+*M* variables) or equation from the original VAR equation was developed; then, the study ensured that the *P* + *M* exogenous variables are included. Thereafter the study developed a counterpart short run TY model by taking the change of the equation. Next, each of the differenced TY equation was run to obtain the residuals. The study thereafter lagged the residuals to 1 and imports the lag residual into the original TY equation. Further, the study ran each of the equations and thereafter carried out the Wald Test only for the *P* lag variables. Finally, the F-statistics and the Chi-square statistics were obtained. The Wald test is unique as it helps to control for the outcome of the intimate relationship between two or more variable while holding other variables in the model constant. In summary, the innovation introduced into the TY procedure involves bringing in the short run dummies into the original TY long run model.

The model adopts modified Wald test, whose statistics for *Y* equation is presented below:

$$F = \frac{(Rss_{RY} - Rss_{UY}) / K}{Rss_{UY} / (N - K)} \tag{3.23}$$

Where *K* represents the number of estimated coefficients. Using the F-test and Chi square statistics, the null hypothesis of no co-integration relationship is defined as: $H_0 = \delta_1 = \delta_2 = 0$ against alternative hypothesis that $H1 \neq \delta_1 \neq \delta_2 \neq 0$ of the presence of co-integration.

Hypothesis 1: Autoregressive Distributive Lag Model (ARDL) Specification

The ARDL specification with defined lag polynomial is in the VAR model family. The ARDL was developed by Henry, Pagan and Sargan (1984), and further popularized by Pesaran and Shin (1997) and Pesaran, Shin, Smith (2001). Stated below is a modified Maddala and Kim (1998) generalized version of panel ARDL with *p* regressors *m* lags in *y*, and *n* lags in each *p* regressors denoted as ARDL (*m, n; p*):

$$y_{it} = \phi_0 + \sum_{k=1}^{m} \alpha_k y_{it-k} + \sum_{j=1}^{p} \sum_{k=0}^{n} \beta_{jk} x_{jit-k} + \varepsilon_{it} \tag{3.24}$$

It is assumed that $\varepsilon_{it} \sqcup$ iid $(0, \sigma^2)$, a white noise process, and that the impact multiplier decreases in successive periods if $\left| \alpha_i \right| < 1$, and additionally by including sufficient lags of the dependent and explanatory variables, the serial correlation in the error term can be eliminated (Hill, Griffiths, and Lim, 2011). Moreover, there is a theoretical connection between the ARDL and ECM. The study modifies in simplified panel form Verbeek (2004) as follows:

$$Y_{it} = \delta + \phi Y_{it-1} + \gamma_0 X_{it} + \gamma_1 X_{it-1} + \varepsilon_{it} \tag{3.25}$$

From 3.25, the long-run equilibrium relationship between Y and X can result by subtracting Y_{t-1} from both side and following transformation process, an ECM representation model could be formed as follows:

$$\Delta Y_{it} = \delta - (1-\phi) Y_{it-1} + \gamma_0 \Delta X_{it} + (\gamma_0 + \gamma_1) X_{it-1} + \varepsilon_{it}$$

or

$$\Delta Y_{it} = \phi_0 \Delta X_{it} - (1-\phi)[Y_{it-1} - \alpha - \beta X_{it-1}] + \varepsilon_{it} \tag{3.26}$$

α and β are the long run equilibrium multipliers of a unit change in Xt. It connotes that the change in *Yt* responds to current change in *Xt* plus an error correction term, and $(1-\phi)$ is the adjustment parameter that determines the speed of adjustment, the current error in achieving long run equilibrium. In this study, the ECM is extracted from the fully modified ordinary least square (FMOLS), and incorporated into autoregressive distributive lag model (ARDL) or Bound testing framework as fully explained below. From 3.24-3.26 above, the actual variable specification is presented in log form below:

$$\begin{aligned} \Delta Cbi_{it} = {} & C_0 + C_1 \Delta Cbi_{it-1} + C_2 \Delta Irs_{it-1} + C_3 \Delta Sbi_{it-1} + C_4 \Delta Svr_{it-1} + C_5 \Delta Pdr_{it-1} + C_6 \Delta Iqx_{it-1} \\ & + C_7 \Delta Rpi_{it-1} + C_8 Cbi_{it-1} + C_9 Irs_{it-1} + C_{10} Sbi_{it-1} + C_{11} Svr_{it-1} + C_{12} Pdr_{it-1} + C_{13} Iqx_{it-1} + C_{14} Rpi_{it-1} + \varepsilon_{it} \end{aligned} \tag{3.27}$$

more formally, including the ECM term:

$$\Delta Cbi_{it} = \beta_0 + \sum_{j=1}^{P} \theta_{ij} \Delta Cbi_{it-j} + \sum_{j=1}^{P} \delta_{ij} \Delta Irs_{1t-j} + \sum_{j=1}^{P} \varphi_{ij} \Delta Sbi_{2t-j} + \ldots + \xi z_{t-1} + \varepsilon_{it} \quad (3.28)$$

Augmented ARDL Regression Procedure for model 1

The augmented Autoregressive Distributed Lag (AARDL) regression procedure adopted for model 1 is as follows: First, the Researcherran the FMOLS and obtained the residual. Furthermore, the residuals was tested for serial correlation i.e. Lagrange multiplier (LM) test. Moreover, co-integration test was carried out, to ensure that the variables have long run bound (Pesaran, Shin and Smith, 2001) which has recently been severally adopted in many empirical research, due to its obvious advantage over conventional techniques, largely promoted in Eagle and Granger (1987), Johansen (1991), Johansen (1988) and Johansen and Juselius (1990) co-integration methodologies. Here, the null hypothesis of no co-integration relationship defined as follows: $H_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0$; tested against the alternative $H_1 = \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq 0$, of co-integration relationship.

The Wald joint significance test (F-statistics) in then applied. Where the result falls below the lower critical threshold, the null hypothesis of 'no long run co-integration' holds, while if it lies above the upper limit the study rejects the null hypothesis; if however the test result lie within the upper and lower limits an 'inconclusive result' suffices (Pesaran *et al.,* 2001). In this last circumstance, unit root test in undertaken as of necessity.

Thereafter, the equation was lagged and brought into the ARDL framework. Then, the ARDL becomes an amended ECM-ARDL. In summary, by bringing in the residual into the ARDL, it becomes an augmented ARDL. The other merits of ARDL include limited restrictions, such as not necessary to carry out pretesting of level integration of each of the variables in the model as either I(0) or I(1). Additionally, it has a robust hedge for detecting long run relationship for variables with small samples (Goh and Wong, 2014) relative to Johansen and Juselius (1990) co-integration test (Pesaran and Shin, 1997).

3.3 Pre-estimation Data Test Specification

i. Panel unit root test

In view of increasing idea that cross sectional information potently influences the behavior of variables, it is a more crucial issue to consider when analyzing heterogeneous variables in a panel circumstance. Thus, Pesaran and Smith (1995) stress that for a heterogeneous dynamic panel the order of stationarity of the variables is crucial to avoiding misleading or bias outcome. This study adopts the Im, Pesaran, and Shin (2003) due to its generalization of Levin, Lin, and Chu (2002), specifically allowing for heterogeneous coefficient in y_{it-1}. Also, the model proposes alternative testing procedure by applying averaging of the individual ADF unit roots test statistics when the *Uit* is found to be serially correlated across sectional units (Baltagi, (2008). The ADF model for each regression is stated as follows:

$$\Delta y_{it} = \rho_i y_{i,t-1} + \sum_{L=1}^{Pi} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mt} + \varepsilon_{it}, \qquad m = 1, 2, 3 \tag{3.29}$$

Where: d_{mt} stands for the vectors of deterministic variables, while α_{mi} stands for the corresponding vector of coefficients for model 1, 2, 3; P_i is lag order across equations. In all cases the null hypothesis is that the time series for respective countries have unit root as follows,

$$H_0 : \rho_i = 0 \forall_i \tag{3.30}$$

While the alternative hypothesis allows some (not all series) of the countries to have unit roots as follows:

$$H_1 : \begin{cases} \rho_i < 0 \, for \;\; i = 1, 2, ..., N_1 \\ \rho_i = 0 \, for \, i = N_1 + 1, ..., N \end{cases} \tag{3.31}$$

The IPS t- statistics sample mean for panel unit root test is:

$$\bar{t} = (1/n) \sum_{i=1}^{n} t_i \tag{3.32}$$

ii. Regression specification error test (RESET)

To avoid issues of omitted variable bias and wrong functional form, the model will be subjected to regression specification error test (RESET). The hypothesis is that:

H_0 = the model is not mis-specified (3.33)

RESET is a Wald (F-statistics) test such that if δ_1 is coefficient of additional variable tested then H_0: $\delta_1 = 0$

Wooldridge (2006), Baum (2006) however argues that RESET is more reliable as a functional relation form test than for omitted variable bias or test of heteroskedasticity.

Panel Cointegration test

Substantial testing for co-integration in a dynamic panel data setting often concentrate on testing for the unit root of the residual of the panel co-integrating regression (Verbeek, 2004). As presented in Baltagi (2008), Kao (1999) proposes an augmented Dickey Fuller (ADF) test that is residual based, such that in a bivariate panel regression model:

$$y_{it} = x'_{it}\beta + z'_{it}\gamma + e_{it} \tag{3.34}$$

where y_{it} and x_{it} are $I(1)$ and no co-integrated, the ADF unit root test for e_{it} could be run in the following regression:

$$\hat{e}_{i,t} = \rho \hat{e}_{i,t-1} + \sum_{j=1}^{p} \vartheta_j \Delta \hat{e}_{i,t-j} + \nu_{i,t\,p} \tag{3.35}$$

as usual, the *Ho* = no co-integration, with the test statistics presented as constructed in Baltagi (2008). It suffice to stress that co-integration is a 'necessary and sufficient' (preliminary testing) condition for granger causality, for if two or more time series are co-integrated, there must at least be a unidirectional causality between them, however the converse is not true.

Pedroni (2000) panel co-integration specification assumes high incidence of heterogeneity and trend among cross-sectional units as regressors, as well as heterogeneity in cross section unit errors. The model is specified as follows:

$$Y_{i,t} = \varphi_i + \phi_t + \sum_{m=1}^{M} \beta_{mi} X_{mi,t} + \varepsilon_{i,t} \tag{3.36}$$

Where m=1, 2,..., M, represents multiple across different regressors in the panel. The H_0 = no co-integration, while seven test statistics thereof for the verifications are specified in the literature (Asteriou and Hall, 2011).

Granger Causality

Granger (1969; 1986) developed a VAR model that expresses both unidirectional and bi-directional feedback relationship between two variables Y_t and X_t estimated as follows:

$$Y_t = \alpha_1 + \sum_{i=1}^{n} \beta_i X_{t-i} + \sum_{i=1}^{m} \gamma_i Y_{t-i} + e_{1t} \tag{3.37}$$

$$X_t = \alpha_2 + \sum_{i=1}^{n} \theta_i X_{t-i} + \sum_{i=1}^{m} \delta_i Y_{t-i} + e_{.2t} \tag{3.38}$$

where e_{yt} and e_{xt} are uncorrelated white noise error terms, the direction of causality could results in any of four causes: a bidirectional causality and a unidirectional pairwise causality. A relationship between the unit root test and granger causality suggested by Engle and Granger (1987) is that should the variables be *I* (1) at least one of the three directions of causalities in the granger causality test is possible.

To test this hypothesis, the study adopts the normal Wald F- statistic on coefficient restriction as follows:

$$F = \frac{RSS_R - RSS_U / m}{RSS_U / n - k} \tag{3.39}$$

Which follows the $F_{m,n-k}$ distribution and K = m+n+1. Should the computed F value exceed the F-critical value, the null hypothesis is rejected and concludes that X_t cause Y_t. Rss_u and Rss_R represents sum of squared residual from the unrestricted and restricted equations respectively.

3.4 Post-estimation Diagnostics Test Specifications

1. Normality of the Residual: Normality of the residual of the sampled data is an essential test to establish the genuineness of the models. Its violation would provide that the inferential statistics: *t*-stats, *F*-stats, etc, are not valid. The second, third, and fourth moments of the distribution should first be computed:

$$\mu_{it_2} = \frac{\sum \hat{\mu}_{it}^{\,2}}{n}; \mu_{it3} = \frac{\sum \hat{\mu}_{it}^{\,3}}{n}; \mu_{it4} = \frac{\sum \hat{\mu}_{it}^{\,4}}{n} \tag{3.40}$$

The Jarque-Bera (*JB)* test statistics combines the skewness (*S*) and kurtosis *(K*) as follows:

$$JB = n\left[\frac{\mu_{it3}^{\,2}}{6} + \frac{\left(\mu_{it4} - 3\right)^2}{24}\right] \tag{3.41}$$

Given that the sample size is sufficiently large, should the true distribution be symmetric, then, the *JB* normality test is a joint hypothesis that *S*= 0, and *K*= 3. Thus, the value of the *JB* statistics is expected to be 0 (Gujarati and Porter, 2009), having chi-square distribution with 2 degree of freedom.

2. Panel Homoskedastic standard error test: As a cross sectional study over time for African countries, the regression point estimator should produce estimated residuals useful for inference on the distribution of the residual**.** Cross sectional datasets can exhibit disturbance variances that respond to some measures of scale (Baum, 2006) among observations. Test for heteroskedasticity on the regression residual between units is carried out, with the null hypothesis of homoskedasticity (identically distributed stochastic errors terms) across observations as follows:

$$H_0 : \text{var}[u_{it} \mid \text{X}] = \sigma_u^2 \tag{3.42}$$

3. Panel Serial correlation Test: Test for independently distributed stochastic errors overtime among the series is tested using the serial correlation of the regression residual, with the first-order Markov process, autoregressive (AR)(1) model as follows:

$$u_{it} = \rho u_{i,t-1} + v_{it}, \quad |\rho| < 1 \tag{3.43}$$

The v_{it} are the uncorrelated random variables with zero mean and constant variance. The null hypothesis is disturbance process u is stationary with finite variance. This condition requires the restriction $|\rho|<1$ strictly imposed.

4. Panel Stability (CUSUM) Test: This study carried out multivariate cumulative sum (CUSUM) test on the stability of the panel data analysis model. Brown, Durbin, and Evans, (1975) initiated the now popular univariate CUSUM test, and sooner the panel data version was extended by Han and Park (1989) which seeks to test the constancy of subsets of the coefficients, bearing any assumption imposed on the others. Thus, irrespective of the theoretical argument of the functional form, it is important that the parameters are consistent in both the sample and forecast periods. A null hypothesis would be tested that the cumulative sum of recursive residual or the parameters are stable over the sample interval and would be stable for the forecast period at the limit of 5 per cent band.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

In this chapter, the study presents the base line unit root test results, the pre-regression summary statistics and the associated correlation analysis results. Thereafter, the main empirical regression results are presented. For hypothesis one, the study used the fully modified ordinary least square (FMOLS) in an augmented autoregressive distributed lag (ARDL) framework. Toda-Yamamoto (1995) technique was augmented to test the rest four hypotheses (two, three, four and five) for the short run dynamic and long run (co-integration) results. The uniqueness of the unit roots of included variables partly inform the techniques used. To ensure that the regression results satisfy standards, some robustness checks performed are presented in the diagnostic sections.

4.1 The Unit Root Test

Within the context of heterogenous panel, and to avoid spurious regression output, the study uses three panel unit root processing techniques to determine the level of stationarity. That is, the study assumes the common unit root based statistics, the Levin, Lin and Chu (LLC); and the study also assumes individual or entity based unit root statistics- Im, Pesaran and Shin (IPS) and ADF-Fisher Chi-Square. A panel data unit root appears to be more complex than the time series due to complexity of heterogeneous feature in panel data. Therefore, this study places overriding priority on the IPS test for its superiority in handling heterogeneities among entity unit roots in panel (Asteriou and Hall, 2011). Presented in Table **4.1** below is the level of stationarity of the variables employed in the research study, whose measurement indicators are stated in Table **3.1**. The interest rate spread (*Irs),* financial deepening *(Fdp),* openness *(Opn),* institutional quality index (*Iqx)* and an interaction variable (*Inio)* of inflation *(Ifr)* expectation and openness *(Opn)* results reveal that they are level variables; Industrial output (*Io),*corporate bond issue (*Cbi),* electricity consumption *(Elc),* savings rate *(Svn),* real per capita income *(Rpi)*, and an interaction variable (*Intc)* of interest rate spread (*Irs)* and corporate bond issue *(Cbi)* are first difference variables; while sovereign bond issue (*Sbi),* corporate bond turnover *(Cbt),* technological development *(Tdv),* inflation rate *(Ifr)* and Bank competitiveness (*Bc)* are second difference

variables. The outcome of these tests influence to a large extent the type of estimation techniques employed in the analyses.

Table 4.1: Tests of variable's unit root

	Common unit root process assumed		Country unit root process assumed					Hypothesis
Variable	LLC test	Prob.	IPS test	Prob.	ADF-FCs	Prob.	Level of station.	
Io	-6.272	0.000****	-5.3576	0.000****	37.704	0.000****	1st diff.	2,3,4.
Cbi	-6.493	0.000****	-2.7895	0.003***	28.847	0.001****	1st diff.	1,2,3,4.
Irs	-23.58	0.000****	-4.4681	0.000****	40.690	0.000****	Level	1,2,3,5.
Elc	-5.457	0.000****	-1.8859	0.029**	22.135	0.014**	1st diff	3,4.
Sbi	-4.341	0.000****	-1.8673	0.030**	19.181	0.013**	2nd diff	1
Cbt	3.288	0.000****	-2.354	0.009***	21.906	0.005***	2nd diff	4
Fdp	-6.072	0.000****	-2.4606	0.007***	31.998	0.022**	Level	2,3.
Svn	-3.311	0.000****	-1.282	0.099*	18.984	0.040**	1st diff	1
Tdv	-3.474	0.000****	-1.337	0.090*	15.432	0.051**	2nd diff	2,3,4
Opn	-10.81	0.000****	-2.006	0.022**	33.470	0.015**	level	5
Pdr	-10.59	0.000****	-2.023	0.021**	34.600	0.011**	level	1,5
Ifr	-14.28	0.000****	-1.292	0.098*	17.664	0.061*	2nd diff.	5
Iqx	-8.592	0.000****	-2.356	0.009***	38.349	0.004****	Level	1,2,3,4
Rpi	-4.114	0.000****	-1.682	0.046**	20.049	0.028**	1st diff.	1,2,3,4
Bc	-11.02	0.000****	-3.192	0.000****	30.220	0.000****	2nd diff.	5
Intc	-9.442	0.000****	-3.864	0.000****	31.758	0.000****	1st diff.	3
Inio	-9.474	0.000****	-2.858	0.002****	41.853	0.001****	Level	5

Source: Field survey (2017) by the Researcher using E-view 9. *,**,***,**** indicates 0.1, 0.05, 0.01 and 0.001 levels of significance respectively.

4.2 Analysis of Results for Hypothesis one (1)

Interest rate structure does not significantly influence primary corporate bond market development: *CBI=f(Irs, Sbi, Svr, Pdr, Iqx, Rpi)*

4.2.1 Correlation Analysis

Correlation study establishes the preliminary course of associations among variables, whether positive or negative association exists among the set of variables. From the Table **4.2** below, it suggests that corporate bond issue (*Cbi*) is positively associated with interest rate spread (*Irs)*, sovereign bond issue *(Sbi)*, savings rate (*Svr)* and Institutional quality index (*Iqx)*, but negatively related to public debt ratio *(Pdr)* and real per capita income *(Rpi*). Interestingly, sovereign bond

issue *(Sbi)* is positively associated to interest rate spread *(Irs*) but at a less value unlike the *Cbi*. Thus, while the association between the *Cbi* and *Irs* is 17%, that of *Sbi* and *Irs* is 15% among the economies of study.

Public debt ratio (*Pdr*) has 31% negative link with the *Cbi*, which suggests that increases in public debt could be increasingly detrimental to corporate bond development in the African economies. The *Pdr* is also negatively linked with sovereign bond issue (*Sbi)* with 25%, which could also suggest that increase in public debts ratio does not encourage *Sbi*. However, the negative 16% link between *Pdr* and interest rate spread (*Irs*) counters the public finance and monetary theory thoughts that increase in public debt is a potential source of high interest rate in many developing economies.

Largely, the high valued 41% and 42% positive association between sovereign bond issue (*Sbi*) and saving rate (*Svr*) to corporate bond issue *(Cbi*) respectively generally underscore the corporate bond development theory. Institutional quality *(Iqx*) is about 27% and 39% positively linked with *Cbi* and *Rpi* respectively. This result suggests the weight of quality institution required in the development of corporate bond and improvement of living standards among African economies.

Table 4.2: Correlation test for hypothesis one (1)

	CBI	IRS	SBI	SVR	PDR	IQX	RPI
CBI	1.000000						
IRS	0.173081	1.000000					
SBI	0.412965	0.152935	1.000000				
SVR	0.427636	0.146055	0.420679	1.000000			
PDR	-0.312445	-0.165108	-0.255320	-0.206816	1.000000		
IQX	0.268929	0.067609	0.125014	0.200858	0.075965	1.000000	
RPI	-0.066380	-0.344915	0.049711	0.094585	0.189833	0.390583	1.000000

Source: Field survey (2017) by the Researcher using E-view 9

4.2.2 Optimal Lag Length

The optimal information lag length criteria set in Table **4.3** below suggests level conflict between lag 1 and lag 4. While the Akaike information criterion (AIC) and the Final Prediction error (FPE) suggest 4 lag lengths, the Schwartz information criterion (SIC) and the Hannan-Quinn (HQ) suggest 1 lag. Following insufficient number of observations, the study employs the SIC and HQ criteria as the preferred choice, that is lag 1.

Table 4.3: Optimum lag length selection process for variables in Hypothesis one (1)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−342.9086	N.A.	0.311071	15.85948	16.10278	15.94971
1	−129.6490	358.6639	0.000100	7.802226	9.505316*	8.433813*
2	−92.96625	51.68928*	0.000107	7.771193	10.93407	8.944142
3	−49.37260	49.53824	9.73e-05	7.426027	12.04871	9.140337
4	−0.144851	42.51487	9.30e-05*	6.824766*	12.90723	9.080427

Source: Field survey (2017) by the Researcher using Eview 9: where LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion. * denotes lag order selected by the criterion.

4.2.3 Short and Long Run Dynamic Effects

The second hypothesis's parametric short and long run regression result is addressed with the use of an augmented autoregressive distributed lag (ARDL) (that is, of order p+m) estimation technique, where p is optimal lag length, that is one, and m is the highest integration order, that is two. However, the variable that is integrated at order two, *Sbi* is dropped from the ECM-ARDL test in compliance with Pesaran *et al*. (2001) theoretical standard and methodology. The result is presented in Table **4.4** below. The short run dynamics interaction is rightly signed by the negative error correction mechanism (ECM) (-1.009), and it is significant at 1 per cent. It reveals that the explanatory variables jointly influence the dependent variable, and the annual speed of adjustment to long run equilibrium is slightly about 100 per cent. Relatively, Rao and Singh (2005) find negative 1.114 (-111.4 per cent) as the speed of adjustment process to equilibrium in a study on the demand for money in Fiji from 1970-2002. Moreover, Nasiru and Usman (2013) apply the ARDL methodology on the relationship between savings and investment in Nigeria,

and the paper find -1.107 (-110.7 per cent) as the speed of adjustment to equilibrium state, at significance of 1per cent.

The long run results are addressed through individual explanatory variables. Dynamic Interest rate spread (*Irs)* in line with *apriori* negatively influences corporate bond issues in the region, which implies that a one per cent increase in interest rate spread would reduce corporate bond issue by about 167 per cent and 50 per cent for lags 1 and 2 respectively. However, the outcomes are insignificant, probably due to data limitation. This result is justified in the 'group interest' theory, and allies with the findings of Tendulkar (2015). Tendulkar (2015) adopts correlation analysis and panel fixed regression technique to study interest rate spread (*Irs*) and corporate bond market in 62 developed and emerging economies between 2004-2013, with an outcome that interest rate spread negatively affects the bond market development.

Other complementary outcomes from the dynamic relationship meet *apriori* requirements, such that a one period lag corporate bond issue *(Cbi)*, saving rate *(Svr*) and institutional quality (*Iqx)* positively effects immediate corporate bond issue (*Cbi)* in the region by 94 per cent, 273 per cent and 77 per cent respectively.

The outcome of the diagnostic results by the significance of the F-statistics and Chi square statistics at 1 per cent reasonably suggest that the explanatory variables determine the dependent variable. The R-square result is 58 per cent, which also suggest that the model is fitted. The overall Wald test, by the F-statistics and Chi-square statistics produce significant outcomes at 1 per cent. The outcome of other diagnostic tests results are presented below.

Table 4.4: FMOLS Residual based ECM-ARDL: Short & Long Run Results

Dependent Variable: CBI				
Explanatory variables	Coefficient	Std.error	T. stat.	P. value
ECM(-1)	-1.0094	0.3286	-3.0717	0.0036***
IRS(-1)	-1.6718	7.6005	-0.2199	0.8269
CBI(-1)	0.9366	0.2982	3.1409	0.0029***
SVR(-1)	2.7318	3.8138	0.7162	0.4774
PDR(-1)	9.5678	3.6822	2.5983	0.0125**
IQX(-1)	0.7732	1.2758	0.6060	0.5414
RPI(-1)	-0.0003	0.0002	-2.0543	0.0457*
IRS(-2)	-0.5000	7.5451	-0.0662	0.9474
CBI(-2)	-0.0775	0.1544	-0.5020	0.6180
SVR(-2)	-1.6071	3.0209	-0.5319	0.5973
PDR(-2)	-9.2058	3.5764	-2.5740	0.0133**
IQX(-2)	-0.8328	1.2785	-0.6514	0.5180
RPI(-2)	0.0002	0.0002	0.9411	0.3516
ALL(WALD) Test				
F. Stat.	4.52078			0.0011***
χ^2 stat.	17.12468			0.0001***
DIAGNOSTICS				
R^2 =	0.5846			

Source: Field survey (2017) by the Researcher using E-view 9. *, ** & *** denote 0.05, 0.01, 0.001 levels of significance respectively.

4.2.4 Diagnostics Tests for Hypothesis one (1)

1. Pesaran Co-integration test for hypothesis 1: Presented in Table **4.5** below is the result of the co-integration test. At 5 per cent level of significance the computed statistics of 3.05 lies between the upper bound of 3.61 and lower bound of 2.46, indicating that neither is the null hypothesis of 'no co-integration' be rejected nor fail to reject, hence the result reveals inconclusive.

Table 4.5: Co-integration test table

BOUNDS TEST RESULT		
COMPUTED F-Stat. (k =6) , df (6,55), Prob. (0.0118)	3.05*	
Pesaran critical value @ 5 per cent level:	lower	upper
critical statistics	2.45	3.61

Source: Field survey (2017) by the Researcher using E-view 9. Critical value is from Pesaran, Shin and Smith (2001) under condition of unrestricted intercept and no trend. * indicates inconclusive result. Critical values for 1 and 10 per cents are 2.12-3.23 and 3.15-4.43 respectively

2. Serial Correlation LM test: The Serial correlation LM test presented below in Table **4.6** suggests that we fail to reject the hypothesis that there is no serial correlation among the series, given 49 degree of freedom, it helps to conclude that there is no serial correlation among the residuals.

Table 4.6: Serial Correlation Test

Lag	*LM-Stat.*	χ^2 D.F	*Probability*
1	58.31717	49	0.1701

Source: Field survey (2017) by the Researcher using E-view 9

3. Model Stability Test: This test examine whether the model is stable. In Figure **4.1** below evidence of the locations of the unit root within the unit root circle indicates that we fail to reject the hypothesis that the model is stable overtime.

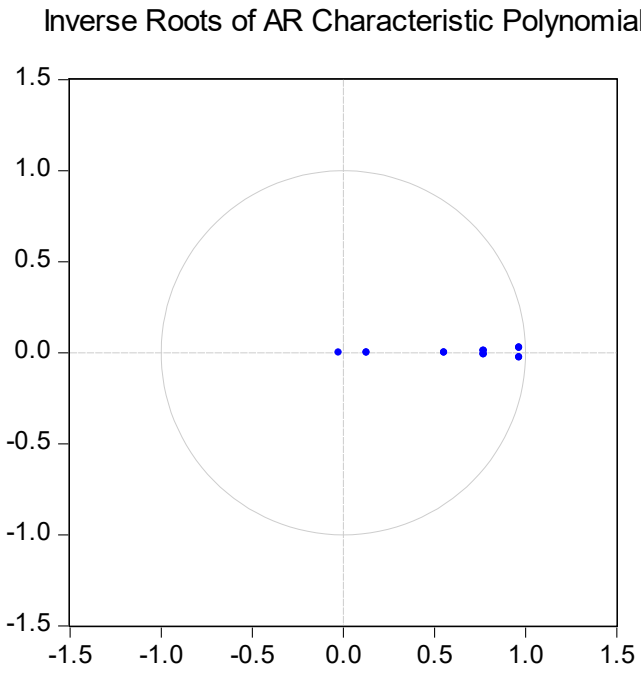


Figure 4.1: Model stability test for hypothesis one (1)**.**

Source: Field survey (2017). Extract by the Researcher from E-view 9

4. Residual test for Cross Section Serial Correlation

The four residual cross section dependency (correlation) tests whose results are presented in Table **4.7** below suggest absence of serial correlation across cross sectional unit, as the probability value is above the 5% threshold. Since the null hypothesis tests 'no cross sectional dependency (correlation)', it indicate that we fail to reject the null hypothesis that the cross sections are independent.

Table 4.7: Cross-section serial correlation

Test	Statistics	d.f.	P.value
Breusch-Pagan LM	43.15326	36	0.1921
Pesaran scaled LM	-0.217641		0.8277
Bias-corrected scaled LM	-0.780141		0.4353
Pesaran CD	0.226660		0.8207

Source: Field survey (2017) by the Researcher using E-view 9

4.3 Analysis of Results for Hypotheses two (2) and three (3)

Hypothesis 2**:** There is no significant relationship between long-run interest rate spread and industrial output growth: *IO=f(Irs, Cbi, Tdv, Iqx, Fdp, Rpi)*

Hypothesis 3**:** There is no significant relationship between primary corporate bond market development and industrial output growth in selected African economies: *IO=f(Cbi, Irs, Intc, Elc, Tdv, Iqx, Fdp, Rpi)* and

4.3.1 Summary Statistics of variables in hypotheses two (2) and three (3)

The summary statistics of the variables in this study, presented in Table **4.8** below, is an attempt to provide basic information of the performance, behavior and trend of the data through time and space. Valuable information such as the mean, median, maximum, and standard deviation scores are produced. Additional information such as the skewness and kurtosis through which the Jarque-Bera statistics is produced are stated. Finally the total sum of each variable, the sum of square deviations and the numbers of observations are outputs of the process. Industrial output (*Io*) ratio has the highest value achieved in 2011 in Ghana with 41 per cent, while the lowest industrial output value was achieved in Botswana in 2009 with negative 27 per cent. Corporate bond issue (*Cbi*) has the highest issue of $4.5173bn in Botswana in 2008, while the lowest issue of $0.2623bn was made in South Africa and Tunisia 2004 and 2012 respectively. Interest rate spread (*Irs*) has the highest value recorded in Mauritius in 2005 with 13.8 per cent, while the lowest spread occurred in Mauritius with 0.5 per cent in 2010.

The interaction variable (that is, the effect of corporate bond issue as modified by interest rate spread) has its highest value of 0.3568 recorded in Botswana in 2008, while the lowest value of -

0.2647 achieved in Mauritius in 2006. Electricity consumption (*Elc*) has its highest value recorded in South Africa in 2007 with 4,903.905 Kwh per capita, while the lowest was recorded in Tanzania in 2013 with 89.478 Kwh per capita. Education expenditure as per cent of total government expenditure, a proxy for technological development (*Tdv*) has its highest amount of 37.7 per cent in Ghana in 2012, while the lowest value of 6.3 per cent is recorded in Nigeria in 2007. The highest institutional regulatory quality index (*Iqx*) value of 0.96 was achieved in Mauritius in 2012, while Nigeria achieved the lowest value of -1.63 in 2004. Finally, the real per capita income (*Rpi*) has the highest value of $7,328.5 in Morocco in 2012, while the lowest value of $11.5 was achieved by Ghana in 2006.

Table 4.8: Summary statistics of studied variables in hypotheses two (2) and three (3).

	IO	CBI	IRS	INTC	ELC	TDV	IQX	FDP	RPI
Mean	0.0325	-0.113	0.0457	0.0051	1305.30	0.0527	-0.2013	0.1553	994.67
Median	0.0375	0.0000	0.0455	0.0000	1200.13	0.0000	-0.1180	0.1245	596.53
Max.	0.416	4.5173	0.3118	0.3568	4904.90	0.3770	0.9600	0.6490	7328.5
Mini.	-0.270	-5.521	0.0050	-0.2647	89.4780	0.0000	-1.6300	-0.0130	11.500
St.Dev.	0.0695	1.641	0.0367	0.1001	1324.73	0.0763	0.6703	0.1205	1346.5
Skewn.	0.7621	0.2111	0.4025	0.6502	1.4782	0.8993	-0.3236	0.2903	2.8749
Kurto.	15.164	4.5486	2.3683	6.3270	4.5029	0.0379	2.0767	8.3435	12.1309
J.B	588.66	10.092	4.1003	49.979	48.083	16.301	4.9791	180.736	456.036
Prob.	0.0000	0.0064	0.1287	0.0000	0.0000	0.0002	0.0829	0.0000	0.0000
Sum	3.0551	-10.58	4.2980	0.4862	122698.7	4.9542	-18.927	14.6030	93499.2
S.S.D.	0.4491	250.36	0.1254	0.9330	1.63E+08	0.5414	44.3212	1.3516	1.69E+08
Obsev.	94	94	94	94	94	94	94	94	94

Source: Researcher's field survey (2017) with E-view 9; S.S.D. indicates sum square deviation.

4.3.2 Lag selection process for hypotheses two (2) and three (3)

Standard multivariate regression study requires that an optimal lag length of the variables be established to guide the limit of time dynamics fitted for the model. Using the All Information Criterion (AIC), Schwarz Information criterion (SIC), Hannan-Quinn Information criterion and final prediction error (FPE), lag 1 is the optimum lag length selected for the model. The lag length 1 appears as that in which the lowest value of majority of the techniques is achieved, as presented in Table **4.9** below.

Table 4.9: Optimum lag selection process for variables in Hypotheses two (2) and three (3)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−697.4455	NA	0.732960	25.23020	25.55570	25.35639
1	−321.9249	616.9267	2.05e-05*	14.71160*	17.96663*	15.97357*
2	−283.5397	50.72328	0.000117	16.23356	22.41812	18.63130
3	−178.5157	105.0240*	9.35e-05	15.37556	24.48964	18.90907

Source: Field survey (2017) by the Researcher using Eview 9: where LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion. * denotes lag order selected by the criterion.

4.3.3 Correlation Analysis: Correlation analysis provides a baseline evidence of the operating relationship that exists among the variables studied. In the hypotheses (2) two and three (3) presented in Table **4.10** below, the main dependent variable, Industrial output *(Io*) ratio positively correlates with corporate bond issue (*Cbi*), the interaction variable (*Intc)* (*Cbi*Irs*), institutional quality index (*Iqx*), and financial deepening (*Fdp*), while against *apriori* expectation, industrial output *(Io)* positively correlates with bank interest rate spread *(Irs*). Moreover, *Io* also relates negatively with electricity consumption (*Elc*), Technological development (*Tdv*), and real per capita income (*Rpi*). This result suggests that for industrial output to develop in the selected African economies, the real sector and associated industrial production variables should exhibit negative correlation with interest rate spread *(Irs)*. Problems of low electricity supply and low purchasing power are evident as they constitute adverse relationship to industrial output growth by 12% and 5% respectively.

In Africa, like other global regions, the quality of electricity production and consumption, and purchasing power are critical to industrial output growth, which also transmits to other incidences that affect human development such as inflation, unemployment and poverty. The 12 per cent negative correlation between electricity consumption (*Elc)* and industrial output *(Io*), and between real per capita income *(Rpi*) and industrial output *(Io)* at 5 per cent provide further evidence to the one per cent African industrial output contribution to world output growth through effort of South Africa, as earlier revealed in the stylised facts. A substantial amount of real per capita income is a necessary and sufficient condition for improvement in aggregate demand and a positive incentive to industrial investment, productivity and output. One of the

major features of African economies is the relatively low real income level of the increasing population. The crises of low real per capita income and associated low demand can naturally frustrate entrepreneurial zeal for investment risk taking in new plant and machinery, which transmits to reducing improvement in productivity that should recreate a circle of employment, leading to high income and cut short the vicious circle of poverty in the region. Limited demand due to low *Rpi*, apart from causing low supply of consumable products opens up the economy towards tendency for more extroversion and low foreign direct investments, as it indicates thin markets.

Moreover, the correlation study finds that Institutional regulatory quality (*Iqx*) positively correlates with the issue market *(Cbi)* by 26 per cent and the interaction variable (the *Cbi* and *Irs*) by 22 per cent. Improvement in regulations, especially the market driven regulations that most African economies now embrace may be having positive influence on the financial system particularly with the recent increase inflow of foreign portfolios, attracted by relative increases in interest rates in African economies. Moreover, the ease with which profits are remitted by investors is correlated with the regulatory governance initiatives that had developed on the strength of the political freedom in African economies.

Additionally, the correlation study finds that financial development (*Fdp*) is negatively associated with real per capita income (*Rpi*) in the region by 35 per cent; attributable to high borrowing costs of funds, ultimately transferred to the people by erosions in the peoples' disposable income, as evidenced in the usual high level of cost-push inflation in the region. Despite the investments in Millennium Development Goals (MDGs) and modest achievements thereof, inflation related finance cost in the region has been one of the highest in the world. Poor labour remunerations, and stagnant wages that are hardly indexed. A common feature in the region in rising inflation; any wage increase results in money illusion, as over 60 per cent of the people are living in either moderate or extreme poverty (less than $1.25 a day) (Knoop, 2013). It may provide further indication of the region's financial market imperfection, and may confirm the non-inclusiveness of the financial system in the region, as has been widely published in financial literature. It has been observed overtime in the literature and affirmed by the World Bank of the non-inclusive economic growth in the region (Demirgue-Kunt, Beck and Honohan, 2008; Knoop, 2013); correspondingly reason been that growth in financial development (money

supply relative to *Gdp*) is being repatriated, due to the high prevalence of capital flight by foreign multinationals in the region. In a wide spread market driven financial system, financial service is expected to serve a wider generality of the people, and positively improve aggregate demand and their real income.

The negative 15.4 per cent correlation between Institutional quality *(Iqx)* and Financial deepening *(Fdp),* and the negative 35.2 per cent correlation between *Fdp* and real per capita income (*Rpi)* raise-up for review wide range of issues that characterize the African economies and the peoples' poverty, as the World Bank emphases the concept of quality institutions as *prima-facie* for "finance for all" in poor countries. Factors such as rising inflation, unemployment and underemployment and corresponding rising population growth rate may also be phenomena linked to these lapses in *Iqx*-*Fdp* linkage, which hence weakens the economies' real per capita income. African economies' domestic financial system development (*i.e.* institutions, markets and instruments, and the people) may have been working less efficiently and less inclusiveness leading to adverse impact on majority of the peoples living standards (by exacerbating vicious circle of poverty) due to preponderance of weak legal and institutions; unstable, weak and untrustworthy currency; lack of lower priced transportation, communication and other public utility facilities, high information costs and uncompetitive banking markets that would have deprived low credit costs and increases resource misallocation; domination of the credit system by the powerful few; high rate of corruption in public and private institutions; and many more. It has been revealed that small unintended consequences of actions and omission (externalities) often interacts, leading to high distortion that frustrate the development intention of capital and further impoverished the people (Todaro and Smith, 2011).

It may be necessary to reveal that the informal finance serves the greater majority of the people in Africa, hence proffering working solution to the under-developed financial system and non-inclusivity of finance would require revisiting the risks associated with formal financial development in the region (Knoop, 2013). Factors such as prevalence of weak institutions, poor macroeconomic environment and unstable policies, high inflation, high public debt, poor information system, and many others which this study reveals may be constraining the development of formal finance in the region, and hence merely restricts the formal finance to serving the governments and the few elites. The banks, the main organ of financial

intermediation in the region direct their energy towards short term government securities for investments, and virtually commit nothing to real sector credits, particularly to the struggling micro, small and medium scale manufacturing sectors.

Another interesting result is the negative correlation between *Cbi* and *Fdp* by 3 per cent, which indicate that corporate bonds has been of low contributory value added to financial deepening in Africa, in support of the observation of the World Economic Forum (2013a). Interest rate spread (*Irs*) is 34 per cent negatively correlated with real per capita income *(Rpi*), which suggest that the higher the rate of bank spread, the higher the erosion of the peoples income level, through poor reward for deposits and high interest on borrowing, putting forth higher poverty rate. The economics of credit reveals that higher bank interest spread has high welfare loss implication (Matthews and Thompson, 2014).

The 14 per cent negative link between technological development (*Tdv*) (proxy for human capital development) and Industrial output (*Io*) provides evidence for the low industrial output contribution of African economies to global industrial growth, which suggests that African economies might be inundated either with inappropriate education and skills which is unfitted for industrial development or the education system provide low quality skill unemployable for modern industrial output growth.

An additional high correlation result that the study produces is that 39 per cent positive correlation exists between institutional regulatory quality (*Iqx*) and real per capita income (*Rpi*). If there is improvement in *Rpi* due to *Iqx* (a combination of effective governance, regulatory quality, and rule of law) may indicate that improvements in the effectiveness of these *Iqx* variables impacting the peoples' living standards, chiefly as a result of improved democratization of African continent since 1990s, the threshold of this study. These economic institutions may have attracted more public exposure such that their effectiveness now positively impacts the peoples' lives.

Electricity consumption (*Elc*) is about 62 per cent positively correlated with technological development (*Tdv*), and about 61 per cent with Institutional regulatory quality (*Iqx*). The high symbiotic relationship is not unexpected, as the *Elc*-*Tdv* nexus suggest that electricity production and consumption can be developed through by deploying appropriate technology. Both variables

remain a development challenge to African growth trajectory. Electricity and technological development are quasi-public goods with high social benefit, thus requiring African government high public fund allocation and investments. As earlier presented African governments still have a long distance to cover to meeting the United Nations 26 per cent annual budgetary allocation to education. The *Elc-Iqx* nexus suggests that quality institutional regulation can help actualise improved electricity production and consumption, just as most developing countries intractable problems have been associated with institutions' failures (North, 1991)

It suffice to note that the correlation study for hypothesis two (2) on the relationship between interest rate and industrial output growth reveals positive outcome of 8 per cent. The correlation result is contrary to *apriori* expectation of negative relationship, which the regression result reveals below (see Tables **4.10** and **4.11)**.

Table 4.10 Correlation Test for hypotheses two (2) and three (3)

	IO	CBI	IRS	INTC	ELC	TDV	IQX	FDP	RPI
IO	1.0000								
CBI	0.0982	1.0000							
IRS	0.0834	0.1731	1.0000						
INTC	0.0681	0.8744	0.0021	1.0000					
ELC	-0.1181	0.2738	-0.1099	0.1723	1.0000				
TDV	-0.1392	-0.0505	-0.1519	-0.0627	0.6167	1.0000			
IQX	0.0185	0.2689	0.0676	0.2237	0.6087	0.2761	1.0000		
FDP	0.0532	-0.0332	0.2626	-0.0897	-0.2314	-0.1902	-0.1538	1.0000	
RPI	-0.0467	-0.0663	-0.3449	0.1011	0.1799	0.1694	0.3905	-0.3515	1.0000

Source: Field survey (2017) by the Researcher using E-view 9

4.3.4 The Short and Long run Dynamic Effects

This section of the research study adopts an augmented Toda-Yamamoto (ATY) technique to address the short and long run dynamic relationship among the nine variables in the model. Following the detail explanation of the development of the empirical method adopted in the last chapter, we set to provide the results of the multivariate interactions among the variables. Presented in Table **4.11** beow are the nine dynamic multivariate equation results, with mixed outcome: industrial output *(Io)*, corporate bond issue *(Cbi*), interest rate spread (*Irs*), interaction of interest rate spread and corporate bond issue (*Intc*), electricity consumption *(Elc)*, Human

capital development proxied by Technological development (*Tdv*), Institutional quality *(Iqx*), Financial deepening (*Fdp*) and Real per capita income *(Rpi*).

The *Io, Cbi, Irs, Intc, Tdv* and *Rpi* results produce the required standard negative short run coefficients, indicative of required speed of adjustment to equilibrium, which additionally reveals that there are short run influences flowing from the respective explanatory variables jointly impacting the dependent variables. Additionally, the results reveal reasonably that the models tend towards long run equilibrium stability. However, the *Elc, Iqx* and *Fdp* equations are positively signed, which suggests that the short run influences of the underlying explanatory variable do not converge to effect the respective dependent variables, and that the long run equilibrium or co-integration may not hold.

Table 4.11: Short Run (Dynamic) Causality Results hypotheses two (2) and three (3)

Dependent variable	Optimal Lag order of exp. variable	Coefficient: Short run residual	Std. error	Prob.	Outcome & Implication
IO	1	-0.313713	0.5059	0.568	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
CBI	1	-0.715874	1.2971	0.610	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
IRS	1	-0.835960	0.4857	0.160	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
INTC	1	-1.447166	1.1971	0.293	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
ELC	1	1.601382	0.9205	0.156	No convergence to equilibrium
TDV	1	-0.561938	0.7836	0.513	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
IQX	1	1.403986	0.4351	0.03*	No convergence to equilibrium
FDP	1	0.105378	0.2624	0.708	No convergence to equilibrium
RPI	1	-0.670318	0.5486	0.289	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium

Source: Researcher's field survey (2017) using E-view 9, * denote 0.05 level of significance

Long Run Causality Results

Presented in Table **4.12 (i)** below is the individual long run causality results meant to answer the demands of hypotheses two (2) and three (3). Corporate bond issue (*Cbi*) positively links industrial output *(Io)*, same as the interaction variable (*Cbi* and interest rate spread, *Irs*) links *Io,* albeit both statistically insignificant. The study therefore fails to reject the hypotheses that both variables do not significantly cause industrial output *(Io)* in the selected African economies.

One-way causality flows from Interest rate spread (*Irs)* to Industrial output *(Io)*, and from technological development *(Tdv*) to *Io*, and similarly from corporate bond issue (*Cbi*) to *Irs*. The uniqueness in the three results is the negative signs of their coefficients, and their significance at both 5 per cent and 10 per cent respectively. In the respective African economies, the result suggests that in the long term, a one per cent reduction in interest rate spread would generate 297 per cent increase in industrial output growth. Similarly, a one per cent increase in corporate bond issue *(Cbi*) could reduce interest rate spread *(Irs*) by about 1 per cent. The *Tdv* link to *Io* regression indicates that a one per cent change in amount budgeted on education results in relative reduction in industrial output by 63 per cent. The negative effect from *Tdv* to *Io* affirms the correlation results presented in the previous section of this chapter. It indicates that the quality of capital and recurrent expenditure on current human capital may not produce expected increase in capacity, hence a reduction in industrial output, perhaps due to poor allocation and uses of educational funds. This result may affirm that since the quality of the education system in many African economies have been in context; the output of the skilled labour across the region may have reduced the rate of change in industrial capacity by 63 per cent. This negative connection points to poorly skilled and unproductive educational institutions, unfit to produce the manpower with expected technical knowhow or to produce requisite skills for current and prospective industrial concerns, all attributable to poorly funded education system. An analysis of the funding ratio from the input data for the empirical output reveals that only South Africa and Botswana managed to achieve the United Nation's specified budget limit of 26 per cent in few years covered in this study.

Positive and significant bidirectional influence flows from institutional quality (*Iqx)* to the interaction variable (*Intc)* and *vice versa;* one-way directional flow from industrial output *(Io)* to *Iqx*; and from corporate bond issue *(Cbi*) to financial deepening *(Fdp*). Negative and significant

influence flows from Interest rate spread *(Irs)* to *Fdp*. In the former case, quality institutions *(Iqx)* can improve the interaction between corporate bond issue and interest rate spread towards reducing the spread, and a feedback effect from the issue market and interest rate management system can serve as incentives to help develop and achieve quality effective governance, social norms necessary for stability of institutions. It further implies that the mutual beneficial relationship between quality institutions and bond market can help to develop an effective financial intermediation via the bonds market. Industrial output *(Io)* growth can spur institutional regulatory performance, and by *apriori* corporate bond issue *(Cbi)* can increase the economies' financial deepening *(Fdp)* levels. This finding shows that *Cbi* can serve aside from the individual financial portfolio, it can boost the nation's financial system by broadening the financing base. In a similar study the Australian centre for financial studies (ACFS, 2014) finds that the Australian corporate bond has assisted in expanding individual investment portfolio, and the economy's financial system development.

In the latter case, that is interest rate spread (*Irs)* negative causal flow to financial deepening (*Fdp*) suggests that increase in *Irs* can encourage diseconomies of scale from the use of financial resources that reduces the African economies' *Fdp* growth rate, that is, the region's financial development. Besides, in bank bases African economies access to finance is being hindered by high lending interest rate, which constitutes the banking system's major source of profit.

The study finds that the interaction variable *(Intc)* (corporate bond market and interest rate spread) has significant positive influence on electricity consumption *(Elc)* by about 1,493 per cent. Moreover, the model finds that explanatory variables *(Io, Cbi, Irs, Intc, Iqx, Tdv, Fdp, and Rpi)* all have significant joint influence flow on electricity consumption *(Elc)* in the long run.

On *apriori,* electricity consumption *(Elc)* positively influences industrial output *(Io)* growth, albeit on low value coefficient, but insignificantly. The result however provides that against their negative correlation coefficient earlier stated, the regression result shows deeper connected outcome. The positive link of 0.0002 from electricity consumption to industrial output growth suggests low quality electricity inputs in the studied economies' industrial development effort. In all modern economies, the quality of electricity supply and consumption defines a country's industrial capacity level, which also transmits to employment potentials and other factor inputs, leading to improved standard of living of the people. It therefore provides anecdotal evidence of

the poor quality electricity consumption in contemporary times in many African economies and thus, the growing need for African economies to invest on electricity production and investment in alternative but sustainable power sources for the growing industrial consumption need.

Very germane and of landmark result is the negative long run flow of relationship between institutional quality *(Iqx)* and financial deepening (*Fdp)*. In line with extant and diverse empirical literatures the qualities of institutions determine to a large extent the performance of all development variables, as widely promoted by development institutions such as the World Bank, UNIDO, UNCTAD, *etc*. Institutions exemplified by the rule of law, effective governance, and regulatory quality is rather *apolitical* in many developing economies, hence may have been misapplied and underutilised, with negative consequence on critical development variables such as not deepening finance and low income per head.

Additional significant result from the model is that human capital development, proxied by technological development (*Tdv)* has a negative causal link with financial deepening *(Fdp)*. This result reinforces the *Tdv-Io* negative causal linkage discussed above. In reality, quality education that is properly funded is required for the development of needful entrepreneurial spirit in the modern graduate for global competitiveness in innovations and productivity. Upon that fit can such skillful innovator engineer financial development through product development.

Moreover, corporate bond issue (*Cbi)* has significant positive causal link to financial deepening (*Fdp),* indicative that financing through the market system can help enhance financial development. Bond market development gives easy access to long term capital sourcing for investment by long term focused real sectors, such as manufacturing and Agricultural and allied industries outfits.

Table 4.12 (i): Long Run Causality Result: Augmented Toda-Yamamoto Granger (Non-causality & co-integration) Approach

Null Hypothesis	Coefficient	Prob.	Causality flow/Co-integration	MWald test (p lag order) value/(prob.): χ^2 Stat. F-Stat.
IRS does not cause IO IO does not cause IRS	-2.9682 -0.0047	0.02** 0.93	IRS→IO	10.99(0.00)**** 5.49(0.07)*
TDV does not cause IO IO does not cause TDV	-0.6300 -0.0782	0.076* 0.7111	TDV→IO	5.79(0.05)** 2.89(0.16)
CBI does not cause IO IO does not cause CBI	0.0164 5.1474	0.4722 0.6385	No causality/ co-integration	1.10(0.57) 0.55(0.61)
INTC does not cause IO IO does not cause INTC	0.1195 0.3444	0.7839 0.5118	No causality/ co-integration	0.26 (0.87) 0.13(0.88) 4.22 (0.12) 2.11(0.23)
CBI does not cause IRS IRS does not cause CBI	-0.0105 5.6204	0.069* 0.8771	CBI→IRS	12.34(0.00)**** 6.17(0.05)**
TDV does not cause IRS IRS does not cause TDV	0.1790 0.3803	0.02** 0.5202	TDV→IRS	13.73(0.00)**** 6.86(0.05)**
IQX does not cause INTC INTC does not cause IQX	0.4145 -1.2426	0.093* 0.0617	IQX↔INTC	9.52(0.01)*** 4.76(0.08)* 19.16(0.00)**** 9.5(0.03)**
ELC does not cause IO IO does not cause ELC	0.0002 -386.6	0.423 0.180	No causality /co-integration	0.47(0.78) 0.23(0.79) 2.83(0.24) 1.42(0.34)
INTC does not cause ELC ELC does not cause INTC	1493.17 0.0002	0.03** 0.7230	INTC→ELC	14.88(0.00)**** 7.4(0.04)**
IRS does not cause IQX IQX does not cause IRS	-2.7286 0.0292	0.070* 0.2376	IRS→IQX	27.67(0.00)**** 13.8(0.02)**
IO does not cause IQX IQX does not cause IO	0.9894 0.1562	0.02** 0.1651	IO→IQX	27.81(0.00)**** 13.9(0.02)**
FDP does not cause IQX IQX does not cause FDP	-1.6476 -0.1055	0.00**** 0.1576	FDP→IQX	60.19(0.00)**** 30.1(0.00)*
TDV does not cause FDP FDP does not cause TDV	-0.5453 0.1479	0.044** 0.4440	TDV→FDP	12.21(0.00)**** 6.1(0.06)***
IRS does not cause FDP FDP does not cause IRS	-2.0074 -0.0592	0.031** 0.2500	IRS→FDP	28.26(0.00)**** 14.1(0.01)*
CBI does not cause FDP FDP does not cause CBI	0.0704 -11.3929	0.007*** 0.2694	CBI→FDP	25.74(0.00)**** 12.8(0.01)***

Source: Field survey (2017) by the Researcher using E-view 9; *,**,***,**** indicate 0.1, 0.05, 0.01 and 0.001 levels of significance respectively; → denotes one-way causality/co-integration; ↔ denotes two-way causality/co-integration. Probability values are in parenthesis.

Presented in Table **4.12(ii)** below is the overall (Wald) test for individual equations in the multivariate model. By adopting the chi-square statistic criterion, all the equations are statistically significant, other than the *Cbi* and *Rpi* equations. It provides overall long run evidence that the respective dependent variables are significantly determined by the explanatory

variables. For example, towards long term improvement in industrial output (*Io)* growth rate in the African region, the result suggests that the joint and contemporaneous influence of interest rate spread (*Irs),* the interaction variable *(Intc),* institutional quality *(Iqx),* electricity consumption *(Elc),* human capital development, a proxy for technological development *(Tdv),* and financial deepening *(Fdp)* would be of necessity.

Table 4.12(ii): Long Run Causality Result: Joint Statistics Modified Wald Test

Variables studied @ lag order P=1: Io, Cbi, Irs, Intc, Iqx, Elc, Tdv, Fdp, Rpi	χ^2 Stat.	F. Stat.	Prob.(χ^2 Stat.)	Prob.(F. Stat.)	Outcome :joint influence flow
Dependent variable: Io	30.3848	3.3761	0.0004***	0.1267	Yes
Dependent variable: Cbi	8.0107	0.8900	0.5331	0.5962	No
Dependent variable: Irs	38.4415	4.2713	0.0000***	0.0878*	Yes
Dependent variable: Intc	15.2231	1.6914	0.0850*	0.3223	Yes
Dependent variable: Elc	18.4086	2.0454	0.0307**	0.2556	Yes
Dependent variable: Tdv	18.6323	2.0702	0.0285**	0.2517	Yes
Dependent variable: Iqx	88.0361	9.7818	0.0000***	0.0211**	Yes
Dependent variable: Fdp	67.3325	7.4814	0.0000***	0.0341**	Yes
Dependent variable: Rpi	13.3463	1.4829	0.1476	0.3736	No

Source: Researcher's field survey (2017) using E-view 9; *, **,*** denotes 0.1, 0.05 and 0.001 levels of significance respectively

4.3.5 Diagnostic Tests for Hypotheses 2 and 3.

1. Co-integration test: The TY approach to long term granger causality approach suggests that co-integration among the variables must be established. We adopt the Kao (1999) residual co-integration test approach to determine the existence of co-integration. Presented in Table **4.13** below is the result which suggests that by the outcome of the three selection criteria we reject the hypothesis of no co-integration.

Table 4.13: Kao Residual Co-integration Test for hypotheses two (2) and three (3)

Selection	Observ.	Residual Var.	HAC Var.	ADF T-Stat.	Prob.
Bertlett Kernal	94	0.0081	0.0037	-4.1013	0.0000
Quadratic Spectral	94	0.0081	0.0072	-3.1612	0.0008
Perzan Kernal	94	0.0082	0.0065	-2.8577	0.0021

Source: Field survey (2017) by the Researcher using E-view 9

2. Model stability test: With the variable points appearing within the unit circle in Figure **4.2** below, it suggests that the model is stable

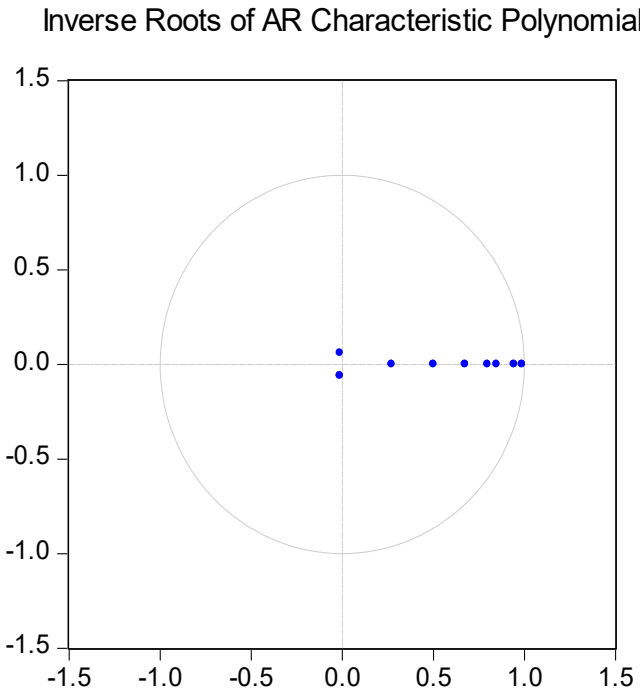


Figure 4.2: Model stability Test for hypotheses two (2) and three (3).

Source: Field survey (2017). Extract from E-view 9

3. Serial correlation test: The *LM* serial correlation test result provided in Table **4.14** below reveals that we fail to reject the null hypothesis that there is no serial correlation in the model as the probability is above 5% threshold.

Table 4.14: The VAR residual serial correlation LM test

Lag	Observation	*LM-Stat.*	*Probability*
1	81	92.94788	0.1716

Source: Researcher's field survey (2017) using E-view 9. Probs. from chi-square with 81df

We fail to reject the null hypothesis, which suggest that the model is free from serial autocorrelation at the specified optimal lag order P=1.

4.4. Analysis of Results for Hypothesis four (4)

There is no significant relationship between the secondary corporate bond market and industrial output growth: *IO= f(Cbt, Elc, Tdv, Iqx, Rpi, Cbi)*

4.4.1 Correlation Analysis

The objective of this hypothesis is to establish if any relationship can be drawn from the rate of corporate bond turnover in the secondary market and industrial output growth. When corporate bond are traded, and increasingly marketable, it is expected that it is a plus to the corporate finance development of the issuer, which could be attracted to raise more capital to increase production and expansion. From Table **4.15** below corporate bond turnover (*Cbt*) is negatively correlated with industrial output (*Io)* and growth by 12%. In line with *apriori Cbt* is positively correlated with corporate bond issue (*Cbi)* and real per capita income (*Rpi)* by 5% and 14% respectively. It implies that as expected, though at a low per centage, corporate bond turnover spurs new corporate issue in the respective economies. Additionally, investing in corporate bond as a risk hedging device is evident in the 14 % positive correlation between the *Cbt* and *Rpi*.

Institutions regulatory quality *(Iqx)* has positive correlation with corporate bond turnover *(Cbt)* but at low rate of about 3%. The outcome suggests that institutions that inspire capital market development such as the capital market regulators and the allied institutions like the legal and judicial institutions need to encourage investors and establish more opportunities for improved secondary market trading.

Table 4.15: Correlation for hypothesis four (4)

	IO	CBT	ELC	TDV	IQX	RPI	CBI
IO	1.0000						
CBT	-0.1249	1.0000					
ELC	-0.1181	0.1367	1.0000				
TDV	-0.1392	-0.1008	0.6167	1.0000			
IQX	0.0185	0.0287	0.6087	0.2761	1.0000		
RPI	-0.0467	0.1413	0.1799	0.1694	0.3905	1.0000	
CBI	0.0982	0.0547	0.2738	-0.0505	0.2689	-0.0663	1.0000

Source: Field survey (2017) by the Researcher using E-view 9

4.4.2 Optimal Lag Length Selection

Lag length selected for the set of variables is based on the criteria chosen by majority of the tests applied. In this case the combined test methods chose lag one as optima, as presented in Table **4.16** below**.**

Table 4.16: Optimum lag length selection process for variables in Hypothesis four (4)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1058.985	NA	80662542	38.07090	38.32407	38.16905
1	−737.0385	551.9086*	4776.374*	28.32280*	30.34815*	29.10803*
2	−719.2291	26.07799	15762.81	29.43675	33.32429	30.90905
3	−679.5752	48.15110	27387.53	29.77054	35.34026	31.92991

Source: Field survey (2017) by the Researcher using E-view 9: where LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion. * denotes lag order selected by the criterion.

4.4.3 Short and Long Run Effects

We adopt the augmented Toda-Yamamoto (ATY) technique to treat the hypothesis that seeks to establish if there is a link between the corporate bond secondary market and the industrial output growth rate in the short and long run in the selected African economies under study. There is a thought in the financial literature that the activities of the secondary market can ignite respective firms to raise more corporate bonds to upstate productivity. Stated in Table **4.17** below is the short term dynamic result for the multivariate model. The Industrial output*(Io*), the corporate bond turnover (*Cbt*), and the corporate bond issue (*Cbi)* equations have the standard negative short run coefficient, which indicate that the there are joint influence of explanatory variables that flows to the dependent variable, that the equations converge to equilibrium in the long term. However, electricity consumption (*Elc)*, human capital (technological) development (*Tdv)*, institutional quality index (*Iqx)* and real per capita income *(Rpi)* are not rightly signed, which suggest that the equations do not converge, and would be explosive in the long term.

Table 4.17: Short Run (Dynamic) Causality Results

Dependent variable	Optimal Lag order of explanatory variables	Coefficient: Short run residual	Std. error	Prob.	Outcome & Implication
IO	1	-0.485043	1.1036	0.669	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
CBT	1	-0.289274	0.8487	0.740	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
CBI	1	-0.107310	0.7991	0.896	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
ELC	1	1.055045	0.5196	0.07*	No convergence towards equilibrium
TDV	1	1.06498	0.3108	0.738	No convergence towards equilibrium
IQX	1	0.026527	0.5737	0.964	No convergence towards equilibrium
RPI	1	0.897472	0.5220	0.116	No convergence towards equilibrium

Source: Field survey (2017) by the Researcher using E-view 9. * indicates 0.1 level of significance**.**

Long Run Causality Results

On the individual variable long term causality relations (see Table **4.18 (i)** below), unidirectional causal flow suffice only from corporate bond turnover (*Cbt)* to institutional quality index *(Iqx)* which imply that increase in corporate bond turnover can positively improve institutional regulatory quality- the information role of the secondary market price theory (Bond, Edmans, and Goldstein, 2011). However, in line with the objective of the null hypothesis for this study, no significant relationship exist between corporate bond turnover (*Cbt*) and industrial output (*Io)* growth is upheld, as the *Cbt* do not influence Io in the long term. Additionally, the *Cbt* does not cause corporate bond issue (*Cbi)* in the long term. By this finding, it can be concluded that the information role of the secondary bond market influences institutional regulations only, while its role in spurring corporate issue, which indirectly should increase industrial output growth is not been felt.

Though contemporary findings of market liquidity impact on corporate issues in the bond market is scarce, nevertheless, few results exist in the equity market. The result is contrary to findings in the work of Hoschi *et al*. (1991), Demirguc-Kunt and Levine (1996b), Andriansyah and Messinis, (2014); and for bond market, Harrison (2002). Andriansyah and Messinis (2014) use dynamic panel regression technique to study the equity market in 54 OECD and non-OECD economies and find that the secondary market liquidity influences capital issues of firms from 1995-2010. Using two sets of industrial firms as case study, Hoschi *et al.* (1991) find that industrial investment is more sensitive to market liquidity in Japan. Harrison (2002) reveals that bond size is a function of market liquidity.

Table 4.18: (i) Long Run Causality Results: Augmented Toda-Yamamoto Granger (Non-causality & Cointegration) Approach.

Null Hypothesis	Coeff.	Prob.	Causality flow/cointegration	MWald test (p lag order) value/(prob.): χ^2 Stat. F-Stat.
CBT does not cause IO IO does not cause CBT	-0.0515 2.1945	0.1265 0.3910	No Causality/ cointegration	3.51(0.17) 1.75(0.22)
CBT does not cause CBI CBI does not cause CBT	-0.3149 -0.1119	0.3149 0.6291	No Causality/ cointegration	0.27(0.87) 0.14(0.87)
IQX does not cause CBT CBT does not cause IQX	-0.2110 0.0807	0.9034 0.0606*	CBT→IQX	6.81(0.03)**3.40(0.074)*

Source: Field survey (2017) by the Researcher using E-view 9; * & ** denote 0.1 and 0.05 levels of significance

The Wald test result presented in Table **4.18(ii)** above reveals that only the technological development (*Tdv*) equation is significant at 10 per cent, as the explanatory variables- *Io, Cbt, Cbi, Elc, Iqx* ,and *Rpi* jointly flow to determine the *Tdv* in the long run. This result reveals that primarily the long term development of the human capital in the African region may need the inputs of industrial output growth, corporate bond market development; improvement in electricity consumption, quality institutions and improved per capita income.

Table 4.18(ii): Long Run Causality Results: Joint Statistics Modified Wald Test

Variables studied @ lag order P=1: *Io, Cbt, Cbi, Elc, Tdv, Iqx, Rpi*	χ^2 Stat.	F. Stat.	Prob.(χ^2 Stat.)	Prob.(F. Stat.)	Outcome: joint influence flow
Dependent variable: Io	5.7377	0.81961	0.5707	0.5923	no
Dependent variable: Cbt	4.8694	0.6956	0.6759	0.6762	no
Dependent variable: Cbi	3.4721	0.4960	0.8382	0.8178	no
Dependent variable: Elc	3.9846	0.5692	0.7815	0.7660	no
Dependent variable: Tdv	13.5536	1.9363	0.0597*	0.1656	yes
Dependent variable: Iqx	9.0397	1.2914	0.2498	0.3446	no
Dependent variable: Rpt	9.5078	1.3583	0.2182	0.3188	no

Source: Field survey (2017) by the Researcher using E-view 9; * denotes 0.1 level of significance

4.4.4 Diagnostic tests for hypothesis four (4)

1. Cointegration test

The Kao residual approach produce result presented below in Table **4.19** which suggests that cointegration exists among the variables under study.

Table 4.19: Kao Residual Cointegration test for hypothesis four (4)

Selection	Observ.	Residual Var.	HAC Var.	ADF T-Stat.	Prob.
Bartlett Kernal	94	0.0084	0.0047	-1.6890	0.0456
Parzen Kernal	94	0.0084	0.0042	-1.2874	0.0990

Sources: Computed by the Researcher using E-view 9

2. Model variable stability test

An examination of Figure **4.3** below reveals that the variables under study are centrally located within the unit circle, which suggests absence of unit root, hence the condition for stability of the model is meant.

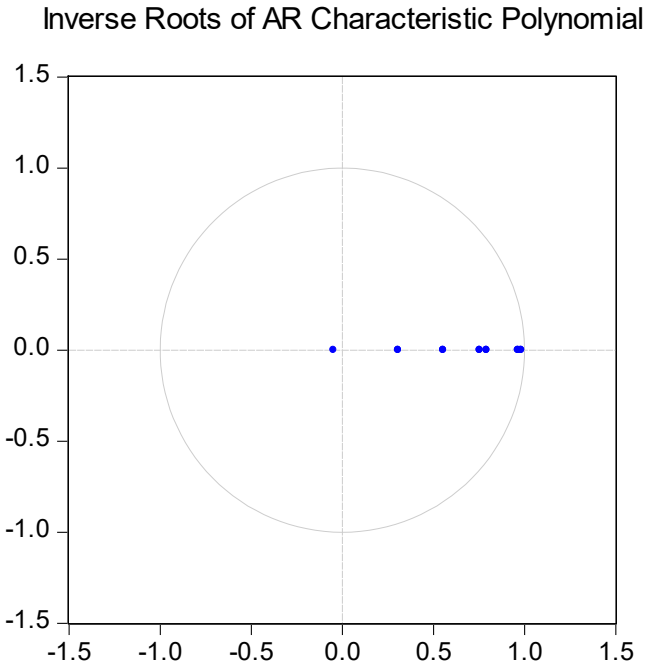


Figure 4.3: Model stability test for hypothesis four (4).

Source: Field survey (2017). Extract by the Researcher using E-view 9.

3. Test for serial correlation

The model's serial correlation test has its result presented in Table **4.20** below. As the probability result of 23.8 per cent is above the 5 per cent threshold, the result suggests that the study fails to reject the null hypothesis that the model is free of serial correlation among the residuals.

Table 4.20: VAR residual serial correlation LM test

Lag	*LM-Stat.*	*D.f*	*Probability*
1	55.66189	81	0.2384

Source: Field survey (2017) by the Researcher using E-view 9

4. Cross unit residual heteroscedasticity test

Presented in table **4.21** below is the cross unit heteroscedasticity test. The result suggests that the study rejects the null hypothesis which indicates that the residuals of the cross sections are heteroscedastic.

Table 4.21: VAR residual heteroscedasticity test

χ^2 Stat.	*D.f*	*Probability*
505.5921	392	0.0001

Source: Field survey (2017) by the Researcher using E-view 9

4.5 Analysis of results for hypothesis five (5)

There is no significant relationship between inflation expectation and interest rates spread in the selected African economies: *IRS = f(Ifr, Bc, Pdr, Opn)*

4.5.1 Summary statistics of variables in hypothesis five (5)

The descriptive statistics for this hypothesis is presented in Table **4.22** below. In the 1995-2014 periods under study, across the 13 economies, inflation rate is highest in Ghana in 2009 by 19.3 per cent while Morocco with 0.9 per cent rate is lowest rate in 2011. The highest bank competitiveness *(Bc)* value of 24.061 occurred in 2008 in Morocco, while the lowest bank competitive rating of 1.3 is recorded by Cameroon in 2009. Public debt rate *(Pdr)* data has its highest value of 0.8903 by Egypt in 2013 while Nigeria recorded the least value of 0.0745 in 2008. Openness (ratio of imports and export relative to gross national product) variable has its highest value in Mauritius in 2006 at 1.3, while the lowest of 0.31 is achieved by Nigeria in 2013.

Three (3) of the variables are normally distributed, that is interest rate spread, public debt rate and openness as we fail to reject the null hypotheses assumption of normally, since their per centage value is above 5 per cent threshold. The other two- band competitiveness and inflation rate are however not normal distributed, hence reject their null hypotheses of normality of the residual.

Table 4.22: Summary statistics of variables in hypothesis five (5)

	IRS	IFR	BC	PDR	OPN
Mean	0.045723	0.068564	9.585298	0.383340	0.785957
Median	0.045500	0.058500	7.501500	0.413900	0.745000
Maximum	0.318000	0.193000	24.06100	0.890300	1.310000
Minimum	0.050000	0.009000	1.300000	0.074500	0.310000
Std. Dev.	0.036731	0.043904	6.243405	0.196242	0.259654
Skewness	0.402484	0.712849	0.761170	0.442020	0.187356
Kurtosis	0.402484	0.712849	0.761170	0.224020	0.187356
Jarque-Bera	4.100364	7.961138	10.60398	2.056524	5.667613
Probability	0.128711	0.018675	0.004982	0.357628	0.058789
Sum	4.298000	6.445000	901.1080	36.13640	73.88000
Sum Sq. Dev.	0.125471	0.179261	3625.150	3.581530	6.270064
Observation	94	94	94	94	94

Source: Field survey (2017) by the Researcher using E-view 9

4.5.2 Correlation Analysis

The correlation result is presented in Table **4.23** below. In line with *apriori* expectations the interest rate spread (*Irs*) positively correlates with inflation rate (*Ifr)* by about 55 per cent, and negatively correlates with bank competitiveness (*Bc)* by about 26 per cent, and Openness (*Opn)* by 6 per cent in the thirteen studied economies. By the correlation coefficient, it implies that inflation expectation may be associated with increases in the lending risks of banks, and ultimately widens the interest rate spread. Additionally, increased bank competitiveness in the studied economies would reduce the level of interest rate spread, while increased openness of the economies would reduce *Irs*.

Bank competitiveness is negatively correlated with inflation rate by about 37 per cent, which imply that competitiveness can help to open the banking markets to varied players, instruments, products and technologies, particularly from advanced economies that may help reduce service cost leading to reduction in inflation.

However, among the principal variables tested, the negative correlation of public debt ratio (*Pdr*) to interest rate spread *(Irs)* by about 17 per cent and about 13 per cent to inflation negates *apriori* expectation.

Table 4.23: Correlation test for hypothesis five (5)

	IRS	IFR	BC	PDR	OPN
IRS	1.000000				
IFR	0.553893	1.000000			
BC	-0.258545	-0.369945	1.000000		
PDR	-0.165108	-0.129716	0.234560	1.000000	
OPN	-0.063875	-0.138733	0.662066	0.113503	1.000000

Source: Field survey (2017) by the Researcher using E-view 9

4.5.3 Optimal Lag Length

Presented in Table **4.24** below is optimal lag structure. The study chose lag one as the optimal lag for the analysis of the hypothesis being the length which the major tests settled for.

Table 4.24: Optimum lag length selection process for variables in Hypothesis five (5)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	93.72979	NA	2.89e-08	-3.168921	-2.988086	-3.098812
1	377.0019	505.8431*	2.89e-08*	-3.168921*	-2.988086*	-3.098812*
2	389.7848	20.54386	4.53e-12	-11.95660	-9.967414	-11.18540
3	407.4793	28.13502	5.79e-12	-11.76712	-8.873758	-10.64537

Source: Field survey (2017) by the Researcher using E-view 9

4.5.4 Short and Long Run Effects

The short and long term results are presented in Tables **4.25** and **4.26** below. In the short run, the interest rate spread *(Irs)* equation achieves the standard negative value, which reveals stability towards equilibrium. Specifically, 70 per cent of the *Irs* is explained by the indicated explanatory variables, and additionally, that the explanatories co-integrate with the dependent variable in the long term.

The inflation rate (*Ifr)* equation produces superior quality output. The coefficient is negative, its value is 99 per cent and it is significant at 1 per cent. The high rate of the speed of adjustment path to long term equilibrium (99 per cent) indicates that annually, any disequilibrium would be restored by 99 per cent. It thus appears that the explanatory variables largely determine the inflation rate in the region, and in the long run there is convergence. More so, the openness

(Opn) equation has negative coefficient which suggests that the explanatory variables determines the dependent variable, and that there is long term convergence.

The output of Bank competitiveness (*Bc)* and Public debt ratio (*Pdr*) equations produce positive coefficients. The results suggest, first, that the other explanatory variables in the model (*Irs, Ifr, and Opn)* may not determine the outcome of the respective dependent variables (in this case, *Bc* and *Pdr)*, and that they may be explosive in the short term.

Presented in Table **4.26(i)** below is the long term coefficient results and the corresponding Modified Wald (WWald) test result for the long run flow of causality between the individual variables tested. There is unidirectional positive causal flow from interest rate spread *(Irs)* to inflation expectation *(Ifr)* while the opposite flow does not hold, relative to *apriori* expectation of bidirectional relationship, or a less expectation is a positive flow from inflation to interest rate. At best, in line with domestic Fisher effect and Taylor rule, inflation expectation and output gap predict interest rate determination. However, the 43 per cent positive flow from interest rate spread to inflation negates the Wicksell process, that interest rate should negatively influence inflation expectation. The result thus informs that against the well-known extant inflation theoretical literature, inflation expectation is being fuelled by interest rate in the studied economies, or that the interest rate policy mechanism in the economies may be unfitting to the needs of their inflation dynamics. The long term MWald test- the Chi and F-statistics, are significant at one per cent, indicating that both variable have long term joint influence.

Additionally, there is significant unidirectional negative causal flow from public debt ratio *(Pdr)* to bank competitiveness *(Bc)*, which indicates that increases in public debt would reduce bank competitiveness. Unmanaged public debt stifles the monetary and financial systems, resulting in increased cost of private and commercial borrowing, hence reducing numbers of banks in lending business.

The result of the test from openness *(Opn)* to inflation expectation *(Ifr)* reveals positive causal relationship. On the other hand, inflation expectation negatively links openness, however insignificantly. The long term Chi square and F- statistics tests of *Opn* to *Ifr* are however significant, which suggests long term equilibrium. This study employs *Opn* as proxy for exchange rate, and thus suggests that, considering the interest rate – inflation conventional

relations (Fisher effect), the causation factors of inflation expectations in the African region is more of internal economies induced rather than external. Therefore, if African economies' internal scale economies factors are not exploited optimally, the dependence on external sources for her needs may exacerbate inflationary tendency. In other word, the long run positive relationship (equilibrium) flowing from openness to inflation expectation would depend on the competitiveness of the local economies. Where the economy is extrovert and the markets are weak (pro-imports), imported inflation would be transferred, and could worsen the respective economies. The negative causal influence of inflation expectation *(Ifr)* to openness (*Opn)* suggests that inflation could be unhelpful to an export promotion efforts of the region. The higher the inflation rate the more uncompetitive African exports relative to imports, with effects transmitted directly to worsen the respective economies current account, balance of payments, and exchange rate quality.

Further interesting result from this model is that bank competitiveness *(Bc)* and Interest rate spread *(Irs)* share negative relationship, with an equilibrium result that is significant in the long run by the respective Wald F-statistic and Chi-square tests. This indicates that in the Africa region, in the long run, bank competition (*Bc)* could assist to reduce *Irs* and *vis- versal,* and an inference from this result suggest that as the African banking market is more increasingly oligopolistic, coupled with the increasing influence of the 'group interest' of financial intermediation, the rate of bank competitiveness rate may be hampered. Bank competitiveness and low interest rate regime are the hallmark of virile market economy, which ought to be the promoted by monetary authorities. In markets where competition is stifled by whatever strategy, there is always extreme sensitivity of prices to supply shortage, and where supply is sensitive to production it constitutes source of inflation.

The monetary policy rate of the economy remains major influence of bank profitability; increased bank competitiveness can limit the freedom of bank control over lending interest rate, reduce concentrated banking practices and hence have the tendency of changing the 'structure-conduct-performance' (SCP) paradigms of the industry, capable of benefiting the national economy. Competitive banking produces innovativeness and 'real value' banking, and thus results in competitive product development, fair pricing of bank products, and fair returns to the

very competitive banker. For a bank based economy, increasing bank competitiveness has profound macroeconomic transforming impacts.

Interestingly also, as expected, the study finds public debt *(Pdr)* to have positive long term influence on inflation rate *(Ifr)* in the region. On a general note, government deficit budget, particularly when such spending is largely uneconomical, by not enhancing capital productivity, could accentuate inflation through aggregated demand and money supply processes. The implications of public debt and inflation nexus may be expansive, and has been attested to by large body of empirical literatures, which often conclude that inflation dynamism, hyper-inflation regime and financial instability are attributed to public debt development overtime in developing countries. Recently, Shirakawa (2015) opines that one of the positive revelations of the recent global financial crises is that public debt is associated with financial instability and drowns of the real sector.

Another interesting result is the positive causal flow from Public debt *(Pdr)* to Interest rate spread *(Irs)* and *vis-versal.* Unpaid public debt hurts the economies of both the creditor and the debtor alike, but when combined with the servicing obligation in particular, it suffocates the financial system of the debtor's economy more, such that surging in interest rate is inevitable. The high interest rate transmits to excessive unpaid debt buildup, especially under variable interest rate regime. As stated in earlier point, this result has anecdotal evidence in the global financial crises of the 1990s upward that witnessed strong link between debt and financial instability in many developing countries. Though, public borrowing remains a fundamental gap filling vehicle for public expenditure in all modern economies; however the excessive build up of public debt has often threatened the entire financial system and the whole economy, particularly in non-resilient developing economies. The positive link between public debt and interest rate provide further evidence that African economies' high interest rate spread has a causal factor from the high build-up of public debt. The incidence of debt burden and financial instability nexus common among the African economies results in little or no financial support for the development of the infrastructure and real sector, as the high interest rate increases credit rationing and reduces availability of development fund for the peoples' social transformational sectors.

Table 4.25: Short run (Dynamic) causality results

Dependent variable	Optimal Lag order of explanatory variables	Coefficient: Short run residual	Std. error	Prob.	Outcome & Implication
IRS	1	-0.702359	0.7171	0.3419	Joint influence of explanatory variables flow to the dependent variable & converges to equilibrium
IFR	1	-0.990741	0.3209	0.0071*	Same with IRS equation
BC	1	0.062650	0.5045	0.9027	No convergence towards equilibrium
PDR	1	0. 496860	0.6240	0.4375	No convergence towards equilibrium
OPN	1	-0.156798	1.2015	0.8978	Same with IRS equation

Source: The researcher's field survey (2017) using E-view 9. * indicates 0.01 level of significance

Table 4.26 (i): Long run causality results: Augmented Toda-Yamamoto Granger (Non-causality and Co-integration) approach.

Null Hypothesis	Coeff.	Lag(p)+d_{max}.	MWald Statistics		Prob. values		Causality flow(s)/Co-integration
			χ^2 Stat.	F-Stat.	χ^2 Stat.	F-Stat.	
IFR does not cause IRS	0.08	1+2=3	4.11	2.05	0.17	0.22	
IRS does not cause IFR	0.43		37.96**	7.85**	0.00	0.00	*IRS→IFR*
PDR does not cause BC	-10.76	1+2=3	15.53**	7.76**	0.00	0.00	*PDR→BC*
BC does not cause PDR	0.01						
OPN does not cause IFR	0.09	1+2=3	23.76**	11.88**	0.00	0.00	*OPN→IFR*
IFR does not cause OPN	-1.3		3.47	1.73	0.17	0.21	
PDR does not cause IFR	0.05	1+2=3	19.74**	9.72**	0.00	0.00	*PDR→ IFR*
IFR does not cause PDR	0.17		0.690	0.345	0.71	0.71	
BC does not cause IRS	-0.00	1+2=3	4.60*	2.302	0.01	0.13	*BC↔ IRS*
IRS does not cause BC	-7.74		15.87**	7.94**	0.00	0.00	
PDR does not cause IRS	0.06	1+1=2	3.98	1.99	0.14	0.17	No causality/
IRS does not cause PDR	0.23		1.35	0.67	0.51	0.52	no cointegration

Source: Field survey (2017) by the Researcher using E-view 9; * and ** denotes 0.01 and 0.001 levels of significance, → denotes one way causality; ↔ denotes two way causality.

The overall model's Wald test results are presented in Table **4.26 (ii)** below. The chi square and F- test of two equations, inflation rate *(Ifr)* and bank competitiveness *(Bc)* are significant at 1 per

cent. This indicates that the explanatory variables- *IRS, PDR,* and *OPN* jointly and contemporaneously influence the respective dependent variables (*Ifr* and *Bc)* in the long term.

Table 4.26 (ii): Long Run Causality Results: Joint Statistics Modified Wald Test

Variables studied @ lag order P=1: *IRS, IFR, BC, PDR, OPN*	χ^2 Stat. F. Stat.	Prob.(χ^2 Stat.) Prob.(F. Stat.)	Outcome: joint influe. flow
Dependent variable: IRS	4.8057 0.9611	0.4400 0.4700	No
Dependent variable: IFR	39.3808 7.8562	0.0000* 0.0007*	Yes
Dependent variable: BC	26.7789 5.3557	0.0001* 0.0044*	Yes
Dependent variable: PDR	4.9980 0.9996	0.4161 0.4491	No
Dependent variable: OPN	7.3071 1.4614	0.1988 0.2566	No

Source: The researcher's field survey (2017) using E-view 9, * indicates 0.001 level of significance

4.5.5 Diagnostics Tests for Hypothesis five (5)

1. Cointegration test

The study tests for the existence of any long run relationship among the variables, a pre-condition necessary for the Toda Yamamoto approach. We adopt the Pedroni (2000) residual correlation approach to examine the existence of cointegration among the variables studied. The result presented in Table **4.27** below suggests that either by the option of no trend, and the constant and trend option we reject the null hypothesis of no correlation among the variables.

Table 4.27: Pedroni residual co-integration test

	Trend Assumption	AR.Coeff.	Statistics	Prob.	Weighted Stat.	Prob.
Panel PP-Stat.	No Trend	common	-2.8891	0.0019	-1.6039	0.054
Panel ADF-Stat.	No Trend	common	-3.5709	0.0002	-2.8908	0.001
Group PP-Stat.	No Trend	Individual	-2.0417	0.0206	—	—
Group ADF-Stat.	No Trend	Individual	-2.4728	0.0000	—	—
Panel PP-Stat.	I & T	common	-6.0432	0.0000	-4.6439	0.000
Panel ADF-Stat.	I & T	common	-3.0815	0.0010	-2.7524	0.002
Group PP-Stat.	I & T	Individual	-6.2863	0.0000	—	—
Group ADF-Stat.	I & T	Individual	-2.2441	0.0124	—	—

Source: Field survey (2017) by the Researcher using E-view 9; I & A indicates intercept & trend

2. Test for Serial correlation

The model serial correlation test of the residual produces LM statistics of 11.48, presented in Table **4.28** below which is in line with the null hypothesis of no serial correlation. So we fail to reject the hypothesis that the model is free of serial correlation in the residual.

Table 4.28: VAR residual serial correlation LM test

Lag	*LM-Stat.*	*D.f*	*Probability*
1	11.4898	16	0.7783

Source: Field survey (2017) by the Researcher using E-view 9

3. Model variable stability test

Presented in Figure **4.4** below is the model stability test which reveals that one of the variables' unit root situates outside the unit root circle. It thus suggests that the model may be unstable. However, further enquiry through redundant and omitted variable tests produce outcomes which suggest that all the variables in the model are necessary.

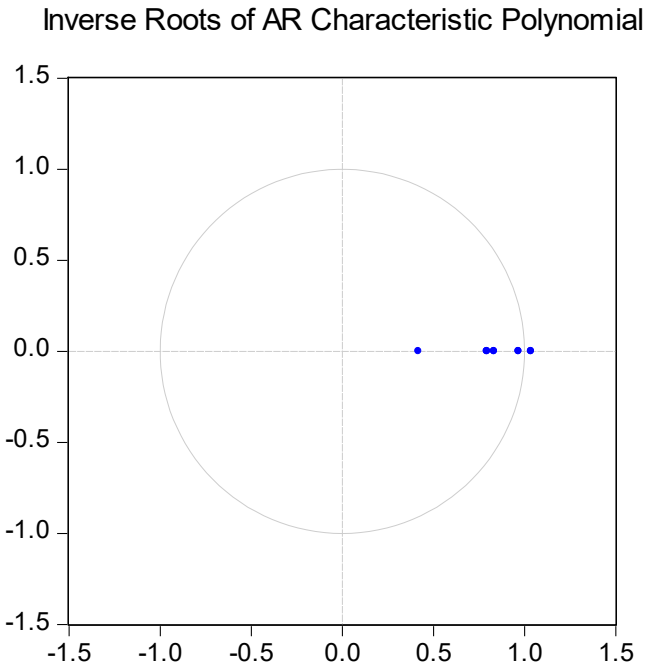


Figure 4.4: Model stability test for hypothesis five (5).

Source: Field survey (2017). Extract by the Researcher using E-view 9

4.6 Discussion of Results

The discussions on the matter of preference for models of a structured finance system- between the bank, equity, and bond finance that can inspire rapid growth in country specific studies, particularly in developing countries have been on. Though cross country studies such as Demirque-kunt and Levine (2001), Levine (2002) and more recent study on European economies, Langfield and Pagano (2015) find that countries could adopt all of these financial intermediation methods that meet the specific desire of the potential borrower and lender, as each mode of finance has inherent merits and demerits. Nevertheless, despite the large bias for bank inspired financial system, as the regular public bail-out support syndrome in time of crises may suggest, large body of literature is on the rise that showcases the relative importance of corporate bond market finance option in the development of the real sector of developing economies, particularly the industrial and manufacturing sector. Perhaps, as 'information economies' about markets continue to grow, and due to the preponderance of risks in banking operations, the quest for sustainable corporate financial stability and high yield returns continue to elicit public interest. Corporate bond financing is seen as cheaper, more effective and efficient for long term real sector development than both the bank finance and equity finance.

In hypothesis one, the study finds that there is 167 per cent negative influence of interest rate spread *(Irs)* on corporate bond issue *(Cbi)*, which provides an examination of the potential financial predicament that may arise from rising nominal interest rate. Rising nominal interest rate benefits the bank by increases in lending-deposit rate spread (profit), and may transmit to increases in the cost of issues in the bond market. When the margin is low however, banks would not have appetite to produce loans for non-finance corporations (NFC), thereby improving patronage of the corporate debt issue market. A high interest spread regime may encourage the practice of 'group interest' theory, and hence frustrate the competitiveness of the financial development. The need for low nominal lending interest rate to stimulate the investors' appetite in the bond market where general price of issue is strictly under control, as it is market determined, that is, a-once–and-for all issued price, is a compelling tasks for African governments. Bosworth (2014) concludes on real interest rate, that it makes little sence to model interest rate using domestic variables only, as more external forces determines intereat rate forecast, in an increasing globalised world. Though this study relied on Fisher's inflation

expectation theorem as determinant of nominal interest rate, the result of hypothesis five (5) reveal that inflation is determined by output gap, as the diffences in natural and money interest rate widens. The bond market can therefore malfunction in an atmosphere of increasing inflation, which exacerbates interest rate spread (Tendulkar, 2015; Rose and Spiegel, 2016). A major empirical result of this study (see hypothesis 5) is that continuous rise in price level (inflation) and interest rate spread have long co-integrating relationship. This study's result is consistent with Tendulkar (2015) and Bhattacharyay (2011).

Tendulkar (2015) examines 62 emerging market economies (EME)'s domestic and international bonds market using multivariate fixed effect model. Mixed results were however achieved in the three corporate bond development categorizations adopted- size, dept, and market activity. Interest rate spread is found to have negative impact to international bond market under the markets size, dept and activity categories but positive to market activity in the domestic market. It implies that for inflation targeting regimes, the bond market remains a strategy to check increasing inflation rate. Bhattacharyay (2011) tests the major determinants of factors that influence the bond market across major Asia economies, and finds that bank interest rate spread negatively impacts market growth in both the government and corporate categories.

Although, this study finds short run dynamics of inflation rate (*Ifr*) and Openness (*Opn*) jointly influencing interest rate spread *(Irs)*, while, however, the long run flow of inflation rate to *Irs* does not hold, it remains that inflation targeting and its reduction can impact the development of the bond market more rapidly, as extant theories and literature reveal that long term high inflation rate remains a disturbing influence on the growth of the bond market, since inflation constitute tax that prices up nominal interest rate. In general, particularly for markets tending to reasonable level of efficientcy and in an atmosphere of 'information capital', bond price react instantaneously to all relevant information, including inflation information to arrive at an implicit optimal risk premium. Thus, the bond market is expected to be a forward looking market that reacts to impending inflation and risks, such that in hyperinflationary economies nominal interest rate comprises negligible real rate (real cost and return) while inflation and allied risk premium constitute lion share.

Additionally, the hypothesis's result of 273 per cent positive impact of savings rate *(Svr)* on corporate bond issue market provides anecdotal support to steady-state growth theories and

efficacy of savings to industrial investment in the region. In the supply leading hypothesis, saving-investment-output nexus are positively linked. The hypothesis's result outcome of positive impact of savings rate on corporate bond issue (*Cbi)* market in the region is supported by the earlier work of Adelegan and Radzewick-Bak (2009). Bosworth (2014) however finds weak relationship between interest rate and economic growth. Savings need to be accumulated to establish capital for investment. This savings rate could sustain the per capita income over and above capital required to maintain investment above the steady state growth. Savings rate need to be attractive to improve savings habit, and hence saving behavior of the people and institutions, needed to attract scarce capital towards the primary bond market growth. However, irrespective of the positive relationship, poor bond market issue development suffices in the African economies. The financial structure system theory says that if the economy is growing, the financial system should behave by moving more towards the market based system such that the financial intermediation ratio improves steadily (Goldsmith, 1969). The relative growth rate of 5 per cent in African economies in the last fifteen years as reported by the World Bank *et al.* (2015) does not seem to filter into capital market fund mobilization in the region, due probably to poor financial structure. For instance in Nigeria, despite the enormous wealth from oil exports the financial system still suffers from poor nexus in savings to low capital formation, to low investment, such that the domestic capital and bond markets are dominated by foreign investors. In many of the sampled economies as bank finance still dominates the investments in project development, due to inactive corporate bond issue market.

Moreover, reasonable state of price and other macroeconomic variable stability are crucial and necessary prerequisite toward improved domestic savings habit, mobilization and capital allocation (Fry, 1995). Uncertainty, Inflation and macroeconomic instability may have been responsible for lack of holding long term bond and hence discouraging bond issuance, for short term investment instruments. Often, financial mismatch of long term development fund needs with short term instruments have resulted in unproductive investments, excessive arrears and defaults in many developing economies. It suffice to state that preponderance of high non-performing assets constitute the greatest threat to the financial system stability in many developing economies that are largely bank based.

From the analysis in hypothesis three (3), the study finds specifically that there is no significant relationship between corporate bond issues *(Cbi)* and industrial output *(Io)* growth in the selected African economies; an indication that the study fails to reject the null. The result is contrary to Fink, Haiss, and Hristoforova, (2003) that finds positive relationship between bond market development and real sector output in 15 EU, USA, Japan, Switzerland and Norway from 1950-2000. The lack of significant relationship between *Cbi* and *Io* in the respective African economies is unconnected with their weak state of the corporate bond market except perhaps in relatively advanced economies such as South-Africa and Mauritius. The outcome suggests a "pervasion" of the financial structure system, as this position is reinforced by the outcome of hypothesis two (2) of 296 per cent inverse relationship of interest rate spread *(Irs)*, a direct product of the African regional economies' bank led financial structure and industrial output *(Io)*. Since the dominant financing structure seems to be misaligned with the financing needs of the real sector in the region, the inverse relationship of *Irs* and *Io*, and the non positive significant relationship between *Cbi* and *Io* may be expected as these variables somewhat co-determine one another. The result provides further objective evidence for critical re-examination of African government policies on bank development in particular and the financial sector in general for prudential regulation and periodic fine-tuned legislation to support the development of the real sector, if the financial sector can be reliable to foster African economic development and improve financial stability (Claessens and Feijen, 2006).

The non-linkage of the corporate bond market to industrial output growth may also reflects defict in policy trust and policy-shaped institution (Torres, Fayen and Ize, 2014), in the region which may explain the various state of industrial development gaps that has remain consistent. Tendulker (2015) notes that among the region's economies that attempt to develop the bond market, long and complex procedural gap often discourage the non-finance corporate (NCF) firms, and at best issue short-tenured bonds. In many African economies even the Central banks have been assuming financing role of long term developments, as access to long term domestic finance is usually non-existence, while external augumentig finance is not being encouraged due to poor institutions.

The dominance of the intermediation process by the banking institutions may have contributed to the poor state of the bond market in line with the 'group interest' theory of financial

development, which reveals that both the industrial and manufacturing firms rely on the bank short term credit to finance industrial and developmental projects. Another possible factor may be the relative poor public perception of the capital market following the unwholesome practices of capital market operators such that in some major African equity markets listed firms are delisting from the market. The poor state of secondary market infrastructure, leading to low liquidity in the market may be frustrating holding long term bonds by investors. The tradition of developing 'information capital' for building credible fund users data is yet to forth-come in many African economies, such that knowledge of potential investors of market borrowers is relatively weak.

The short run dynamic and long term stability results reveal that industrial output *(Io)* growth is collectively influenced by all the explanatory variables in the model- corporate bond issue, interest rate spread, the interaction variable, electricity consumption, technological development, institutional quality index, financial deepening, and real per capita income. The result finds semblance in the earlier empirical works in the financial literature (Schumpeter (1912), Goldsmith (1969), Gurley and Shaw (1955), King and Levine (1993)) and specifically the bond market (Fink *et al.,* 2003) as all conclude that financial sector development improves national wealth and per capita income, and also that, financial deepening increases the level of a nation's industrial growth.

Interestingly, institutional quality index *(Iqx)* has positive correlation with corporate bond issue market by 26 per cent and the interaction variable *(Intc)* of *Cbi* and *Irs* by 22 per cent. Aside, there exist mutual bi-directional long run causal flows between institutions and the interaction variable. The significance of the long run bi-directional causal flow between institutional regulatory quality index *(Iqx)* and the interaction variable *(Intc)* (a combination of corporate bond issue *(Cbi)* and Interest rate spread *(Irs))* is germane for the development of the Africa's financial intermediation industry, as viable financial system is shaped by quality institutions, which itself also requires encouragement from superior policies, liberalizations ideals, laws, social norms and prudential regulations (Knoop, 2013). Institutions' influences are multidimensional in the development of any society, as in specific reference to financial intermediation, it provides the platform for genuine borrowing and lending business, key

instruments for information sharing, upholding the rule of law, and key to resolving conflicts arising from adverse business behaviour (Knoop, 2013).

In this research, institutional regulatory quality (*Iqx*) combines institutional quality, effective governance, and rule of law in the respective countries. Though, no unique institutional policies can be applicable for all financial systems, particularly for multicultural African economies as contexts such as culture, beliefs, political system, structures and markets differs, every financial system require distinct home grown financial culture, financial knowledge, inspirations, incentives and policies. However, institutional ingredients and incentives need continuous fine-tuning, in line with exigency of development. These contextual features may explain while in many African economies substantial cash and related financial instruments still lie outside the control of the banking system, and transmit to the high interest rate gap in the financial system. The same contextual features may have been responsible for transforming the financial system and hence economic development of nations such as High Performing Asia Economies (HPAE).

On the whole, an institution's positive linkage with financial intermediation instrument is potent to reducing or eliminating risks and uncertainty in the financial system. Due to the importance of institutions to the success of many finance and economic variables, it happens that most of the economic and finance variable are somewhat co-determinant of one another. This may mean that as quality institution embodies effective governance, then factors and incentives that augment the growth of political systems and institutions may be co-determinant with financial system development. The political system's link is evident in the outcome of ARDL result of Institution quality (*Iqx*) positive impact on *Cbi* in hypothesis two, which also supports the result of *Iqx* and *Intc* two–way nexus. The result underscores the importance of quality institutions and governance to improvement in financial variables and financial development. In African economies, quality regulation is capable of augmenting the performance of financial intermediation and overall development of the financial system through increasing level of political and economic democratization. Quality institutional regulation is an embodiment of genuine democratization. Improvements in the economic institutional regulatory quality may have revealed the quality of political stability and reduction in associated investment risks currently prevailing in African economies, which may result in improving the number of bond issues, particularly the sovereign bond issues in African continent in recent years.

The positive bi-directional causality between *Iqx* and *Irs* (*Irs* being element of *INTC*) may also provide empirical support for the foreign portfolio investors' domination of African capital markets as improved democratic governance, market liberalization, and high investment returns (profit) may have been encouraging the investors to African markets. African governments have recently been improving their institutions' regulatory standards for improved capacity capable of attracting foreign portfolios and foreign direct investments. The improvement in democratic governance and political changes should be matched with improved regulations. Improvement in political governance, institutional regulations and investment returns are capable of having greater impact on African image, which should be encouraged. An IMF report states that since the wave of liberalization reforms started economies with strong legal and effective regulatory institutions seemed to have advanced relatively faster than others with weak regulatory system (McDonald and Schumacher, 2007). However, regulations should be effectively managed not to hurt the African economies disproportionally, through the unwholesome activities of hot money.

Since fundamentally, institutions are formal and informal rules and norms that governs the successes of an economy (Nallari and Griffith, 2011), its positive empirical tie with financial intermediation instrument in Africa provides an encouragement for predictability, such that working on the continent's spheres of institutions would remain a better antidote to the economies' financial sector development, particularly the corporate bond market development. Though literature reveals that institutions are difficult to change, its low rating in many African economies may have explained the poor performance of the continents financial system, hence elements in the heart of quality institutions such as governance effectiveness, rule of law, quality regulation, control of corruption, political accountability and stability must be change along the lines of global standards.

Another interesting outcome for discussion is that technological development *(Tdv)* a proxy for human capital development, has 13 per cent negative correlation with industrial output *(Io)* in the short run, and also, *Tdv* is found to have significant long run negative causal influence (63 per cent) on industrial output *(Io)* in the African region. It indicates that the output of the educational system has dysfunctional linkage with industrial concerns in African economies, since the schooling system is not industrial skill oriented (no interface between the school and industry). Of consolation however, is that there is long run convergence of the explanatory variables in the

model- *Cbi, Irs, Intc,* and *Rpi* to determine both *Io* and *Tdv* as confirmed by the Wald test statistics. The result suggests that in the longer term, given appropriate policy interventions both variables may positively correlate contemporaneously to influence the developments of one another, with positive feedback effects, as expected *apriori*.

First, the *Tdv* negative link to *Io* suggests that only and largely imported technology may have been responsible for the little industrial output growth in the African region. A common parlance in the business world is that "a factor is only as good as the people that run it", may be revealing the obvious in African economies. As the data from the stylized facts reveals that Africa provides virtually nothing to world industrial value added, then the low quality technical skill and management skill of the regression result validates the UNIDO statistics. Moreover, the syndrome of higher growth rate without corresponding impact on the African peoples' wellbeing is attributable, as increasing investments in education, though still lower than the UN 26% of annual budget recommendation, seem not to yield expected industrial output results. It goes to reveal that the import substitution strategy of industrialisation that had been promoted since early 1980s merely ends in transferring unfitted technology for African region's industrial growth effort. Secondly, the regression's long run negative outcome testifies to the poor state of technological development and industrial output nexus in African economies. Africa is still far behind in industrial output contribution and growth rate per global standard. Thirdly, the result implies that the long term industrial development depends on virile human capital development. A new endogenous model of human capital development is germane to achieving higher industrial feat.

The crucial role of technological and human capital accumulation and innovation to long term industrial output growth cannot be overemphasized. This is the fulcrum of the Solow-Swan's long run growth theory, later exemplified by Romer's endogenous long run growth theory. Irrespective of limitations in the prescriptions and workings of these neoclassical and new growth theorists in developing economies, technology upscale human capital skills and augments the "discipline of the mind" of the people, which may have been the source of transformation and thus brought forth nations from paralysis to stardom such as the United States, Singapore, South Korea, China, and many others. Technological development has been found to be the basis of structural change and improved industrial productivity, which thus requires countries

deploying necessary capital, capabilities and competence (UNIDO, 2015), and African economies are expected to act not less. 'Industrial' development is the new phase of modern economies; and hence target of both emerging and more adventurous developing economies. Industrial development does not only transform nations' overall outlook and image but is also capable of transforming the life of average citizen for better, by raising the peoples' per capita income and life expectancy.

Public investment in education is a "pro-poor" instrument for income distribution, and hence poverty reduction, as their output that forms new labour entrants in the industrial sector gets relative higher wages. Quality human capital links technological development, and also links industrial output growth, which is crucial to making economic growth truly meaningful. Though, education remain a "pro-poor growth" channel, development literature is still unsettled on a more equitable strategy and investment mechanism to achieving economic growth and income distribution that is pro-poor in developing countries (UNIDO, 2006). Remarkably however, any human capital development as social investment that fails to address industrial technological labour employability needs may be unsuccessful to drive down poverty reduction in largely poor African economies.

'Industrial' development is about modernization, while development is a long run process capable of transforming the average citizen's life and living conditions (Heng, 2015). Wide differences exist between developing and advanced economies in technological development on manufacturing output growth. UNIDO (2015) on structural change and technological development, notes how technological structure has changed the face of manufacturing in Latin America and Asian economies relative to Africa in the last four decades, and concludes that the Asian high tech advancement ranks highest. Additionally, African technological structure in manufacturing as at 2012 merely compared with what existed in Asia and Latin America in 1972 (UNIDO, 2015).

Advancement in technology development and the associated industrial growth rate can positively accelerate the transformation of African economies financial structure and the system's stability. Technological development externalities can also be felt in allied development sectors like food security, education, agriculture, housing, road constructions, and many others. On this note, wide gulf currently exist between majority of African economies and the advanced economies in the

areas of scientific research and development (R&D), technological developments and the rate of advancements in manufacturing output growth. Capital resources misallocation on political bases and the unhelpful annual low budgetary allocation to education and science and technology partly accounts for the abysmal performance of the negative nexus in African economies. Of note particularly, are the efforts, energy, discipline and the corresponding outcomes from technological innovations through R&D of high performing economies in the Asian region, currently been acclaimed as the newly industrializing nations.

Another result that may have showcased the weakened nature of the African economies is the negative dynamic flow effects of corporate bond issue *(Cbi)* on interest rate spread *(Irs)* and vice versa, which suggests that 'low deposit and high lending rate' phenomenon of many of the region's financial system results from 'corrupt' economic policies, that may have exacerbated more policy distortions and hence market failures, through the 'financing culture' of asset-liability mismatch of borrowers and lenders in the regions financial system. The consequence may be the poor financing gap currently faced by the real sector in the region, since the saving mechanism is affected. In related study, Afful and Asiedu (2013) find that the stock market had no influence on interest spread in three sub-Sahara economies of Botswana, Ghana and Mauritius from 1980-2010.

This study also finds that saving rate *(Srt)* has dynamic long run positive flow to corporate bond issue *(Cbi)* in the region. This result and the last therefore suggest that non-availability and or non-boosting the long-term saving instruments by 'disciplined' policies is detrimental to the household, firm, and the economy's long-term interests. The household's long term savings through investment in the corporate bond issue market can assist her to apply the long-term market's higher fixed returns to smoothen her long-term life-cycle income. At the firm level, financing assets through the bond market is best antidote for asset-liability financial crises, save her from loan rollovers and business failure likelihood; while the banking firm remains healthy. At the country level, the economy is free of distortions from high interest rate spread, lower business cycles that often arise from financial sector's failure and general financial crises.

Moreover, the study finds that technological development (*Tdv),* a proxy for human capital development has negative long run impact on financial deepening (*Fdp*). Any financial sector development requires substantial quality education, particularly in entrepreneurial skill and

information technology. Quality human capital is required for entrepreneurialism which transmits to improved financial sector development. Schumpeter (1934) links innovation and entrepreneurship as critical factor to economic development in developing countries, which can rub-on increased financial development. Levine (2004) links human capital development with financial development by revealing that capital allocation and quality investments by firm managers require reliable information production and processing.

This negative result suggests that African economies that are largely characterized by much lower education budget ratio relative to the UNESCO standard of 26 per cent need to upstate their budgetary provision. Knoop (2013) reveals that despite financial liberalization and structural reforms which African economies bought into over two decades ago, the continent is yet to benefit substantially from financial deepening of financial development, such that the economies are characterized with poor real interest rate, low credit expansion, low investment productivity, high credit risks, poor information network and dissemination, weak legal framework for creditors and property rights, high capital flight, and so on. Improvement in technological education can substantially change these shortcomings, and improve the fortunes of financial development in the region.

Additionally, the study finds that in the long term, reduction in interest rate spread *(Irs)* increases financial deepening (*Fdp)* by 200% and thus financial development and vice versa in the region. Policies that reduce lending rates and increase savings habit, such as reduction in policy interest rates, competitive banking, low public debt ratio, low budget deficits, and macroeconomic stability would make this a reality. Many African economies are in quest of such fiscal and monetary policies capable of reducing lending rate to boost access to industrial finance, particularly for the increasing numbers of SMEs. Examining the banking structure in 81 developed and developing economies, Rashid (2015) informs that in economies where there is low competitive banking and where foreign banks dominate the financial system, interest rate spread is higher, and hence lowers financial deepening potency, such as, less credit to private sector and high bank loan volatility.

In Namibia, Eita (2012) notes that increase in interest rate policy is a cost to banks which causes interest rate spread to rise, and is eventually passed-on to their customers. The outcome deters further borrowing and reduces financial development. Khan and Sattar (2014) study four banks

in Pakistan, between 2008-2012 using Pearson correlation analysis to establish strong and positive relationship between interest rate changes and bank profitability. The pearson correlation imply that increase interest rate as monetary policy tool may be useful to moderate bank profitability and increase the rate of financial development. A major factor responsible for poor access to production loan, 'credit crunch' and hence lack of financial deepening is high nominal interest rate on lending and low savings rate. Though, banks are still being stifled with unhelpful lending restrictions, such as negative real interest rate and repressive policies, the desire for increased spread, for high profit takings by granting high risk long term credits has to a large extent frustrated financial deepening.

Positive real interest rate is a function of prevailing inflation rate, hence appropriate macroeconomic policies are needed to check inflation to stabilize prices, and evolve positive real interest rate that can improve the savings behavior. High real savings rate will attract idle funds in informal financial markets and private vault, to the national pool of financial resources which will act to assist to deepen the financial market. Full liberalization and guarded regulation can assist to realize improve real interest rate regime, hence a major panacea for financial system deepening in developing economies.

The result that corporate bond issue *(Cpi)* impacts financial deepening *(Fdp)* in the region significantly helps to inform that should the impediments to market based finance be effectively tackled corporate bond can significantly transform Africa's financial system. The bond market helps to deepen the long end of the maturity spectrum of the market. It is an instrument to hedge instability in the financial market. This is evident from the relative stability and steady growth of the developed western countries markets. This result has support in the South Africa market from Kapingura (2014) that uses Eagle-Granger causality technique to discover that there exists co-integrating relationship between corporate bond market capitalization and economic growth.

Forces that seem to frustrate accelerated development of the African corporate bond market to help deepening the region's financial system is unconnected to poor market infrastructure, insufficient liquidity, longer period or circle to realise bond issuance relative to a loan production, poor investors' confidence, high inflation leading to low investment instrument yield, high cost issuance cost, high fiscal competition, poor awareness of potential investors of the potency of the bonds investment for fixed return, relative to more riskier variable return

investments, problem arising from overregulation, and many more. Khan (2005) says the bond market serves as additional sources of capital mobilization, which can free emerging markets from the burden of external funding, moving it close to economic independence. It also implies that financial deepening can aid the market development through appropriate institutions, low inflation regimes and appropriate macroeconomic policies. Moreover, Montiel (2003) justifies the potency of the financial market that it improves as per capita income increase (Khan, 2005).

The regression result finds that electricity consumption *(Elc)* positively influences industrial output *(Io)* growth in the region, albeit on a weak coefficient (0.02%). The result suggests that large energy supply gap exists that needs to be filled to meet the industrial and allied sector demand in African region. Electricity production and consumption may have been rising in emerging and developing economies, in line with increasing modernization and industrial development of respective economies, many African economies however lack in the area of energy infrastructure towards industrial growth, a veritable prerequisites towards achieving momentum in industrialisation.

This study's finding of negative long-term regression link between institutional quality *(Iqx)* and financial deepening *(Fdp)* may signal grave consequences, impacting on macroeconomic and the peoples' welfare enhancing variables, as the outcome of negative long-term causal flow from financial deepening *(Fdp)* to real per capita *(Rpi)* suggests. In African economies, development looks blink if institutions does not compliment and hence spur financial development. These outcomes may further exacerbate inequality, noninclusivity and poverty sustainability in African region.

The forth (4) hypothesis's finding enables the study to fail to reject the null on the secondary corporate bond turnover (*Cbt*) (proxy for bond market liquidity) signaling to industrial output (*Io)* and investment. The outcome proves contrary to findings in some earlier contemporary works, particularly in the equity market. Nevertheless, the lack of relationship between the secondary bond market (liquidity) on one hand and the corporate bond issue market signals liquidity risk of the corporate bond investment in the region, resulting in buy and hold attitude of investors in the bond market, as also often experienced in many of regions' equity markets. Furthermore, the lack of link between the secondary the market to the industrial output growth

would signal lack of information flow of the market and necessary feedback from activity of industrial output growth.

Both the issue and liquidity markets should be mirror image of themselves. The issue market requires the information from the liquidity market for varied purposes, such as access to the stock trading performance, industry performance, potential issue price settings, competitive pricing and strategies to overcome competitors, and many more. On the other hand, the liquidity market is often boosted by incentives from the offer market. The liquidity market needs more securities to be issued in order to deepen the market and open it for more breath and liquidity. Moreover, entrepreneurs with requisite and sound managerial skills may have to approach the market to offer their skills, raise capital and further diversify the risk market. This is the hallmark of the growing capitalist system. The weak regression result between the two markets may however be unconnected with lack of protective laws on rights of private property, weak regulatory institutions, and poor state of the rule of law in developing markets.

The lack of linkage of the primary and secondary markets may have further stressed the underdeveloped nature of the corporate bond market, as the liquidity of the secondary market provides information signaling on efficient pricing and traded volume. These two way flow is important for the financial and the corresponding real sector growth. Therefore, naturally it can be argued that industrial output growth which should be evidence of liquidity of the bond market suffers from the low perception of investors or lack of information of industrial activity to bond investors.

The study however, finds that corporate bond market liquidity influences institutional regulatory quality (*Iqx)* in the region, which brings to light the potencies and pervasive influence of liquidity in the long tenure market. The primary function of the market regulatory institutions (*i.e.* the Securities Commissions, (SECs)) and other self-regulatory institutions are for the creation of enabling environments for competitiveness for market participants and by legal support and incentive create opportunity for financial market infrastructures development. Reliance on the private sector for the provisions of market infrastructure is crucial. Regulators should advance the course of stability of the markets, protection of investors, market transparency and efficiency. Infrastructural development should include trading facilities, information and data availability. Where these functions are not effectively managed, it might

reduce patronage of the primary market and frustrate the secondary market, affect investors' morale and low liquidity might ensue. Harrison (2002) informs that severe liquidity shock is equally as bad as credit quality shock in the bond market, and is capable of widening the credit spread. Liquidity signaling is capable of shutting firms from the market, which could perpetuate market inactivity. As firm are unable to obtain investment funds, industrial growth rate declines, the effects transmits to rising unemployment level and low productivity. A highly deep and liquid (breath) market aside from helping to meet current capital needs of investors can serve as buffer and an instrument for market resilience during period of financial market distress. The IOSCO (2002) argues that use of indirect monetary policy instrument such as open market operation is capable of improving patronage of secondary trading in the bonds market.

Some potential factors that may have militated against the linkage of both markets and negatively impacts the corporate output growth, leading to underdeveloped corporate bond market, may be unconnected to the weak market infrastructure; existence of few market intermediaries; higher interest issue cost and coupon rate; long offer circle period due to complex regulations (Tendulkar, 2015). Upon effective regulations, the growth of the pension fund and life insurance markets could provide support and can be of significant development partner for the liquidity needs in the secondary market. As investors, both institutions would new provide impetus on corporate governance in investee institutions. Increasing capital and investible funds base of the pension fund can serve other ancillary needs of the secondary market such as provision of sustainable investment fund.

The fifth (5) hypothesis major finding is that there is no long run causality flows from inflation rate *(Ifr)* to interest rate spread *(Irs)* in the region. The result contradicts both the dynamic Fisher effect and the Wicksell process. This result may have unearthed grave consequences of the weakness of the financial system in the region, reinforcing the argument in economic development literature that inflation may be more structural, institutional and endogenous issues in the region's economies (Nitzan, 2009). First, the 43 per cent positive flow from interest rate spread to inflation negates the Wicksell process, that interest rate should negatively influence inflation expectation. In a recent study, Anari and Kolari (2016) reveal that both the Wicksell process and Fisher's effect process suffice in the United States economy and some other advanced economies. For African economies, the result suggests that they may not have been

operating on the longer term perception of inflation targeting to managing interest rate movements or that the targeting may not have been effective predictor of anticipated interest rate for bond investments. Hence, with no expectation or knowledge of the yield curve, then no dependable yield curve is feasible. It may also imply that the markets participants lack substantial financial literacy because the future is not being anticipated. The ability to anticipate the future, as regards the movement in the interest rate is the most effective weapon to managing the bond market, as essentially, what is effectively been traded on is the interest rate and its volatility.

Where yield curve movement is not effectively been targeted, by implication, it increases the risk on the real cost of holding bond, then managing bond becomes difficult. Inflation, irrespective of the methods of measurement in developing economies is often made of two drivers in the short and long terms, each with domestic, and global (extent of open-economics) angle to its expectation (Arslan, Jašová and Takáts, 2016). The domestic side has Philip's curve short term, high frequency (business cycle) inflation inducement that arises from economic slacks; and the long term (low frequency), such as demographics, labour cost changes, credit cycle changes and others. In the global end, the short term factors are commodity price change, such as oil and food prices; exchange rate; the long term factors include low frequency movements through trade, globalization and technology. A more credible inflation tracking framework would employ appropriate measure to track these pass through effects on nominal prices.

The inability to anticipate long run inflation for the bond yield curve management, by this study, may be unconnected to the extent and perception of financial system instability, macroeconomic instability and therefore account for why the government treasury bills and other gilt-edged investment papers remains the highest investment assets allocation of the banks and the general investment industry, including the upcoming bourgeoning pensions funds in many African economies. Sound investment behaviors and orientation of economic units are often informed by prevailing macroeconomic and structural conditions in the macroeconomy, and this may largely be shaped by the performance of the real sector. Where the financial system and the real sector are not dynamically co-integrating, inflation expectation may be difficult to anticipate, because there is no diffusion of the real and financial system. In such economy large industrial and consumer needs are externally supplied. The financial system is therefore maladapted and the

yield curve pattern for bond investment may be misinforming. The problem of uncertainty remains a major deterrent to financial sector and by its expected direct linkage to real sector investments, the real sector remains underdeveloped.

Incidental to poor interest rate anticipation of the inflation expectation is that the investment industry apart from being short-termist, the financial market may increasingly become more dollarized, as the investment climates invites foreign investors to quick money making venture in the short term end of the financial market. For instance, in contemporary times in Nigeria, as a result of high interest rate and potential high short tenure investment returns, the level of dollarization of the economy has been alarming, while exacerbating increasing influence on the economy's macroeconomic variables and hence pressures inflation rise.

On the supply side, only few firms would be able to offer bonds in the environment where interest rate cannot reasonable estimate and anticipate inflation expectation and hence build a yield curve for its bond issues. The drive towards source of industrial and non-industrial growth funding is therefore unexpected. Macroeconomic stability, including fiscal discipline is required for long term investments.

Furthermore, although, the dynamic short run results for both interest rate spread and inflation expectation equations produce negative convergences to long run equilibrium, the one-way significant positive flow from interest rate spread to inflation expectation that is achieved among the individual variable relationship, brings to light, that interest rate is more exogenous to inflation expectation. In support of this result, anecdotal evidence from a Ph.D thesis titled, "inflation as restructuring. A theoretical and empirical account of the US experience" Nitzan (2009) concludes that inflation is an integral part of the structural and institutional changes in an economy. The result of the study suggests that inflation is 'natural' and endogenous in an economy, of which policy variable like interest rate influences.

Being a financing cost, given structural and institutional weakness in African economies, and in the context of adaptive expectation theory, rational expectation, and behavioral expectation theory (Robert, 1998), interest rate cost would usually be expected in every production and pricing equations. The natural transmission implication of this phenomenon is to influence both the level of unemployment, as high finance cost leads to high production cost, leading to low

demand, lost production, outputs drop proportionately, and high unemployment results (Dornbusch *et al.,* 2011). Furthermore, fixed term contracts in the economy are affected- the long tenure fixed interest loan and wage contracts, leading to another round of inflation expectation circle. In fact, as the natural rate of unemployment increases, the market system and market discipline mechanism become less effective in the era of expected price level volatility. However, the banking institutions benefit more in era of rapid price level changes, as it increases the velocity of money, numbers and volume of monetary transactions, particularly in emerging and frontier financial markets (Beim and Calomiris, 2001).

Interestingly also, public debt rate is found to negatively and significantly influence bank competitiveness. In developing economies, with limited fine-tuning of government policies, various channels of linkages of the public debt to macroeconomics variables are apparent. Specifically, increases in public debt can negatively affect bank interest cost, crowding out of private sector credit, leading to low productivity and overall economic growth decline. High interest cost as being experienced in African economies is a sign of financial instability which can discourage foreign direct investment and domestic entrepreneurial initiatives. Other channels that connects with domestic bank stability and bank competitiveness through which public debt stock negatively affects the economy include low private savings, increase in prices and low real interest rate, increased capital taxes, reduced private investment, high sovereign risk premium, and declined economic growth, as suggested by Nauret and Meensel (2011). Debt services crowds out critical public investments, hurting macroeconomic stability in developing countries (Blavy, 2006). Matthews and Thompson (2014) reveal the positive link between government budget deficit and banking lending rate, which weakens the level of competitive banking. As bank based economies African countries would only achieve competitive banking despite wave of liberalization, if government imbibes sound fiscal and public financial management culture.

The implications of excessive government's bank and capital market borrowings and the rate at which public debts reduce availability credit, and as a major source of inflation, both transmit adverse implication for financial underdevelopment. As stated earlier, positive link between government budget deficit and banking lending rate has the consequence of weakening the level of competitive banking. African economies are generally noted as imperfect markets, less liberalized, and the banking market is oligopolistic, implying that under high debt regimes,

entrepreneurial risk of new entrants into the banking market may not be encouraging. As bank based economies African countries would only achieve competitive banking despite wave of liberalization, if government imbibes sound fiscal and public financial management culture. It is on record in finance literature, that the High performing Asian economies have three key factors that are perhaps behind their successes in recent time- price stability, fiscal discipline and policy credibility (Knoop, 2013).

Very complimentary to the above is to reflect on the long run inverse bidirectional causal flow between bank competitiveness and interest rate spread. African bank based economies have not been competitive, which may narrate the regions' financial underdevelopment with highest interest rate spread relative to global peers. The financial system had operated largely under government controlled as monopoly banks until the wave of structural adjustments, privatization, and liberalization of 1990s made the banking system largely oligopolistic. Despite, the financial liberalization, the policies merely transferred the monopoly powers of the erstwhile government banks to privately controlled oligopoly banks (Knoop, 2013), still characterized by monopoly features, including repressive consequences such as worsening savings rate, high interest rate spread, poorer bank per capita statistics, and reduce access to finance, particularly in the rural areas. Knoop (2013) further reveals that African banks produce least credit relative to other economies that have same capital. This outcome suggests that the region requires competitive banking model that would overcome the challenge of inclusivity of the very low income people, hence broaden the financial system, by which financial development and economic growth would be symbiotically related, such that the very poor can enjoy formal finance.

Finally, and worthy of discussion, particularly in the Africa' case is the positive and significant long run link from public debt *(Pdr)* to inflation *(Ifr)* expectation in the region. As generally noted earlier in the theoretical review, responsible debt finance constitutes leverage, however if otherwise applied it constitutes a nation's albatross, a heavy tax burden on the people, particularly when major political and economic shocks occurs. In many poor African economies, public debt trap seems to have weighed down on their economic activities and State responsibilities, such that inflation spiral and falling output growth rate may have accentuated the peoples poverty. Due to the preponderance of economic crises occasioned by outstanding public debt, the strictness in lending to governments may be inevitable. However, the 'economics of

lending' to the public sector is a little complex issue; as though public lending request is difficult to resist, particularly through the banking sector. The 'elasticity' of credit creation constitutes a high incentive for such lending, considering higher interest earning advantage occasioned by availability doctrine.

Short run significance result exit in the relationship that suffices from openness, interest rate spread to inflation expectation to spot inflation. Through trade and finance African economies get more and more integrated in the globalised economy, hence there are attendant pass through effects on inflation and play a higher role in explaining domestic inflation. In many African economies global influence in the domestic investment and production is increasing, aside for the short run oil and commodity producing countries export activities, longer term technological connections is driving the global inflation pass true.

A sustained phase of development, driven by market-determined capital allocation requires high level of transparency of the potential borrower. To have a greater level of financial market architecture, that is less associated with frictions require a sophisticated information flow among market participants. However, bond markets in Africa remain largely underdeveloped, with corporate bond markets virtually non-existent in many economies or in their infancy.

An Appraisal of the Nigeria Situation

Nigeria occupies a central position in the demographic, economic and political affairs of Africa. At the moment, the Nigerian economy largely epitomizes what prevails in Africa by the following fundamentals: high population growth rate average of 2.7 per cent 2010-2015 (UN, 2015) with corresponding high poverty rate, high youth unemployment rate; high human capital and technology development gaps, and her economy is largely dominated by primary product and commodity export. Nigeria's rating on global Human development index *(HDI)* has been below 0.527 since the 1990s, barely increased from 0.429 to 0.527 between 2005 and 2015 as one of the world poorest (UNDP, 2015). The economy is not empowered by value addition in industrial growth, as the extractive (mining) export sector overtook agricultural sector from the 1970s, earning more than 90 per cent of her foreign exchange.

The economy is also characterized by poor domestic linkage and interactions, leading to poor value spillovers of the agriculture and manufacturing sectors, and none of these sectors with the

technology (human capital) development sector; and indeed poor linkage of the real sector and the financial sector. Indeed, relative to experiences of now advanced economies and the High Performing Asia Economies (HPAE), in the Nigerian case, the mining sector took over from agriculture rather than the economy transfoming from Agriculture to manufacturing (Okigbo, 1993). The mining sector foray was a structural distortion that merely advanced her 'extroversion' and has rather become the economy's albatross. The 'perversity' not only weakened the macroeconomic super-structure but may have implanted the seed of infinite financial instability, as its financial system became 'maladapted' thereon. Mining export resources are both 'mismanaged and unproductively utilised' such that high external borrowing and debt overhang rules the economy (Ojo, 2010). Frankly, the lack of inter-sectoral 'value-chain development' integration may have been a setback on the economy's resilence, aiding its frequent business cycles and instabilities.

Although, development economic theory reveals that dynamic structural changes are often the norm in an economy's development trajectory (Okigbo, 1993), it nevertheless requires effective policy guardian. However, in the current time, given appropriate industrial policies, the structure of the country's population may induce future high production capacity as it is youth dominated in excess of 60 per cent. As a developing and relatively stable country, Nigeria's financial resources, just like other African counterparts, are limited in supply for the much desired transformation from agrarian economy towards improved industrial growth rate. The stylized facts are presented in Tables **4.29 (a)** and (**b)** below:

Table 4.29 (a): Nigeria's Summary Facts (2004-2014)

Variables	Io	Cbi	Sbi	Rpi	Irs	Fdp	Svr	Tdv	Iqx
Year Max. V.	2011 0.08	2011 $2.46bn	2010 $2.65bn	2009 $1,139	2010 0.111	2007 0.649	2012 0.33	2004 0.068	2007&'11 - 0.99
Year Min. V.	2007 -0.006	2005 -2.938	2004 -0.560	2010 $22	2008 0.035	2010 0.068	2004 0.11	2007 0.063	2004 -1.63

Table 4.29 (b): Nigeria's Summary Facts (2004-2014)

Variables	Opn	Ifr	Cbt	Bc	Elc
Year Max. Value	2006&'8 0.65	2005 0.179	2012 $0.64bn	2010 6.51	2012 155.754 Kwa p.c.
Year Min. Value	2013 0.31	2006 0.082	2004-2011, 2013 0.000	2006 3.75	2006 111.144 Kwa p.c.

Source: industrial output (*Io)*; interest rate spread (*Irs*); financial deepening (*Fdp)*; savings rate(*Svr*); technological development (*Tdv)*; openness(*Opn*)*;* inflation rate (*Ifr)*; bank competitiveness (*Bc*); and electricity consumption (*Elc*) are from World Bank Development Indicator (WDI); corporate bond issue (*Cbi*)*;* sovereign bond issue (*Sbi)*; and corporate bond turnover (*Cbt)* are from Bank of International Settlement (BIS) (2004-2014); real per capita income *(Rpi)* computed by the Researcherwith input from WDI (2014) ; institutions quality index (*Iqx)* is from Worldwide Governance Indicator (WGI) of the World Bank (2014); Max. V. indicates maximum value, Min. V. indicates minimum value. Prepared by the Researcher (2016).

Presented in Table **4.29 (a)** and **(b)** above is the stylized facts from 2004-2014. Nigeria's industrial growth rate has highest value in 2008 with 8 per cent and the lowest in 2007 with negative 0.6 per cent. It suffices to mention that Nigeria recorded negative industrial growth from 2006 to 2008. This is a poor showing compared to South Africa, Kenya, Mauritius and Ghana that have positive growth rates through the stated period. Ghana, Africa's sub-Saharan best industrial growth economy in the stated period has highest growth rate of 41 per cent in 2011. On corporate bond issue, Nigeria has highest issue in 2011 with $2.46bn compared with African's highest in Botswana with $4.56bn in 2008. On Sovereign bond issue *(Sbi*) Nigeria has highest issue in 2010 with $2.65bn relative to Africa's best performance of $5.875bn in Botswana in 2008. The real per capita income *(Rpi)* in Nigeria is highest in 2009 with $1,139 and lowest in 2010 with $22.2 relative to Africa's highest of $7,328.5 in Morocco in 2012 and lowest in 2006 in Ghana with $11.5.

Nigeria's highest statistic for interest rate spread is 11.1 per cent in 2010 while the lowest is 3.5 per cent in 2008, and from 2010 to 2015 the simple average interest rate spread is 8.8 per cent. This record is high compared with the sampled economies' highest spread of 13.8 per cent in Mauritius in 2005 and lowest spread of 0.5 per cent in 2010, and sooner improved impressively thereon, by maintaining low spread of 1.6 per cent on average from 2010-2015. Nigerian high interest rate spread, and indeed banking and financial services that should be catalyst for the peoples' growth and wellbeing, may have actually increased their poverty propensity through negative real saving rates and high lending rate, whose cost is passed on to the consumers' goods and services. The High interest spread regimes in Nigeria may be a reason for her current high business risks, low investments, low bank competitiveness, all being indicators that may have undermined industrial output growth rate. In Nigeria, poverty and unemployment remain daunting macroeconomic challenges, as the World Bank reports (World Bank, 2014a) that 33.1% (rural area 45%) live below poverty line, while the National Bureau of Statistics (NBS, 2016a) says unemployment rate as at December 2016 is 13.9% (underemployment, 19.7; youth unemployment 45.65%).

On technological development *(Tdv)*, a proxy for human capital development, measured by per centage of government expenditure on education relative to total government budget in Nigeria has the highest value of 6.8 per cent in 2004, while the lowest in the period is 6.3 per cent in 2007. The poor education financings must have accounted for *Tdv*'s negative and significant link with Industrial output *(Io)*. The result reveals the problem of contemporary Nigeria's dysfunctional and skill-less educational system, which is not industry focused. The performance of regulatory institutions, measured by an index of governance standards in the economy as per the World Governance Indicator (WGI), is negative through the 2004-2014 periods, as the country records the highest negative value in the continent in 2004 with -1.63 and the lowest in 2007 and 2011 with -0.99. This record is far from Africa best performance achieved in Mauritius in 2012 at 0.96. On openness a measure of the country's trade to GDP, Nigeria appears as not very open economy relative to average standard of the selected African economies. The country's highest openness value is in 2006 and 2008 with 65 per cent ratio to GDP, while the lowest is 0.31 in 2013. The continent highest openness value is in Mauritius in 2006 with 103 per cent, the lowest is in Nigeria at 31 per cent.

On inflation rate, Nigeria's highest rate in 2005 is 17.9 per cent, a little short of the selected economies' worst performance of 19.3 per cent in Ghana in 2009. Nigeria's best inflation record is 8.2 per cent in 2006 relative to the best selected economies record of 0.9 per cent in Morocco, 2011. This statistics suggests that Nigeria is highly inflation prone and would have challenge of inflation management. The corporate bond turnover (*Cbt)* has highest and only performance is in 2012 at $0.64bn compared with the continent's highest performance of $7.75 in 2010 in Namibia. The *Cbt* performs poorly in all the economies with zero value in many countries other than Tunisia and Namibia. On bank concentration (commercial bank branch per 100,000 adults), and a measured of bank competitiveness *(Bc)*, Nigeria records highest performance in 2010 with 6.51 compared to the continent's highest standard of 24.061 in Morocco. The result reveals that the banking industry is highly concentrated, less competitive relative to the population. On electricity consumption *(Elc)*, the Nigerian economy records the highest electricity consumption of 155.754 Kwh per capita in 2012, and lowest of 111.14 Kwh per capita in 2006, compared to African countries' highest performance of 4,903.905 Kwh per capita in South Africa in 2007. In 2012 South Africa's *Elc* was 4,405.748 Kwh.

Earlier, this study finds that on the supply side, the interaction variable (corporate bond issue and interest rate spread) has long run significant influence on electricity consumption *(Elc).* While corporate bond issue, interest rate spread, technological development, institutional quality index, financial deepening and real per capita have significant long run joint influence flow to electricity consumption *(Elc)*, nevertheless *Elc* still lacks long run influence on industrial output (*Io)* may have had series of implications on the Nigeria's economic trajectory, particularly on the quality of productivity and unemployment situation. These results may have accounted for the low industrial productivity of Nigeria relative to her comparators in Africa and global peers. This findings provide credence to the findings on a recent study conducted by the World Bank in 2008 (Iarossi, Mousley and Radwan, 2009), when Nigeria appears as the highest electricity outraged economy among comparators like Kenya, Indonesia, Brazil, Venezuela, South Africa, India and China, and more recently in the global enterprises survey by the World Bank (World Bank, 2017) Nigeria ranked lower relative to average sub-Saharan economy, using indicators that supports manufacturing competitiveness. In the 2008 study, 97 per cent of firms in Nigeria experienced power failure, while 86 per cent of firms own their generators that produce 61 per cent of their electricity needs. The Nigerian alternative in diesel powered energy supply is ever

non-sustainable and evolves at higher cost of production, which makes the average Nigerian manufacturer ever uncompetitive. More seriously, it would have aggravated Nigeria's high social cost in health and noise pollution of the environment. In 2014, World Bank global survey on electricity outrage among manufacturing firms reveal that Nigeria ranks 8th most outraged with 32.8 times of outrage per month (World Bank, 2017).

Electricity constraint in Nigeria constitutes huge direct and indirect costs militating against business competitiveness, particularly the SMEs subsector of the manufacturing sector. Given the huge population and the high population growth rate, the onerous problem may have stagnated Nigeria economic progress, such that, as at the last two decades several manufacturing firms have chosen to migrate to other neighboring, but more competitive economies on the bases of electricity infrastructure, while some other manufacturing firms have scaled down productivity or short down their plants on account of poor electricity consumption per capita (WEF, 2016). The consequences of electricity related industrial crises have been very severe which may have increased the rate of unemployment, and poverty, particularly among the urban poor, and the crime rate. Many industrial warehouses built in the 1980s on the heels of the import substitution industrialisation (*ISI*) in many of Nigerian cities have been converted to religious worship centers. Hitherto crimes that were alien to Nigeria in the 1960s-1980s, such as terrorism, kidnapping, advance free fraud, and others, are common now rampant among the citizens, in particular, the youths.

From the above analysis, it can be deduced that Nigeria's relatively poor industrial growth performance from 2004 to 2014 may not be unconnected with the outcome of the explanatory variables in the short and long run regression results in this study. The negative influence of interest rate spread and technological development towards industrial growth rate may explain the not too impressive industrial capacity utilization (*ICU*) since the 1990s, as the two variables in practice are acting inimical to industrial output ratio (*IOR*). The World Bank report says Nigeria's IOR is on average 22.4 per cent from 2010-2014 (see table **2.3**). The result suggests the inference that the country needs to produce alternative financial and educational system that would meet the demands of contemporary times needed for industrial output growth, as prescribed by the endogenous theory. As previously analysed, the average annual interest spread of 22.4 per cent as reported by the Central Bank of Nigeria's statistics from 2010 to 2014 (see

table **2.3**) indicates higher level of financial inefficiency which may have been unhelpful to provide desired economic growth, as cost of capital for investments constitutes higher risk factor for current and potential investors; hence there is the need for the development of alternative funding institutions for industrial growth needs, particularly at the small and medium scale level.

Very similarly, the availability, capacity and quality of technology and entrepreneurialism needed for industrial growth is not unconnected to a country's expenditure on education and general human capital development, particularly in an increasing populated but developing country like Nigeria. The significant negative relationship with industrial output growth may indicate disconnection overtime between the two development variables needed for the country's transformation, suggesting that the country education system needed restructuring. For instance on funding, relative to UNESCO prescribed minimum 26 per cent funding capacity for human capital needs for development convergence, the best the Nigerian economy could allocated is 6.8 per cent in 2004. Little wonder thus, that the Nigerian economy is overly extrovert, lives on 'economic rent' from natural resources export as little or no value added goes into the natural resources and agricultural commodities for export, with adverse implications. In line with Solow-Swan's long run growth theorems, technology augmented substitutability in the production process remains another daunting challenge to Nigerian extroversion story. The Nigerian economy extroversion rate (the export structure) has remain high over the years, in excess of 95 per cent from 2010-2014, only comparable to Angola (99 per cent) and Ghana (92 per cent) as provided in table **2.4**.

On the higher extroversion rate in Nigeria, it suffices that the hypothesis that there is connection between quality of entrepreneurialism, level of extroversion, and quality of business/ investment climate may be relevant to Nigeria when benchmarked with the quality of certification obtained from some Nigerian universities. In recent years, industrial concerns, particularly the foreign organizations seem to prefer foreign based certification relative to that of Nigeria, due to low local graduate productivity. Given that Nigeria's business environment is perceived as of low quality, a high quality educated, skilled and knowledge graduate and entrepreneur can assist to arrest the extroversion economics, irrespective of the low quality business environment. Quality of education delivered simultaneously corresponds to qualities of skill, productivity and transmits to quality of entrepreneurialism in any economy. Hence, improvement in the budget

allocation and quality of education expenditure can transform industrial productivity and build quality entrepreneurial skills.

The negative influence of corporate bond issue (*CBI)* on industrial rate spread (*IRS)* and *CBI*'s positive flow to industrial output (*Io)* are intertwined, which finds significance in the Nigeria economy. The economy's average lending cost of 25 per cent (2010-2014) increases the interest spread of the bank that would have resulted in low *Io,* which a developed corporate bond market could ameliorate. Lack of viable bond market has not been helpful for the growth of the real sector, as the non-finance corporations have mainly relied on bank finance for long term capital investment, at penalty of high interest cost. At the present time, the small bank ratio (about 25 banks to estimated population of about 180 million) stifles bank competitiveness, exacerbates the 'group interest' influence and domination of the intermediation system. Evidently, off recent (2013 upward), cross section of the Nigerian banks in the domestic and international bond/ Eurobond market, made offers at high interest rate for onward lending to the non-finance corporations (NFCs), particularly the helpless manufacturing and the SMEs sectors at higher interest rates. The consequence may have been the high interest rate gap that pervades the economy since 2014.

The negative influence of bank competitiveness (*BC)* to interest rate spread *(IRS)*, and *BC* to Public debt *(Pdt)* is apt in Nigerian case. As described above, the oligopolistic market of the bank-based financial structure is unhelpful to the economy, as it heightens interest rate spread, as the banks' credit structure favours the trade and services subsectors, such that the trade and service subsector currently contributes excess of 50 per cent of gross domestic product (NBS, 2016). The link between the high per centage of bank credit to the trade and service sector relative to the real sector and Nigerian macroeconomic weaknesses may have paradox implication for the Nigeria economy. Regulatory reforms, such as low license fees, tax holiday, and others, that can attract investors into the banking industry, and more formally attractive fiscal policies on the financial model for the non-finance corporations (NFCs) to embrace the domestic and international bond market would be helpful towards reduction in interest rate gap.

For a more inclusive real sector to take preeminence, industrial sector credit especially the small and medium enterprises (SMEs), should be encouraged. A refocused finance structure in favour of the real sector would be better achieved through a developed bonds market that has long term

view. Government should take the lead by issuing very long term bonds, such as 30 years and above for its productivity, inflation management and yield curve development impacts. Moreover, government needs to pursue industrial policy albeit by encouraging the small and medium scale enterprises to issuing corporate bonds.

Additionally, as earlier stated Nigerian economy has been experiencing the high interest rate spread *(Irs)*. To this effect, the following regression results are relevant, the regression finds negative link from corporate bond issue (*Cbi)* to interest rate spread (*Irs)*, from *Irs* to Financial deepening *(Fdp)*, and positive link from *Cbi* to *Fdp*, which indicates that a developed and attractive corporate bond issue market, especially for longer term non-bank financial issues could assist to manage the interest rate gap downwards and deepen the financial system.

Recently, the record on the credit history in Nigeria at year ended December, 2016 reveals that the Nigerian economy is weighed-down by high non-performing loans (NPL) in excess of ₦1.85 trillion (about $6.60 billion) (NDIC, 2017) largely attributed to high interest rate spread as source of bank profit, that eventually limits financial deepening. The NPL level represented 10 per cent of the total loan portfolio in the economy, as insider related lending stood at ₦740 billion ($2.43 billion) against regulatory threshold of 5 per cent (NDIC, 2017). The high loan delinquency may have been a function of 'availability' at excessive lending rate, credit market mismatch, and speculative business lending. Other reasons adduced in the NDIC Reports include corporate governance plus regulatory failures, which have remained common features of bank-based developing economies, as theorized by Rajan and Zingales (2003b). Rajan and Zingales (2003b) opin that one of the noted features of the relationship-based finance system is that bank lending is hardly transparent and the risk rating hardly reflect the intrinsic value of the project being financed.

The current low non-finance corporate (NFC) bond issue in Nigeria may be better improved by policies that enhance macroeconomic stability, quality institutional governance, improved investors' confidence, unfitted access to corporate information, and freedom of capital mobility. These variables are also needed to attract international capital. Financial deepening (*Fdp*) that is negatively influenced by interest rate spread *(Irs)* may have clearly revealed the high interest margin ratio, which serves as major source of bank profit in the recent time, and therefore low

financial development statistics as measured by the low ratio of private sector credit to GDP (PCGDP), and private sector credit to total credit (PCTC) in the Nigerian economy overtime.

Another interesting result relevant to Nigeria is that interest rate has significant long term influence on inflation rate while the reverse does not hold, negates extant hypothesis of Fisher's interest rate theory and Taylor's monetary policy rule, as analysed earlier. As the result is apt for other selected African economies, it may however explain the current Nigeria's financial development challenge, since long term finance and economic development planning by investors may be more onerous if inflation risks cannot be reasonably determined empirically towards estimating interest rate. Then, it can be opined that monetary policy decided rates itself overtime would more or less have been under or over estimated. This may additionally explain why monetary policies have been ineffective towards improving the fortunes of the real sector in Nigeria. The real sector's stability and growth requires sound macroeconomic policies, while the basis upon which the policies are drawn should be products of proven research. Although empirical evidence suggests that inflation economies cannot be of a single factor model (Brown and Matysiak, 2000), as demand (monetarist view) and supply (structuralist view) forces often pressure inflation in developing countries, the monetary pressure against inflation in the study suggests high money supply distortion in Nigeria.

The positive nexus from public debt to inflation expectation, also finds relevance in Nigeria's economic challenge. Considering the history of both variables in less productive developing economies such as Nigeria, there are many channels of the linkage; particularly fiscal policies if not prudently managed could have complex complication on the economy beyond inflation, than monetary policies. Although, development institutions such as the IMF has overtime described Nigeria as low risk debt country (IMF, 2015), however, linear and non-linear links suffice for her debt accumulation and inflation growth rate that transmit to the peoples' welfare loss. In particular, Nigeria's overdependence on crude oil sale for sourcing FX supply may over the years have accounted for her debt accumulation, since her FX liquidity is often affected given recurrent oil price shock. Fiscal deficits rate has been on the rise over the years, while the corresponding rise in per centage of debt service to budget has shortchanged the private sector economy of development funds.

Higher debt accumulation is a major characteristic of successive Nigerian governments since the debt forgiveness for the country occasioned by the global debt crises of the 1990s. The prudency level of government debt has been in contest, following evidences that debt accumulation is often not deployed for productive capital development but largely to support gaps in public sector consumption and transfer, hence its inflation outcome is not unusual.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This study has examined the effects of interest rate spread and corporate bond market development on industrial output growth in some selected African economies. This chapter presents the summary of findings, hypotheses tested and their results, contributions and additions to knowledge, suggestions for further studies, conclusion and major policy recommendations.

5.1 Summary

This study noticed that the major weakness of many African economies is their state of economic extroversion. The continent's overreliance on primary and commodity products for growth, revenue and export earnings may have compromised her sustainable and inclusiveness growth, such that, an industrial leg growth could have curtailed the unfortunate vulnerability to external shocks and deepening povety. A vital antidote which this study examines is how to finance the industrial output and growth ambition via the corporate bond market. An accelerated industrial output growth is imperative for all modern economy, as it serves to keep capital and labour in constant employment, drives innovation, research and technology, ensures the supply of the peoples' welfare needs, provide revenue and foreign exchange support to government, and ensure that income flows to the people. The United Nation Industrial and Development Organisation (UNIDO) records reveal that while other global regions are faring well in industrial output growth rate annually, African economies, apart from South Africa, is underperforming.

This study underscores high interest rate spread as a major challenge to improving corporate bond financing of the industrial output in African economies. Following the 'group interest' theory, the banking industry consolidates its hold-on financing African industrialisation at the detriment of the corporate bond market, at high interest rate. Theoretically, the finance-led growth hypothesis presumes that long tenured or development funds should be supplied to long term industrial needs, while the banks in Africa by 'availablility doctrine' have in majority short-term fund which is unsuitable for long term lending. The inappropriate financing model results to benefiting the banks via increased interest rate spread (high lending rate, low deposit rate), while

the corporate bond market issuing remains undeveloped. The financing 'behavior' by the banks have however made the long term bond market become seemingly unattractive.

The sampled economies are thirteen out of the population of fifty-four (54) economies in the continent. Within the sample frame and size, as at 2015, twenty-five countries are members of the African Stock Exchange Association (ASEA), with sixteen active corporate bond markets, as reported by ASEA 2014 financial report. The final selected thirteen is largely determined by the limitation of data. The economies are Botswana, Cameroon, Cote d'Ivoire, Egypt, Ghana, Kenya, Mauritius, Morocco, Namibia, Nigeria, Rwanda, South Africa, and Tunisia. The data period is from 1995 to 2014.

The technique of estimation employed for the five hypotheses tested are the augmented Toda-Yamamoto (ATY) granger causality, and the fully modified ordinary least squares (FMOLS) regression, within the framework of autoregressive distributed lag. Both techniques employed were largely determined by the state at which the variables became stationary. As some of the variables are stationary at second difference, the Johansen long run (co-integration) estimation became impossible. The ATY is unique as it incorporates the short run dynamic regression (the residual) into the original Toda-Yamamoto (TY) d+m model, which itself is limited to the long run examination. The optimal lag length obtained for each of the hypothesis is one.

5.2 Major Findings

The major findings of the dynamic multivariate regressions are as follows:

5.2.1 Interest rate structure and corporate bond market development: Model 1 seeks to establish if significant relationship exist between interest rate spread and corporate bond market development. With the use of FMOLS in an ARDL framework, the short run error correction mechanism (ECM) coefficient is statistically significant with about 100 per cent speed of adjustment to long run equilibrium, which implies all the explanatory variables jointly determine the corporate bond issue *(Cbi)* and they have long term co-integration. On the long term, individual explanatory variables meet the *apriori* expectation for Interest rate spread *(Irs)*, Corporate bond issue *(Cbi)*, Saving rate (*Svr)*, and Institutional quality *(Iqx)*.

Expectedly, in line with the 'group interest' theory, interest rate spread *(Irs)* negatively relates in dynamic form with corporate bond issue *(Cbi)* in the long term by 167%. Although, interest rate spread *(Irs)* is a monetary policy mechanism that activates economic activities, the high spread rate overtime in the region may have accounted for the high negative coefficient, hence may reveal pervasiness of the spread that has produced adverse monetary and financing transmissions, which may have succeeded in retarding economic activities. Correspondingly, in model 2, *Cbi* negatively drives interest rate spread *(Irs)* which suggests that should there exist business and market discipline in the region, where industrial firm assets are financed by bond issuing, banks' interest rate spread may reduce proportionately.

5.2.2 Savings rate has high positive link to bond market development: Another important result from model 1 is that savings rate has 273% positive link to corporate bond issue market, which would lead to growth in financial development. The high capital raising rate evidenced in this result can promote the link between effective savings, capital formation, capital allocation and growth via the bonds market than the banking system channel. This finding is corroborative of the thoughts of Smith on living parsimoniously in order to grow capital; and Keynes revolution that savings is of private virtue and public vice towards capital formation development *(Ibid)*. From risk sharing perspective, it implies that such financial development of saving would grow rapidly under more secured capital market environment for "funding, finding and monitoring" more long tenured investment opportunities.

5.2.3 Interest rate spread and Industrial output growth: In model 2, the study finds that interest rate spread negatively influence industrial output growth in the long term, which reveals the failure of the bank-based finance model at promoting industrial output growth. High interest rate reduces the potency of industrial investment, leading to low factor productivity, low employment, wide output gap. The transmission leads to high imports of locally produceable goods, thereby reinforcing the doctrine of extroversion.

5.2.4 Corporate bond issue and Industrial output growth: In model 3, the study examined if corporate bond issue impacts industrial output growth. With use of augmented Toda Yamamoto (ATY) technique, the short run dynamic causal equations' coefficients results are appropriately signed, which satisfies the sufficient condition that the joint influence of interest rate spread *(Irs),* corporate bond issue (*Cbi),* Technological development (*Tdv*) and Real per capita income (*Rpi*)

variables flow to the dependent variable, Industrial output *(Io)* growth, implying convergence to equilibrium.

Importantly, in the long run, positive causal flow exists from corporate bond issues *(Cbi)* to industrial output *(Io)* growth rate, albeit insignificantly, an indication of 'perverse' financial structure and real sector relations, as the real sector is being financed through the money market, or that the financial structure in place does seemto serve the long term interest of industrial growth. Additionally, the interaction variable (corporate bond issue and interest rate spread) though has positive link, although insignificantly, hence does not affect *Io*, while however a component of the interaction variable, that is interest rate spread *(Irs)* negatively affects *Io* which is indicative of high short run money market finance cost being deplored to real sector inefficiently. One way negative causal flow exists from other included explanatory variables such as from technological development *(Tdv)* to industrial output *(Io)* growth. The *Tdv* negative influence on *Io* however negates *apriori* expectations, which suggests low standard education quality in the selected African economies. Corporate bond issue *(Cbi)* and *Tdv* have long run influence on *Irs*. Moreover, *Irs* and *Cbi* flow to financial deepening *(Fdp)* in the long run.

5.2.5 Interest rate spread and financial deepening: Furthermore, the multivariate results in model 3 reveal that interest rate spread negatively affects financial deepening in the region. Interest rate spread (*Irs*), is a product of the bank-dominant financial structure while financial deepening *(Fdp)* proxies financial development. Moreover, corporate bond issue (*Cbi)*, a product of market-based financial structure has long run positive effect on financial deepening. A draw-down from these results may suggest that the macroeconomic variables distortion such as high inflation rates, often in the second digit, and monetary system's instability in the region are not unconnect with the poor long-run financing structure. Both results suggest that African economies have unduely relied on short term bank-based finance, often characterized by short run business cycles to drive financial deepening inequitably. Financial deepening may be better driven by policies that are of market-based finance.

5.2.6 Human capital development and financial development: Additionally, a vital outcome among endogenous variables in model 3 is that technological development (*Tdv*), a proxy for human capital development does not promote financial deepening (*Fdp*) in the region. By *apriori* and intuitively, there ought to be synergy between human capital development and financial

development. As the quality of human capital determines the individual technical knowhow, and their entrepreneurial prowess, financial development should evolve rapidly from entrepreneurialism, through inventions and innovations that puts forth capital, enterprises and markets in action to satisfy human wants and feel future utility gaps. The causal variable-government spending on human capital may not have been effectively applied, such that the gap suggests lack of innovative learning and training for skill and competence in the schooling process. Moreover, financial deepening can grow through intrapreneurship- an innovative idea beyond current thinking of management, acquired through quality education, just as Schumpeter (1934) links entrepreneurship through innovations and quality thinking for dynamic economic growth by "creative destruction". Perhaps, the low quality human capital being produced by the education system in many economies in the region- poorly skilled, non-entrepreneurial graduates may be attributed to the negative relationship.

5.2.7 Institutional quality *(Iqx)* and the interaction variable *(Intc)* (corporate bond issue*interest rate spread) are co-determinants of one another: Model three (3) finds that both institution quality *(Iqx)* and the interaction variable *(Intc)* have simultaneous causal influence in the long term. It suggests that in line with extant empirical evidences, institutions and financial development are co-determinants of one another (Levine, 2004; Knoop, 2013). If institutions are better seen as incentives by governments and the societies to engage and promote mutual and beneficial transactions, then adopting and promoting quality incentives in forms of legal, culture, beliefs, social norms, *etc,* that fosters mutual trust of relationships, cooperation, and honesty of purpose would benefit the financial system, enhance financial intermediation and inspire greater financial and economic development of African economies. Quality institutions not only reduce cost of transactions, but also facilitate markets for exchanges, and production of goods and services (Nallari and Griffth, 2011).

5.2.8 Institutional quality has negative long-run causal flow with financial deepening: This result suggests that weak institutions in inform of culture, beliefs, rule of law, regulations, and others pervade African econmy, and adversely influence resources transfer and allocation among surplus and deficit economic agents. Quality institution is a product of quality human capital, manpower and skill development, which this study finds to have weak regression link with financial deepening, and industrial output. Where low skill manpower exists it is transmitted to

weak institution setting, which adversely influences development variables such as productivity variables in the financial system, that is markets, instruments and institutions.

5.2.9 Correlation study finds that financial development (*Fdp*) is negatively correlated with real per capita income (*Rpi*) in the region by 35 per cent: An indication that the growth in financial deepening has been less inclusive; an environment characterized by high cost push inflation, hence erosion of the peoples' disposable income.

5.2.10 Secondary corporate bond market and industrial output growth: the fouth (4) hypothesis (model 4) seeks to establish if the secondary market information on liquidity has added value (signaling effects) for real investment. Although, the short run dynamic causality results for industrial output *(Io)*, corporate bond turnover *(Cbt)*, and corporate bond issue *(Cbi)* equations have negative coefficients, that the joint influence of each equation's explanatory variables determines the dependent variable and converge to equilibrium, no long run joint or one-way causal flows is achieved from the *Cbt* to *Io*. That is, against the thought in the theoretical literature, market liquidity does not have signaling effect on real investment in the African region's sampled economies. This result may be informed by the low trading capacities of the corporate bond trading in most of the economies, except, perhaps South Africa and Mauritius. The liquidity signaling effects is however found to influence regulatory institutional quality *(Iqx*) in the region. It implies that increased market activities can spur quality regulations, as the institutions can act ahead of the market.

5.2.11 Inflation expectation and interest rate spread: it seeks to establish if dynamic significant relationship exist between inflation expectation and interest rate spread using the ATY technique. The short run dynamic coefficients for interest rate spread *(Irs)*, Inflation expectation *(Ifr)* and Openness *(Opn)* are negatively signed, which implies that the joint influence of explanatory variables of the three equations influence the dependent variable and they all converge to equilibrium, indicating long run stability. In the long term, there is a significant positive one way causal flow from interest rate spread *(Irs)* to inflation expectation *(Ifr)*, which indicates, though that in line with Milton Friedman's inflation theory, inflation expectation in the region is a monetary phenomenon, its positive flow negates the Wicksell process of negative postulation. Similarly, however, in line with Fisher's interest rate theory and the hypothesis tested, the reverse flow from inflation to interest rate spread (*Irs*) is not found. It

implies that in line with recent development in the literature inflation may be structural, institutional and endogenous in the region's economies (Nitzan, 2009).

5.2.12 Public debt on Bank competitiveness: From model 5 above, the study suggests additionally that negative and significant long run influence exists from Public debt *(Pdr)* to Bank competitiveness *(Bc)*. This implies that being a bank based financial structure region, increased public debt can accentuate the oligopolistic tendencies of the banking market in the region and effectively reduce the rate of bank competitiveness.

5.2.13 Bank competitiveness and Interest rate spread share negative long run relationship: a unique finding is that bank competitiveness can produce the capacity and capability towards reduction in interest rate spread in the region, just as high interest rate can frustrate bank entrants, since it constitutes high cost and hence risk of doing banking business. Given the anti-competitive tactics of oligopolistic banking model in practice in Africa, the high interest rate is attributable to usual high inflation rate and macroeconomic instability in the region.

5.2.14 Public debt positively links inflation expectation in the long term: Finally, very intriguing result is that significant long run positive link from public debt to inflation expectation suffice in the African economies. High inflation rate and macroeconomic instability have been the phenomena in African economies, such that this study reveals that Africa's preponderance to recalling high inflation rate would be the adverse effects of the nature of her high extroversion economies (see Table **2.4)**.

5.2.15 Other findings:

a. The interaction variable (corporate bond issue and interest rate spread) has significant positive link with electricity consumption *(Elc)* in model 1. It indicates that if corporate bond issue interacts with interest rate can positively drives electricity consumption in the region. Moreover, the chi-square statistics of the modified Wald test indicates that the long run electricity equation is significant, which indicates that the joint explanatory variables influence electricity production in the long term. Electricity production is capital intensive and of diverse macroeconomic impacts, hence should be financed through the bond market.

b. Real per capita income *(Rpi)* links corporate bond issue market *(Cbi)* negatively in model 1 result. It would imply that on average the per person income level in the region is declining and may not be helpful for the growth of corporate bond issues. The *Rpi* indicates the rate of growth of the economy per person after discounting inflation rate, and reflects the extent of growth inclusiveness. Since capital asset consumption expenditure is a function of personal income, the respective high inflation rate in the region would have been responsible for the low purchasing power for the corporate bond issue market.

5.3 Hypotheses tested

Hypothesis 1

The study rejects the null hypothesis that interest rate structure does not significantly influence primary corporate bond market development in the selected African economies

Hypothesis 2

The study rejects the null hypothesis that there is no significant relationship between interest rate spread and long-run industrial output growth.

Hypothesis 3

The study fails to rejects the null hypothesis that there is no significant relationship between primary corporate bond market development and industrial output in the selected African economies

Hypothesis 4

The study fails to reject the null hypothesis that there is no significant relationship between the secondary corporate bond market and industrial output growth.

Hypothesis 5

The study fails to reject the null hypothesis that there is no significant relationship between inflation expectation and interest rates spread in the selected African economies.

5.4 Implications of Findings

Further to the general discussion on the results in chapter four, the implications of specific findings that tie with the research questions are here presented.

The first research question on whether interest rate spread *(Irs)* does not cause corporate bond issue *(Cbi)* is affirmed, as the study rejects the null hypothesis. Interest rate spread (*Irs)* in line with *apriori* negatively influences corporate bond issues, which implies that bank interest rate spread may continue to frustrate the corporate bond issue market to develop competitively, as the 'group interest' theory had foretold. As the bank-based system continue to meet the non-finance corporate (NFC) credit needs at the usual higher interest cost, rather uncompetitively, inappropriately, and inefficiently for the financial system. The financial system may continue to withness stress and weak industrial growth due to poor state of long term industrial finance. The right form of financial institutions for potent market-based financial development may be needed, as suggested by Gerschenkron (1962).

The second question on whether significant long run relations exist between interest rate spread and industrial output is affirmed as the study rejects the null hypothesis. The result implies that increasing interest rate spread would continue to weaken domestic industrial investment, leading to low factor productivity, low employment potential, wide output gap and possibly stagflation. The consequence may not abate the doctrine of extroversion in the selected African economies.

The third research question on whether corporate bond issue (*Cbi*) does not cause industrial output *(Io)* is affirmed as the study fail to reject the hypothesis that *Cbi* does not cause industrial output*(Io)* in the selected African economies. Moreover, the interaction variable (*Cbi* and interest rate spread, *Irs*) has no causal link with Industrial output. These resulte affirms that the manufacturing concern and the SMEs have continued to rely on the unsustainable money market for industrial finance need, at very at high cost, transmitable to high input cost and inflation, and may have being accentuating poverty. High cost of manufacturing increases their global uncompetitiveness, leading to instability; and low incentive to entrepreneuring may suffice. With increasing rate at which technology substitute for human capital in these economies, the manufacturing concern remains the highest source of employment, however high finance cost would cause more unemployment combined with inflation. As earlier discussed under the

extroversion doctrine, in order to achieve employment diversification, economic resilience and improved living index in African economies, mechanisms must be built-up that would redirect the much populated young African energies from trading (distributive) economies towards industrial productivity, at best by evoluting from light technology manufacturing.

The fourth question on whether the secondary corporate bond market significantly drives industrial output growth is not affirmed as the study fails to reject the null hypothesis. The implication is that significant primary issued securities are not being exchange traded, perhaps due to few formal exchanges. Stock Exchange infrastructures in many African economies are publicly provided. For market based economy, there is need for legal and regulatory framework to encourage the private sector to set up securities exchanges. The significance of the liquidity market is not imbibed by the non-finance corporate (NFC) to direct their credit sourcing to the issue markets rather than the short-term bank finance market. Weakness in financial reforms and regulation may be frustring this necessity.

The fifth question on why high interest rate spread in the economies, that produces the hypothesis that 'no significant relationship between inflation expectation and interest rate spread', is affirmed, as the hypothesis is not rejected which implies that interest rate structure is not of a monetary phenomenon. The finding is that on the contrary, interest rate spread significantly drives inflation expectation. The implication is that interest rate spread may be driven by structural weakness and distortions in the production system, beyond what monetary policies can offer. It may require finetuning institutional and regulatory reforms to manage the spread downwards.

5.5 Contributions to knowledge

In relation to the empirical findings, the hope for industrial output growth in African economies lies partly in monetary affair- relatively lower interest rate spread, through the growth of the corporate bond issue market, which is also a monetary phenomenon. Specific contributions are:

1. Interest rate spread is inimical to corporate bond market development. This study contributes to the 'group interest' theory of financial development, that for bank-based developing economies, the more magnified the interest rate spread, the more disadvantaged it is for the corporate bond issue market to be effective as a long term fund

raising platform for industrial output investment and growth. In other words, capital issue markets would flourish if the interest rate spread narrows down. The interaction rate is high between the interest rate gap and corporate bond issue, which is unhelpful to industrial output growth. Given that other regions or country specific economies share similar financial structure, the finding may be a generalization.

2. That corporate bond market development could reduce the preponderance of high interest rate spread. The study reveals that corporate bond issue is a viable instrument to drive down bank interest rate spread. Should institutional reforms that promote non-finance corporate issuing, particularly by ensuring information availability for investors efficiently, bank lending-deposit rates could decline. High lending rates and the associated non-performing loans (NPL) of bank arise from disproportionate matching of assets and liabilities of borrowers and lenders. This result may have revealed how 'corrupt' financing policies have exacerbated business distortions, business cycles, and market failures in the region.
3. That bank-based financial system structure may not induce long run financial development. The study has found out that in the long run while interest rates spread negatively influences financial deepening, corporate bond issues positively influences financial deepening. Moreover, the study finds that high interest rate spread is unhelpful to long run industrial output growth, hence is inimical to African economies' quest for long run financial development.
4. Weak institutions adversely affect financial deepening in the long term. In this study, institutional quality and financial deepening share negative long-run causal relationship.
5. For extremely backward (structurally weak) economies such as sub-Sahara countries, the process of capital formation for corporate bond market development enroute industrial output growth, requires strong savings culture, as the study finds long-term saving as strong predictor of corporate bond issue.
6. Provide the fact that the secondary (liquidity) market can be helpful to develop effective institutional governance of the bonds market by providing valuable information. While the study establishes long term causal flow from corporate bond turnover *(Cbt)* to institutional quality index *(Iqx)*, it however finds that negative relationship exist between the secondary (liquidity) market and industrial output *(Io)* growth. Thus, it is discovered

that though the secondary corporate bond market is unable to drive industrial output growth through information signaling to the issue market, such can be achieved via effective institutional governance in the African region. By implication, the much needed role of the secondary market 'noise' to issuers, such as the non-finance corporations (NFC), for the patronage of the primary corporate bond market is either ineffective or downplayed, or that the market does not offer corporate issue information needed by non-finance corporations. Therefore secondary market link to institutional governance quality can perform valuable information transition to develop the issue market. For instance, the issue market looks toward innovations for enhanced market liberalization, an information that the extent of depth of the liquidity market can provide.

7. Study establishes a fact that inflation expectation is positively driven by interest rate spread in bank-based Africa's developing economies. Study contributes to the theory of inflation, as it suggests that inflation expectation is positively driven by interest rate, and effectively managed by it; which suggests affirmation of the Wicksellian cumulative process, and thus implies that inflation is a monetary affair; while the otherwise propositions of Fisher's dynamic duality effects and the extant Taylor rule could not be established.
8. Study establishes that public debt is detrimental to long run bank competitiveness which can promote high interest rate spread. A finding from model 5 is that there is long run negative relationship between public debt and bank competitiveness, while additionally the result establishes that interest rate spread and bank competitiveness are negatively bi-directionally causal. Therefore, there is a transition from public debt to high interest rate spread through bank non-competitiveness.
9. Other contributions include:
    a. That electricity development can be financed through the bond market. The Study uncovers that the interaction between corporate bond issue market and interest rate spread positively drives up electricity consumption in the region, which imply that in order to finance electricity supply the corporate bond market could be helpful, rather than bank finance.
    b. A fact that link exists between human capital development and institutional quality towards electricity development. Study establishes that the drivers of

electricity consumption include technological development and institutional governance quality, as they are highly and positively correlated with electricity consumption in the region.

c. A fact that unguarded openness can worsen inflation expectation. Study reveals that openness could affect inflation expectation negatively; and that public debt impacts inflation expectation negatively.
d. Additionally, this study extends the Toda-Yamamoto (T-Y) long run technique of estimation. It incorporates the short run dynamic process into the existing d+m framework in the literature to carry out the analysis. Previous empirical applications on the T-Y techniques were limited to long run analysis. Similarly, the study incorporates the short run dynamics into the autoregressive distributive lag (ARDL) model to account for the short run effects.

5.6 Suggestions for further studies

Further studies can be carried out on the following and other allied areas:

1. The competition for dominance in financial intermediation in African economies by the banking and securities market industries relative to their impact on financial development can be studied using alternative methodology such as Game theory.
2. Cross country and cross regional analysis in other continents can be examined on the influence of interest rate spread on industrial output and for comparison with the outcome of this study.
3. A study to examine the determinants of liquidity in the secondary corporate bond market at country specific and African regional economies.
4. A study to compare the potency of the equity market and the corporate bond market for industrial investment growth in African economies.
5. Given the relative low technological development (knowledge and poor education quality) in some African economies, a hypothesis of entrepreneurialism, business/investment climate and level of extroversion, particularly in primary product export African economies can be tested.

5.7 Conclusion

In line with the expectation of financial architecture growth of the financial structure system theory, this study examines the requirements necessary to finance industrial led growth in selected African economies. Following the 'group interest' theory, which has provided the background information to the implications of the increasing dominance of the bank finance of the industrial sector, African economies is yet to be industrially productive to compete with her global regional peers. An indication of the inappropriateness of the bank led industrial financing scheme is that the industrial output growth rate in African economies is relatively poor, accounting for just one per cent of global industrial output as at 2011, and 4 per cent of total emerging and developing countries' contribution in 2014, according to data of the UNIDO. It may therefore required that long term capital finance be restructured for the financial system, which is best provided by the corporate bond market, rather than the bank lending mechanism to enable stable financial and economic development process.

The persistence and increasing dominance of bank finance of industrial growth of African corporate industry lending, may have had its attendant consequences such as high non-performing loans (NPL) and high interest rate gap- the profit making mechanism of the banks, and overall recurring financial system crises. This study hypothesizes that the more magnified the interest rate gap, the more it may be difficult to raise funds via the corporate bond market to achieve higher industrial output growth, as testified by the group interest theory in developing economies, such as African underdeveloped financial markets, with enormous consequences on financial development. Hence, the study tests the theoretical doctrine of supply leading or the finance-economic growth instinct.

The study uses an augmented Toda-Yamamoto (ATY), and the fully modified ordinary least square (FMOLS) in an augmented autoregressive distributive lag (AARDL) framework to test five hypotheses in a panel study of thirteen African economies from 1995-2014. The short run dynamic results and the error correction mechanism (ECM) coefficients produce appropriate *apriori* signs which reveal stability and cointegration. In the short term, industrial output growth *(Io)* is jointly influenced by corporate bond issue *(Cbi)*, interest rate spread *(Irs)*, technological development *(Tdv)* and real per capita income *(Rpi)*. The long run, results however show that corporate bond issue (*Cbi)* does not cause industrial output *(Io)* growth, which suggest that the

continent relies more on the money market instruments to fund industrial output. The result provides evidence of poor industrial investment funding and hence the near stagnation of industrial output growth, as exclaimed by the World Economic Forum (WEF, 2013). Such a weak-link to funding industrial output is a mismatch, which may have increased the quantum of non-performing loans, and may have been the root cause of financial system fragility in the continent.

Furthermore, there is negative influence from interest rate spread *(Irs)* and technological development *(Tdv)* to industrial output *(Io)* growth respectively; and more importantly *Cbi* negatively influences *Irs*, and positively influences financial development. The negative influence from *Irs* to *Io* by 296% indicates that the high interest rates discourages industrial investments, which may have been responsible for unemployment in human and material resources, exacerbating extroversion. The apparent interest rate imperfection in African economies which manifests in high credit spread in favour of the banks could have been operating to constrain the growth of the long term corporate bond market necessary for industrial output growth and development. Thus, the high interest spread may have constituted the highest bane of the financial system of these economies, as its negative effect by 200% on financial deepening manifests. Since, the financial system shapes the economic destiny of nations, however, in African economies the financial system may have failed to produce strong or mature bond market institutions, as prerequisite for industrial output growth and economic development.

The negative link from technological development (measured by per centage of government expenditure on education) to industrial output implies that there is a largely low quality educational output from the schooling system in African economies which does not fit for industrial labour and production, indicative that the little industrial output efforts may have been from foreign certificated labour supply. The interest rate spread (*Irs)* negatively influences financial development *(Fdv)*, while Institutional regulatory quality *(Iqx)* positively influences the interaction variable *(Cbi* and *Irs)*. That *Irs* negatively affects financial development *(Fdv)* may satisfy the investment theory that suggest that high interest rate discourages credit risk taking and lowers investment drive, and ultimately frustrates growth of entrepreneurialism. By extension, since financial development proxy's private sector credit to GDP, it may imply that increases in

bank interest rate spread in African region is inimical to the promotion of African economic nationalism.

Very fundamentally, that institutional regulatory quality *(Iqx*)-a combination of governance effectiveness, rule of law and regulatory quality, positively affects the interaction variable (corporate bond issue and interest rate spread) may have put the management of the macroeconomic environment for the development of African corporate bond's market in contest. In developed economies and some emerging markets the combination of the effectiveness of the four major parties- the issuers, the investors, the intermediaries and the regulators help to produce robust bond market, under conducive macroeconomic environment. The same is expected for African economies. Capital market regulators may be timely and crucial, to strengthen the development of the bond market. The study invites their attention, as their role is critical for a robust corporate bond market, such that their interventions would help ensure stakeholders' trust, stability and growth of the market.

African governments should evolve sound fiscal and monetary policies, stable plus effective regulations that would help develop the corporate bond market and in turn help reduce interest rate spread, by putting the bank's industrial financing in check. For instance following effective macroeconomic policy framework, a low inflation regime may ensue, such that can ignite the peoples' interest in long term savings via the bond market, attract more issuers to offer longer term financial instruments, leading to further stability of the financial system. Again, should government opt for low deficit and low debt regimes, the crowding-out of the financial system from the private sector would reduce, thereby increasing more private sector capital development, leading to higher and diverse economies of scale and scope, high productivity, high industrial output, and improve overall welfare. In other-words, with right macroeconomic framework, the market-based resource allocation mechanism can provide better welfare outcomes. Similar argument flows from appropriate legal environment, better information dissemination from users of borrowed capital via better accounting standards, and so on.

Moreover, interest rate spread *(Irs)* negatively affects corporate bond market issue *(Cbi)*, while both savings rate *(Svr)* and institutional regulatory quality *(Iqx)* positively influences corporate bond issue. On savings rate in particular, and in line with financial development theory, the study

reveals the primacy of saving growth rate to the success of corporate bond issue market in African region, as the positive coefficient is 273 per cent.

The test on secondary market liquidity on industrial output reveals that the secondary market does not influence industrial output growth in the long term. However, study reveals that the liquidity market can enhance institutional regulatory quality, needful for the development of the issue market. Moreover, in the short term dynamics, joint influence of corporate bond turnover *(Cbt)* and corporate bond issue *(Cbi)* flows to industrial output growth.

Finally, interest rate spread *(Irs)* positively influences inflation rate in the region, which affirms Milton Friedman's theorem that inflation is more of a monetary phenomenon. Against the hypothesis tested, the converse case (from inflation expectation to interest rate) is not established, implying that inflation may have been chiefly sustained through monetary accommodation, against the domestic Fisher's theory, that domestic interest rate is chiefly influenced by inflation expectation. In support of this outcome, Fisher argues that the real and monetary sector economy are independent (Brown and Matysiak, 2000), while money demand asserts more forces on inflation pressure. Importantly, the positive flow from interest rate spread to inflation indicates that Wicksell's cumulative process exists in these economies, that interest rate should positively influence inflation expectation. The result thus informs that in line with the well-known extant inflation theoretical postulation, inflation expectation is being fuelled by interest rate in the studied economies, or that the interest rate policy prescriptions may have been unfitting to the needs of respective economies' inflation dynamics. Since the study's hypothesis of inflation expectation to interest rate does not hold, which contradicts an extant interest rate theory (expectation hypothesis), it suggests that more structural and institutional causal issues, perhaps structural disequilibrium of the external context of the economies may be adversely influencing the interest rate structure in the respective economies, as suggested by the Wicksell cumulative process of inflation. In the short term however, openness, interest rate spread and public debt are joint drivers of inflation expectations in the region. More intriguing result is that there is significant long run positive influence of public debt on inflation expectation in the region, which suggests that effective public financial management of public debt issue process and execution, may be far from guarded in line with best practice.

The study suggests diverse sets of recommendations that address the regression outcomes and finding as presented below. On corporate bond negative effect on interest rate spread, the study hopes for competitive financial intermediation through improved investment climate and incentives by governments to develop needfully the bond market infrastructures through the private sector. Overall, this study reveals that, given the preponderance of increasing bank high interest rate margin the future of a corporate bond industrial-led finance in African region may be bleak. Thus, the study provides evidence that suggests that the finance-led growth hypothesis of economic development does not hold in the selected economies.

5.8 Policy Recommendations

The recommendations target institutions connected to each variable studied in this research work with significant outcome. The institutions are broadly in the private sector, the public sector, and international development partners, as policy thrust effectiveness depends on efficient institutions and their social interactions (North, 1991). This study notices that African economies are inherently fragile due to low productivity in the industrial sector chiefly spearheaded by a 'maladapted' financial system, as professed in Ojo (2010); Rajan and Zingales (2003).

5.8.1 Private sector recommendations

1. Interest rate spread adversely affects corporate bond issue as informed by the ARDL technique: Bank interest cost is partly a function of their administrative structure and should be managed to eliminate wastes; innovation in digital banking can also drive down cost of service production; scale and scope economies should be promoted, that can reduce cost and interest rate spread. Bank management should place lending limit on maturity, cost and volume. Savings drive should be promoted.
2. Moreover, real saving/deposit rate need to be positive trend to attract latent savings in African economies. Market determined saving rate that may attract idle funds in the economies, to give them investment life and improve capital mobilization and formation in the financial system is urgently needed, as current deposit rate across most African markets are unattractive relative to inflation and market risks.
3. The second objective and its finding is that interest rate spread adversely affects industrial output, which could imply that bank finance of industrial output investment

may have been misplaced in the selected African regional economies. It is indicative that the bank spread need to be narrowed; all stakeholders in the saving-investment value chain should work to achieve it, particularly the banking institutions. New and innovative saving products should be compelled by the Central Banks of the respective economies, required to encourage increased savings, as many of these economies have large proportion of money outside the banking system.

4. The third objective of this study provides an outcome that corporate bond issue *(Cbi)* does not link industrial output *(Io),* which suggests the need for capital market institutions to be widely promoted. Licensing of long term oriented (investment) banking institutions such as merchant and investment banking firms would help in mobilizing long term private and corporate savings, and correspondingly mobilize the primary securities issue markets, which ultimately recycles locked up long term savings such as pension/ provident funds toward productive investment and a reproductive higher saving capacity. Investment banking strengthens relationships among stakeholders in the long term finance industry, as sustainable relationship is conditioned on effective monitoring and efficient information network, which investment banking firms are proficient at (Anand and Galetovic, 2001).
5. Moreover, on the third objective of corporate bond non-linkage to industrial output growth, regulatory and self-regulatory institutions such as the industry professional bodies can assist on savings mobilization, which would improve the deposit base of bank, with the expectation that bank would lower the interest rate spread. Additionally, it is recommended that alternative source of industrial financing be explored, such as the corporate bond finance. Private regulatory institution such as the Stock Exchanges responsible for corporate bond issues should device attractive sweeteners, in the interest of corporate firms.
6. Furthermore, Investors need to be encouraged to set up capital trade point outside capital cites to improve rural capital issues. Primary industrial institutions such as those in agriculture and mining businesses should set up long term corporate funds to manage their interest in corporate bond market and reduce extroversion doctrine, such as the pension and provident funds of employees' interest.

7. The fourth objectives on secondary corporate bond market insignificant drive of industrial output growth would require encouraging private sector investments in establishing Exchanges and allied infrastructures, and opening the investment space for foreign direct investment for the purpose by the Securities and Exchange commissions. The ease of marketability of issued securities is fundamental to encouraging prospective investment in the issue market
8. Creditors' protective rights and information sharing practices (Jappell and Pagano, 2005; Galindo and Micco, 2017) are two antidotes that financial development theorist promotes, capable of accelerating the bond market which the respective regulatory and self- regulatory authorities should adopt and promote.
9. Issuing Houses operating in the bond market should innovate on products suitable for small and medium scale enterprises (SMEs) in the real sector businesses to be promoted for long term capital sourcing, through pension funds and life insurance funds rather than SMEs reliance on short term bank finance.
10. Technological development *(Tdv)* negatively influences industrial output *(Io)* growth rate: the negative regression result may be largely attributed to low education budget; inappropriate and poorly designed curriculum; non-skilled targets for trainees, and poorly equipped trainers. The private sector is the driver of industrial development in modern economies, and should therefore be allowed to take the lead; integral but more technical education is advocated, as industrial training research units should be set up by private and public universities and allied research bodies in line with the 'gown and shop' development model of tertiary institutions-industry collaborations.
11. Technological development (*Tdv)* has negative causal link with financial deepening *(Fdp)*. This result though does not meet *a priori*, however the recommendation thereof follows the *Tdv-Io* negative causal linkage on point 10 above. In reality, one of the great problems in modern development in developing economies is lack of technology. Quality education, such as its element- the digital technology is capable of transforming Africa's financial system, broaden and deepen it. Educational development as instrument for "modern freedom" can provide functioning capability for the citizens on entrepreneurialism. The process can spur exchanges and thus market development, impact financial instruments, financial institutions and financial markets. For instance, as

part of financial innovation and financial product inventions, by maximizing the use of digital money to complement financial liberalization policies, transactions and information cost could continue to fall thereof, thereby enhancing bank intermediation's capabilities, transmitting to lowering lending cost and its interest rate spread.

12. Corporate bond issue market negatively affects interest rate spread as revealed through the Toda-Yamamoto technique: management of industrial/manufacturing firms in the region should be well educated by their relevant trade/industry/ bodies or organizations such as in Nigeria, the Manufacturers Association of Nigeria (MAN), on the benefits of bond issuing, as contract (market) finance mechanism advances economies of scale better than the relationship banking mechanism, for their production plans. Values are better appropriated, financial stability is more assured and other advantages, above the reduction in interest rate, which Rajan and Zingales (2003) theory conjectures.
13. Institutional reforms that would further liberalise the bond market, promote sound legal regimes, and establish information as 'capital' for the benefit of investors are needed. Annual awards should be instituted by market regulator towards the promotion of the bond finance culture.
14. Similar to result above is the non-linkage of corporate bond issue to industrial output, which necessitates private sector investment in the bond market development in African region. Appropriate and competitive investment and business environments are required for private sector to provide needed infrastructure for corporate bond market to strive. It is needful of government to support this cause with appropriate legal safeguards and protection for the potential promoters.
15. For the SMEs and smaller non-finance corporates with supply and demand mismatch of financial resources, ways to expanded access to long term funds is through the bonds market. However, requisite training of SME managers for production of credible information needed by investors is important, while the legal environment has to be up-scaled by governments. Innovative products by the issuers and issuing houses would facilitate patronage of new issues. Moreover, respective Exchanges should provide institutional supports for SMEs on bond issuing.
16. Long-term financial sector development requires sufficient commitment to long term savings to positively develop the corporate bond issue market. Savings is a generic

variable, required in all investment-growth process and therefore involves promotion at the individual and government level. New saving products such as indexed saving to protect savers capital can be attractive. Electronic savings for individual and the firm convenience can be promoted by the banks and other deposit money institutions. Since inflation reduces saving capacity, government should tackle it through monetary, fiscal policies and improved productivity measures. Moreover, government can stimulate by fiscal means sector savings bonds such as farmers savings bond; specified industrial savings bond, *i.e.* the small and medium enterprises bond; *etc*

5.8.2 Public Sector recommendations

1. On the first objective, interest rate spread adversely affects corporate bond issue: Higher interest rate spread is partly a function of government financing structure. Government through appropriate legislation should fund their short and long term projects via the bond market to promote the bond finance culture across the financial industry, which could reduce pressure on the bank. Tendulkar (2015) finds that government bond issues positively drive corporate bond development in emerging market economies. The study recommends competitive financial intermediation through improved investment climate and incentives by governments to develop bond market infrastructures through the private sector.
2. The second objective and findings that interest rate spread *(Irs)* negatively links industrial output *(Io)* growth, which reveals severe structural distortion and reasons for the region's high output inflation, requires that government adopt tax measures to develop alternative long tenured financing model for industrial output growth. The result of negative 296 per cent impact on industrial output underscores why interest rate may be a macrostructure variable, since interest rate that feeds the real sector is beyond the capacity of the various economies monetary authorities (Bosworth, 2014). Macroeconomic environment need to be conducive to attract both local and foreign investors' long term savings for long term fixed capital formation and development finance. Government need to encourage market economies by supporting the building up of security institutions and market-based funding model for all manufacturing industries.

3. This study recommends 'complementary instititutional reforms' to drive up incentives in all area that would support and encourage market-based finance. Promoting complementary institution reforms becomes vital in these economies since the study finds that corporate bond issues (*Cbi)* positively links *Io,* albeit insignificantly; similarly, as the interaction variable (*Cbi* and *Irs*) positively links *Io*, albeit insignificantly. Complementary institutions that can aid the growth of the market-based finance system, may include political, legal, fiscal, the Central Banks, institutions linked with financial system infrastructure, and as the finance-world become shrinker science and technology institutions, particularly information and communication.
4. The third objective and finding that non-linkage of corporate bond issue *(Cbi)* to industrial output *(Io)* exist in the selected economies may have confirmed the poor state of industrial finance in African economies, and hence the weak link in the industrialisation process, as earlier established in the study. The result thus suggests the inadequacy and perhaps the inappropriateness of existing framework to address this burning issue. Governments therefore need to address the problem as follows: First, for industrial output growth to be financed via the corporate bond market in the African region, large manufacturing firms and the SMEs industries need fiscal incentive on capital funds, as long term interest obligations are higher than short term bank finance cost. Secondly, and most important, is that since industrial finance, epitomised by the corporate bond market has not been forthcoming, African governments should periodically carry out comprehensive review of the financial system by setting up independent panels for periodic overhaul of the economies' financial institutions, markets and instruments. This may be fundamental following deductions from the 'group interest' theory on the activites and oligopolistic behavior of African banking system, as this institution may have frustraited the development of the corporate bond market. For instance the modest developments in the Nigerian capital market may have been achieved following the recommendations of the 1959 Barback committee; the 1995 Industrial Enterprises (Adeosun) panel; the 1976 Pius Okigbo committee on the review of the Nigerian Financial System; the 1996 Dennis Odife Committee on the review of the capital market. These experiences may be across other African economies.

Thirdly, the ongoing liberalization and financial reforms should be improved, and may impact the target objectives of economic efficiency, among others if the reforms are complimented by contemporaneous reform in associated variables such as human capital development, political development, and macroeconomic stability, internal security (Ousmanou, 2017). Particularly, the privatisation of state enterprises would accelerate development of the corporate bond market for industrial finance of their production and expansion, if the privatization scheme interacts with other variables that are complementarily reformed. More vigor should be deplored towards privatisng all state firms to encourage the capital markets development. Fourthly, and equally significant, government should adopt 'friendly' and less costly regulations towards mobilizing and assisting investment banking firms in the security industry, particularly against investment bank failings. In Africa, there is need for aged and resilient investment banking firms, as sustainable and long term relationship between investment banking and non-finance corporate characterized sound and advanced corporate bond market (Anand and Galetovic, 2001). Fifthly, capital market (regulatory) authorities can influence foreign direct finance investment in capital market institutional development. Finally, government should adopt her fiscal powers, in taxation, subsidies and public expenditure to redirect the entrepreneurial spirit and thinking of the young and growing African population from distributive trades (on imports and exports) towards industrial value addition and productivity.

5. Moreover on the third objective, from point three (3) above where corporate bond issue does not link industrial output: governments should encourage and support long tenured corporate issuing of indexed bonds through tax incentives, such as tax cut to promote bond issue culture and drive down interest rate as the empirical result has unveiled. The bond market requires modern efficient infrastructure, of which government can provide supports to promoters. Investment banking firms' operations should be supported with "caring" regulations; for instance, bureaucracies in the issue process chain should be eliminated by main regulatory institutions and self-regulators. Adoption of technology can fasten registration process.
6. Governments of Africa economies should ensure attractive macroeconomic environments in the spirit of on-going global liberalization reforms for industrial investments and

output growth. Both fiscal and monetary policies must target the private sector led industrial output growth. Firstly, government through the Central Banks should pay competitive rates for domestic banks lock-up funds of the reserve requirement policy. Secondly, government should aid the banks with low interest rate on the lenders of last resort scheme. Additionally, to encourage low interest rate regime bank licensing requirements should be made attractive to investors for competitive banking and financial market.

7. Technology development: the negative but significant influence of education to industrial output informs that public education is not being managed effectively and efficiently in line with the need of industry. The United Nation's suggested 26 per cent minimum budget allocation for education advancement should be implemented by the African economies. To achieve quality, tertiary education should largely be private sector affair, for efficiency criteria, while government provides fiscal support. Legal support to drive the College-Industry interface is needed. University education curriculum should be designed jointly by faculty and industry experts. Practically, domestic industrial production would suffer with poor quality education. Indeed, the lack of inter-sectoral 'value-chain development' integration has had enormous multiplier effects and continually retard Africa's economies resilence, and accentuating its pro-cyclicality.
8. Industrial firms' skill acquisition and annual training should be given tax relief, more than the capital expenditure on technological innovations and discoveries which some of these economies currently provides. Government should create and fund industrial study centers; make study materials available in local language for local artisan and provision of training infrastructure support through local government authorities; the setting up of industrial packs to showcase local inventions; endogenous innovation or industrial breakthrough on the productive use of local raw material should be rewarded; grant scholarships to indigent bright students particularly in science and technology.
9. Government should make the people more productive. Contracts laws and agreements should be respected to limit strikes and labour unrests. Public finance theory advocates that for the sake of efficiency and effective in scarce resource management, any good or service that can be priced, whose consumption is excludable, and divisible should be left to the private sector.

10. Regulatory institutions positively affect interest rate/corporate bond issue interaction and otherwise: regulatory institutions can encourage bond finance by placing a capital raising limit of bank finance for industrial production. Regulators should reduce issue requirements to encourage corporate issues. Corporate issue awards should be instituted.
11. Generally, institutional incentives, norms and social belief are seen as the hardcore requirements to drive institutions and individuals associated with long term capital development, leading to long term investment, such as infrastructural and industrial investments. African Governments should therefore legislate appropriate laws on 'easy of doing business', property rights, information sharing, qualitative and technological education, promote participatory democracy to eliminate political instability, sound macroeconomic management; and other social incentives that can reduce cultural and religious bias.
12. Industrial output growth affects regulatory institutions: in order to promote industrial standards, industrial production processes and final outputs should be respectively inspected and tested by regulatory agencies such as the Standard Organization of Nigeria (SON) and the equivalence in other economies to promote local and international competitiveness.
13. Institutional quality has negative long-run causal flow with financial deepening: Quality institution exemplified in prevailing practices of rule of law, governance effectiveness, regulatory quality, accountability, and many more, needs to be overhauled through appropriate legislations and regulations in African economies, as they directly impact the economy's financial culture, trust culture, and the financial system. Periodic review of African economies' requlatory institutions capacity for global competitiveness standard or indices would be needed. Moreover, since quality human capital to a large extent informs quality institutions, leadership training courses should be included the curriculum of tertiary institutions, as leadership skill-gap is a factor in the development of quality and sustainable institutions. In policy frameworks and formulations, regulators should focus more on long term gains of reforms and their implications rather than on short term gains.
14. Savings positively influence corporate bond market: Saving culture can be effectively promoted to drive corporate bond via fiscal incentives on through the savings and

investment process. Effectively implemented indexed tax system that would improve citizens' purchasing power, and then encourage more savings is urgently needed.

15. To help the financial system develop the long term saving for industrial loanable fund, government should assist in insuring long term savings at a market determined deposit insurance price. The risk of long term savings is high while the stake or needed development funds is as well high.
16. On the fourth objective corporate liquidity market does not spur industrial output growth, may require public support of the market through tax incentives for bond market investments. Reforms to eliminate traces of latent information asymentary between corporate firms and both current and prospective investors would help to spur corporate trust.
17. In the same fourth model however, corporate bond turnover positively influences regulatory quality: market liquidity can be promoted to have positive influence on regulation by improving the financial market liberalization, where market is made to determine prices. Government via the Securities and Exchange Commission can help to promote private initiative to establish market infrastructure and exchanges for secondary trading. Moreover, there is the need to promote derivative exchanges across all African markets to give live support to secondary bond market trading.
18. On the fifth objective, interest rate positively influences inflation rate: interest rate influences inflation as a cost element in the production structure. Central banks should reduce policy rate, ensure that currencies in circulation are within the banking system control through saving promotion. Following the mechanics of interest rate macrostructure earlier examined in this study, government should promote endogenous production process in which domestic sourcing of raw material be promoted through tax incentives, to manage cost of world interest rate inflow.
19. Public debt negatively drives bank competitiveness: Government financial management if not effective and efficient can harm the economy's financial system, reduce bank competition, and entrench adverse consequence of oligopoly banking. The audit arm of the public financial management should be professionalized. Zero-based budgeting should be promoted for the economies in the region. Debt growth rate should be a subject of recurrent legislative oversights checks for control.

20. Public debt positive link to inflation expectation in the region underscores need for prudent management of public financial system. While fiscal policy remains more effective macroeconomic tool than monetary policy for growth and economic transformation, its positive linkage via public debts to inflation may however suggest that budget deficit are much more invested in consumptive investment expenditure rather than the much needed infrastructural deficit finance, whose multiplier effects and positive externalities are enormous on the domestic economy. Huge public debt in less resilient African economies, aside from the crowing out impacts, additionally exacerbates the vulnerability of financial system instability, uncertainty on taxation burden, and possible accelerate political instability. Therefore, for the region, fiscal reforms on public expenditure management effectively targeted at specific public project; and only very long term borrowing (above 50 years) at concessional interest rate, that would assist the monetary system (help to pattern the yield curve at low inflation rate) are advised.
21. Finally, the correlation study finds that financial development (*Fdp*) is negatively correlated with real per capita income (*Rpi*) in the region, which indicates limited outreach of financial services to the majority of African people, particularly the poorer households. Government should promote access to finance by broader liberalization of the financial system for private sector interventions to set up micro-finance institutions. Fiscal incentives will help to attract the investments. More effort at de-risking the macroeconomic environment, institutional reforms, and access to information, manage inflation downwards, and institute indexed wage system are positive steps to improve the positive relationship between the two variables.

5.8.3 Development Partners' recommendations

1. The non-linkage of corporate bond to industrial output may be ameliorated in African economies by global development partners. Global capital market authorities- African Development Bank (ADB), the World Bank, International Monetary Fund, International Finance Corporation, can influence foreign direct finance investment in capital market institutional development, such as promotion of securities' exchanges and supportive institutions, like underwriting institutions, that is, investment banking firms.

2. The second objective which produce negative outcome of interest rate spread on industrial output requires that African economies' development partners like the World Bank, International Monetary Fund, International Finance Corporation, and others should assist in promoting competitive banking; local banks and allied financial institutions that is consistent with low interest rate regime should be supported such as by provision of long tenured loans, grants of technical assistance, and so on. African banking market is of relatively large consumer markets, hence development partners should encourage international banks and capital market institutions to establish in the continent.
3. Technological development produce negative influence on industrial output requires that best practice model on industrial research from Industrial economies should be sponsored by United Nations Industrial and Development Organizations (UNIDO) for emerging and frontier African markets. Moreover, being an advocate of global industrial development convergences local research outputs from Africa should be supported by the UNIDO for large scale production and promoted to meet international standards and markets.
4. Corporate bond issue positive flow to industrial output growth requires that with increasing financial globalization and integration, African development partners and associations such as the Sino-African and Indo-African trade groups, inter-country trade associations, and many others can be sources through which their financial market can open-up for African industrial bond issues.
5. Institutional quality and financial deepening: Having negative long-run causal flow between institutional quality and financial deepening would require global development partners like the United Nations, World Bank, IMF, UNESCO and others to assist in providing global best practice training skills to Africa's human capital enroute augmenting the quality of African institutions; assist to pressure African governments on the need for legislations to change African social institutions, such as the anti-financial discipline of the peoples' financial culture, social norms and beliefs that are harmful to financial deepening in the region.
6. Finally, the study finds that interest rate spread *(Irs)* positively links inflation *(Ifr)*, which may have provides evidence of Wiskillian cummlative process (output gap) in the region. It reveals that the studied African countries' may be experiencing poor macroeconomic management or wrong policy choices, hence would require development parters counsel.

Global Development Partners may need to provide technical support for effective macroeconomic management. Macroeconomc stability is a major prerequisite for the financial sector development (Spratt, 2009). Development of market-based finance system requires sound macroeconomic management, whose pre-requisite includes sound fiscal, monetary and exchange rate policy frameworks.

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Appendix: 1: Data source- List of Members of African Securities Exchanges Association (ASEA) 2015

EXCHANGES	LOCATION
1. Botswana Stock Exchange	Botswana
2. Bourse de Tunis	Tunisia
3. Bourse Regionale des Valeurs Mobilieres (BRVM)	Cote d' Ivoire
4. Casablanca Stock Exchange	Morocco
5. Dar es Salaam Stock Exchange	Tanzania
6. Douala Stock Exchange	Cameroon
7. Egypt Exchange	Egypt
8. Ghana Stock Exchange	Ghana
9. Johannesburg Stock Exchange	South Africa
10. Malawi Stock Exchange	Malawi
11. Nairobi Securities Exchange	Kenya
12. Namibia Stock Exchange	Namibia
13. Financial Market Dealers Quotation	Nigeria
14. Nigerian Stock Exchange	Nigeria
15. Rwanda Stock Exchange	Rwanda
16. Stock Exchange of Mauritius	Mauritius
17. Uganda Stock Exchange	Uganda
18. Zimbabwe Stock Exchange	Zimbabwe

19. Swaziland Stock Exchange	Swaziland
20. Sierra Leone Stock Exchange	Sierra Leone
21. Lusaka Stock Exchange	Zambia
22. Libya Stock Market	Libya
23. Khartoum Stock Exchange	Sudan
24. Bolsa de Valores de Cabo Verde	Cape Verde
25. Mozambique Stock Exchange	Mozambique
26 Seychelles Securities Exchange	Seychelles

Source: ASEA (2015). African Stock Exchange Association, retrieved from *http://www.mondovisione.com/_assets/files/ASEA_Annual_Report_2015.pdf*accessed May 26, 2016.

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List of Abbreviations and Acronyms

ADB	African Development Bank
AGOA	Agricultural Growth Opportunity Act
AARDL	Augmented Autoregressive Distributed Lag
ASEA	African Securities Exchange Association
ATY	Augmented Toda-Yamamoto
BIS	Bank for International Settlements
CAPMS	Central Agency for Public Mobilization and Statistics
FMDQ	Financial Market Dealers Quotation
FMOLS	Fully Modified Ordinary Least Square
EBA	Everything but Arms
ECM	Error correction mechanism
GDP	Gross Domestic Product
HPAE	High Performing Asia Economies
ICU	Industrial capacity utilization
IDI	Industrial development index
IFC	International Finance Corporation
IFE	International Fisher Effect
IMF	International Monetary Fund
IRS	Interest rate spread
ISID	Inclusive and sustainable industrial development
IVA	Industry value added
LI	Loan Index
MDG	Millennium Development Goals
MPR	Monetary Policy Rate
MI	Manufacturing Index
MVA	Manufacturing value added
NASD	National Association of Securities Dealers
NBS	National Bureau of Statistics (Nigeria)
NIM	Net interest margin

OECD	Organization of Economic Cooperation and Development
OTC	Over the Counter
PSVAR	Panel Structural Vector Autoregression
RIR	Real Interest Rate
SARS	South Africa Revenue Service
SI	Savings Index
SME	Small and Medium Scale Enterprises
SVR	Savings Rate
SSA	Sub-Saharan Africa
Tbill	Treasury bill
TC	Treasury certificate
TIPS	Treasury inflation protected securities
TST	Term structure theory
UNIDO	United Nations Industrial Development Organization
UNCTAD	United Nations Conference on Trade and Development
VECM	Vector Error Correction Mechanism
WIR	World Interest Rate
WDI	World Development Indicator

ACCEPTANCE

This thesis titled "Interest Rate Macrostructure, Corporate Bond Market Development and Industrial Output in Selected African Economies" is hereby accepted as an original work carried out by Eke, Omoruyi Patrick, Matriculation no CUGP 100295 in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Finance of Covenant University, Ota.

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