Publication Of The Central Bank Of Nigeria www.cbn.gov.ng

BULLION

Volume 44 No. 2 | April - June, 2020

Education, Inclusive Growth and Development in Nigeria: Emperical Examination
by: Prof. Emmanuel Onwioduokit

Analysis of the Causal Link between Economic Growth and Development in Nigeria (1960-2019)
by: Muhammed Umar

Is Central Bank of Nigeria Pursuing Preferential Development Finances? Some Parametric and Non-Parametric Evidence
by: Xavier-Itam A. Okon (Ph.D)

Efficiency Gain Argument of Fiscal Federalism and Economic Growth: Evidence from Five Selected Developing Federal Economies
by: Prof. Hyacinth E. Ichoku
Walter O. Ugwoke (Ph.D)

Capital Adequacy Requirement and Bank Behaviour in Nigeria
by: Baba N. Yaaba (Ph.D)
Lailah Sanusi

The Impact of External Debt on Agricultural Production in Nigeria (1980-2016): Autoregressive Distributed Lag Modelling
by: Aishatu U. Yerima
Hussaini M. Tahir

Unlocking The Potential

10 Commodities, 10 Million Jobs in 5 Years

A nation that is self-sufficient in producing most of what it consumes and in creating jobs for its youth, will ultimately drive growth that will make life better for all its Citizens, Exciting times are here. Support the economic revolution.

Call your banker today for more details on how to get involved.

CENTRAL BANK OF NIGERIA
www.cbn.gov.ng
+234 700 225 5226

Follow us on

@cenbank
Central Bank of Nigeria
@centralbankng
@cenbank

CONTENTS

BULLION is a quarterly publication of the Central Bank of Nigeria. Views expressed therein do not necessarily reflect the opinion and thinking of the Bank's Management. Copies are available without charge through formal request to the Editor.

BULLION ISSN - 0331 - 7919


CENTRAL BANK OF NIGERIA

Education, Inclusive Growth And Development In Nigeria: Empirical Examination

Prof Emmanuel Onwioduokit
Department of Economics
University of Uyo

Abstract

Fundamental changes in the intellectual and social stance of any society have always been preceded by educational renaissance. This paper investigates the role of education in achieving and sustaining economic development in Nigeria. Abstracting from the theory, the paper examines education in Nigeria, its financing, including comparative analysis with selected African countries and its connection with economic development. The ARDL model was adopted to examine both the short run and long run relationships between education and development proxied by HDI and education and economic growth within the context of inclusive growth model.

Evidence from the estimated long run ARDL model indicated that Secondary school enrolment (SSE) is positively correlated to economic development (proxied by HDI). The results further suggest a direct relationship between GDP per capita (GDPPC) and economic development. The coefficient of HDI indicates that Past economic development enhances current economic development in the short run. Evidence from the estimated error correction model indicates that School enrolment has a positive short run effect on economic growth in Nigeria. The growth rate of population is estimated to improve economic growth with lags. Given the established relationship between education and economic growth and by extension development, the paper made recommendations on admission process, teacher recruitment process, renumeration, funding, discontinuation of the quota system as well as abrogation of some institutions created in the educational sector including JAMB and the Education TED fund.

Keywords: *Education, Economic Development, Inclusive Growth*

JEL Classification: *I20, N10, P17,020*

Introduction

Fundamental changes in the intellectual and social outlook of any society have always been preceded by educational renaissance. Education for Sustainable Development (ESD) is commonly understood as education that encourages changes in knowledge, skills, values and attitudes to enable a more sustainable and just society for all (UNESCO, 2014). Its aim is to empower and equip current and future generations to meet their needs using a balanced and integrated approach to the economic, social and environmental dimensions of sustainable development.

The most productive investment any country can make towards the development of the economy is in education. Education is one of the key pathways through which sustainable development could be secured and maintained. The launch of the United Nations (UN) Decade of Education for Sustainable Development (2005-2014) activated a global initiative to reorient the education system to address the challenges of sustainable development (UNESCO, 2018). Investment in education has been identified as a critical enabler for development from various studies in both the advanced and developing countries. For instance, Kalu (2001) argued that the capital stock of a country should be broadly defined to include the body of knowledge possessed by the population and the capacity of the population to use that body of knowledge effectively.

Economic Growth is the increase in the real output of the country in a particular span of time. Whereas, Economic Development is the increase in the level of production in an economy along the improvement of living standards and the advancement of technology. In essence economic development has to do with how the growth is distributed to enhance the standard of living of the citizenry.

Education facilitate the creation of a more productive labour force, and equips the labour force with knowledge and skills. Also, it produces a body of sophisticated leaders in both the private and public sectors of the economy to drive the economy in the desired direction. Education is key to the development of people's ability to manage and induce change required to confront the task of making choices and of broadening the range of choices.

Development entails a free release of the energy of a people. Education, especially qualitative education, has been identified as the only vehicle that can facilitate the emergence of a political structure that will produce the right kind of leaders. For a country to

develop, education (human capital) is needed in addition to investment in physical infrastructure. Boyi (2013), rightly noted that Education shall continue to be highly rated in all countries' development plans because education is the most important instrument for change.

In Nigeria the broad educational objectives, include: the inculcation of national consciousness and unity as well as the right type of values and attitudes for the survival of the individual in Nigerian society; training of the mind in understanding the world around and the acquisition of appropriate skills, abilities, competences for contributing to the general development of society.

Similarly, Umo (2012) contended that one must remain a life-long student or learner. The unique property of the educational production function is that it is an input not only for the production of other items, but also in the production of education itself. Kenneth Arrow (1962), averred that knowledge cannot be absorbed unless some knowledge is already possessed.

The initial possession of knowledge is therefore a prerequisite for gaining ability to learn further. In modern pedagogics, a teacher is expected to impact to his/her students the ability in 'learning how to learn'. Thus, educational enterprise is adjudged successful if its products acquire the ability for self-learning or self-instruction. It is the only attribute that would enable one use education to unlock the inscrutabilities of his/her environment.

Education is one of the sustainable development goals (SDGs). Apart from being one of the sustainable development goals itself, education has a transformative characteristic that, if delivered properly, can meaningfully facilitate economic development, enhance social inclusion, foster environmental sustainability and improve governance. Undoubtedly, quality education is what is needed to achieve sustainable development.

The transmission mechanism by which education exert on development include its empowerment of those educated for employment, creativity, lifelong learning and economy's competitiveness.

However, the Nigerian education system has not been able to play this catalytic development role. Umo (2012) attributed the failure of the Nigerian education system to funding deficit in the educational sector, leading to deterioration in quality, uncontrolled growth in educational institutions, failure to concoct a match between labour needs and the educational curricula, inadequate research funding, etc.

The objective of this paper is multifaceted. The paper examines education, financing, and its connection with economic development in Nigeria. The remaining sections of the paper is organized into six parts. Part II dwells on theoretic and conceptual issues regarding education, inclusive growth and development. Part III contains comparative analysis of education investment in selected African countries. Part IV reviews the empirical literature on education, economic growth, and development. Methodological issues regarding empirical relationship between education and some critical development variables, including empirical findings are contain in Part V. Part VI dwells on recommendations and some concluding remarks.

PART II. THEORETIC AND CONCEPTUAL FRAMEWORK

In the traditional neo-classical growth model advanced by Robert Solow and Trevor Swan in the 1950s, economy output is a function of larger inputs of capital and labor (all physical inputs). In the neo-classical growth models, variables, including human health, skills, knowledge, were excluded from the growth equation of an economy. This was essentially classified as the Exogenous growth theory. This theory was called to question a few decades after as it failed to explain why countries with little capital and labor grew faster than countries with abundance of these resources.

This gap in the explanation of the growth process resulted in the emergence of the endogenous growth theory in the 1980s pioneered by Romer (1986). They argued that economic growth and development in most fast-developing economies, particularly, the East Asian developing countries, where the economies grew consistently for over three decades, demonstrated the inefficacy of the exogenous growth theory. They averred that, it was not only technology, that was the main driving force for maintaining such high growth performance in these economies, but that there were clearly other factors outside the remit of the neoclassical growth model.

Romer (1986) broadened the concept of capital to include human capital. He argues that the law of diminishing returns to scale phenomenon might not hold true as demonstrated in the case for the East Asian economies. The theory holds that if a firm or an economy that invests in capital (physical) also employs educated and skilled workers who are also healthy, then the labor will be productive, as the labour force will utilize capital and technology more effectively. This will bring about "neutral' shift in the production function and, thus, there will be increasing rather than decreasing returns to investments. This means that technology and human capital are both endogenous to the growth process.

Other scholars including, Lucas (1988), Marchand, Michel, Paddison, and Pestieau (2003) have argued that the basic assumption of the endogenous growth theory is that policy measures can have an impact on the long-run growth of an economy. They contended that investment (subsides) on education or research and development increase the growth rate by increasing the incentive to innovate.

Lucas (1988) acknowledged two sources of economic growth to include human capital accumulation due to education investments and technological progress due to learning-by-doing externalities. In other words, education and learning-by-doing improve the knowledge and skills of labor in the production sector.

The endogenous theorists assumed that research and development (R&D) was the key to the growth and development of an economy. Research and development generate new ideas or new technologies. Whenever there is technological change in a given productive process, those with education or greater skills are more likely to adopt the new technology faster (Eicher and Penalosa, 1999).

Aharonovitz (2007) observed that as managers (or employees) are trained, they will become heads of production units and train more managers who will, in turn, head other production units or establish new firms and further train more managers. As the process continues growth and development will be sustained. This will reduce poverty and improve income per capita or standard of living in the society.

II.1 Education

The term education has been defined and abstracted in a number of ways; Kalu (2001) understood it as the training and enlightenment of people in order to increase their knowledge of the world in which they live. Such knowledge is required for the improvement of living conditions in the society. In the same light, Ilechukwu, Njoku and Ugwuozor (2014) perceived education as the development of the cognitive, affective and psychomotor domain and abilities of an individual for optimal function and performance in the society. The individual has to be helped to maximize his mental, emotional and psychological abilities which will be beneficial to him and the society in which he belongs.

Ekpo (2017) asserted that education is the training of human being to become beneficial to the society at large and not necessarily for self – fish reasons. UNESCO (2000), submitted that "education is the total process of developing human ability and behaviours". It is an organized and sustained instruction intended to communicate a combination of knowledge, skills and understanding value for all activities of life.

Specifically, education refers to the process of knowledge acquisition at all levels (primary, secondary and tertiary) whether formal or informal. *Education entails a life-long formal and informal process of equipping an individual to be fully aware of his environment and to exploit, manage and dominate same for the benefit of himself and the society at large*. It is any process by which an individual gains knowledge, insight, or develops aptitudes. It is a process to achieve acculturation through which the individual is helped to attain the development of his potentialities.

Anyanwu (1998) opined that It is the cultivation of "the whole person" including intellectual, affective, character and psychological development. Education is the process of teaching or learning, especially in a school or college, or the knowledge acquire therefrom. It is the process of facilitating learning or the acquisition of knowledge, skill, values, beliefs and habits. Education is a gradual process which brings positive change in human life and behavior. It can also be defined as a process of acquiring knowledge through study or impacting the knowledge by way of instructions.

Barros and Katz (1992) identified three channels through which education influences economic growth: education has a direct effect on growth even after controlling for measures of a nation's fertility rate and rate of investment in physical capital. This direct effect is likely to reflect a positive effect of a more educated labour force on a notion's ability to adopt and develop new technologies-increased productivity; increased educational attainment is associated with increased physical capital investment. This factor will be of greater importance in the future because the skills of a nation's labour force are likely to be crucial in attracting internationally mobile capital in an increasingly globalized economy; A more educated population tends to have a lower fertility rate and plausibly more intensive parental investments in each child (Anyanwu, 1998).

Umo (2011) stated that development heights attained by contemporary industrialized nations have largely been explained by the impressive height of their educational attainment, hence education has been widely acknowledged as a development catalyst. The education sector from a broad perspective contains the cognitive skills, knowledge, technology, social, political, networking skills, and migration, which forms the basis for economic growth. When education is offered on a broad front, if serves as the most effective instrument of inclusive growth. Education plays a key role in reducing

unemployment, hence inequality. Hardly is there any of our assets with a powerful distributive attribute. Resource-based growths have been showing serious limitations with the explosive progress in service and technology.

He identified three key developmental variables that are affected by education as follows:

Education and poverty: The first step in empowering any individual is to provide an opportunity to be educated. It will equip him with the skills to find livelihood. Quality education offers the recipient the ability to address and overcome absolute poverty and relative poverty.

Education and Employment: Education can aid employment in several ways. Formal education is needed for paid employment. Cognitive attributes and certificates that any employer requires are gained through formal education. Also, quality education is needed to master the skill for self-employment. Education disciplines the mind, directs it to productive ends and enhances trainability. It develops one's critical faculties and creativity.

It is therefore indispensable for invention, innovation, discoveries and extending the frontiers of knowledge. Education and Global Competitiveness: The international competitiveness of any economy critically depends on education, technology and innovation system. Countries with high level of these have been able to register high level of global competiveness. These countries have also made substantial progress in reducing poverty.

They include China, India, South Korea and Malaysia. The case is not so in most African countries because of low quality of education, low level of ICT skills and innovativeness. He asserted that education can best be conceptualized as a generalized human capital. This allows linkages of education with technological advancement and the innovation system both of which are critical to modern-day development. Education can take place in formal or informal settings and any experience that has a formative effect on the way one thinks, feels, or acts may be considered educational. Its methods include: story-telling, discussion, teaching, training and directed research.

There are three broad categories of education: formal education; informal education, and non-formal education.

Formal *Education* is generally structured into such stages as pre-school, nursery, primary school, secondary school, technical/vocational college, polytechnics, university, or apprenticeship. Formal Education usually takes place in the premises or school, where a person may learn basic, academic, or trade skills.

Children often attend a nursery or kindergarten but formal education begins in elementary school and continues through secondary school. Post-secondary education (or higher education) is usually at the college or university which may grant an academic degree/certificate. Formal education is structured hierarchically, it is planned and deliberate. Scheduled fees are charged, it has chronological grading system, it has a syllabus and it is subject-oriented. The syllabus has to be covered within specific time period.

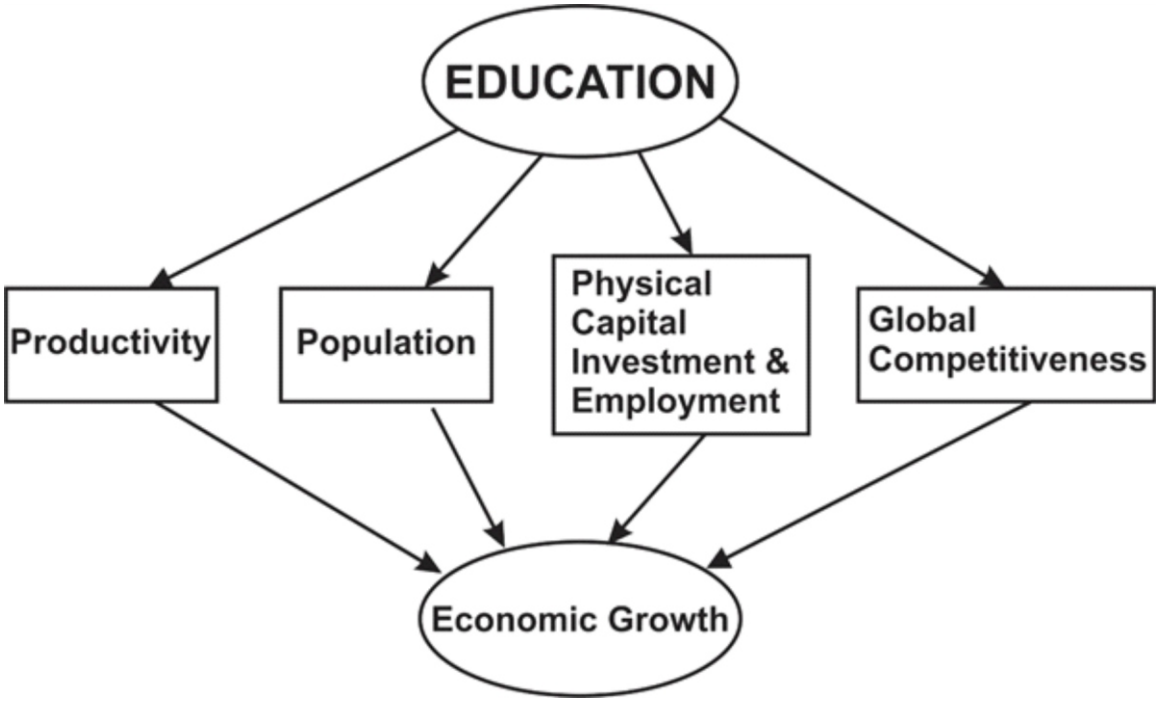
Informal Education: does not involve studying in a school or the use of any particular learning method. It is not impacted by an institution such as school or college and it is not delivered according to any fixed time table or set curriculum. Informal education is without walls, has no definite syllabus, and no fees required, no certificates/degrees awarded.

It could be accessed through any source, including media, life experiences, friends, and family. It is pertinent to note that while informal learning often takes place outside educational establishments, and does not follow a precise curriculum, it can also occur within educational settings and even during formal learning.,

Non-Formal Education includes adult basic education, adult literacy education or school equivalency preparation. It is practical and has no age limit. In non-formal education, someone (who is not in school) can learn literacy and other basic skills or job skills. It is imparted intentionally and methodically. It is programmed to serve the need of the identified group. It allows for flexibility in the design of the curriculum and the structure of appraisal.

Other forms of education include Alternative education, developed in part as a reaction to perceived limits and flaws of the traditional education. It includes self-learning, alternative schools (e.g. Montessori schools, Friends schools, Sands school, Summer school, Walden's path, open classroom schools) and home school.

FIG 1. Channels Through Which Education Influences Economic Growth



II.2 INCLUSIVE GROWTH

Broadly, inclusive growth implies economic growth that creates employment and aids in reducing poverty. It relates to having access to critical services in health and education by the poor. It is also designated as pro-poor growth. It is an impartial allocation of resources such that the benefits accrued to every section of the society. For growth to be sustained and effective in reducing poverty, it has to be inclusive (Berge and Ostry, 2011; and kraay 2004).

Ali and Son (2007) defined inclusive growth as the growth process that increases the social opportunity function which depends on the average opportunity available to the population and how these opportunities are shared among the population. It is the growth that allows individuals or groups in the society to partake in the growth process regardless of their circumstance.

Ranieri and Ramos (2013) stated that inclusive growth is both an outcome and a process. On one hand, it ensures that everyone can participate in the growth process, both in terms of decision making for organizing the growth progression as well as in participating in the growth itself. On the other hand, inclusive growth makes sure that everyone shares equitably in the benefits of growth.
Anyanwu (2013), identified the three pillars of inclusive growth to contain social protection and promotion; productive inclusion and generation of opportunities; as well as territorial development and systemic competitiveness.

Several authors including Ali and Son (2007), have sketched three key measures that play critical role in achieving inclusive growth to include: *Creating employment opportunities and promoting higher productivity*.

Achieving inclusive growth requires both the creation of full employment and productive employment, distinguishing between the creation of low-quality jobs and decent-quality jobs. Increasing productivity and employment for long run sustainable growth requires a matching strategy of investing in dynamically growing sectors while at the same time building capacity in sectors where the majority of labour is employed.

Investing only in the dynamic sectors may suffice to accelerate growth, but may not be inclusive, particularly the poor mainly because the fastest growing sectors may often not be where the majority of the vulnerable or poor are employed and may require skills and training people are unlikely to possess.

Development in Human Capabilities growth provides the resources to enhance sustained improvements in human development and improvements in human

development raise the capacities of economic agents who make the critical contributions to economic growth. Human capabilities can be developed through adequate investment in basic social services of education and health. The concept of inclusive growth does not support postponing improvements in human development till economic resources expansion makes it affordable, as postponement may fail to sustain growth itself.

Social Safety Nets and Targeted Interventions to help those who are vulnerable and/suffer from extreme deprivation. In all nations, market failures are common. When market fails, the outcomes will undermine inclusive growth in the sense that market failures prevent the poor from participating in the economy. Social safety net programmes and targeted interventions of those who suffer extreme deprivation are vital for achieving inclusive growth. There are several instruments for protecting individuals from acute deprivation or inadvertent decline in income.

Targeted assistance is essential to reach those who cannot access market opportunities because of lack assets including, knowledge and skills, capital, land, or certain basic needs.

The justification for targeting is that the social returns for a given level of transfer are higher for individuals or households at the lower end of the income spectrum than at the upper bracket. To take full advantage of the welfare effect of a transfer programme, the appropriate target would be the population segment deemed poor according to known criteria. Hence the capacity to measure poverty and identify the poor is indispensable for designing targeted transfer programme.

II.3 Sustainable Development

The idea of sustainable development seeks to combine environmental concerns with social and economic development. It was first muted in 1987 by the World Commission on Environment and Development, directed by the United Nations General Assembly to recommend long-term environmental strategies for achieving sustainable development by the year 2000 and beyond.

Sustainable development is, an all-encompassing goal of balancing the improvement in the well-being of current generation without jeopardizing the well-being of the future generation.

Bruntland Commission, (1987) defined sustainable Development as the development that meets the needs of the present generation without compromising the ability of the future generations to meet their own needs.

Age (2005) identified some objectives which sustainable national development is expected to realize to include: increase capital income and employment, promoting human welfare satisfying basic needs; as well as protecting the environment. Bearing in mind the path of future generation, achieving equity between rich and poor and participation on a broad basis in development and decision making is important.

Currently, education that will lead to sustainable development is at the core of the 2030 Agenda for Sustainable Development and its seventeen (17) Sustainable Development Goals (SDGs) (United Nations, 2015).

The SDG framework focuses on crucial systemic barriers to sustainable development including, inequality, unsustainable consumption patterns, weak institutional capacity, and environmental degradation that were not prominent in the MDG. In all the Official Schema for Sustainable Development as adopted in 2015 adumbrated 17 Sustainable Development Goals and its associated 169 targets (see United Nation, 2015).

It is clear that education is the only all-embracing instrument that can support sustainable development process.

This is because education obviously covers content of all sustainable development goals (SDGs) and provides skills and competencies, necessary to deal with the challenges of a sustainable future.

Hence, there is need for proper planning to ensure that education for sustainable development aids all individuals to fully develop the knowledge, perspectives, values and skills necessary to take part in decisions to improve the quality of life on terms which are most relevant to daily lives (Mohammed, 2016).

Furthermore, education is a lifelong process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and co-operative actions. Put differently, education enables individuals to develop the knowledge, values, and skills to participate in the decisions regarding the techniques, that will improve the quality of life today without jeopardizing the planet for the future generation. The role of education in the attainable of the SDG are capture succinctly in ICSU and ISSC (2015)

PART III EDUCATIONAL INVESTMENT IN NIGERIA: PAN CONTINENTAL COMPARATIVE ANALYSIS

The success of any education system pivots on proper planning, efficient administration and adequate funding (Gbosi, 2003). Several government agencies are involved in educational planning in Nigeria. These include: The National Council on Education (NCE), the Federal Ministry of Education, States Ministries of Education and Local Governments.

The National Council on Education comprises the Minister of Education and State Commissioners for Education as well as the Joint Consultative Committee on Education (JCCE).

The latter is made up of educational officials, and other experts; they also participate in the formulation of educational policy. The objectives of the planning, administration, inspectors, supervisory and financial services in education include to; ensure adequate and effective planning of all educational services; provide efficient administrative and management control for the maintenance and improvement of the system; and provide adequate and balanced financial support for all educational services.

The Federal Ministry of Education is responsible for various aspects of educational planning in Nigeria. Some of the major areas include establishing a National Policy on Education, setting and maintaining minimum standards, coordinating educational policies in Nigeria and coordinating international co-operation in education.

Another key organ involved in educational planning is the state ministry of education. Some of the functions of states ministries of education are planning, research, and development of education, provision of broad educational services and provision of appropriate education laws and ensuring their enforcement.

States ministries of education also make policy and have control over primary, secondary education and tertiary institutions owned by the states in accordance with the requirement of the National Policy on Education.

Local governments deal with people at the grassroots through their responsibility for the financing and management of primary education within their local government area. Some of the functions of the Local Educational Authorities include the payment of primary school teachers' salaries and allowances, the re-training of teachers and the payment of pensions and gratuities (Gbosi, 2003).

The development experience of the Asian Tigers signed post the critical role of education in the acceleration of economy and development. However, what could be gleaned from the data on the enrollment at the various levels of education in Nigeria is not a success story. Nigeria is far from realizing the import of education.

The primary school gross enrolment ratio shows decline from 96.06 in 2008 to 93.27 in 2009. In 2018, the ratio was 84.70.

The trend of the secondary school enrolment ratio is not significantly different from this. For a country such as Nigeria that has been experiencing consistent increase in population, one would have expected consistent increase in enrolment ratio, but the reverse is the case.

The implication is that more and more children are out of school, thus missing out on the economic benefits of education. These are partly the reasons why supposed the economic growth recorded in Nigeria in the past years have neither been inclusive nor translated to development.

One of the major errors various governments especially in developing countries, including Nigeria make is to categorize educational funding as expenditure. No. Education must be seen as investment in the most critical resource that has the capacity to create economic growth and sustain development.

In Nigeria, Government recurrent expenditure on education as a ratio of the GDP, total recurrent expenditure and the total government expenditure have been grossly inadequate. As a ratio of GDP, the percentage of recurrent expenditure in Nigeria has been consistently less than 0.9% from 1991 to 2017. Rather than increasing with population growth, it declined from 0.82% in 1999 to 0.35% in 2017. In the same vain, the percentage channeled towards recurrent education expenditure has consistently been below 9.0% from 1991 to 2017.

Table 1.: Education Expenditure as % of GDP, Total Recurrent Expenditure and Total

Year	Recurrent on education as % of GDP	Recurrent expenditure on education as % **of total recurrent** expenditure	Recurrent **expenditure on** education as **a % of** total expenditure
1991	0.211395	3.294979	1.89246
1992	0.031875	0.54686	0.3125
1993	0.705283	6.494552	4.643623
1994	0.41865	8.202734	4.586985
1995	0.336764	7.63927	3.919283
1996	0.304303	9.252555	3.410237
1997	0.36117	9.365541	3.467844
1998	0.296144	7.630545	2.789924
1999	0.821689	9.698439	4.61716
2000	0.840307	12.55633	8.267598
2001	0.490279	6.884171	3.917485
2002	0.710627	11.55712	7.9092711
2003	0.487011	6.581327	5.283893
2004	0.441826	7.410671	5.366008
2005	0.371801	6.766365	4.544280
2006	0.415247	9.224926	6.141383
2007	0.456973	9.487374	6.152026
2008	0.418766	7.744549	5.05983
2009	0.309627	6.4437	3.971051
2010	0.31275	5.493057	4.071921
2011	0.533182	10.13121	7.126394
2012	**0.485819**	**10.47769**	**7.565048**
2013	0.487461	10.58318	7.529333
2014	0.386047	10.03093	7.493368
2015	0.345414	8.48628	6.518323
2016	0.334301	8.155554	5.791184
2017	0.35525	8.451063	6.256446

Source: CBN Statistical Bulletin 2017 and 2018.

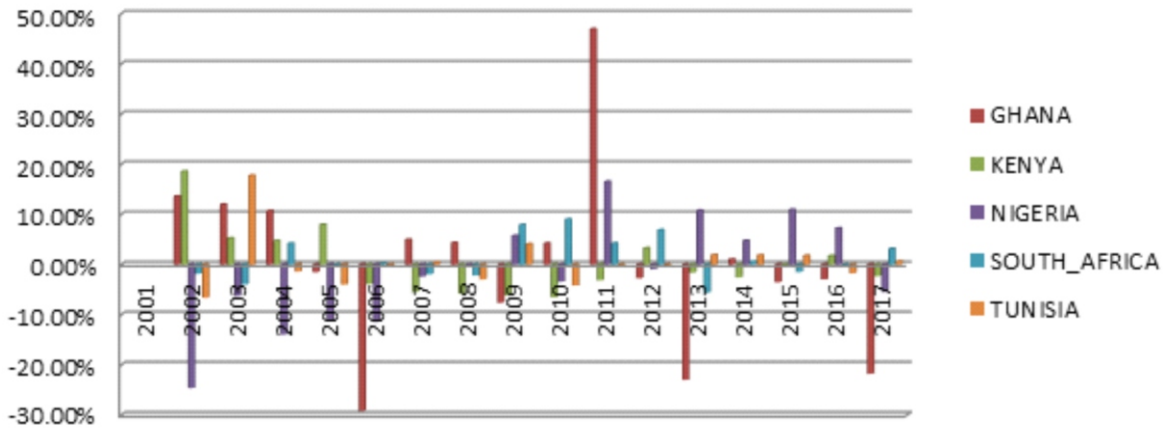
To benchmark Nigeria's Educational investment with the framework of Africa Continent, it is useful to attempt a continental comparative analysis of the educational investment over the past 17 years.

For this purpose, five countries including Nigeria were selected. These countries were: Ghana, Kenya, Nigeria, Tunisia, and South Africa.

The first indicator to be considered is the education expenditure as a ratio of Gross Domestic Product (GDP).

This is presented in Table 2. **Ghana** invested on the average 6.18 per cent of its GDP on education between 2001 and 2017, with highest ratio of 8.14 per cent in 2011 and the lowest of 4.51 per cent in 2017.

Figure 2: Year % Change in Government expenditure on education, total (% of GDP)



In the review period (2001 -2017), **Kenya** education investment/GDP ratio ranged between 7.34 per cent in 2005 (highest) and 5.21 percent in 2001 (lowest). The ratio was consistently over 5.0 per cent in all the years. On the average the country invested 5.93 per cent of her GDP on education over the period.

Nigeria education investment/GDP ratio was consistently below 3.0 per cent over the period (2001-2017), with the exception of 2001, when a ratio of 3.20 per cent was achieved. The ratio ranged between 3.20 per cent in 2001 (highest) and 1.48 per cent in 2008. The average ratio for the country during the studied period was 1.97 per cent.

For **South Africa**, the ratio was consistently above 5.0 per cent in all the years under review with the exception of 2003, 2007, and 2008. The highest ratio of 6.37 per cent was achieved in 2012, while the lowest ratio of 4.86 per cent was recorded in 2003. The average investment in education as a ratio of GDP over the period 2001 to 2017 stood at 5.15 per cent.

Tunisia education investment-GDP ratio was consistently above 6.0 per cent, between 2001 and 2017, with the exception of 2002, when 5.79 per cent was recorded.

The highest ratio of 6.82 per cent was achieved in 2003. On the average, the education-GDP ratio for Tunisia from 2001 to 2017 was 6.41 per cent.

Table 2: GOVERNMENT EXPENDITURE ON EDUCATION, TOTAL (% OF GDP)

Year	GHANA	KENYA	NIGERIA	SOUTH AFRICA	TUNISIA
2001	5.35	5.21	3.20	5.15	6.20
2002	6.08	6.17	2.41	5.07	5.79
2003	6.81	6.49	2.26	4.86	6.82
2004	7.54	6.79	1.94	5.07	6.72
2005	7.42	7.34	1.72	5.06	6.45
2006	5.26	7.05	1.53	5.07	6.44
2007	5.52	6.66	1.49	4.97	6.47
2008	5.76	6.28	1.48	4.87	6.27
2009	5.32	5.89	1.57	5.25	6.53
2010	5.54	5.51	1.51	5.72	6.25
2011	8.14	5.34	1.76	5.96	6.25
2012	7.92	5.51	1.75	6.37	6.25
2013	6.10	5.42	1.94	6.01	6.37
2014	6.16	5.28	2.03	6.05	6.48
2015	5.94	5.27	2.25	5.97	6.60
2016	5.77	5.36	2.41	5.94	6.48
2017	4.51	5.24	2.28	6.13	6.52

Source: Computed by the Author from WDI (2018)

In comparable term, this key indicator showed that **Nigeria's highest ratio of 3.20 per cent was below the lowest ratio of all the countries studied.**

Nigeria's highest ratio was 0.95 percentage points lower than the bottommost ratio of Ghana, 2.01 percentage points than the lowest ratio of Kenya, 1.66 percentage points below the lowest ratio of South Africa and 2.59 percentage points lower than the lowest ratio of Tunisia.

Additionally, the data indicate that on the average, education investment as a ratio of GDP for Ghana was at least 3.14 times higher than Nigeria's ratio from 2001 to 2017. Comparable data with Kenya was 3.01times, South Africa, 2.61 times, and Tunisia, 3.25 times.

The second indicator considered is the year change in government investment on education as a ratio of total expenditure. This is shown in Table 3.

Table 3: Year % Change in Government Expenditure on Education as a ratio of

Year	GHANA	KENYA	NIGERIA	TUNISIA	SOUTH AFRICA
2001					
2002	14.06	14.43	5.00	-7.17	-1.84
2003	12.32	-2.53	-8.64	21.00	-2.51
2004	10.97	6.76	-3.71	0.54	1.75
2005	4.70	3.00	-10.76	-4.09	-0.05
2006	3.12	-8.69	7.19	0.62	-9.64
2007	-7.64	-4.51	-11.16	-1.61	0.12
2008	7.71	-4.72	-10.69	-4.43	-0.67
2009	-6.42	-4.96	12.20	0.01	2.23
2010	-8.00	-5.22	-1.96	-1.64	-1.43
2011	48.02	-6.34	19.60	-7.76	5.08
2012	22.48	3.49	15.40	-8.41	8.83
2013	-43.44	-3.96	9.89	3.03	-7.10
2014	-1.12	-10.74%	31.59	2.94	-0.17
2015	13.46	-2.44%	7.85	2.86	-2.29
2016	-7.21	4.04%	11.73	-2.78	-3.48
2017	-9.03	1.41%	-34.16	0.95	3.76

Source: Computed from WDI (2018)

A cursory perusal of Table 4 indicates that in ***Ghana***, the percentage change in education financing as a ratio of total expenditure, though on a declining trend, was consistently positive between 2002 and 2006. In 2007, the ratio plummeted by 7.64 per cent, but reversed in the succeeding year by 7.71 per cent. Between 2009 and 2010, respective negative ratio of 6.42 and 8.0 per cent were recorded.

However, the ratio turned positive in 2011 and 2012. From 2013 to 2017, negative ratios of varying degrees were recorded with the exception of 2015, when the ratio was positive. In all, between 2002 and 2017, the overall change in the ratio was 56.76 per cent between 2002 and 2017.

For **Kenya**, the ratio has been largely negative. Between 2002 and 2015, negative ratios of varying degrees were recorded with the exception of 2002, 2004, 2005, and 2012. Positive ratios were however registered in 2016 and 2017. Overall the change in the ratio was negative 20.98 per cent over the period 2002 and 2017.

The ratio was broadly negative in Nigeria between 2002 and 2010, with the exception of 2002, 2006 and 2009, when the ratios were in the positive trajectory. The ratio reversed in the remaining year to 2017. From 2011 to 2016, the ratios were positive, but turned negative in 2017. Cumulatively, the ratio was 49.53 per cent between 2002 and 2017.

The data for **Tunisia** indicates that the ratio was negative in seven years between the period 2002 and 2017. On the whole, the ratio was negative 6.97 per cent for Tunisia over the period 2002 to 2017.

For **South Africa**, the ratio was negative for ten of the sixteen years (2002-2017) with the overall variation of negative 7.41 per cent.

To understand the implications of the above analysis on economic development, Table 4 shows the countries' ranking on HDI. The cursory perusal clearly shows that countries that finance their education with higher percentage of their GDP also performed better in that order on this critical indicator of development.

All the comparable countries analyzed above were ranked better than Nigeria mimicking the order of the level of resources devoted to education investment. Between 2010 and 2017, with the exception of Nigeria, none of the countries scored below 0.55, the threshold that separate the middle performing economies from the worst on the HDI ranking, a metaphor for development terms.

Table 4: Human Development Index For Selected Countries

Year	GHANA	SOUTH AFRICA	NIGERIA	KENYA	TUNISIA
Variable	HDI	HDI	HDI	HDI	HDI
2001	0.483	0.61		0.456	0.661
2002	0.489	0.617		0.456	0.666
2003	0.49	0.615	0.443	0.468	0.673
2004	0.498	0.613	0.462	0.48	0.682
2005	0.509	0.614	0.465	0.49	0.689
2006	0.519	0.616	0.475	0.505	0.695
2007	0.53	0.621	0.479	0.514	0.701
2008	0.542	0.633	0.485	0.523	0.707
2009	0.547	0.642	0.49	0.533	0.71
2010	0.554	0.649	0.484	0.543	0.716
2011	0.563	0.657	0.494	0.552	0.718
2012	0.57	0.664	0.512	0.559	0.719
2013	0.577	0.675	0.519	0.566	0.723
2014	0.576	0.685	0.524	0.572	0.725
2015	0.585	0.692	0.527	0.578	0.728
2016	0.588	0.696	0.53	0.585	0.732
2017	0.592	0.699	0.532	0.59	0.735

Source: UNDP (2018)

In Nigeria, beyond the poor investment in education is the a more serious problem of the recruitment process of teachers, starting from the training. The requirement for admission into the colleges of education where the first level of teachers for the primary school is weak and unacceptable for a nation that want to develop its manpower. Data from 2015 to date indicate that the admission requirements for candidate to colleges of education is not comparable to those for the university and the polytechnics.

Furthermore, the required cut off point in the qualifying examination is such that 20.0 per cent in each subject is considered a pass mark. This essentially tantamount to recruiting graduates with pass or third-class degrees to lecture in the university as against the global practice of selecting the best and the brightest to teach. This is one of the foremost drawbacks in the education process currently in Nigeria.

PART IV EMPIRICAL LITERATURE REVIEW

Investment in human capital is universally recognized as a key pillar of achieving inclusive growth. Investment in education has been statistically linked to better economic development outcomes. Education enables poor men and women both to participate in and benefit from economic growth (Ravallion,2004).

Maddisson (2007) conducted a survey of impact of education on rural economy and reported that in rural economies, educational improvement has been shown to increase returns to small scale farmers because they can readily absorb new technique and innovation as well as adapt more effectively to climate change risks.

Rauwyar and Kandbur (2009) found that by improving infrastructure qualities, social benefits for deserving people, advanced agriculture technologies, social services (including education), GDP growth and increased contribution of agriculture GDP growth will provide the basis for inclusiveness of economic growth.

Rahul et al (2013) estimated a unified measure of inclusive growth for emerging markets by integrating their economic growth performance and income distribution outcomes, using data over three decades. They applied the micro economic concept of social mobility function at the macro-economic level to measure inclusive growth that macro-economic stability, human capital (education), and structural changes are foundation for achieving inclusive growth.

Elena and Sushana (2013) focused on both the pace and pattern of growth and have identified the employability of the poor and cost of capital, geography and infrastructure and building blocks of inclusive growth analytical framework. They pointed out that rapid pace of growth is necessary for substantial poverty reduction but for growth to be sustainable in the long run, it should be broad across the sectors and inclusive of the large part of the country's labour force.

Andersson, Jagers, Lindskog and Martinsson (2013) investigated whether education for sustainable development (ESD) might have the intended effects on teacher education students. More specifically, they account for the results from a panel study on the effects of a course on SD held in autumn 2010 at the University of Gothenburg (n = 323) on teacher education students. The surveys consisted of questions about the students' concerns about various issues, including issues related to SD, and their attitudes towards SD and views of moral obligations to contributing to SD. The study included a control group (n = 97) consisting of students from the teacher-training programme at University West, which had not and did not include ESD. They found positive effects of ESD on almost all attitudes and perceptions, including e.g., personal responsibility in relation to SD and willingness to contribute to SD, while there is no noticeable effect in the control group.

Boyi (2013) explained the concept of education, the concept of sustainable national development and relationship between education and sustainable national development. The study provided an insight into various challenges confronting education in Nigeria such as gender inequity in education, dearth of teachers, inadequate infrastructures, overcrowded classrooms etc. It finally suggested way on how to solve challenges confronting education in Nigeria. This is done through creation of conducive atmosphere for learning, allocation of enough funds for educational development, discouraging gender disparity in education by an enlightenment programme, setting up a trustworthy committee that will manage and supervise education etc.

Ilechukwu, Njoku and Ugwuozor (2014) examined education and development disconnect in Nigeria and made a case for education for Sustainable Development (ESD) as the critical path to Nigeria's sustainable development and global competitiveness. The outcome of the study revealed that education is the pivot of national transformation and development, but Nigeria's dysfunctional educational system perpetuates and deepens poverty and underdevelopment and consequently, the resource-rich Nigeria is described as a low human development country and as a country with blunted

edges in the United Nations Development Programme (UNDP) Human Development Reports and the World Economic Forum Africa and Global Competitiveness Reports, respectively. Relying on secondary data, the study argued that a human-rights-approach-to-education, investment in quality education, environmental education, research and innovation, achieving the millennium development goals (MDGs) and science and technology are prerequisites for Nigeria's sustainable development and global competitiveness.

Essentially, that Nigeria's educational system, policies and practices should be reoriented towards sustainable development, which is a tripod of interdependent and mutually reinforcing pillars of economic growth, human development and environmental conservation, in an equitable and sustainable manner, for present and future generations. The study submitted that all curricula and taxonomies of education, including environmental education are subsumable under ESD which equips individuals and societies with the knowledge, values and skills to live and work in an equitable secure and sustainable manner and balances economic well-being and human development with cultural tradition and respect for and protection of earth's natural resources and environment.

Adedeji (2014) examined university as a catalyst for sustainable development in Nigeria with particular emphasis on the Federal University of Technology, Akure using the political economy method. They also examined some of the challenges plaguing the Nigerian university system in the achievement of its objectives with emphasis on sustainable development. The place of the university system in the nation's attainment of the position of one of the best twenty economies by the year 2020 was discussed.

It further reviewed the importance of university education to the knowledge economy through collaborations and linkages, knowledge dissemination and sharing occasioned by globalization, since no part of the world is insulated from the current challenges facing mankind which threaten sustainable development.

They also reviewed some of the variables that needed to be given proper consideration in order to improve the quality of university education in Nigeria. It posited that with quality university education, the gap between Nigeria and the developed countries of the world can be bridged. The study concluded that through research and innovation, university education is a veritable and dynamic source of knowledge and human capital to transform the nation and ensure sustainable development.

Pauw, Olsson and Berglund (2015) used data from 2413 students in grades 6, 9, and 12 from 51 schools across Sweden to study the effectiveness of education for sustainable development (ESD). In line with the current debate on the definition of ESD, the researchers quantified the extent to which teaching can be labeled as holistic and/or pluralistic. Through a series of descriptive analyses and the estimation of structural equation models, their results indicated that ESD can indeed impact on student outcomes in terms of their sustainability consciousness. The results also revealed the key role ESD plays in addressing SD, paving the way for a more sustainable future.

Azra et al (2016) in their study of measurement and determinates of inclusive growth integrated growth, inequality, accessibility and governance into one single measure. Their results showed that macroeconomic stability and social financial deepening are important determinants to enhance inclusiveness, and reduce poverty and inequality.

Ekwueme and Ezenwa-Nebife (2016) studied education for sustainable development through academic freedom using political economy approach. The authors observed that academic freedom leads to the expansion and discovery of new ideas of knowledge, transmits and preserves culture developed in the learner's independent judgment of an environment free from external control and domination. Educational opportunities that Nigerian children would have enjoyed through Education for all to achieve sustainability and self-reliance is lacking due to: education for all, Gender Equality, Cultural Diversity, among others.

Robert, Yuko, Nonoyama-Tarumi, Rosalyn, and Charles (2016) investigated the contributions of education for sustainable development (ESD) to quality education in 18 countries. The analysis revealed that major themes repeated across the 18 studies, showing that ESD contributes in many ways to quality education in primary and secondary schools.

Teaching and learning transforms in all contexts when the curricula include sustainability content, and ESD pedagogies promote the learning of skills, perspectives and values necessary to foster sustainable societies. The research also identified the need to integrate ESD across all subjects, to provide professional development for teachers to ensure ESD policy implementation and to adopt ESD management practices to support ESD in the curriculum in order to broaden ESD across countries.
Faouzi and Othman (2017) investigated the causal relationship between education expenditure and inclusive growth in Saudi Arabil (1981-2013) using inequality adjusted human development index for inclusive growth, ratio of human resources

development expenditure to GDP for education and structural Auto Regressive model of analysis. They found out that education expenditure has a positive impact on inclusive growth.

Ibukun and Aremo (2017) utilized Nigeria's annual data from 1981 to 2014, and employed both the autoregressive distributed lag model (ARDL) and Error Correction Method (ECM) to investigate long run and short run parameter among inclusive growth variables. They found out a negative relationship between Government consumption education expenditure, and inclusive growth both in the short run and long run.

Onovughe and Mordi (2017) examined the role of religious education in attaining Sustainable Development in Nigeria using research approach which relied on logical slogism that adhere to the rule of logical slogism. The study identified factors/affecting sustainable development, and posits that education is a determinant factor for development of any nation or society.

Again, the study found out that the right values are integrated in the educational system through religious teaching. It demonstrated that the right change of persons is through moral value which is the prerequisite for developing in any nation. As there is no nation that can rise above the quality of her education.

Florian, Norma, Rodrigo, Daniela and André (2019) conceptualized the impacts of higher education institutions (HEIs) on sustainable development (SD). Inductive content analysis was applied to identify major themes and impact areas addressed in the literature to develop a conceptual framework detailing the relationship between HEIs' activities and their impacts on SD.

The findings revealed six impact areas (education, research, outreach, campus operations and campus expenses) where direct (qualified workforce, research uptake in business and policy making, cultural dialogue, GHG emissions caused by operations and positive attitudes towards SD, in-migration of students) and indirect (economic growth, change of societal and business practices, social cohesion, contribution to climate change and sustainable lifestyles) impacts of HEIs on SD may occur. The findings also indicated a strong focus on case studies dealing with specific projects and a lack of studies analyzing impacts from a more holistic perspective.

PART V: METHODOLOGICAL FRAMEWORK

Table 5: Description of Variables

variable		source
HDI	Human development indicator (a proxy for Economic development)	World development indicator 2019
SSE	Secondary school enrollment % of gross (a proxy for education)	World development indicator 2019
INFMOT	Infant mortality rate	World development indicator 2019
GDDPC	Gross Domestic product per capita	World development indicator 2019
POPGRT	Population growth rate(annual)	World development indicator 2019
TOP	Trade openness (ratio of export +import to GDP)	CBN Statistical bulletin 2018
FD	Financial deepening (ratio of broad money supply to GDP)	CBN Statistical bulletin 2018

To determine the impact of education on economic development in Nigeria, the study adopts ARDL model. The functional form of the adopted model is given as

HDI = f (SSE, INFMOT, TOP, FD, GDPPC, POPGRT) 1

Taking the logarithm of the variables, equation 1 transforms to

log (HDI) = f(Log (SSE), Log (INFMOT), Log(TOP), log(FD), log(GDPPC),log(POPGRT))..... 2

The ARDL Specification of equation 2 is given as:

$$\Delta log(HDI) = \delta + \sum_{i=1}^{k} \alpha_1 \Delta log(HDI)_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta log(SSE)_{t-i} + \sum_{i=1}^{k} \alpha_3 \Delta log(InfMot)$$

$$\sum_{i=1}^{k} \Delta\alpha_4 log(TOP)_{t-i+} + \sum_{i=1}^{k} \alpha_5 \Delta log(PopGrt)_{t-i} + \sum_{i=1}^{k} \alpha_6 \Delta log(GDPPC)_{t-i} +$$

$$\sum_{i=1}^{k} \Delta\alpha_7 log(FD)_{t-i+} + \beta_1 log(SSE)_{t-i} + \beta_2 log(InfMot)_{t-i} + \beta_3 log(TOP)_{t-i}$$

$$+\beta_4 log(GDPPC)_{t-i} + \beta_5 \log(PopGrt)_{t-i} + \beta_6 log(FD)_{t-i} +$$

μ_t 3

Where α_1-α_7 are short run coefficients, $\beta_1 - \beta_6$ captures long run relationships, δ represents the intercept or constant, μ is the error term and Δ represents the difference operator.

In testing the hypothesis of no cointegration or otherwise among the variables, the F-test of the joint significance of the coefficients of the lagged levels of the variables was employed. The null hypothesis of no cointegration between economic development and the explanatory variables given as:

$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$

The alternative hypothesis is given as:

$H0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$

Decision on the rejection or acceptance of the null hypothesis is based on the lower and upper bounds critical values (Pesaran *et al*., 2001). The null hypothesis of no cointegration is rejected if the calculated F-statistics is above the upper bound critical value. Also, if the F-statistics falls below the lower bound critical value, the null cannot be rejected.

If the F-statistics is between the lower bound and upper bound critical values, the result becomes inconclusive.

The conditional ARDL model is used to estimate the long-run impact if a cointegration relationship is established. The ARDL long run model is specified as:

$$\text{HDI}_t = \beta_1 + \beta_2 Log(SSE) + \beta_3 Log(INFMOT) + \beta_4 Log(GNIPC) + \beta_5 log(FD) + \beta_5 Log(TOP) + \beta_6 Log(POPGRT + \mu \text{.....4}$$

After selecting the optimal lag length of the ARDL model using the Akaike information criteria or the Schwarz Bayesian criteria, the dynamic short run error correctional model is specified as

$$\boldsymbol{log}(HDI) = \boldsymbol{\delta} + \sum_{i=1}^{k} \boldsymbol{\alpha_1 \Delta log(HDI)_{t-i}} + \sum_{i=1}^{k} \boldsymbol{\alpha_2 \Delta log(SSE)_{t-i}} + \sum_{i=1}^{k} \boldsymbol{\alpha_3 \Delta log(InfMot)}$$

$$\sum_{i=1}^{k} \Delta \boldsymbol{\alpha_4 log(TOP)_{t-i+}} + \sum_{i=1}^{k} \boldsymbol{\alpha_5 \Delta log(PopGrt)_{t-i}} + \sum_{i=1}^{k} \boldsymbol{\alpha_6 \Delta log(GDPPC)_{t-i}} +$$

$$\sum_{i=1}^{k} \Delta \boldsymbol{\alpha_7 log(FD)_{t-i+}} + \lambda ECM_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

Where $\boldsymbol{\alpha_1}$ - $\boldsymbol{\alpha_7}$ are the short run parameters and λ is the parameter which indicate the speed of adjustment and ECM is the lagged error correction term obtained from estimating equation 4

Table 6: Descriptive Statistics

	LGDPPC	LINFMOT	LFD	LHDI	LSSE	LTOP	LPOPGRT
Mean	10.53581	47.91619	2.286304	0.438405	31.42861	0.486038	2.580884
Median	10.71001	46.12500	2.105062	0.410000	27.21662	0.512432	2.585222
Maximum	13.27682	53.87500	3.033669	0.532000	56.17987	0.917539	2.715063
Minimum	7.510994	45.63500	1.777875	0.380000	17.09992	0.117670	2.488183
Std. Dev.	2.038944	2.680551	0.434240	0.051414	9.274569	0.212895	0.067963
Skewness	-0.189859	0.979300	0.800694	0.579741	0.861540	-0.068701	0.104441
Kurtosis	1.570659	2.427305	1.973050	1.821172	2.795688	2.128307	1.726538
Jarque-Bera	3.371934	6.419647	5.579396	4.214969	4.641570	1.200538	2.567393
Probability	0.185265	0.040364	0.061440	0.121543	0.098196	0.548664	0.277011
Sum	389.8249	1772.899	84.59326	16.22100	1162.858	17.98339	95.49271
Sum Sq. Dev.	149.6625	258.6727	6.788331	0.095161	3096.634	1.631676	0.166282
Observations	37	37	37	37	37	37	37

Source: Computed by the Author

From the Table 6, the average value of SSE (secondary school enrolment) is about 31.42, the mean of population growth rate is 2.5 while mean HDI stands at 0.43. Skewness which is a measure of asymmetry of the distribution indicates that all the variables except LGDPPC and TOP are positively skewed.

On the other hand, the kurtosis which is a measure of the peakedness or the flatness of the distribution indicates that all the variables are not normally distributed.

V.1 STATIONARITY, LAG LENGTH AND BOUND TEST

Unit Root Test

ADF Unit Root Test

The ADF unit root test results with intercept and trend indicate that all the variables are stationary at first difference 1(1), with the except POPGRT and log(gnipc) which were stationary at level as shown in table 7 below.

Table 7: ADF Unit Root Test

VARIABLES	LEVELS	1ST DIFF.	CRIT. VAL.	DECISION
Log(HDI)	-1.531694	-6.019464	3.54	I(1)
Log(SSE	-2.662887	-3.528971	3.54	I(1)
Log(INFMOT)	-4.373296		3.54	I(0)
Log(FD)	-2.024840	-5.487367	3.54	I(1)
Log(TOP)	-2.270112	-5.755109	3.54	I(1)
Log (GDPPC)	-0.481445	-8.014258	3.54	I(1)
Log(POPGRT)	-4.180215		3.54	I(0)
	-6.089438	-4.235990	3.54	I(1)

Source: Author's Compilation Using EViews 10

V.2 LONG RUN MODEL

Evidence from the estimated long run ARDL model Table 8 indicate that Secondary school enrolment (SSE) is positively related to economic development (proxied by HDI). The effect is also statistically significant. The positive relationship implies that the higher secondary school enrolment is required for promoting long term development in Nigeria. The is in agreement with earlier studies including Onwioduokit and Tule (2002). Education increases the productivity of the population leading to an improved income and standard of living. This finding is in line with apriori theoretical expectation.

The estimated model further suggests a direct relationship between GDP per capita (GDPPC) and economic development. The effect is also statistically significant indicating that increases in per capital income will enhance economic development in the long run. Contrary to theoretical expectation, infant mortality (INFMOT) has a positive relationship with economic development in Nigeria in the period under review. The effect is however statistically non-significant.

The model established a long run positive relationship between (POPGRT) and Economic development in Nigeria. However, population growth rate was found to have no significant impact on economic development in the period under review.

Taking a look at the other explanatory variables, trade openness (TOP) and financial deepening (Log (FD)) both have negative impacts on Economic development in Nigeria. Low level financial inclusion and the small size of the manufacturing sector relative to GDP are some of the plausible explanations for the inverse relationship. Trade openness is however, statistically insignificant indicating that it is not a determinant of HDI in the model

Table 8. Long Run Coefficient

Dependent Variable: Log (HDI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDD)	-0.021023	0.024200	-0.868687	0.3965
LOG(INFMOT)	0.020351	0.121884	0.166974	0.8693
LOG(SSE)	0.139681	0.046770	2.986579	0.0079
LOG(TOP)	-0.043784	0.019599	-2.233980	0.0384
LOG(POPGRT)	0.305426	0.189081	1.615321	0.1236

V.3 DYNAMIC SHORT RUN ERROR CORRECTION MODEL

The short run error correction model Table 9 indicate that school enrolment is positively related to economic development at zero lag but negative at lag one.

The impact is insignificant in both periods implying that School enrolment has no short run impact on Economic development.

Similarly, Financial deepening has a statistically significant positive short run impact on economic development.

However, this is in contrast to the long run scenario where evidence of negative relationship was established between financial deepening and economic development.

Going further, it can be seen that in the period under review, Trade openness (TOP) has a positive short run relationship with economic development. while population growth (POPGRT) has a statistically significant negative impact on economic development at lag one. The coefficient of HDI indicates that Past economic development enhances current economic development in the short run.

Finally, the error correction parameter is negative and statistically significant. its coefficient of 0.80 indicates that 80% of the discrepancies between long run and short run equilibrium is corrected each year.

V.4 COEFFICIENT OF SHORT RUN MODEL

Table 9: DEPENDENT VARIABLE: LOG(HDI)

ECM Regression				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-1.802062	0.200278	-8.997795	0.0000
DLOG(HDI(-1))	0.427181	0.087040	4.907868	0.0001
DLOG(FD)	0.060885	0.010456	5.823057	0.0000
DLOG(FD(-1))	0.032634	0.011086	2.943834	0.0087
DLOG(SSE)	0.021108	0.014686	1.437295	0.1678
DLOG(SSE(-1))	-0.032115	0.016650	-1.928833	0.0697
DLOG(TOP)	-0.006151	0.003834	-1.604305	0.1260
DLOG (TOP (-1))	0.035401	0.004016	8.814582	0.0000
DLOG(POPGRT)	0.297449	0.263689	1.128028	0.2741
DLOG (POPGRT (-1))	-1.082484	0.267953	-4.039832	0.0008
CointEq(-1) *	-0.807869	0.089466	-9.029937	0.0000
R-squared	0.874332			
Adjusted R-squared	0.821970	D.W		2.5

Source: authors compilation using EViews 10

MODEL TWO

V.5 STATIC LONG RUN MODEL

Similar to the long run model for development, school enrolment has a positive long run effect on economic growth in Nigeria. Trade openness is positively related to economic growth in the long run signifying that the more open an economy is, the more its output is likely to grow. Furthermore, evidence from the long run model indicate that Infant mortality (INFMOT), GDP per capita (GDPPC) and financial deepening (FD)are all negatively related to economic growth in Nigeria.

This is largely explained by the structural defects in the economy and the restrictiveness of growth mechanisms in Nigerian economy. while population growth rate (POPGRT) exhibit a direct impact on economic growth rate in the period under review.

Table 10: Dependent variable: Log (RGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(FDD)	-0.111956	0.086844	-1.289159	0.2295
LOG(INFMOT)	-2.640342	0.472296	-5.590445	0.0003
LOG(SSE)	0.232393	0.144262	1.610914	0.1417
LOG(TOP)	0.222460	0.068047	3.269215	0.0097
LOG(POPGRT)	0.787736	0.681080	1.156598	0.2772
LOG(GDPPC)	-0.068418	0.067731	-1.010147	0.3388

V.6 DYNAMIC SHORT RUN ERROR CORRECTION MODEL

Evidence from the estimated error correction model Table 11indicates that School enrolment has a positive short run effect on economic growth in Nigeria. Similarly, GDP per capita has a dynamic positive effect on economic growth.

On the other hand, financial deepening is negative and significant, but positive and statistically significant at lags one and two.

The estimated error correction model indicate that Trade openness has an adverse effect on economic growth at lags one and two. The growth rate of population improves economic growth.

VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
C	17.90883	1.778399	10.07019	0.0000
DLOG(RGDP(-1))	0.743388	0.083747	8.876588	0.0000
DLOG(FDD)	-0.103006	0.022003	-4.681522	0.0011
DLOG(FDD(-1))	0.198889	0.027888	7.131702	0.0001

DLOG(FDD(-2))	0.143591	0.028495	5.039228	0.0007
DLOG(INFMOT)	-10.87532	2.108564	-5.157692	0.0006
DLOG(INFMOT(-1))	1.326441	3.242596	0.409067	0.6921
DLOG(INFMOT(-2))	7.990338	2.047605	3.902284	0.0036
DLOG(SEC_SCH_ENRT)	0.078415	0.033759	2.322809	0.0453
DLOG(TOP)	0.036587	0.009476	3.861018	0.0038
DLOG(TOP(-1))	-0.078265	0.015705	-4.983461	0.0008
DLOG(TOP(-2))	-0.044195	0.010899	-4.054832	0.0029
DLOG(POPGRT)	6.927170	1.346675	5.143906	0.0006
DLOG(POPGRT(-1))	-7.571435	1.955985	-3.870906	0.0038
DLOG(POPGRT(-2))	3.517142	1.128949	3.115414	0.0124
DLOG(GDPPC)	0.070261	0.031166	2.254384	0.0506
DLOG(GDPPC(-1))	0.147475	0.036017	4.094593	0.0027
DLOG(GDPPC(-2))	0.184914	0.034967	5.288204	0.0005
CointEq(-1)*	-0.812897	0.080857	-10.05351	0.0000
R-squared	**0.959431**	**Mean dependent var**		**0.047013**
Adjusted R-squared	**0.910749**	**S.D. dependent var**		**0.036938**
S.E. of regression	**0.011035**	**Akaike info criterion**		**-5.876128**

Evidence from the estimated error correction model indicates that School enrolment has a positive short run effect on economic growth in Nigeria. Similarly, GDP per capita has a dynamic positive effect on economic growth in the short run as evidenced from the model. On the other hand, financial deepening is negative and significant at lag zero but positive and statistically significant at lags one at two.

The estimated error correction model indicate that Trade openness has an adverse effect on economic growth at lags one and two. While the growth rate of population is estimated to improve economic growth at lags zero and two.

PART VI SUMMARY, RECOMMENDATIONS AND SOME CONCLUDING REMARK

VI.I SUMMARY

This paper sought to investigate the role of education in achieving and sustaining economic development in Nigeria. The traditional neo-classical growth model advanced by Robert Solow and Trevor Swan in the 1950s, averred that economy output is a function of larger inputs of capital and labor (all physical inputs). This theory was called to question a few decades after, as it failed to explain why countries with little capital and labor grew faster than countries with abundance of these resources.

This gap in the explanation of the growth process resulted in the emergence of the endogenous growth theory in the 1980s pioneered by Romer (1986). The endogenous growth theory averred that, it was not only technology, that was the main driving force economic growth but identified and situated human capital as a critical variable in the economic growth and development.

Abstracting from the theory, the paper examined education in Nigeria, its financing, including some comparable analysis with selected African countries and its connection with economic development. The study adopted ARDL model to examine both the short run and long run relationships between education and development proxied by HDI and education and economic growth within the context of inclusive growth model.

Evidence from the estimated long run ARDL model indicated that Secondary school enrolment (SSE) is positively correlated to economic development (proxied by HDI). The effect is also statistically significant. The positive relationship implies that the higher secondary school enrolment is required for promoting long term development in Nigeria. The results further suggest a direct relationship between GDP per capita (GDPPC) and economic development. The effect is also statistically significant indicating that increases in per capital income will enhance economic development in the long run. The model established a long run positive relationship between (POPGRT) and Economic development in Nigeria. However, population growth rate was found to have no significant impact on economic development in the period under review.

The short run error correction model indicate that school enrolment is positively related to economic development. The impact is insignificant in both periods implying that School enrolment has no short run impact on Economic development. Similarly, Financial deepening has a statistically significant positive short run impact on economic development. However, this is in contrast to the long run scenario where evidence of negative relationship was established between financial deepening and economic development.

The coefficient of HDI indicates that Past economic development enhances current economic development in the short run. The error correction parameter is negative and statistically significant. its coefficient of 0.80 indicates that 80% of the discrepancies between long run and short run equilibrium is corrected each year.

In the second model that adopted real GDP growth as the dependent variable, the long run model for development, school enrolment has a positive long run effect on economic growth in Nigeria. Trade openness is positively related to economic growth in the long run signifying that the more open an economy is, the more its output is likely to grow. Evidence from the estimated error correction model indicates that School enrolment has a positive short run effect on economic growth in Nigeria. Similarly, GDP per capita has a dynamic positive effect on economic growth.

Evidence from the estimated error correction model indicates that School enrolment has a positive short run effect on economic growth in Nigeria. Similarly, GDP per capita has a dynamic positive effect on economic growth in the short run. The estimated error correction model indicate that Trade openness has an adverse effect on economic growth with a one to two-year lags, while the growth rate of population is estimated to improve economic growth with lags.

VI.II RECOMMENDATIONS

Given the established relationship between education and economic growth and by extension development, the following recommendations should be considered by the relevant authorities in Nigeria:

Admission Process

(I). The admission process into the schools at all level should be made competitive. The idea of labeling a child disadvantaged and granting such child concession at birth is psychologically damaging to the psychic of such children. The danger of such arrangement is to institutionalized *entitlement syndrome*. Thus, such children will go through adult lives seeking for exception from competition thereby robbing the country of benefitting from the full potentials of such children. There must be a level playing field for every Nigerian child to excel for education to contribute to development.

Teacher Recruitment Process

Teaching should be the exclusive preserve of the best and the brightest. The idea of lowering cut off points for candidates seeking admissions into the Colleges of Education to as low as 80.0 per cent out of 400.0 per cent in the UMTE is not acceptable. It tantamount to recruiting graduates that made third class or pass degrees to lecture in the university.

The universally acceptable standards is that those who made first class or very high Second Class upper division are those recruited as graduate assistants. The real danger of current admission requirement in Nigeria is that since NCE is now the minimum qualification for teaching in Nigeria the children in the primary schools are being taught by weakest echelon of the academic society. The negative multiplier effects on the future of education is unfathomable.

Renumeration

To attract, maintain and retain the best and the brightest to the educational sector will require a competitive renumeration package. Teachers at all levels must be paid higher than the regular public servants. For the university, the arrangement must be more forward looking. The university lecturers' wages should be indexed to some macroeconomic variables, like inflation and exchange rate to guarantee the value of their income over time and in time. The advantage of such arrangement will be that it will curtail brain drain while attracting foreign scholars to Nigeria.

Funding

(I). The current educational funding arrangement in Nigeria is clearly inadequate. The different level of governments (Federal, States and Local) should device a more creative way to educational investment. Expenditure on Education must be considered as investment and not just expenditure. Both the scale and funding modalities need to change radically. The access SUBEC funds that is currently tied to counter-part funding from states is counterproductive, it tantamount to requiring anemic patience to donate blood to be able to access more blood to survive. There is need to directly release the funds to the different tiers of government base on a very realistic formula that excludes counterpart funding.

(ii). Education at the lower levels (Primary and Secondary) could be considered a public goods that the government must strive to provide at a qualitative manner. In this regards, boarding school arrangement must be reactivated nation-wide. This will certainly guarantee access and quality control including character building. However, at the tertiary level there is need to build in some level of cost recovery in the form of fees to finance this level of education.

To guarantee access while accommodating the indigent students, there is need to set up an **EDUCATION BANK** where students can access loan to pay for their fees and repay such loans securing employment over a period of time ranging from five to ten years.

(iii). There are several institutions currently operating in Nigeria ostensibly to manage educational funding that are drainage pipes, one such example is the TedFund. The Money spend on maintaining the Bureaucracy would have been better utilized if the resources were allocated directly to the various institutions to support both the capital and recurrent expenditures with adequate monitoring and evaluation to ensure productive use of such resources.

(iv). Joint Admission and Matriculation Board has outlived its relevance in Nigeria, the Board should be disbanded so that the candidates could apply directly to the university of their choice as is practiced in other countries. The arrangement of having both JAMB and the Universities conducting post-UTME is not tidy.

Again, the money that will be realize from the sale of admission forms could serve as one of the creative sources of funding of the universities and other institutions. From 2015 to date the realizable revenue as declared by JAMB ranged from #5.0 billion to #7.8 billion. This would go a long way to minimize the inadequate funding experienced by the tertiary institutions in Nigeria.

(v). The government should creative an admixture of incentive to encourage scholarship. This could be done by dedicating 80.0 per cent to merit and

reserving 20.0 per cent for fee paying. This will reduce the number of Nigerian students that are all over west Africa paying fees to attend substandard university out post colleges that are found in these countries.

VI.III SOME CONCLUDING REMARKS

There is no alternative to education if the goal of a nation is to achieve sustainable economic development would be realized. All the countries that have made progress in the world today, without exception, have been driven with knowledge. The 21st century economy is knowledge based and education is the ONLY sure way to acquire all the knowledge and know-how needed for the turnaround of the fortune of Nigeria. Education is not just imperative but an ultimatum for development. Expenditure on education is an investment with the potentials of multiples returns both in the short and long-runs. Nigeria education funding model needs to be revisited.

SELECTED REFERENCES

Adedeji, A. O. (2014). The University as a Catalyst for Sustainable Development in Nigeria: A Case Study of the Federal University of Technology, Akure. *Journal of Engineering and Engineering Technology*, 8(2), 55-60.

Adesina, S. (1981). Introduction to Educational Planning. Ile-Ife University of Ife Press

Adiele E., Obasi K., & Ohia A. (2017). Fundamentals of Educational Planning. Nigeria. Harey Publication Coy.

Age, E. (2005). Objectives of Teaching Education in Nigeria. London, British Council.

Aharonovitz, G. (2007). Expansion of firms and human capital accumulation by training: A growth model for the not-so-growing. Available at www.wsu.edu

Aliu, Y. O. (1997). Introduction to Manual on University Management. Abuja. National University Commission.

Andersson, K., Jagers, S. G., Lindskog, A. & Martinsson, J. (2013). Learning for the Future? Effects of Education for Sustainable Development (ESD) on Teacher Education Students. *Journal of Sustainability 2013, 5, 5135-5152;* www.mdpi.com/journal/sustainabilit.

Arrow, K. (1962) 'The Economic Implications of Learning by Doing', *Review of Economic Studies*, vol. 29, no. 3, June, pp. 155–73.

Boyi, A. A. (2013). Education and Sustainable National Development in Nigeria: Challenges and Way Forward. *Mediterranean Journal of Social Sciences MCSER Publishing, Rome-Italy, 4(8), 147-152.*

Dike, K. O. (1980). 100 Years of British Rule in Nigeria, 1857-1957. In I. Obaro (Ed), Groundwork of Nigeria History. Ibadan: Heinemann.

Eicher, T. & Penalosa, C.G. (1999). Inequality and growth: The dual role of human capital in development. Available at www.eheschrs-mrs.fr.

Ekpo, A. H. (2017). *The Nigerian Economy: Current Recession and Beyond*. 33rd Convocation Lecture at Bayero University, Kano, Friday, March 17, 2017.

Ekwueme, C. O., Ekon, E. E. & Ezenwa-Nebife, D. C. (2016). Education for Sustainability through Academic Freedom. *Global Journal of Educational Research Vol 15, 2016: 23-30 Copyright© Bachudo Science Co. Ltd Printed In Nigeria. ISSN 1596-6224 www.globaljournalseries.com;* Info@globaljournalseries.com.

Fabunmi, M. (2005). Historical Analysis of Educational Policy Formulation in Nigeria:

Implications for Educational Planning and Policy. International Journal of African & African American Studies Vol IV, No. 2, July 2005.

Fafunwa, A. B. (2004). History of Education in Nigeria. Ibadan: NPC Educational Publishers Ltd.).

Federal Republic of Nigeria (FRN) (1979). The Constitution of Republic of Nigeria. Lagos: Federal Ministry of Information.

Federal Republic of Nigeria (2014). National Policy on Education. Lagos: NERD Press.

Federal Republic of Nigeria (1999). Constitution of the Federal Republic of Nigeria. Lagos: Federal Republic of Nigeria Official Gazette.

Florian, F., Norma, S., Rodrigo, L., Daniela, R. & André, M. (2019). The impacts of higher education institutions on sustainable development. A review and conceptualization Sustainability in Higher Education, *Emerald Publishing Limited* 20(1), 23-38.

Gbosi, A. N. (2003). *Economics of Human Resources Development*; Emihai Printing and Publishing Company, Nigeria.

Hauwa, I. (2012). Italian Journal of Sociology of Education, 1, 2012.

ICSU & ISSC. (2015). *Review of Targets for the Sustainable Development Goals: The Science Perspective*. Paris: International Council for Science (ICSU).

Ijaduola, K. O. (1998). Education in Nigeria: An Historical Perspective. Ijebu-Ode: Lucky Odoni (Nig) Enterprises.

Ikechukwu, O. G. (2006). "Proliferation of Private Schools In Nigeria: Its Effects on Nigerian Educational System". *In Farfaru Journal of multi-Disciplinary Studies.*

Ilechukwu, L. C., Njoku, C. C. & Ugwuozor, F. O. (2014). Education and Development Disconnect in Nigeria: Education for Sustainable Development (ESD) as the 21st Century Imperative for Nigeria's National Transformation, Sustainable Development and Global Competitiveness. *Journal of Economics and Sustainable Development,* 5(23), 44-56.

Imam, Hauwa. (2003). A Survey of Pre-colonial Almajiri Education in Kanem-Borno and Hausaland. SAPHA – Journal of Historical Studies 1 (1), 1-6.

Kalu, I. E. (2001). *Issues in Problems and Policies of Development. Mmeograph Series No. 1, 2001*. Techno Consult LTD, 29, Lye Oyekammi Street Hasa, Lagos, Nigeria.

Lucas, R.E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics.* 22, 12-23.

Maclean, P. (2008). Education for peace building and sustainable development: delusion, Illusion, or reality? *Retrieved from http://www.daneprairie.com*.

Marchand, M., Michel, P., Paddison, O., & Pestieau, P. (2003). Optimal education subsidy and taxes in an endogenous growth model with human capital, Available at http://www.core.ucl.ac.be/services/psfiles /dp03/dp2003-19.pdf. Retrieved on September 01, 2016.

Mohammed, S. M. (2016). Rethinking Education for Sustainable Development: The Role of Tertiary Institutions in Nigeria. *Book of Topical Educational Issues* (March, 2016): 465 – 473.

Munasinghe, S. (2004). *Effective Instructions through Dynamic Discipline. Ohio, Charles E. Merill.*

Nnokam, N. C., & Sule, H. (2017). Teachers Education and Sustainable Development Goals in Nigeria: Problems and Prospects. *International Journal of Scientific Research in Education, 10*(4), 401-412.

Nwagwu, C. C. (2011). The Environment of Crises in the Nigeria Education System.

Comparative Education, 33 (1), 87-96.

Odukoya, D. (2009). Formulation and Implementation of Education Policies in Nigeria. Educational Research Network for West and Central Africa (ERNWACA),

www.slideshare.net.

Ogunnu, M. (2000). Introduction to Educational Management. Benin City, Mabogun Publishers.

Omole, C. O. & Ozoji, B. E. (2014). Science Education and Sustainable Development in Nigeria. *American Journal of Educational Research*, 2(8), 595-599.

Onovughe, S. & Mordi, J. F. (2017). Religious Education A Vital Tool for Sustainable Development in Nigeria. *International Journal of Religious and Cultural Practice,* 1(3), 12-19.

Onwioduokit, E.A. and Tule, M. (2002). "Options for Sustainable Funding of Education in Nigeria" *Proceedings of the Nigeria Economic Society,* Ibadan.

Osokoya, I. O. (2002). History and Policy of Nigerian Education in World Perspective. Ibadan: AMD Publishers.

Osili, U. O. I. (2005). Does Female Schooling Reduce Fertility? Debating and Proposing Policy Options for National Development. Enugu: African Institute for Applied Economics,

Ozigi, A., & Ocho, L. (1981). Education in Northern Nigeria. London: George Allen and Unwin Publishers Ltd.

Pauw, J. B., Gericke, N., Olsson, D. & Berglund, T. (2015). The Effectiveness of Education for Sustainable Development. *Journal of Sustainability 2015, 7, 15693-15717.* www.mdpi.com/journal/sustainability.

Romer, P. (1986). Increasing returns and long run growth. *The Journal of Political Economy*, 94, 1002-1037.

Sasnett, M. T., & Sepmeyer, H. I. (1967). Education System of Africa. Los Angeles: University of California Press.

Taiwo, C. O. (1980). The Nigerian Educational System. Lagos: Thomas Nelson Nigeria Limited.

Tahir, G. (2001) Federal Government Intervention in U.B. E. form 1(1) 1-12 Kaduna, Nigeria.

Uchendu, V. C. (1979). Education and Politics in Tropical Africa. New York: Conch Magazine.

Umo, J. U. (2012). *Escaping Poverty in Africa. A Perspective on Strategic Agenda for Nigeria.* Millennium Text Publishers Limited 14 Science Road, Unilag Estate, Magodo, Isheri, Lagos, Nigeria.

United Nations (2015). Transforming Our World: The 2030 AGENDA for Sustainable Development, New York.

UNESCO (2000). *Nigerian Human Resource Development and civilization: Education and world Affairs*, Newyork.

UNESCO. 2014b. *UNESCO Roadmap for Implementing the Global Action Programme on Education for Sustainable Development*. Paris: UNESCO. http://unesdoc.unesco.org/images/0023/002305/230514e.pdf (accessed 3 February 2017).

Woolman, D. C. (2001). Educational Reconstruction and Post –Colonial Curriculum

Development: A Comparative Study of Four African Countries. International Education Journal, 2(5), 27-46.

Analysis of The Causal Link Between Economic Growth and Development in Nigeria (1960-2019)

Muhammad Umar
Department of Economics and Development Studies, Faculty of Art, Management and Social Sciences, Federal University Gashua, Yobe State, Nigeria.

Abstract

Taking cognizant of Nigeria's recent policies toward translating growth to meaningful development, this study aimed at analysing causality amid economic growth and development using annual series from 1960-2019.The study engaged vector autoregressive method by embracing Toda and Yamamoto 1995 model. The results reveals a bidirectional causality between economic growth and dependency ratio; population growth rate and economic growth and also it reveals the evidence of uni-directional causality from dependency ratio to life expectancy and from population growth to life expectancy. But economic growth and life expectancy as well as dependency ratio and life expectancy does not present evidence of causality.

Key Words: *Economic Growth, Population Growth, Dependency Ratio, Life Expectancy and VAR.*

JEL Code: *O1, O4*

INTRODUCTION

Over the years great care has been paid toward assessing the link concerning development and economic growth. Nigerian economic performance in general since independence in 1960 has been categorically uninspiring despite the availability of resources and increase in expenditure, immense amount of foreign exchange derived mainly from its oil and gas resources, economic growth has been feeble and the incidences of poverty has enlarged. The objective of every self-governing nation like Nigeria is to upturn the standard of living of her populace and promote economic growth and development of the country. Due to inequality, level of poverty, the insufficiency of capital resources and the law of comparative advantage, countries depend on each other to foster economic growth and achieve justifiable economic development.

Economic progress is fundamental and indispensable to economic development. This tells why in Nigeria, growth endlessly dominates the main policy thrust of government's development objectives. Fundamentally, economic growth is linked with policies aimed at improving and reformation of the real economic sectors. However, deficiency in national resources, savings and investment in the economy is a key impediment to economic development in a nation since the gap amid savings and investment is crucial (Imimole and Imoughele, 2012). Savings provides emerging states with the much desirable capital for outlay which enhanced economic growth. Growth in savings leads to rise in capital formation and invention that will lead to employment creation and lessen external borrowing of government. Low internal saving rates may sustain low-growth levels since Harrod Domar model suggested that savings is an imperative factor for economic growth.

The rising concern among researchers in the arena of macroeconomics focuses on providing answers to economic questions as what defines economic growth. Why some nations develop faster than the other, what lead to unequal growth rates across countries, are these factors country-specific. There are assorted answers to the above questions in the literature. However, many studies have been conducted in investigating the correlation between growth and development in nations like Nigeria. This study complements the prevailing body of knowledge on the link between economic growth and development from a different perspectives.

Numeral studies on economic progress in Nigeria focus on the affiliation between economic growth, FDI and economic freedom, political system, see (Bengoa and Sanchez, 2003); Javorcik (2004); Kapuria (2007); Akinkumi (2017) Broadberry and Gardner (2019). Others like Misztal (2011) and Uwakaeme (2015) looked at market capitalization, productivity and national saving and growth; Zubair (2014) entrepreneurship and development, Hanif and Arshed (2016) education and growth, Babatunde (2012) growth and development strategies; Paul (2017) financial development and growth and many more.

The country-specific studies on the connection amid economic growth and development is unlimited in the case of Nigeria. In addition, most of the previous studies use ARDL, OLS, Co-integration, ARIMA model and conventional granger causality but this study used augmented VAR (granger non causality test) in analysing the causal link between economic growth and development in Nigeria from 1960-2019 and the use of most recent dataset with a large scope is another contribution to the existing research.

The basic aim of this paper is to empirically examine the causal link that existed amid economic growth and development in Nigeria using time series regression basis.

2.0 LITERATURE REVIEW

Although there is no universally established definition, most of the scholars think of the economic development as a process that produces economic and societally quantifiable and qualitative wealth, which causes the general economy to cumulatively and robustly increase its real domestic product. Linked to development, economic growth is in a partial sense, an escalation of the nationwide income per capita. Specifically in quantitative terms, it just centers on the functional links among the endogenous variables. In a broader sense, it involves the growth of the state treasure, including the manufacturing ability, expressed mutually in absolute and relative size, per capita, and encompassing also the structural modification of the economy while development displays how growth influences the society by growing the standard of life. While economic growth relate to quantitative aspect of economic activities, development relate to larger scope including qualitative changes in an economy (Haller, 2012).

Economic Growth means continuous increase in the size of production of a country, or an increase in gross national product as the core quantifiable signs of production over a period of a time. Economic development is not only quantitative variations once it comes to the economic condition of the nation, however a qualitative modifications of the economic arrangement, the advent of new sectors and businesses and new employments. So a better and further comprehensive fulfilment of human necessities. Production per capita is a degree of the capability of a society to realize their aims of social and economic development, so as to meet the continuously increasing societal requirements (Ivic, 2015).

Diverse growth models have been utilised to study the conversion from static living standard to a contemporary era of economic progression. Almost all of these models integrate the Malthusian diminishing returns. Romer model of growth placed an importance on the human capital accumulation in his model while Hansen and Prescott (2002) placed importance on a neoclassical model that advocates a fundamental change from agriculture to manufacturing. The neoclassical philosophy of growth took its origin from Harrod-Domar model.

The model was developed to elucidate the relation among investment, growth rate and employment in a nation with stationary growth. Barro and Sala-i-Martin (1992) documented the existence of convergence because economies grow faster in per capita terms when they are below the steady-state position. And the technology-gap and speed of convergence is a function of diffusion of technology and level of technology is spread out from advanced nations to less advanced economies. In the traditional neoclassical growth model, the long-term growth is dogged by physical and human capital buildup, as well as technology while other elements are restricted to temporary effects on the proportion of growth. But, the endogenous growth ideal has encompassed several variables such as financial development, education, population, global trade, and public strategy.

Structural-change model deals with policies devoted to changing the economic arrangements of emerging countries from being mainly dependent on subsistence agricultural practice to new technologically diverse industrial and service economy (Chenery & Taylor, 1968). Empirical scrutiny through which the economic, industrial and institutional structure of less developed economy is transformed over time to warrant new industries to replace traditional agriculture as the apparatus of economic progress.

It faced criticism for highlighting urban progress at the cost of rural development which will lead to a considerable rise in inequality within a country. The dual-sector model has been disapproved for its basic assumption that typical agricultural societies suffer from excess of labor. Authentic empirical studies have exposed that such labor excesses are only periodic and taking such labor to city areas can result in a downfall of the agricultural sector (Todaro & Smith, 2011).

International dependence theories take their roots in evolving countries and opined that problem of development is largely external in nature, relatively than internal. The idea that unindustrialized countries being cautiously and politically reliant on more persuasive advanced countries which take interest in preserving their overriding position on less developed nations. Neoclassical theories maintain that governments would not interfere in the economy. They claimed that an unhindered market is the best way for promoting fast and effective development.

Linear-stages-of-growth model adjusts Marx's philosophy of development and emphasize more on accelerated accumulated capital, via the use of both internal and external savings as aggregate capital to stimulate investment, the stages of economic growth and development encompasses "the traditional society, the pre-conditions for take-off, the take-off, the drive to maturity, and the age of high mass-consumption". However, it was criticized for not recognizing that capital accumulation is not a sufficient condition for development. That is to say that the theory was unable to consider the political, social and institutional obstacles in relation to development (Todaro & Smith, 2011).

Another common theory that relate growth and development is Keynesian theory, which emphasize on viable economic development and the role of economic policy in the understanding macroeconomic goals. The Keynesian theories stress that demand controlling policies can be reused to rally round macroeconomic performance and sustainability. That is, macroeconomic programmes would embrace setting monetary and fiscal variables in every period at the standards which are assumed indispensable to achieve the government's ambitions (Abata, Kehinde, & Bolarinwa, 2012).

Though Keynesian philosophy is of the opinion that the private sector is characteristically unstable, it is subject to recurrent and significant disturbances in the workings of aggregate demand. It is the job of counter recurring or palliative programmes to counterbalance these private sector instabilities and so retain actual output near to its market-clearing equilibrium (Omitogun & Ayinla, 2007). So, based on the Keynesian economic growth model, macroeconomic strategies of government (both the fiscal and monetary policies) ought to be used to accomplish the preferred levels of economic growth and development.

Karagiannis and Kvedaras (2016) observed the correlation between financial development and economic growth in the European Union and the Euro zone. The results shows that the type of financing fund obtain is vital in the financial depth-growth link. Cigu et al. (2018) studied the relation between the transport arrangement and the economic enactment in 28 EU nations, during the period from 2000 to 2014, by means of panel data techniques. The results display significant effects from transport arrangement components even after influential and more factors are controlled, for the path analysis outcomes.

The study ratify unidirectional long-run causality connection between growth, transport infrastructure and public sector performance. Transport infrastructure has significant effect on economic development. On the other way round, corruption, regulatory atmosphere, size of economy, child mortality, earnings inequality, inflation and unemployment rate adversely affect the economic growth, and on the other hand there is a healthy progressive link among the quality of the judiciary, education attainment, life expectancy and economic growth. Peleckien et al. (2018) examined the relations between insurance development and economic growth across the European Union states and came up with diverse results.

Tiwari and Mutascu (2010) studied the impact of foreign direct investment on economic growth in Asian countries with panel data through 1986 to 2008 and also examined the nonlinearities accompanying foreign direct investment and exports in economic progression procedure of Asian countries. They recognized that in cooperation, overseas direct investment and exports increase development process, labour and capital also contributed immensely in the development of Asian states, and at the similar period they pronounced that export-led growth is a superior chance to growth attractiveness in Asian emerging states when related with overseas direct investment driving growth.

Shrestha (2013) compare the level of economic development between South Asia and East Asia and

realized that some development indicators express that the South Asia in all-purpose is lagging behind East Asian countries in term of high outlay, emphasis on the industrial sector, export-led growth and effort on infrastructure and human capital. Hence, South Asia would take note of some of these features regardless of changing conditions.

Hanif and Arshed (2016) and Broadberry and Gardner (2019) studied growth and development of sub Saharan African countries taking into cognizance the relation between education and growth and general progress of the region respectively. Their findings indicate that tertiary education enrollment has maximum impact on growth as they relate to primary and secondary schooling enrollment. It addresses the undesirable growth which limits long run progress across sub Saharan African countries due to unsatisfactory performance of the region as a whole.

Babatunde (2012) strongly canvasses for the expanding regional integration, increasing productivity and effectiveness through investment in knowledge and training, and the reinventing of African labour markets to encourage productivity and good labour relationships to spur growth and development.

Itumo (2017) revealed the degree of suffering in Africa, even with huge resources across the region. The trials before several African states about development are not just structural, micro-economic or macro-economic indices, but primarily triggered by certain African individuals. A cautious study of the prevailing and ongoing state of affairs in African societies exposes that a lot of economic disappointments are caused by human aspects and not by environmental or the deficiency of resources.

Ranis and Ramirez (2000) investigates connections between economic growth and human development with cross-country regressions that displayed a momentous relationship in both directions. And they argue that human development should be given sequencing priority. Zubair (2014) adopted correlational research design on time series from 1992-2013 with the help of autoregressive integrated moving average opined that finance in transportation and commerce, manufacturing and food processing and other activities have meaningfully impacted on economic growth and development of Nigeria.

Uwakaeme (2015) demonstrated a positive and significant long-run relationship between economic growth and productivity index (industrial), stock market capitalization and FDI. However, the impact of trade openness, although positive, is not quite impressive as reflected in the size of its regression coefficient. Inflation and excessive government fiscal deficit were significant but inversely relationship with economic growth, directions of causality between economic growth and the selected determinants are mixed – unidirectional, bilateral and independent.

Ajide (2014) used Multivariate Regression methodology on yearly time series of Nigeria over the period covering 1980 through 2010 recommended for liberalization in the degree of openness and consolidation of economic freedom precisely, through lessening unnecessary government interference so that more financial allocations have to be directed to health provision and education supporting activities that promote living standard. Paul (2017) studied relationship among financial development and economic growth in Nigeria using annual data for the period spanning from 1981-2014, by embracing multivariate VAR method estimate long-run relationships between financial development and economic growth. The paper found that real gdp per capita and financial development variables have common stochastic tendency driving their relationship.

Akinkunmi (2017) probes the determinants of economic growth using sample period 1960-2015 and Autoregressive Distributed Lag (ARDL) results indicate that investment significantly influenced economic growth while political stability and freedom have a negative insignificant impact on the growth rate of the Nigerian economy. Misztal (2011) evaluate the reason and consequential relationship between economic growth and savings in innovative economies and in unindustrialized and emerging states using co-integration and Granger's causality test. The outcomes established the presence of one-way causative correlation amid gross domestic savings and gross domestic product in the situation of industrialized nations as well as in unindustrialized and transition nations. Haller (2012) posits that economies and the world are facing a new stage named the stage of knowledge which is fundamental processes to economic growth and development.

Chukwuemeka (2015) Using comparative investigation between Nigeria and Malaysia, realised that human capital, financial development, capital accumulation, technology and institutions have cumulatively delayed Nigeria's economic growth transforming to economic development. Sertoğlu et al. (2017) studied the impact of agricultural segment on the economic growth of Nigeria, using time series data from 1981 to 2013 and observed that real gross

domestic product, agricultural productivity and oil prices have a long-run connection. Vector error correction result reveled that, the speed of adjustment of the variables towards their long run equilibrium path was low, yet agricultural productivity had a progressive impact on economic growth.

Ogunleye et al. (2018) with the aid of Ordinary least squares regression studied population and economic growth of Nigeria from 1981-2015 and the study disclosed that population growth has an affirmative and significant influence on economic growth of Nigeria, while fertility remained negative and significant for economic growth in Nigeria. Exchange rate and crude death rate are insignificant for economic growth of Nigeria.

Ismail and Imoughele (2015) posited that gross fixed capital formation, foreign direct investment and total government expenditure are the key factors of Nigeria's economic output under a stable inflationary rate. Matuzeviciute and Butkus (2016) used data of 116 nations with dissimilar growth levels over the era of 1990–2014, realised that remittances have a progressive bearing on long-run economic growth, but the bearing varies based on the nation's economic development level. Using data for 132 countries over 15 years, Ali et al. (2018) disclosed that human capital has progressive role in per capita GDP growth when there is presence of improved economic opportunities, high-quality legal institutions, organize business and trade internally or worldwide, the robust the outcome of human capital on growth.

3.0 METHODOLOGY

This work employs yearly time series data on GDP per capita growth rate (% of annual growth rate) represent economic growth, population growth (annual %), life expectancy at birth and dependency ratio (% of working-age population) as a proxy to economic development in Nigeria from 1960 to 2019. The annual series were sourced from World Bank development indicators relating to Nigeria. Once the series are non-stationary, the conventional asymptotic concept is not appropriate to hypothesis testing." For example, Ziramba (2008), Chiawa et al. (2012) and Rauf et al. (2012) posited that the Toda and Yamamoto method is superior to the Conventional Granger Causality since it does not need the pre-testing of variables for cointegration. This suggests that investigation can be done without testing for cointegration of the variables. So, its helps in overcoming the problem of asymptotic critical values when causality tests are done in the incidence of nonstationarity or no cointegration.

In addition, it reduce the risks related with the likelihood of errors in ascertaining the order of integration of the variables. Additionally, the technique is suitable for any arbitrary levels of integration for the variables. It is right for the standard VAR since the variables can be estimated in their levels rather than the first difference as in the case with the Ordinary Granger Causality and therefore it does not requires converting VAR into Vector Error Correction Tool (VECM). So this study follow Toda and Yamamoto (1995) method and the model is as follows

$$GDPP_t = \propto_0 + \sum_{t-i}^{k+dmax} \propto_1 GDPP_{t-1} + \sum_{t-i}^{k+dmax} \beta_1 LEXP_{t-1} + \sum_{t-i}^{k+dmax} \gamma_1 DRT_{t-i} + \sum_{t-i}^{k+dmax} \emptyset_1 PGR_{t-i} + U_1 \quad (1)$$

$$LEXP_t = \propto_0 + \sum_{t-i}^{k+dmax} \propto_2 LEXP_{t-1} + \sum_{t-i}^{k+dmax} \beta_2 GDPP_{t-1} + \sum_{t-i}^{k+dmax} \gamma_2 DRT_{t-i} + \sum_{t-i}^{k+dmax} \emptyset_2 PGR_{t-i} + U_2 \quad (2)$$

$$DRT_t = \propto_0 + \sum_{t-i}^{k+dmax} \propto_3 DR_{Tt-1} + \sum_{t-i}^{k+dmax} \beta_3 LEXP_{t-1} + \sum_{t-i}^{k+dmax} \gamma_3 GDPP_{t-i} + \sum_{t-i}^{k+dmax} \emptyset_3 PGR_{t-i} + U_3 \quad (3)$$

$$PGR_t = \propto_0 + \sum_{t-i}^{k+dmax} \propto_4 PGR_{t-1} + \sum_{t-i}^{k+dmax} \beta_4 LEXP_{t-1} + \sum_{t-i}^{k+dmax} \gamma_4 DRT_{t-i} + \sum_{t-i}^{k+dmax} \emptyset_4 GDPP_{t-i} + U_4 \quad (4)$$

Via such models, it turn out to be possible to study dynamic relations among variables. The models utilised in the causality analysis of Toda and Yamamoto (1995) and composed of absolute variables have been accepted for this study the value *k*, denotes the optimal lag length in VAR model and d max represents the maximum order of integration values of the variables within the system. To express *k* and d max values designated as the optimal lag length, *k* can be defined by means of Akaike and Schwarz information criteria while d max, the highest integration order value, can be defined by use of unit root tests. In order to analyse the causal link between economic growth and developments (GDP per capita growth rate, life expectancy, dependency ratio and population growth rate) of Nigeria the resulting hypothesis were verified using modified WALD test statistics. $H_{01}: \beta_1 = \gamma_1 = \emptyset_1 = 0$. That is life expectancy (LEXP), dependency ratio (DRT) and population growth (PGR) does not significantly granger cause economic growth (GDPP); $H_{02}: \beta_2 = \gamma_2 = \emptyset_2 = 0$ signifying that economic growth (GDPP), dependency ratio (DRT) and population growth (PGR) does not significantly granger cause life expectancy(LEXP). $H_{03}: \beta_3 = \gamma_3 = \emptyset_3 = 0$. That is causality does not significantly run from life expectancy (LEXP), economic growth (GDPP), and population growth (PGR) to dependency ratio (DRT). $H_{04}: \beta_4 = \gamma_4 = \emptyset_4 = 0$.

Means that there is no causality from life expectancy (LEXP), dependency ratio (DRT), economic growth (GDPP), and population growth (PGR).

4.0 RESULTS AND DISCUSSION

The empirical analysis was initiate with examining the unit root test for the variables. Because if the results of stationarity are violated, this might lead to spurious results. In examining the time-series data properties, there are numerous models of testing the stationarity, but the most essential one are the Augmented Dickey–Fuller (ADF) (Dickey & Fuller, 1979), the (Phillips–Peron, 1988) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) (Kwiatkowski, Phillips, Schmidt & Shin, 1992) unit root tests. The real values of the variables were tested for stationarity using both the ADF and KPSS test, and the results are presented in figure 1 and table 4.1 respectively.

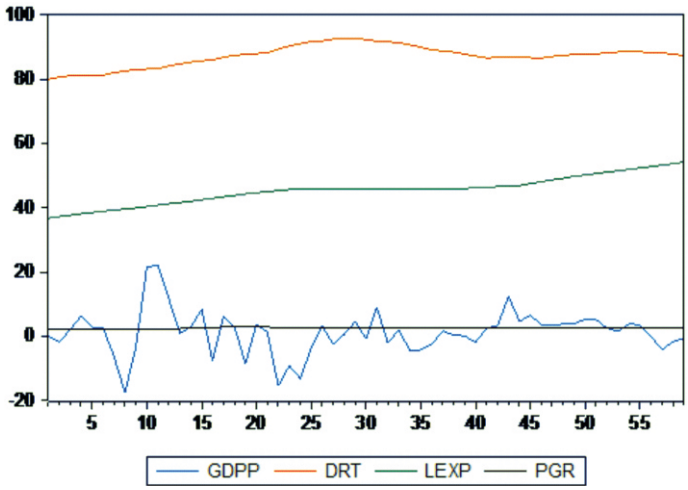


Fig.1: Trend of the series

Table 4.1Stationarity Test Results

Variable	ADF			KPSS		
	t-statistics	Probability	Order of integration	Critical value	LM-statistics	Order of integration
DRT	-4.222462	0.0086	I(1)	0.119000	0.099921	I(1)
GDPP	-4.674277	0.0020	I(0)	0.119000	0.081107	I(0)
LEXP	-7.402321	0.0000	I(2)	0.119000	0.077903	I(2)
PGR	-4.197520	0.0091	I(0)	0.119000	0.069166	I(1)

Source: Authors'Computation Using Eviews8 (2020).

Table 4.1 Indicates that using augmented dickey fuller (ADF) test, dependency ratio (DRT) is non stationary at level but at first difference that is I(1), while economic growth (GDPP), life expectancy (LEXP) and population growth rate (PGR) were all found to be stationary at level that is I(0). On the other hand the results for KPSS displays the same for dependency ratio (DRT), economic growth (GDPP) and life expectancy (LEXP) but differs in the case of population growth rate (PGR) which is stationary at first difference I(1). Going by this results the highest order of integration in both the ADF and the KPSS is order two i.e. I (2).

Root	Modulus
0.978288	0.978288
0.955644 - 0.203169i	0.977002
0.955644 + 0.203169i	0.977002
0.777351 - 0.503167i	0.925987
0.777351 + 0.503167i	0.925987
0.246038 - 0.786168i	0.823769
0.246038 + 0.786168i	0.823769
0.517496 - 0.578366i	0.776086
0.517496 + 0.578366i	0.776086
-0.523309 - 0.519127i	0.737120
-0.523309 + 0.519127i	0.737120
0.614698	0.614698
-0.593023	0.593023
0.189807 - 0.424655i	0.465143
0.189807 + 0.424655i	0.465143
-0.074578	0.074578

Source: Authors' Computation Using Eviews8 (2020).

From the table 4.2 it reveals that all the modulus that is chances of the root is not statistically significant because they are greater than 0.05 so it can conclude that no root lies outside of the unit circle therefore, the VAR model fulfils the stability condition.

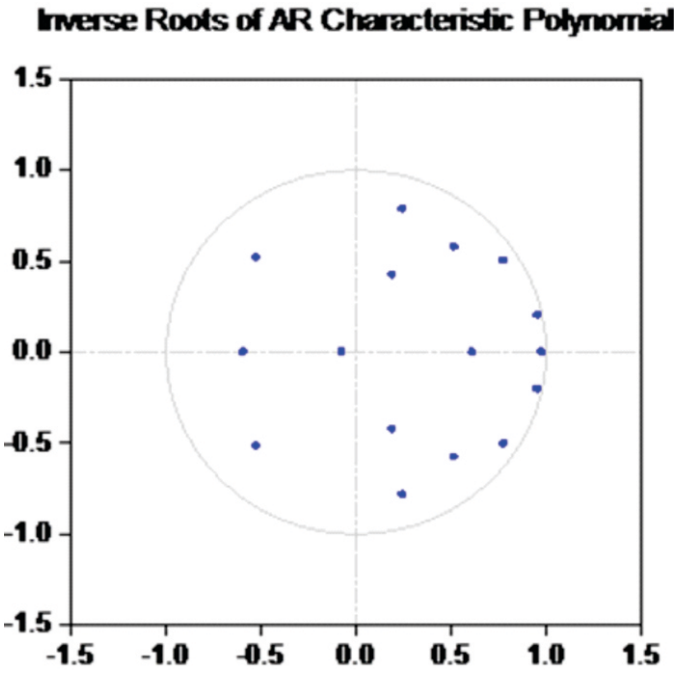


Fig.2: Model Stability

Figure 2 further indicate that the model is stable because all roots are within the circle that no root lies outside of the circle so there is stability in the model.

Table 4.3 Results of the VAR Granger Causality/Block Exogeniety Walt Test

DEPENDENT VARIABLE GDPP		
EXCLUDED	Chi-sq	Probability
LEXP	1.5540460	0.8195
DRT	15.11668	0.0045
PGR	11.43210	0.0221
DEPENDENT VARIABLE LEXP		
EXCLUDED	Chi-sq	Probability
GDPP	2.032107	0.7299
DRT	12.22230	0.0158
PGR	7.679155	0.1041
DEPENDENT VARIABLE DRT		
LEXP	3.431447	0.4884
GDPP	10.85777	0.0282
PGR	9.208025	0.0561
DEPENDENT VARIABLE PGR		
EXCLUDED	Chi-sq	Probability
LEXP	0.704163	0.9508
DRT	1.851515	0.7630
GDPP	17.51340	0.0015

Source: Authors' Computation Using Eviews8 (2020).

Table 4.3 Discloses that there is bidirectional causality between economic growth (GDPP) and dependency ratio (DRT), as well as population growth rate (PGR) and economic growth (GDPP), life expectancy (LEXP) and dependency ratio, population growth rate (PGR) and life expectancy reveals the evidence of uni-directional causality. Dependency ratio and life expectancy as well as economic growth and life expectancy does not present any evidence of causality hence their probabilities are greater than 5%.

The implication is that we accept the null hypothesis which states that $H_{01}: \beta_1 = 0$ meaning that life expectancy does not significantly granger cause economic growth meaning that past values of life expectancy cannot better predict future value of economic growth. However, in terms of dependency ratio and population growth rate null hypotheses is been rejected meaning that $\gamma_1 = \emptyset_1 \neq 0$ so we conclude that dependency ratio and population growth rate significantly granger cause economic growth. That is to say future values of economic growth cannot be better predicted by previous values of dependency ratio and population growth rate but going by the results in table 4.3 the null hypotheses is been rejected in case of dependency ratio and population growth rate but accepted with regard to life expectancy so future values of GDP per capita can be better predicted by past values of DTR and PGR than by the previous values of GDPP alone.

In the same vein $H_{02}: \beta_2 = \gamma_2 = \emptyset_2 = 0$ was fond to be true in case of GDPP and PGR because the probabilities were greater than 5%. It's agreed that economic growth and population growth does not significantly granger cause life expectancy. However, in case of dependency null was rejected because the p-value is less than 0.05 so dependency ratio granger cause life expectancy, so future value of life expectancy can be only better predicted by the past values of dependency ratio than using past values of dependency ratio alone. It is also observed that the null hypothesis $H_{03}: \beta_3 = \gamma_3 = \emptyset_3 = 0$ is in reality only in case of life expectancy since its probability is above 0.05 that there is no evidence of causality from life expectancy to dependency ratio. However, GDPP and PGR reveals the evidence of causality having their p-values less than 0.05. With respect to population growth rate it shows that dependency ratio and life expectancy are statistically insignificant signifying that $\beta_4 = \emptyset_4 = 0$ but economic growth is statistically significant in predicting future values of population growth having probability less than 0.05, hence we reject null hypothesis $\gamma_4 \neq 0$ and accept alternative hypotheses that $\gamma_4 = 0$ as a result one can conclude that future values of population growth can be better predicted using previous values of economic growth than using only past values of population growth.

5.0 Conclusion and Recommendations

Based on the results, the conclusion is that there is presence of causality only in the case of economic growth, population growth rate and dependency ratio. In specific it was concluded that economic growth and dependency ratio, population growth level and economic progress granger cause each other meaning that they have bi-directional relation. It is also concluded that life expectancy and dependency ratio, population growth rate and dependency have one way directional causality. This suggest that to translate growth to meaningful development there is a need to improve and diversify the economy in order to enhance quality of life expectancy so as to promote productivity and reduce dependency level that perpetuate the nasty circle of poverty.

REFERENCES

Abata, M. A., Kehinde, J. S., and Bolarinwa, S. A. (2012). "Fiscal/Monetary Policy and Economic Growth in Nigeria: A Theoretical Exploration", *International Journal of Academic Research in Economics and Management Sciences,* Vol.1 No.5

Ajide, K. B. (2014). "Determinants of Economic Growth in Nigeria". *CBN Journal of Applied Statistics,* Vol. 5, No.2 (December, 2014), pp. 147-170.

Akinkumi, M. A. (2017). "Nigeria's Economic Growth: Past, Present and Determinants", Journal of Economics and Development Studies June2017, Vol. 5, No. 2, pp. 31-46

Ali, M., Egbetokun, A. and Memon, M. H. (2018). "Human Capital, Social Capabilities and Economic Growth", *Economies,* Vol. 6, No. 2, September-January, pp. 1-18.

Babatunde, M. A. (2012). "Africa's Growth and Development Strategies: A Critical Review". Council for the Development of Social Science Research in Africa, Vol. 37, No. 4, pp. 141 – 178.

Barro, R. J., and Sala-i-Martin, X. (1992). "Convergence." Journal of Political Economy, Vol. 100 No. 2, 223-251.

Bengoa, M., & Sanchez, R. (2003). "Foreign Direct Investment, Economic Freedom and Growth: New evidence from Latin American". European Journal of Political Economy Vol. 19, February-July, pp. 529-545.

Broadberry, S. and Gardner, L. (2019). "Economic Growth in Sub-Saharan Africa, 885-2008 U niversity of Oxford, Oxford Economic and Social History". Working Papers Number 169, March, pp. 1-50.

Chiawa, M.M., Torruam, J.T., and Abur, C.C. (2012). "Cointegration and causality analysis of government expenditure and economic growth in Nigeria". *International Journal of Scientific and Technology Research*, Vol.1, No.8, pp. 165-174.

Chukwuemeka, O. (2015). "A Case of Growth without Development: A Comparative Study between Nigeria and Malaysia". MPRA Paper No. 77202, pp. 1-17.

Cigu, E., Agheorghiesei, D. T., Gavrilut,a, A. F. and Toader, E. (2018). "Transport Infrastructure Development, Public Performance and Long-Run Economic Growth: A Case Study for the Eu-28 Countries". *Sustainability,* Vol. 11, No. 67, Nuvember-December, pp. 1-22.

Dickey, D.A. and Fuller, W.A. (1979). "Distribution of the estimators for autoregressive time series with a unit root". *Journal of the American Statistical Association,* Vol. 74, No. 366a, pp. 427- 431.

Haller, A. (2012). "Concepts of Economic Growth and Development. Challenges of Crisis and of Knowledge". *Economy Transdisciplinarity Cognition*, Vol. 15, No. 1, pp. 66-71.

Hanif, N. and Arshed, N. (2016). "Relationship between Schooling Education and Economic Growth in Sub Saharan African Countries", *International Journal of Economics and Financial Issues,* Vol. 6 No.1, pp. 294-300.

Hansen, G. D. and Prescott, E. C. (2002). Malthus to Solow. *The American economic review,* Vol. 92, No. 4 (September, 2002) pp. 1205-1217.

Imimole, B. and Imuoghele, L.E (2012). "Impact of Public Debt on an Emerging Economy: Evidence from Nigeria (1980 – 2009)". *International Journal of Innovative Research and Development*. Vol. 1No. 8.

Ismail, M. and Imoughele, L. E. (2015). "Macroeconomic Determinants of Economic Growth in Nigeria: A Co-integration Approach". *International Journal of Academic Research in Economics and Management Sciences, Vol. 4, No. 1, pp. 34-46.*

Itumo, V. N. (2017). "What Hinders Economic Development in Africa?" *European Journal of Interdisciplinary Studies,* Vol. 9, No. 2, pp. 13-31.

Ivic, M. M. (2015). "Economic Growth and Development", *(JPMNT) Journal of Process Management – New Technologies, International,* Vol. 3, No.1, pp. 55-62.

Javorcik, B. (2004). "The composition of foreign direct investment and protection of intellectual property rights: evidence from transition economies". European Economic Review Vol. 94, No. 3, June, pp. 605-627.

Kapuria, V. (2007). "Economic Freedom and Foreign Direct Investment in Developing Countries". The Journal of Developing Areas, Vol. 41, No. 1), pp. 143-154.

Karagiannis, S. and Kvedaras, V. (2016). "Financial development and economic growth". *A European perspective. doi*: 10.2791/53648

Kwiatkoski, D., Phillips, P.C.B., Schmidt, P. and Shin, Y. (1992). "Testing the null hypothesis of Stationary against the alternative of a unit root". *Journal of Econometrics,* Vol. 54, No. 1, pp. 159-178.

Matuzeviciute, K., and Butkus, M. (2016). "Remittances, Development Level, and Long-Run Economic Growth". *Economies,* Vol. 4, No. 28, June-December, pp. 1-20.

Misztal, P. (2011). "The Relationship between Savings and Economic Growth in Countries with Different Level of Economic Development", e-Finanancse, pp. 17-29.

Ogunleye, O. O., Owolabi, O. A. and Mubarak, M. (2018). "Population Growth and Economic Growth in Nigeria: An Appraisal". *International Journal of Management, Accounting and Economics*, Vol. 5, No. 5, May, pp. 282-299.

Omitogun, O., and Ayinla, T.A. (2007). "Fiscal Policy and Nigerian Economic Growth". *Journal of Research in National Development*. Vol.5 No.2, December

Paul, N. (2017). "An Examination of the Relationship between Financial Development and Economic Growth in Nigeria: Application of Multivariate VAR Framework". *An International Multi-Disciplinary Journal, Ethiopia,* Vol. 11 (2), No. 46, April, pp. 160-177.

Peleckien, V., Peleckis, K., Dudzeviciute, G. and Peleckis, K. K. (2018). "The Relationship between Insurance and Economic Growth: evidence from European Union Countries". *Economic Research-Ekonomska Istrazivanja,* Vol. 32, No. 1, (April 2017-May 2018), pp. 1138–1151.

Ranis, G. and Ramirez, A. (2000). "Economic Growth and Human Development", *World Development*, Vol. 28, No. 2, pp. 197-219.

Rauf, A., Qayum, A., and Zaman, K. (2012). "Relationship between public expenditure and national income: an empirical investigation of Wagner's law in case of Pakistan". *Academic Research International*, Vol. 2, No. 2, pp. 533-538.

Sertoğlu, K., Ugural, S., Bekun, F. V. (2017). "The Contribution of Agricultural Sector on Economic Growth of Nigeria". *International Journal of Economics and Financial Issues,* Vol. 7, No.1, pp. 547-552.

Shrestha, P. K. (2013). "Economic Development in South and East Asia: Empirical examination of East Asian Development Model". *Asia-Pacific Development Journal,* Vol. 20, No. 2, December 2013, pp. 1-28.

Tiwari, A. K. and Mutascu, M. (2010). "Economic Growth and Foreign Direct Investment in Asia: A Panel Data Approach. Munich Personal RePEc Archive" (MPRA) Paper No.28172, 13 December 2010, pp. 1-15.

Todaro, M. P. and Smith, S. C. (2011). "*Economic Development*". Eleventh Edition, Pearson Educational Limited Edinburg Gate Harlow Essex CM20 2JE, England, pp.109-125.

Uwakaeme, O. S. (2015). "Economic Growth in Nigeria: An Empirical Investigation of Determinants and Causal Relationship (1980 – 2012)", *American Journal of Economics*, Vol. 5, No.1, pp. 9-20.

Ziramba, E. (2008). "Wagner's Law: An Econometric Test for South Africa, 1960-2006". *South African Journal of Economics*, Vol. 76, No. 4, pp. 596-606.

Zubair, A. I. (2014). "Entrepreneurship and Economic Development in Nigeria: Evidence from Small and Medium Scale Enterprises (SMEs) Financing", *International Journal of Business and Social Science,* Vol. 5, No. 11, October, pp. 215-230.

World Bank (2019). World Development Indicators.

APPENDIX I: RESULTS OF THE ADF, KPSS AND CAUSALITY TEST RESULTS

Null Hypothesis: DRT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 7 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.302439	0.8762
Test critical values:	1% level	-4.148465	
	5% level	-3.500495	
	10% level	-3.179617	

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

Null Hypothesis: D(DRT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 10 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.222462	0.0086
Test critical values:	1% level	-4.165756	
	5% level	-3.508508	
	10% level	-3.184230	

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

Null Hypothesis: GDPP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.674277	0.0020
Test critical values:	1% level	-4.124265	
	5% level	-3.489228	
	10% level	-3.173114	

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

Null Hypothesis: LEXP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.598333	0.2827
Test critical values:	1% level	-4.127338	
	5% level	-3.490662	
	10% level	-3.173943	

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

Null Hypothesis: D(LEXP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.469123	0.8287
Test critical values:	1% level	-4.127338	
	5% level	-3.490662	
	10% level	-3.173943	

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

Null Hypothesis: D(LEXP,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.402321	0.0000
Test critical values:	1% level	-4.130526	
	5% level	-3.492149	
	10% level	-3.174802	

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

Null Hypothesis: PGR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 10 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.197520	0.0091
Test critical values:	1% level	-4.161144	
	5% level	-3.506374	
	10% level	-3.183002	

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

Null Hypothesis: DRT is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.206732
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: D(DRT) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.099921
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: GDPP is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.081107
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: LEXP is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.123038
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: D(LEXP) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.181862
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: D(LEXP,2) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.077903
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: PGR is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		LM-Stat.
Kwiatkowski-Phillips-Schmidt-Shin test statistic		0.150505
Asymptotic critical values*:	1% level	0.216000
	5% level	0.146000
	10% level	0.119000

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

Null Hypothesis: D(PGR) is stationary
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

Kwiatkowski-Phillips-Schmidt-Shin test statistic		
Asymptotic critical values*:	1% level	
	5% level	
	10% level	

*Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1)

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 12/31/19 Time: 14:06
Sample: 1 59
Included observations: 51

Dependent variable: DRT

Excluded	Chi-sq	df	Prob.
GDPP	10.85777	4	0.0282
LEXP	3.431447	4	0.4884
PGR	9.208025	4	0.0561
All	38.73599	12	0.0001

GDPP	10.85777	4	0.0282
LEXP	3.431447	4	0.4884
PGR	9.208025	4	0.0561
All	38.73599	12	0.0001

Dependent variable: GDPP

Excluded	Chi-sq	df	Prob.
DRT	15.11668	4	0.0045
LEXP	1.540460	4	0.8195
PGR	11.43210	4	0.0221
All	38.30234	12	0.0001

Dependent variable: LEXP

Excluded	Chi-sq	df	Prob.
DRT	12.22230	4	0.0158
GDPP	2.032107	4	0.7299
PGR	7.679155	4	0.1041
All	15.52723	12	0.2139

Dependent variable: PGR

Excluded	Chi-sq	df	Prob.
DRT	1.851515	4	0.7630
GDPP	17.51340	4	0.0015
LEXP	0.704163	4	0.9508
All	21.42889	12	0.0444

APPENDIX II: ROW DATA ON DEPENDENCY RATIO, LIFE EXPECTANCY, GDP PER CAPITA GROWTH AND POPULATION GROWTH RATE

Year	DRT	LEXP	GDPP	PGR
1960	79.9604	36.732	0.00000	1.975879
1961	80.67089	37.198	-1.82038	2.028764
1962	81.06261	37.664	1.964127	2.075966
1963	81.23485	38.13	6.311081	2.110499
1964	81.28522	38.498	2.739205	2.129492
1965	81.25698	38.866	2.66466	2.139634
1966	82.02366	39.234	-6.28831	2.151235
1967	82.56126	39.602	-17.5534	2.171305
1968	82.92265	39.97	-3.39658	2.19939
1969	83.15643	40.382	21.449	2.23777
1970	83.30143	40.794	22.18228	2.285762
1971	84.11357	41.206	11.61603	2.321519
1972	84.78661	41.618	0.952507	2.36091
1973	85.32492	42.03	2.852699	2.439609
1974	85.72851	42.482	8.34449	2.56608
1975	86.02079	42.934	-7.76568	2.714443
1976	86.87475	43.386	5.954255	2.872891
1977	87.42084	43.838	2.897577	2.99325
1978	87.76086	44.29	-8.57849	3.031979
1979	87.99054	44.636	3.633874	2.971375
1980	88.14098	44.982	1.277672	2.849252
1981	89.33447	45.328	-15.4504	2.709843
1982	90.32588	45.674	-9.19512	2.599832
1983	91.10952	46.02	-13.1531	2.534264
1984	91.65625	46.006	-3.58494	2.52888
1985	91.95033	45.992	3.233565	2.562422
1986	92.5384	45.978	-2.50994	2.602904
1987	92.76325	45.964	0.525849	2.625517
1988	92.67591	45.95	4.546948	2.630947
1989	92.33276	45.934	-0.70885	2.612566
1990	91.77359	45.918	8.930678	2.57931
1991	91.67141	45.902	-2.16447	2.545949
1992	91.30309	45.886	2.025823	2.521578
1993	90.71426	45.870	-4.45708	2.503347
1994	89.95781	45.896	-4.23282	2.493414
1995	89.08523	45.922	-2.53005	2.489914

1996	88.82994	45.948	1.634581	2.488917
1997	88.38973	45.974	0.406833	2.488785
1998	87.83086	46.000	0.0572	2.49131
1999	87.22963	46.188	-1.89573	2.496357
2000	86.64026	46.376	2.419142	2.503847
2001	86.77312	46.564	3.290568	2.511617
2002	86.80496	46.752	12.45747	2.521515
2003	86.77276	46.94	4.657786	2.537255
2004	86.7034	47.504	6.4896	2.559662
2005	86.61516	48.068	3.721624	2.585689
2006	87.10568	48.632	3.326217	2.610844
2007	87.44537	49.196	3.82207	2.632173
2008	87.6687	49.76	3.972514	2.649864
2009	87.80764	50.198	5.197959	2.662917
2010	87.87659	50.636	5.158545	2.671443
2011	88.24452	51.074	2.525324	2.677884
2012	88.49244	51.512	1.472867	2.680914
2013	88.59182	51.95	3.853731	2.6769
2014	88.49849	52.396	3.513963	2.665019
2015	88.2036	52.842	-0.0293	2.647419
2016	88.154	53.288	-4.16841	2.627703
2017	87.83665	53.734	-1.78883	2.607676
2018	87.31509	54.18	-0.66558	2.586546

Source: World Development Indicators and United Nation-World Population Project (2019).

Is Central Bank of Nigeria Pursuing Preferential Development Finance? Some Parametric and Non-Parametric Evidence

Xavier-Itam A. Okon (Ph.D)
xaokon@cbn.gov.ng
Development Finance Department
Central Bank of Nigeria

Abstract

As encompassing as the development finance interventions of the Central Bank of Nigeria are, there appears to be a preference for the agricultural sector and the manufacturing sub-sector. The study applied the parametric ANOVA and the non-parametric Kruskal-Wallis Tests, to inferentially determine whether this is, indeed, the case. Findings, however, indicate that the intervention intensity is equal for all sectors, implying the Bank adopts a holistic, rather than preferential, approach to its development finance practice. This strategically engenders, among others, uniform development, inclusive growth and economic diversification. The interventions should be sustained and their coverage extended to other crucial sub-sectors such as mining & quarrying and education, given their strong potential for employment generation, human capital development and deepening of socio-economic inclusiveness.

JEL Classification: E51, E58

Keywords: central bank; development finance; monetary policy; intervention; preferential; preferred sectors.

1.0 Introduction

The developmental function of the Central Bank of Nigeria (CBN) is tangential to the achievement of its core mandates of ensuring monetary and price stability, maintaining external reserves to safeguard the international value of the naira, and ensuring sound and stable financial system (when we consider financial system development as the ratio of private sector credit to gross domestic product (GDP), and the Bank's developmental function as improving access to credit, among other forms of finance). It also fosters its mandate of acting as banker and economic and financial adviser to the government when, for instance, it supports public policies by funding special purpose vehicles such as the Nigerian Bulk Electricity Trading Plc., to meet various government commitments.

By this function, the Bank is at liberty to intervene in the financial market by targeting micro, small and medium enterprises (MSMEs) and large enterprises for investment and production. This function is motivated by several developmental imperatives. These include, promoting inclusive growth and job creation; economic diversification; reducing capacity underutilisation; conserving and shoring up foreign exchange reserves by curbing high import bills; and enhancing the effectiveness of, and responsiveness to, monetary and credit policy actions by attracting and retaining more economic agents, such as households and firms, in the formal financial system.

During the era of direct control or economic regulation, the CBN adopted sectoral credit allocation and interest rate administration as monetary policy instruments to stimulate the productive sectors of the economy, stem inflationary pressures, encourage investments and achieve overriding policy objectives such as promoting the flow of credit to the preferred sectors (Tule et. al. 2015; Udeaja and Udoh, 2014; Ojong et al, 2014). The credit allocation policy classified the economy into preferred, less-preferred and unclassified sectors, with specified minimum credit limits (Udeaja and Udoh, 2014; Ojong et al, 2014). The successes and failures of these policies abound in the literature (CBN, 2016; Ojong et al, 2014; CBN, 2011; Ajayi and Ojo, 2006).

Following economic liberalization and the advent of the Structural Adjustment Programme (SAP), 'preferred sector' status of the productive sectors was discontinued. According to Anyanwu (2010), the enforced funding from the banks ceased, while the market-determined interest rates tended to exclude these sectors, especially agriculture, from the credit market. Presently, the huge MSME funding gap estimated at US$158.13 billion (48 trillion), low credit to the private sector to GDP ratio of 17.63 per cent (low financial deepening), persistently low credit to

SMEs of less than 1 per cent of total banks' loans and advances, and the skewed sectoral credit distribution of banks, all necessitated pragmatic intervention in the market in favour of needy sectors (Bruhn et al, 2017; CBN, 2018a).

In the last ten years, CBN has aggressively intervened by sustaining or introducing financing programmes and schemes that reduce credit rationing or offer relatively low-interest and long-tenored financing for MSMEs. Given the frequent reference to agriculture and manufacturing as the target candidates for these interventions (CBN, 2018b; CBN, 2011). With the large concentration of interventions directly targeting both, it becomes interesting to determine whether, knowingly or unknowingly, there is still a financing preference for them, or whether a holistic approach is being adopted by the Bank. If a sector-preferential policy is in place, the favoured sectors will dominate the entire intervention basket or suite in terms of intensity of financing over time.

Establishing sectoral dominance, in this case, would be synonymous with the application of statistical inference methods. That is, testing the null hypothesis of no difference in the mean intensity of intervention by the CBN between the sectors of the economy over time, against the alternative that there is. In other words, the null hypothesis that there is no sectoral preference in the CBN's development finance function, against the alternative that such a preferential policy based on sector exists. For purposes of this study, intervention intensity is the totality of financing from the CBN, whether induced by credit guarantee and other policy actions of the Bank, or by direct funding (on-lending) through participating financial institutions (PFIs).

The paper proceeds as follows: Section two is the literature review and conceptual issues, which include sectoral credit allocation and preferred sectors, administrative interest rates, credit to SMEs, sectoral credit distribution of banks and overview of CBN's development finance interventions. Section three presents the methodology or analytical procedure, while section four discusses the results, findings and implications. Section five concludes the study with recommendations.

2.0 Literature review and conceptual Issues

2.1 Sectoral Credit Allocation and Preferred Sectors

The sectoral credit allocation policy was a direct monetary policy instrument adopted by the Bank in the 1981-85 period (CBN, 2011). It classified the economy into preferred (agriculture, solid minerals, exports and manufacturing); less-preferred (real estate, public utilities, transport and communications, finance and insurance, government, import and domestic trade); and other sectors, with specified minimum credit limits (Udeaja and Udoh, 2014; Ojong et al, 2014). According to CBN (2016), the monetary authorities deployed direct tools such as credit ceilings and controls and administration of interest and exchange rates, among others, to achieve price stability and allocate financial resources to preferred sectors such as agriculture and manufacturing at concessionary interest rates.

Ojo (1992) stated that the preferred sectors were to receive 75 – 79 per cent of banks' loans and advances. In the early 1980s, the cap on specific banks' credit to the preferred sectors was pegged at 30 – 40 per cent of cumulative loans and advances, but was trimmed down to 7 per cent by 1985 (Ajayi and Ojo, 2006). Between 1981 and 1983, the policy mandated commercial banks to utilise 56 per cent of their total credit in funding the production sub-sectors of the preferred sectors, namely agricultural production, mining, manufacturing, agro-allied industries and construction, while the services sub-sector was to receive 12 per cent (Soyibo and Adekanye, 1992).

The policy prescribed permissible aggregate credit expansion ceilings and selective credit controls to encourage indigenous businesses, small-scale enterprises and the rural areas (CBN, 2011). The required minimum ratio of loans and advances of commercial banks to indigenous entrepreneurs was raised from 70 per cent in 1980 to 90 per cent in 1984. Besides, by 1982, banks were to mandatorily lend not less than 30 per cent of their rural deposits to their rural customers. This ratio was increased to 40 per cent in 1985 (Ojo, 1992).

With respect to merchant banks, the policy changed the distribution of their assets portfolio with a view to inducing long term lending. For instance, in 1980, a minimum of 40 per cent of their credit was to be of medium and long-term nature, while a maximum of 20 per cent was to be channelled to short term projects. In 1985, the ratio of medium to long-term credit was raised to 50 per cent (Ojo, 1992). Apart from these banks, and in furtherance of the preferential policy, development finance institutions (DFIs) have been established by government with the mandate to channel credit to specific sectors (CBN, 2000). These DFIs are the Bank of Agriculture (BOA) for agriculture, Bank of Industry (BOI) for industry (including manufacturing), Federal Mortgage Bank of Nigeria (FMBN) for real estate, and the Nigerian Export-Import Bank (NEXIM) for exports.

According to Udeaja and Udoh (2014), agriculture gained as its share of credit grew from 2.6 per cent in

1975 to 10.8 per cent in 1985 even as its contribution to GDP expanded from 20.6 per cent in 1980 to 32.7 per cent in 1985. However, the controls were ineffective because it was difficult to keep banks within the stipulated targets. In this regard, Ikhide (1996) noted that although 75 per cent of credit was supposed to go to the preferred sectors, the commercial banks achieved 69.1 per cent while the merchant banks only achieved 62.8 per cent of their 79 per cent limit. He concluded that both types of banks, it would seem, extended more credit to the non-preferred sectors during the period, with the merchant banks faring worse. According to CBN (1996), the policy, which was inconsistent with the principle of a deregulated financial sector, seemed to have made some impact even though its prolonged use engendered distortions and inefficiencies.

The sector-specific credit allocation targets were reduced to four sectors in 1986, and two in 1987. From October 1996, all mandatory credit allocation mechanisms were abolished (CBN(undated)). However, the CBN (2010) alluded to the preferred sectors concept when it endorsed complimentary policies put in place, especially the revised guidelines for loan loss provisioning for the "preferred sectors" and the SME Credit Guarantee Scheme, among others. While this may have been a reference to the importance of the sectors in discourse, which included agriculture and manufacturing, it left policy analysts wondering if a policy reversal, akin to the interest rate deregulation policy reversal in 1994, was in the offing.

2.2 Administrative interest rates

The sectoral allocation of credit was accompanied by a concessionary interest rate policy. The fixed interest rate regime was intended to provide cheap credit to the preferred sectors of the economy, including SMEs (CBN, 2003a, CBN, 2003b), and encourage the upsurge of small-scale industrialization which is a catalyst for economic development (Udoka and Roland, 2012). The concessionary rates were typically below the minimum rediscount rate. They averaged about 7.25 per cent in 1978-85, which was outpaced by inflation, resulting in negative interest rates (Ojong et al, 2014).

The policy regime produced adverse consequences, with nominal interest rates dropping to their lowest before 1986 (CBN, 2016). According to the CBN, apart from the fixed interest rates trailing inflation and causing financial disintermediation and misallocation of resources, the policy objective of improving investment and growth in the real sector was not achieved. Eventually, the preferred sectors were unable to access funding owing, partly, to the inability of banks to mobilise sufficient loanable funds at the concessionary interest rates, as exemplified by the directive to banks to lend to agriculture at 7 per cent in 1984, whereas average savings deposit rate was 9.5 per cent (Ojong et al, 2014).

With the introduction of SAP in 1986, the Bank implemented a series of financial reforms to enhance competition, reduce distortion in investment decisions and evolve a sound and more efficient financial system. The major reforms were deregulation of exchange and interest rates, removal of preferred sector credit allocation and free entry into banking business subject to fulfilment of several conditions (Asekome and Aihie, 2014; Ogwuma, 1993; Ojo, 1993). Interest rate was deregulated in August 1987 as part of the SAP package (Adofu and Alhassan, 2018). Although there were was a slight policy reversal in 1994 with the pegging of deposit rates at 12 – 15 per cent and the introduction of 21 per cent ceiling on lending rates, flexible interest rate regime was resumed in October 1996 (Amassoma et al, 2011; Okpara, 2010; Omole and Falokun, 1999).

2.3 Credit to SMEs and sectoral credit distribution of banks 2009 – 2018

In the decade immediately following the 2007-2008 global financial crisis, commercial banks' loans to small-scale enterprises (or SMEs) as a proportion of total credit to private sector, increased from 0.17 per cent in 2009 to 0.26 per cent in 2018 (Figure 1). On the basis of sub-periods, it averaged 0.15 per cent between 2009 and 2013, rising to an average of 0.20 per cent in the 2014-2018 lustrum.

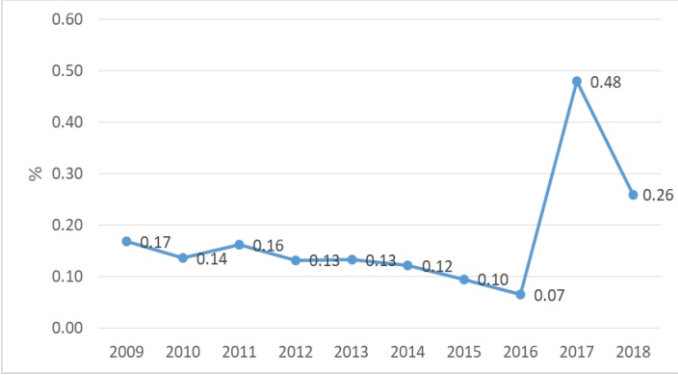


Figure 1: Commercial banks' loans to small-scale enterprises as a percentage of total credit

Source: Central Bank of Nigeria Statistical Bulletin 2018

This sharply contrasted with the fact that, together with micro enterprises, the small-scale enterprises (or MSMEs) contributed about 48.5 per cent of national income and about 7.3 per cent of exports (SMEDAN/NBS, 2013). The realisation of the immense economic importance of these enterprises that are definitely under-funded by the banking system further provided impetus for CBN's interventions in the MSME segment in recent years.

Relatedly, an examination of commercial banks' loans and advances by sector is even more revealing (Table I). The analysis is similarly disaggregated into the two sub-periods as in the preceding discussion, but due to dissimilarity in the sectoral classification scheme over both periods. Ostensibly a carry-over from the era of sectoral credit allocation and preferred sector policy, the classification scheme for the 2009-2013 had production, general commerce, services and others as the broad sectors. In this sub-period, the production sector, comprising agriculture, manufacturing, mining and quarrying, and real estate and construction, attracted 40.9 per cent of loans and its share of credit grew at a compounded growth rate of 9.2 per cent. Services share was 20.9 per cent but with a decline of 1.9 per cent.

Table I: Analysis of Sectoral Distribution of Commercial Banks' Loans and Advances

Period: 2009 – 2013				Period: 2014 - 2018			
Sector	**Component sector**	**Share (per cent)**	**Growth* (per cent)**	**Sector**	**Sub-sector**	**Share (per cent)**	**Growth* (per cent)**
Production		40.9	9.2	**Agriculture**		3.4	3.8
	Agriculture, forestry and fishery	2.8	26.2	**Industry**		36.7	10.9
	Manufacturing	12.6	4.4		Mining and quarrying	0.1	-10.1
	Mining and quarrying	18.0	16.0		Manufacturing	13.6	6.5
	Real estate and construction	7.5	-17.0		Oil and gas	20.4	14.4
General Commerce		10.7	-11.4		Power and energy	2.6	10.9
	Bills Discounted	0	0	**Construction**		4.1	2.5
	Domestic Trade	0	0	**Trade/ General Commerce**		6.9	0.4
	Exports	0.5	-45.9	**Government**		7.9	17.9
	Imports	10.2	-10.7	**Services**		41.0	-1.6
Services		20.5	-1.9		Real estate	4.8	6.7
	Public utilities	1.0	30.2		Finance, insurance and capital market	6.1	8.0
	Transport and communications	12.4	15.7		Education	0.5	-6.5
	Credit to financial institutions	7.1	-28.4		Oil and gas	8.0	2.0
Others		27.9	3.9		Power and energy	1.7	20.1
	Government	6.1	19.5		Others	19.8	8.6
	Personal and professional	0	0				
	Miscellaneous	21.8	0.6				

* Compound annual growth rate.

Source: Author's compilation from Central Bank of Nigeria Statistical Bulletin 2018

In the 2014-2018 sub-period, following review of the sectoral classification scheme to emphasis the nature of production, the shares of agriculture, industry, construction and services were 3.4 per cent, 36.7 per cent, 4.1 per cent and 41.0 per cent respectively, while the growth rates of banks' credit to these sectors within the same sub-period were 3.8 per cent, 10.9 per cent, 2.5 per cent and -1.6 per cent, respectively. In summary, agriculture recorded the lowest share of credit while services, although with the highest share, registered the slowest growth, which was negative. It is also noted that the oil and gas sub-sector attracted the highest financing within this time, at 28.4 per cent of all credit, with manufacturing coming a distant second with 13.6 per cent.

In this latter lustrum, these two sectors were driving real economic growth and contributing significantly to national income. Agriculture consistently posted positive growth even during the recession, averaging 3.6 per cent for the review period. Conversely, services consistently captured more than half of gross domestic product, with average growth of 2.56 per cent. Credit to government ranked third overall, setting aside the "others" in services.

Understandably, commercial banks' preferences, guided more by profit than other motive, appeared not quite in sync with national priorities of, for example, food security, job creation and promotion of investments. Their pattern of financing of economic activities, characterised by high interest rates and short-tenored loans, seemed to favour the highly-lucrative but capital-intensive oil and gas sub-sector, thereby tending to promote growth without inclusion. The CBN, obviously aware of the adverse implications of this on macroeconomic policy effectiveness and on other facets of national life such as security of life and property, assumed a proactive role through its development finance interventions to address the observed lop-sidedness.

2.3 Overview of CBN's Development Finance Interventions 2009 - 2018

The CBN (2019a) believed the MSME funding gap of about ₦48 trillion or US$158.13 billion reflected the risk-driven apathy of financial institutions to lend to these enterprises. This gap represented about 47.7 per cent of the MSME financing gap of Sub-Saharan Africa, and specifically compared unfavourably

with US$30.34 billion for South Africa and US$46.72 billion for Egypt, both in Africa, and US$21.45 billion for Malaysia, an emerging market economy (Bruhn et al, 2017). This was despite the Bank's vigorous efforts, especially in the 2014 – 2019 sub-period, to address this challenge using a myriad of intervention policies in form of programmes, schemes and institutions. This paper focuses on the operative programmes and schemes of the Bank from 2009 to 2018.

The Agricultural Credit Guarantee Scheme (ACGS), which commenced operations in 1978, was jointly established by the Federal Government and the Bank to provide guarantees to banks that lend to the agricultural sector. It continued operations in the review period, with overwhelming patronage from microfinance banks, mostly targeting small and medium farmers. On the other hand, immediately following the 2007-08 global financial crisis and the subsequent credit squeeze, the Bank introduced the Commercial Agriculture Credit Scheme (CACS) in 2009 to fast-track development of the agricultural sector through credit for commercial agriculture at single digit interest rate, enhance national food security through increased food supply and engender lower agricultural output prices and low food inflation, among other objectives (CBN, 2017). This was routinely followed in 2010 by the Power and Airline Intervention Fund (PAIF) and the Small and Medium Enterprises Re-financing and Restructuring Facility (SMERRF) which were to serve as credit enhancement instruments to improve the financial position of banks in view of the global financial crisis.

Since then, other intervention policies have been introduced by the CBN either solely or collaboratively with financial institutions, but definitely inspired by it. The interventions and their sectoral focus as espoused by the respective policy guidelines are outlined hereafter.

2.4.1 Agriculture Sector Interventions

These target the entire agricultural value chain and all enterprise segments by size. A few of these target specific commodities or value chain segments, e.g. PAS, which is for rice millers. They include:

- Agricultural Credit Guarantee Scheme (ACGS);
- Commercial Agriculture Credit Scheme (CACS);
- Anchor Borrowers' Programme (ABP);
- Paddy Aggregation Scheme (PAS);
- Accelerated Agricultural Development Scheme (AADS); and
- Interest Drawback Programme (IDP).

2.4.2 Industrial Sector Interventions

These are overwhelmingly targeted at manufacturing. They include:

- Small and Medium Enterprises Re-financing and Restructuring Facility (SMERRF);
- Presidential Fertiliser Initiative (PFI);
- CBN-BOI Industrial Facility (CBIF); and
- Textile Sector Intervention Facility (TSIF).

2.4.3 Services Sector Interventions

These interventions target services sector, especially public utilities. These include:

- Power and Airline Intervention Fund (PAIF);
- Nigerian Bulk Electricity Trading - Payment Assurance Facility (NBET-PAF);
- Shared Agent Network Expansion Facility (SANEF); and
- Nigeria Electricity Market Stabilization Facility (NEMSF).

2.4.4 Multi-Sectoral or Cross-Sectoral Interventions

These interventions target a mix of sectors and sub-sectors, cutting across agriculture, industry (manufacturing), services and trade. These include:

- Real Sector Support Facility (RSSF);
- RSSF using Differentiated Cash Reserve Ratio (RSSF-DCRR or DCRR);
- Micro, Small and Medium Enterprises Development Fund (MSMEDF);
- National Food Security Programme (NFSP);
- Export Development Facility (EDF);
- Non-Oil Export Stimulation Facility (NESF);
- Agri-business/ Small and Medium Enterprises Investment Scheme (AGSMEIS); and
- Youth Empowerment Development Programme (YEDP).

To sustain momentum in the 2019 – 2024 term and magnify previous successes in its development finance policies, the CBN (2019b) reiterated its policy thrust of working with banks to improve access to credit for smallholder farmers, MSMEs, consumption and real estate (mortgage), as well as, supporting efforts at diversifying the economy through its intervention programmes in agriculture and manufacturing.

3.0 Methodology

3.1 Data

Data on the cumulative disbursements to MSMEs and large enterprises from the interventions was obtained from the Central Bank of Nigeria Economic Report 2018.

3.2 Analytical Framework

The analytical framework adopted inferential methods. Analysis was to proceed in three or four steps, depending on the third step:

(i) Test for normality (normal distribution of residuals), using Jarque-Bera Test;

(ii) Test for equality of variances or homogeneity between the intervention intensities of the sectors, using Bartlett, Levene or Brown-Forsythe Tests;

(iii) Conduct parametric test (ANOVA) or non-parametric test (Kruskal-Wallis H), for differences in means or medians between the intervention intensities of the sectors; and

(iv) Conduct post-hoc tests to determine the specific sectors that are different if the means or medians are indeed unequal, or terminate analysis in (iii) if otherwise. Post-hoc tests include (i) Tukey HSD (ii) Dunnett and (iii) Hsu's MCB, for ANOVA, or (i) Conover (ii) Dunn and (ii) Nemenyi methods, for Kruskal-Wallis (Frost, 2019).

The analytical procedure leans heavily on some assumptions about the inferential methods. These Include: independence of observations, i.e. individual interventions are drawn randomly and independently of each other; equality of group/ sector variances or homoscedasticity/ homogeneity of sectoral intervention intensities, at = 0.05; group/ sector samples are drawn from normally distributed populations, that is, normality tested at = 0.05; and independent group samples, i.e. groups/ sectors are drawn independently of each other. When these assumptions hold true, the parametric test is used, in this case, analysis of variance (ANOVA). When the assumptions are argely violated, the non-parametric Kruskal-Wallis test is used (see Zaiontz, 2019).

The study utilised the Analysis of Variance (ANOVA) model to test the null hypothesis of no difference in the intensity of intervention by the CBN among the sectors of the economy over time, against the alternative that there is. Interpretively, the null stated that the CBN is not conducting sector-preferential development finance, while the alternative stated that it is. That is, if the population mean intensity of intervention under each group/ in each sector, also known as the group mean, is μ_{agr}, μ_{ind}, μ_{srv} and μ_{mlt} for agriculture, industry, services and multi-sector, respectively, the null hypothesis (H_0) is presented as:

$$H_0: \mu_{agr} = \mu_{ind} = \mu_{srv} = \mu_{mlt} \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The alternative hypothesis (H_A) states that at least a pair of the means is not equal. That is,

$$H_A: \mu_{agr} \neq \mu_{ind} \; or \; \mu_{agr} \neq \mu_{srv} \; or \; \mu_{agr} \neq \mu_{mlt} \; or \; \mu_{ind} \neq \mu_{srv} \; or \; \mu_{ind} \neq \mu_{mltd} \; or \; \mu_{srv} \neq \mu_{mlt} \quad (2)$$

ANOVA is fairly robust, implying that test results remain valid to a certain extent in the face of mild violations of these assumptions. The model is of the form:

$$F^* = \frac{MSS_B}{MSS_W} \quad \frac{\sum_{i=1}^{k} n_j(\bar{X}_j - \bar{X})^2 \Big/ (k \quad 1)}{\sum_{j}^{k} \sum_{1}^{nk} (X - \bar{X}_j)^2 \Big/ (N \quad k)} \quad . \quad . \quad . \quad . \quad (3)$$

Where:

$*F$	= Value by which the statistical significance of the mean differences is judged.
MSS_B	= Mean sum of squares of treatment or sum of squared deviations between the mean intervention intensity of each sample and the overall or grand mean intervention intensity, divided by the number of independent groups less one.
MSS_W	= Mean sum of squares of error or sum of squared deviations within, that is, sum of squared deviations of each intervention intensity from the mean intervention intensity of its sector or group, divided by the overall number of observations less the number of independent groups.
nj	= Sample size in *j*th group or sector, where *j* =*agr*, *ind*, *srv*, and *mlt*, and the respective sample sizes are n_{agr}, n_{ind}, n_{srv} and n_{mlt}.
$\bar{X}_j$	= Sample mean of/ in the *j*th group or sector.
$\bar{X}$	= Total, overall or grand mean of intervention intensity.
X	= intervention intensity in/ for each intervention.
k	= Number of independent or comparison groups, in this case the 4 sectors.
N	= Total sample size or number of observations in the analysis.

The F statistic is evaluated at $\alpha = 0.05$, at two degrees of freedom (*df*): the numerator *df*, df_1 = *k*-1 and the denominator *df*, df_2 = *N*-*k*. If the variability of the group/ sector means around the total mean (MSS_B) is less than the variability of each group/ sector around its mean (MSS_B), the F statistic is small and the null hypothesis is true. If, however, it is large, the null hypothesis is false, and will be rejected. Conclusively, if the null hypothesis is true, and so the population means μ for the *k* groups are equal, any variation of the group means around the total mean is due to chance and can, therefore, be considered error (Zaiontz, 2019; Sullivan, 2019; Statistics Solution, 2013).

On the other hand, the Kruskal-Wallis H test is the non-parametric alternative to the one-way ANOVA because there are no assumptions about the distribution of the data. It is used when the assumptions of ANOVA are not met. That is, the H test relaxes the assumptions such as normality and homogeneity, among others. Since it uses the ranks of the data values rather than the actual data for the test, it is often called ANOVA on ranks, while the null and the alternative hypotheses are given as:

H_0: the group population medians are equal . . (4)

H_A: the group population medians are not equal . .(5)

The H statistic is given as:

$$H = \left[\frac{12}{N(N+1)} \sum_{j=1}^{k} \frac{R_j^2}{n_j} \right] - 3(N+1) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

Where:

H = Value by which the statistical significance of the median differences was judged.

n_j = Sample size of the *j*th group or sector.

k = Number of groups, samples or sectors.

R_j = Sum of ranks in/ of the *j*th group or sector.

N = Total sample size or number of observations in the analysis.

The H statistic is evaluated at $\alpha = 0.05$, at *k*-1 *df*. If the test statistic is less than the critical value, the null hypothesis of no difference between the population medians is true. Contrarily, if the test statistic is more than the critical chi-square value, the null hypothesis is rejected as the evidence suggests inequality of means (Zaiontz, 2019; Statistics Solution, 2013).

4.0 Results and Discussion

Table II shows data used in the analyses. Panel A shows the sectors included in the sector samples while Panel B shows the corresponding intervention intensities. The intervention intensity is defined as the totality of financing from the CBN, comprising direct funding interventions and induced funding interventions. In the direct funding interventions, the Bank provides PFIs with funds for on-lending at approved lending rate and tenor. The figures refer to the cumulative disbursements in such interventions, e.g. ₦174.48 billion for ABP.

Table II: CBN's intervention intensity by sector

Panel A – the interventions				Panel B – the intervention intensities (₦ bn)			
AGR	**IND**	**SRV**	**MLT**	**Agr**	**Ind**	**Srv**	**Mlt**
ABP	SMERRF	NEMSF	NESF	174.48	300.0	183.09	25.4
CACS	PFI	PAIF	EDF	603.29	30.0	301.37	10.18
PAS	TSIF	NBET-PAF	MSMEDF	44.4	55.77	534.18	83.36
AADS	CBIF	SANEF	NFSP	0	100.0	5.5	38.96
ACGS			RSSF	85.68			115.51
IDP			DCRR	3.11			6.16
			AGSMEIS				0.42
			SMECGS				3.4

Source: Central Bank of Nigeria Annual Report 2018

In induced funding interventions, financing arises from the direct policy actions of the Bank. These are sub-divided into two types, namely the credit guarantee schemes and the interventions involving mobilisation of banking system resources. For the credit guarantee interventions, that is, ACGS and SMECGS, the guarantee policy instrument covers 75 per cent and 80 per cent of principal and interest, respectively. Hence, these respective proportions of total disbursements were assumed to directly evince the faith of financial institutions in the guarantee and, therefore, applied for purpose of this study, e.g. for ACGS, ₦85.68 billion represents 75 per cent of cumulative financing from inception, and is assumed to reflect the portion of credit granted as a result of the existence of the guarantee.

The second sub-group consists of interventions under which the CBN has no financial burden, namely AGSMEIS and DCRR. However, it played significant roles in mobilising and channelling the resources of the banking system to MSME financing. Accordingly, it used moral suasion and its affiliation, as Head of the Bankers' Committee, in the case of AGSMEIS. It also deployed financial regulation to implement a differentiated dynamic cash reserves requirement, in the case of DCRR (CBN, 2018b).

4.1 Test for normality

As can be seen in Table III, the small values of the Jarque-Bera statistics indicate that the standardised residuals of all samples are normally distributed. This is so because the associated probability values ranged from approximately 0.31 for agriculture to 0.88 for services, which are all higher than $\alpha = 0.05$.

Table III: Test for normality

	AGR	IND	SER	MLT
Mean	151.8267	121.4425	256.0350	35.42375
Median	65.04000	77.88500	242.2300	17.79000
Maximum	603.2900	300.0000	534.1800	115.5100
Minimum	0.000000	30.00000	5.500000	0.420000
Std. Dev.	230.3980	122.4978	221.7421	42.37430
Skewness	1.499560	0.970579	0.194096	1.015582
Kurtosis	3.638148	2.181530	1.830545	2.538011
Jarque-Bera	2.350490	0.739664	0.253053	1.446354
Probability	0.308743	0.690850	0.881151	0.485208
Sum	910.9600	485.7700	1024.140	283.3900
Sum Sq. Dev.	265416.2	45017.17	147508.7	12569.07
Observations	6	4	4	8

Source: Author's computation using Eviews 7.0.

Moreover, agriculture had the largest mean of 151.83, while the multi-sector had the least, at 35.42. Services displayed the most symmetry, with 0.19, which indicated that its sample was near normal, since a normal distribution has 0 skewness. Multi-sector and agriculture had kurtoses which were nearest to that of a normal distribution (3), at 2.53 and 3.63, respectively. On the whole, the result of the Jarque-Bera test suggested that all samples are normally distributed, which makes further analysis with ANOVA consistent.

4.2 Test for Homogeneity of Variance

The test for homogeneity of variance gave mixed results (Table IV), while the Bartlett Method indicated that the variances were not equal (α = 0.0036 which was less than α = 0.05), a violation of the ANOVA assumption of equality of variances. However, both the Levene and the Brown-Forsythe Methods did not reject the null hypothesis, suggesting that the variances were equal.

Table IV: Test for equality of variances of sectors

Method		df	Value	Probability
Bartlett		3	13.53922	0.0036
Levene		(3, 18)	2.459726	0.0959
Brown-Forsythe		(3, 18)	1.337388	0.2935
Category Statistics				
			Mean Abs.	Mean Abs.
Variable	Count	Std. Dev.	Mean Diff.	Median Diff.
AGR	6	230.3980	158.0389	135.9900
IND	4	122.4978	89.27875	78.55750
SER	4	221.7421	161.7400	161.7400
MLT	8	42.37430	32.88969	30.38375
All	22	170.1059	100.7012	91.82727
Bartlett weighted standard deviation: 161.6772				

Source: Author's computation using Eviews 7.0.

In the absence of unanimity of outcomes from this test, analysis proceeded with both ANOVA and Kruskal-Wallis Tests. Simultaneously conducting the parametric and non-parametric tests served to capitalise the benefit of doubt afforded by the divergent outcomes of the homogeneity tests to provide reasonable room for trustworthy inference. Additionally, the outcome of the earlier conducted normality test supported the use of ANOVA. Recall that ANOVA was said to be fairly robust to mild violations of its assumptions, such as that emerging from this test.

4.3 Test of ANOVA

ANOVA test results are presented in Table V which showed that there was no difference between the mean intervention intensity of the sectors by the CBN. The probability α = 0.19 was more than the α = 0.05, with the associated test statistic equal to 1.74, which is quite low.

Table V: ANOVA test for equality of means between sectors

Method	df	Value	Probability
ANOVA F-test	(3, 18)	1.748891	0.1930
Welch F-test*	(3, 6.15214)	1.881916	0.2315
*Test allows for unequal cell variances			
Analysis of Variance			
Source of Variation	**df**	**Sum of Squares**	**Mean Square**
Between	3	137145.5	45715.16
Within	18	470511.1	26139.50
Total	21	607656.5	28936.03

Source: Author's computation using Eviews 7.0.

Note, also, that the Welch Test, a parametric alternative to ANOVA which allows for unequal variances as found in the data used herein, also indicated that the null hypothesis of no difference in the means cannot be rejected. From the foregoing, there was no need for post-hoc test.

4.4 Kruskal-Wallis H Test

In Table VI, the Kruskal-Wallis H Test results similarly indicated that the null hypothesis of homogeneity of medians cannot be rejected, given the low test statistic of 4.40 and the 0.22 probability, which is above α = 0.05.

Table VI: Kruskal-Wallis test for equality of medians between sectors

Method		df	Value	Probability	
Med. Chi-square		3	4.000000	0.2615	
Adj. Med. Chi-square		3	1.791667	0.6168	
Kruskal-Wallis		3	4.409091	0.2205	
Kruskal-Wallis (tie-adj.)		3	4.409091	0.2205	
van der Waerden		3	4.028200	0.2584	
Category Statistics					
			> Overall		
Variable	Count	Median	Median	Mean Rank	Mean Score
AGR	6	65.04000	3	11.33333	-0.043712
IND	4	77.88500	3	13.75000	0.277152
SER	4	242.2300	3	16.00000	0.621019
MLT	8	17.79000	2	8.250000	-0.416302
All	22	50.08500	11	11.50000	-2.02E-17

Source: Author's computation using Eviews 7.0.

Other non-parametric tests, including the van der Waerden Method, also suggested that the null hypothesis was true. In view of this, no post-hoc test was conducted.

4.5 Policy Implications

Several implications emanate from these findings. Firstly, the CBN is pursuing a holistic development finance practice. That is, there is no preferential policy towards a single sector or group of sectors as all sectors are viewed as priority for development. This approach of simultaneous and uniform development of all sectors shows that the Bank is neither unmindful of nor unresponsive to current economic realities. For instance, the services sector has since overtaken agriculture as the dominant sector, and it would seem untenable to deny it its fair share of financing. Similarly, agriculture has been driving growth and was partly responsible for recent economic recovery. This justifies the sustained intervention in the sector.

Secondly, there is the confirmation that the promotion of economic diversification is a major policy thrust of the Bank's development finance strategy. Intervening in as many sectors as possible within the broader non-oil sector classification reflects a deliberate and guided approach to growth, which should help quicken the pace of overall economic development.

Thirdly, the Bank pursues a high level of economic inclusiveness/ inclusive growth. By throwing a wide net of interventions to cover many sectors, it engenders wider income distribution through job creation and poverty alleviation. It also has the additional benefit of bringing more economic units under the influence of monetary and interest rate policies, thereby eliciting greater responsiveness to, and effectiveness of, both.

Fourthly, since no sector is preferentially treated, there is no sectoral dominance. This implies that irrespective of the chosen sector of investment or operation by an enterprise, there is statistically an equal opportunity of accessing any of the Bank's interventions which have more favourable terms, compared with own balance sheet lending by banks, including low interest and long tenors, among others. This should encourage investors and entrepreneurs to venture into more diverse and potentially lucrative endeavours since such activities stand an equal chance of attracting intervention finance like the often referenced activities of agriculture and manufacturing.

Fifthly, there is reassurance that the CBN had, definitely, discontinued the preferred sector policy. More pragmatically, it is sustaining a relatively market-driven intervention policy now, with no directives to banks to maintain credit floors and ceilings or to lend at regulated interest rates. Rather, indirect approaches such as credit guarantees, ex-post interest rebates, low-cost and long-term funding to financial institutions, are being used by the Bank to deepen the financial market and provide diverse investment options for banks. In the same vein, interest saved by MSMEs that have accessed the interventions is an additional source of real and financial investments in the economy.

Since the sectoral intervention intensities are normally distributed, we can reasonably expect that the intensity of each intervention will most likely be close to the mean sectoral intervention intensity. Furthermore, as the interventions are mostly enterprise size-specific (targeting one of micro, small and medium, or large enterprises), it implies that each intervention contributed almost equally to the sectoral intervention intensity. In other words, there is a lower probability of dominance of one intervention within each sectoral basket as well. This is particularly illuminating because of the higher credit risk and higher transaction costs often associated with MSMEs, compared with large corporations, and which would have made the latter to have a highly-skewed chance of being financed. But, CBN's development finance intervention practice appears to have addressed the disparity or discrimination, by providing equal opportunity for enterprises, irrespective of size, to derive benefits from its interventions.

5.0 Conclusion and Recommendations

An evaluation of the development finance strategy of the CBN has shown that there is no dominant or preferred sector of intervention by the Bank, despite agriculture and manufacturing being the most frequently referenced sector and sub-sector with respect to the Bank's interventions. The parametric ANOVA and the non-parametric Kruskal-Wallis Tests did not reject the null hypotheses of equality of means and medians, respectively, between the intervention intensity of the Bank in relevant sectors of the economy. The implications are that development finance strategy is holistic, inclusive and are geared towards economic diversification and uniform development, among others.

It is recommended that the Bank should sustain the implementation of the interventions. Although intervention impacts or policy effectiveness could be the subject of other studies, the intensity of intervention suggests that the interventions are promoting the policy thrusts of economic diversification and inclusiveness. Implementation should also continue to be guided by successful

principles which have eliminated disparity in financing between MSMEs and large enterprises.

Besides, the bank should consider increasing the focus of its interventions on education sector and mining & quarrying sub-sector. From Table I, we noted that both had not only attracted the lowest shares of banks' credit in recent times, at 0.1 per cent and 0.5 per cent, respectively, but also had negative credit growth of -10.1 per cent and -6.5 per cent respectively. Education is crucial for human capital development while mining & quarrying, which used to employ the largest proportion of labour after agriculture, has since paled into insignificance, although with huge potentials to drive growth.

REFERENCES

Adofu, I. and A. Alhassan (2018). "Impact of Interest Rates Deregulation on Gross Domestic Investment in Nigeria". Journal of Economics and Development Studies, Vol. 4 No. 1, pp. 111 – 143.

Ajayi, S. I. and O. Ojo (2006). "Money and Banking: Analysis and Policy in the Nigerian Context". Ibadan: Daily Graphics Nigeria Limited.

Amassoma, J. D., P. I. Nwosu and A. F. Ofere (2011). "The Nexus of Interest Rate Deregulation, Lending Rate and Agricultural Productivity in Nigeria". Current Research Journal of Economic Theory, Vol. 3 No. 2, pp. 53 – 61.

Anyanwu, C. M. (2010). "An Overview of Current Banking Sector Reforms and the Real sector of the Nigerian Economy". Economic and Financial Review, Vol. 48 No. 4, December, pp. 31 – 56.

Asekome, O. M. and J. A. Aihie (2014). "Challenges of Banking Sector Reforms in Nigeria: An Appraisal". International Journal of Business and Social Science, Vol. 5 No. 7(1), June, pp. 224 – 230.

Bruhn, M., Hommes, M., Khanna, M., Singh, S., Sorokina, A. and J. S. Wimpey (2017). "MSME Finance Gap: Assessment of the Shortfalls and Opportunities in Financing Micro, Small and Medium Enterprises in Emerging Markets". World Bank Group.

Central Bank of Nigeria (1996). "Monetary, Credit, Foreign Trade and Exchange Policy Guidelines for 1996 Fiscal Year". Circular No. 30. Lagos: Central Bank of Nigeria.

Central Bank of Nigeria (2003a). "Central Bank and the Globalizing Forces of the 21st Century". Governor's lecture delivered at the Senior Executive Course No. 25 of the National Institute for Policy and Strategic Studies, Kuru, Jos, Nigeria, July 28.

Central Bank of Nigeria (2003b). "Goodwill Address by the Governor at the 9th Bankers' Conference", Sheraton Hotel and Towers, Abuja, August 14.

Central Bank of Nigeria (2000). "Banking Supervision Annual Report". Abuja: Central Bank of Nigeria.

Central Bank of Nigeria (2010). Communiqué No. 69 of the Special Monetary Policy Committee (MPC), April 15.

Central Bank of Nigeria (2011). "Understanding Monetary policy Series No. 1: What is Monetary Policy?" Abuja: Central Bank of Nigeria.

Central Bank of Nigeria (2016). "Interest Rate". Education in economics Series No. 3, Research Department.

Central Bank of Nigeria (2017). "Commercial Agriculture Credit Scheme Guidelines". Revised guidelines issued August 15, 2017.

Central Bank of Nigeria (2018a). "Annual Report (draft)". Abuja: Central Bank of Nigeria. Retrieved from the CBN website, https://www.cbn.gov.ng/Out/2019/RSD/2018 per cent20AR per cent20KAMA1.pdf, on August 6, 2019.

Central Bank of Nigeria (2018b). Communiqué No. 119 of the Monetary Policy Committee (MPC), July 23 – 24.

Central Bank of Nigeria (2019a). Address by the Governor at the Workshop on the Operations of the Secured Transaction in Movable Assets (STMA) Act and the National Collateral Registry (NCR), organized by the Bank and the National Judicial Institute (NJI) for judicial officers, February 11, 2019.

Central Bank of Nigeria (2019b). "5-Year Policy Thrust of the Central Bank of Nigeria 2019 - 2014". Statement of Intent of the Governor for the second governorship term.

Central Bank of Nigeria (undated). "Monetary Policy Measures". https://www.cbn.gov.ng/MonetaryPolicy/policy.asp. Accessed on August 16, 2019.

Frost, J. (2019). "Using Post Hoc Tests with ANOVA". Retrieved from https://statisticsbyjim.com/anova/post-hoc-tests-anova/. Accessed on August 25, 2019.

Ikhide, S. I. (1996). "Financial Sector Reforms and Monetary Policy in Nigeria". Institute for Development Studies (IDS) Working Paper 68.

Ogwuma, P. A. (1993). "Recent Developments in the Nigerian Financial Services Industry: Problems and Challenges". An address at the Annual Dinner of the Chartered Institute of Bankers of Nigeria, Lagos, November.

Ojo, O. (1992). "Monetary Policy in Nigeria in the 1980s and Prospects in the 1990s". Economic and Financial Review, Vol. 30 No. 1, March.

Ojo, M. O. (1993). "A Review and Appraisal of Nigeria's Experience with Financial Sector Reform". CBN Occasional Paper No. 8, August.

Ojong, C. M., A. Ekpuk, A. Ogar and E. G. Emori (2014). "Banking Sector Reform in Nigeria: A Regulatory Imperative for a Sustainable Banking Industry". Research Journal of Finance and Accounting, Vol. 5 No. 13, pp. 166 – 189.

Okpara, G. C. (2010). "The Effect of Financial Liberalization on Selected Macroeconomic Variables: Lesson from Nigeria". The International Journal of Applied Economics and Finance, Vol. 4 No. 2, pp. 53 – 61.

Small and Median Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS) (2013). SMEDAN and National Bureau of Statistics Collaborative Survey: Selected Findings.

Omole, D. A. and G. O. Falokun (1999). "The impact of Interest Rate Liberalization on Corporate Financing Strategies of Quoted Companies in Nigeria". Proceedings of the Conference on African Economic Research Consortium, pp. 52 – 52.

Soyibo, A. and F. Adekanye (1992). "The Nigerian Banking System in the Context of Policies of Financial Regulation and Deregulation". African Economic Research Consortium. Nairobi, Kenya.

Statistics Solutions. (2013). "ANOVA". Retrieved from https://www.statisticssolutions.com/manova-analysis-anova/. Aaccessed on August 11, 2019.

Sullivan, L. (2019). "Hypothesis Testing - Analysis of Variance (ANOVA)". Retrieved from http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_HypothesisTesting-ANOVA/BS704_HypothesisTesting-Anova_print.html. Accessed on August 25, 2019.

Tule, M. K., I. Audu, K. O. Oji, V. U. Oboh, S. Z. Imam and K. J. Ajayi (2015). "Determination of the Floor and Optimal Threshold of Lending Rates in Nigeria". CBN Working Paper Series, Vol. 1 No. 3, September.

Udeaja, E. A. and E. A. Udoh (2014). "Effect of Monetary Policy on Agricultural Sector in Nigeria". Economic and Financial Review, Vol. 52 No. 2, June, pp. 33 – 71.

Udoka, C. O. and A. Roland (2012). "The Effect of Interest Rate Fluctuation on the Economic Growth of Nigeria, 1970-2010". International Journal of Business and Social Science, Vol. 3 No. 20, pp. 295-302.

Zaiontz, C. (2019). "Kruskal-Wallis Test: Omnibus Test". Real Statistics Using Excel. Retrieved from http://www.real-statistics.com/one-way-analysis-of-variance-anova/kruskal-wallis-test/. Accessed on August 10, 2019.

Efficiency Gain Argument of Fiscal Federalism and Economic growth: Evidence from Five Selected Developing Federal Economies.

Prof. Hyacinth E. Ichoku
Vice Chancellor, Veritas University Abuja, Nigeria

Walter O. Ugwuoke (Ph.D)
Department of Economics, Federal University, Lafia, Nasarawa State

Abstract

This paper investigated efficiency gain argument of fiscal federalism and economic growth with evidence from five selected developing federal economies. The curiosity is to ascertain whether the efficiency gain –the fundamental argument why countries adopt fiscal federalism is justified in these economies. The paper uses stochastic frontier model to achieve this objective. The evidence from the selected developing federal economies revealed diverging results. While in Nigeria, Ethiopia and India there is more expenditure decentralization than revenue decentralization suggesting that efficiency gains from fiscal federalism may remain elusive, in Brazil and South Africa there is more revenue decentralization than expenditure decentralization suggesting evidence of efficiency gains from fiscal federalism. The major reason why efficiency gains from fiscal federalism is elusive in Nigeria, Ethiopia and India is because of top – bottom approach to fiscal federalism orchestrated by the delay that money and services witness before reaching the local beneficiaries. Naturally, the gamma parameter (δ_s^2) that measures the percentage of the disturbance term due to inefficiency is expected to be low to ensure allocative and technical efficiency of fiscal federalism. However, while the values of (δ_s^2) are 0.98, 0. 92 and 0.65 in Nigeria, Ethiopia and India meaning that about 98%, 92% and 65% of the disturbance terms (μ) are due to allocative and economic inefficiencies in fiscal federalism, in Brazil and South Africa only 0.041 and 0.23 representing 4% and 23% disturbance terms are due to allocative and economic inefficiencies in fiscal federalism. This implies that while allocative and technical inefficiencies in fiscal federalism truncates economic growth in Nigeria, Ethiopia and India, the allocative and technical efficiencies in fiscal federalism promotes economic growth in Brazil and South Africa. On this basis, the paper recommends the need for most developing federal economies to adopt Bottom – Top approach to fiscal federalism as opposed to Top – Bottom approach. This will ensure that sub national governments are coordinates not subordinates to federal government revenues.

Keywords: Efficiency gain, Fiscal Federalism, Economic growth, Federal Economies

INTRODUCTION

Fiscal federalism as a reform package for improving technical, allocative and overall economic efficiency in delivering public goods so as to stimulate economic growth has always been a focus of attention in most developing federal economies. This is because economic cum political considerations suggest that policies aimed at providing public goods that are sensitive to sub national conditions are likely to be more technical and allocative efficient in stimulating economic growth than central provisions that disregard this geographical differences (Baskran, Lars & Jan, 2016).

Consequently, fiscal federalism which defines the degree of fiscal autonomy and constitutionally assigned responsibilities of the sub national governments, has become an important discourse in the policy arena of most developing federal economies (Hatfield & Kosee, 2013). This is because the practice of centralized system of economic and political administration in the context of ethnic heterogeneity hinders the actualization of economic potential and in the process limits efforts aimed at achieving sustained economic growth (Asatryan & Feld, 2015).

Similarly, from 1980s to date, there has been a resurgence of interest in economic growth of most developing federal economies (Ibih, Ajaude & Nkamare, 2016). An outstanding element in the policy mix given to the developing federal economies to

stimulate economic growth is the need to restructure the public sector finances so as to make it more efficient in promoting economic growth.

It has been observed that despite several decades of fiscal federalism experience, extant studies have established a downward trend in economic growth of most developing federal economies in the last three or four decades. (African Development Indicators, 2016). For instance, the two biggest economies in Sub Sahara African -Nigeria and South Africa entered into technical recession in 2016 as their Gross Domestic Products (GDP) declined by 3.16 and 0.70 percent respectively (World Bank Development Indicators, 2016). This has made researchers like Baskran, Lars and Jan (2016), Appah (2010), Alade (2003) to describe economic growth performance of most developing federal economies as of prolonged lackluster performance and of crisis proportion.

In spite of these dire situations with potential dangers for sustained economic growth, much have not been done to actually underscore how efficient is fiscal federalism in bringing about sustained economic growth in developing federal economies. Much of the extant studies on fiscal federalism in developing federal economies have been explicitly or implicitly disposed towards studying the theory and dimension of fiscal federalism (Dare, 2011, Lukpat,2013) or explaining the pattern of intergovernmental fiscal relations (Jose,2003, Jason, 2006, Igwebuike & Emengini,2010) or providing an inexplicit view within the context of political economy of probable consequences of such relationship (Odukwe, 2016, Ugwu, Eme & Emeh, 2012). A notable exception in the extant studies is the work of Owolabi (2011), Ojide and Ogbodo (2014) and Baskran, Lars & Jan (2016) that investigated the impact of fiscal federalism on economic growth.

However, the fundamental argument (efficiency gain argument) why countries adopt fiscal federalism and how such measures influences economic growth is conspicuously missing in the existing studies. Further, the paucity of systematic comparative evidence as the focus of the established studies is mainly on specific country analysis makes it difficult to have a broader and generalized view of the evidence of efficiency gain in fiscal federalism. It is in a bid to fill this gap and add to the body of knowledge in the field of fiscal federalism, that, this paper investigates efficiency gain of fiscal federalism and economic growth: Evidence from selected developing federal economies. To achieve this objective, this paper is structured into five sections as follows:- Section two reviews theoretical and empirical literature. Section three presents data sources, methodology and model specification. Section four discusses empirical results, while section five concludes the paper with conclusion and recommendations.

2.0 Literature Review

2.1 Theoretical Literature

Decentralization Theorem, constitutes the fundamental building blocks of what may be referred to as the first generation theory of fiscal decentralization (Oates, 2006; Bird, 2009). The theory focuses on situations where different levels of government provide efficient levels of outputs of public goods. That is those goods whose special patterns of benefits are encompassed by the geographical scope of their jurisdictions (Oates, 2006).

According to the theory, each levels of government is seen as seeking to maximize the social welfare of the citizens within its jurisdiction (Bird, 2009). This multi-levels quest becomes very important where public goods exists, the consumption of which is not national in character, but localized (Qates, 1972). In such circumstances, local outputs targeted at local demands by respective local jurisdictions clearly provide higher social welfare than central provision (Qates, 1972).

The theory also recognized that, given the multiplicity of local goods with varying geographical patterns of consumption, there was hardly any level of government that could produce a perfecting mapping for all public goods (Qates, 2006). This is because sub national governments are better in adapting output of public goods to a particular preferences and circumstances of their constituencies as compared to the federal government provisions that assumes that one size fits all. Thus, it is recognized that there would be local public goods with inter-jurisdictional spill-overs (Musgrave, 1959). That is public goods whose benefits are enjoyed beyond the local jurisdiction. In that situation, the local authority may then under-provide for such a good (Musgrave, 1997). To avoid this, the theory requires the central government to provide matching grants to the lower level government so that it can internalize the full benefits (Samuelson, 1954).

Based on the theory, the role of government in maximizing social welfare through public goods provision is assigned to the lower tiers of government (Qates, 2006). The other two roles of income distribution and stabilization are regarded as suitable for the central government. Based on the total agreement among the proponents of this theory, we can summarize the role assignment which flows from the theory thus: the central government is expected to ensure equitable distribution of income, maintain macroeconomic stability and provide public goods that are national in character. Sub national governments on the other hand are expected to concentrate on the provision of local public goods with the central government providing targeted transfers in cases where there are jurisdictional spill-overs associated with local public goods.

Following from the assignment of functions, taxes that matched more effectively the assigned functions are also assigned to the relevant level of government. Benefits taxes are also prescribed for sub national governments based on the conclusion that such taxes promote economic efficiency when dealing with economic units. The final element of this basic theory is the need for fiscal equalization. This is in the form of transfers from the central government to decentralized governments where there are spill-over effects.

2.2. Empirical Literature

Extant empirical literatures show a link between federalism, efficiency gain and economic performance. For instance, (Ogbonna & Osadume ,2017, Anit, 2014, Gemmell & Sanz, 2013, Baskaran & Feld,2013, Rodriquez –Pose & Ezcurra,2011, Eric,2009) Wibbles,2006), Abu,2005, Rodden and Wibbles ,2001, Treisman,2000, Bruecker,1999, Anyanwu,1999, Davoodi & Zou,1998, Grossman and West ,1994, , Egwaikhide, 1994, Ariyo,1993, Oyejide,1972), stress that increased fiscal federalism has negative effect on growth. To them collective action of problems and variance of interests that affect federalism jeopardize implementing macroeconomic policies and economic adjustment policies that are seen as public goods which have serious negative implication on growth.

On the contrary, studies by (Ibi, Ajaude & Nkamare, 2016, Ojide & Ogbodo, 2014, Federico & Elliott, 2012, Antonis, Manthos & Pantelis, 2008, Jason, 2006, Stansel, 2005, Iimi, 2005, Akai & Sakata, 2002,Lin & Liu, 2000, Yilmaz, 1999, Kletzer & Singh,1996), found a positive relationship between decentralization and economic growth. This is because to the authors, better targeting of growth-enhancing infrastructure investment under federalism could raise country's growth rate.

However, findings from extant studies like (Baskaran & Feld, 2013, Gemmell & Sanz, 2013) were mixed. This is because their findings revealed that spending measure of fiscal federalism decreases economic growth while revenue measure increases growth. This arises due to the choice of empirical measure adopted by different researchers. Although, the main objective of fiscal federalism is to ensure efficiency gain in public good delivery, however, this fact is not sufficiently recognized in the existing literature.

3.0 Data Sources, Methodology and Model Specification

3.1 Analytical Framework

The economic rationale for fiscal federalism is the need to promote efficiency in the use of a nation's resources. Thus the role of different tiers of governments in efficient delivery of public goods under the partnership arrangement called fiscal federalism is usually the focus of attention. Therefore, the analytical framework underpinning this study is the Barro(1990) two – sector production function framework. This production function assumes that an economy is made of two sectors called the public sector (G) and the Private sector (P) whose output depends on two inputs of Labour (L) and Capital (K). The production function takes the form of

$Y = f(L, KP, KG)$ ----------(1)

Where Y = Output, L = Labour, KP = Private capital per labour, KG = Public Capital per labour. The function also assumes that the public sector (G) has some influence on the output of the Private sector (P). Given this scenario, the sectoral production function becomes:

$YP = f P(LP, KP, G)$ ----------(2)

$YG = fG(LG, KG)$ ----------(3)

Combining equation (4.2) and (4.3) yields

$Y = fP(LP, KP, G) + fG(LG, KG)$ ----------(4)

It also assumed from equation (4.4) without generality loss that public sector (G) is made up of three tiers of government called the Federal, the State and the Local governments and by extension that public spending imbedded in the function is carried out by these three tiers of governments. Therefore, taking K as private capital stock, G as total government (F =federal government spending, S as state

government spending and L as local government spending), all measured on per capita basis, the production function becomes

$Y = \beta_1 + L_\mu + K_\theta + G_\gamma + \epsilon_t$ ----------(5)

Where Y = Economic growth, L = Labour, K = Private capital stock, G =(federal, state and local Governments), ϵ_t = Error term and β, μ, θ and γ are parameter estimates, where $1 > \beta > 0, 1 > \mu > 0, 1 > \theta > 0, 1 > \gamma > 0$ and $\beta + \mu + \theta + \gamma = 1$. ----------(6)

Flowing from equation (4.5), the study assumes that the size of government (G) impacts on economic growth and that fiscal federalism that reduces the size of central government promote efficiency by matching preference to needs. Therefore, theoretically, it is anticipated that fiscal federalism fosters economic growth via technical, allocative and economic efficiency in public goods delivery. However, empirical evidence on the direction of impact is mixed and controversial. A strand of extant literature showed that increased fiscal federalism reduces economic growth (Baskaran & Feld, 2013, Rodriques –Pose & Ezcura, 2011,). Other strand of empirical studies revealed a positive impact (Sansel,2005, Gil – Serrate & Lopez –Laborda,2006, Ibi, Ajaude & Nkamare,2016). In addition, some existing studies revealed mixed results (Gemmell & Sanz, 2013, Bodman, 2011). This showed that the impact of fiscal federalism on economic growth is an empirical issue. Also, intergovernmental fiscal relations or fiscal federalism is expected to influence the output of government (G). Therefore, introducing fiscal federalism (FDC) as an explanatory variable in the model gives

YG = f(FDC)----------(7)

Therefore incorporating the three measure of fiscal federalism in equation (7) into equation (5) gives

$Y = f(L_\mu + K_\theta + \emptyset g_1 + \varphi g_2 + \mu g_3) + \epsilon_t$ ----------(8)

Where $\emptyset g_1$ = the proportion of sub national governments revenue to total government revenue (Revenue measure (FDCI),

φg_2 the proportion of sub national governments revenue to total government spending (Simultaneity measure (FDC3).

Where $\emptyset g_1 + \varphi g_2 + \mu g_3 = 1$----------(9)

and $< \emptyset_i < \varphi < \mu$ for $i = g_1, g_2$ and g_3.

However, total government spending (g) is financed through government revenue (R). So that,

G = RY ----------(10)

Combing equations (4.9) and (4.10), the solution for efficiency gain from fiscal federalism can be stated thus:

$$\frac{\partial y/\partial t}{\partial y} = \frac{1}{\sigma}\left[(1-R)R^{1-\alpha/\alpha} \cdot \theta g_1^{\beta/\alpha} \cdot \varphi g_2^{\gamma/\alpha} \cdot \mu g_3^{\omega/\alpha} - P\right]$$

----------(11)

Equation (4.11) is a function of share of revenue and spending by the sub national governments. However, the existing studies like (Baskaran, Lars & Jan, 2016) have it that given the share of total government spending in Gross Domestic Product (GDP), a reallocation of public spending to sub national governments can bring about higher economic growth if the existing allocation is not a growth – maximizing expenditure share. To underscore this, by maximizing equation (4.9) subject to equation (4.10) as constrain gives the growth – maximizing sub national government spending share thus:

$$\theta^*_{g1} = \frac{\beta}{\beta+\gamma+\omega}, \quad \varphi^*_{g2} = \frac{\gamma}{\beta+\gamma+\omega}, \quad \mu^*_{g3} = \frac{\omega}{\beta+\gamma+\omega}$$

----------(12)

In equation (4.12), the numerator is the share of the sub national governments' spending and the denominator is the consolidated or total (federal, state and local governments) spending. Hence as far as the sub national governments' shares are different from growth – maximizing share, the growth rate will always increase without changing the total budget's share in Gross Domestic Product (GDP).

3.2. Model Specification

The study adopted stochastic frontier model developed by Farrell (1957). This was found appropriate for two reasons:- first, the model assumed that the disturbance term has two components called the statistical noise or error term and the inefficiency component. Therefore, the greater the amount by which the realized economic growth (Y) falls short of this stochastic frontier, the greater the level of inefficiency gains from fiscal federalism. Secondly, the model captures the effect of exogenous shock due to measurement error. That is to say, the model accounts for unbiased identification in the midst of confounding variables. An appropriate stochastic frontier formulation is:

$Y_t = \alpha_0 + \beta_{X1} + (V_i - \mu_i)$ ----------(13)

Where Y = Economic growth (GDP), Xi = Input, Vi = random variables assumed to be normally distributed, μi = random variables that account for the inefficiency. Given this scenario, the reformulated stochastic frontier model for this study becomes:-

$$\ln Y_t = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + (v_i - \mu_i)$$

---------- (14)

Where ln = Natural Logarithm, Y_t = Economic growth proxied by RGDP, X_1 = Labour input, X_2, X_3 and X_4 = Three measures of fiscal federalism (FDC1, FDC2 and FDC3), β_0 = Constant, β_1, β_2 and β_3 = Parameters to

be estimated, v_i = random variable assumed to independently and normally distributed with zero mean and constant variance N $[\mu_\sigma^2 \quad v]$ ---------- (15)
μ_I = Non- negative random variable that accounts for inefficiency in economic growth – fiscal federalism nexus. It is also assumed to be normally distributed with N $[\mu_\sigma^2 \quad \mu]$ ---------- (16)
It is expected that the gamma parameter (δ_s^2) that measures the percentage of disturbance term due to inefficiency be low to ensure allocative and technical efficiencies of fiscal federalism that will promote economic growth.

3.3 Data sources and definitions of Variables

This section presents the selected federal countries for the study and the rationale for their selection, the data set used and the definition of the variables on which the data are sourced. The selection of five (5) countries is based on the fact that their institutional frame work of their fiscal federalism followed a complex political, social, economic and ethnic pluralism and that they are among the most fiscally decentralized countries as measured by the degree of government expenditures at the sub national levels. The study examined the period from 1980 to 2016. The variables used in this study include revenue measure (FDC1) defined as sub national governments 'own revenue as a ratio of total government revenue. This reflects the decentralization of taxing power. Expenditure measure (FDC2) defined as sub national governments' spending as a ratio of total government expenditure. It reflects the decentralization of the spending power and Simultaneity measure (FDC3) defined as Sub national expenditure as a ratio of total federal revenue. Data for these variables are sourced from the apex bank statistical bulletins of the respective countries. Other variables include, Real Gross Domestic Product (RGDP), sourced from World Bank development indicators.

4.0 Discussion of Empirical Results

This section of the paper presents results of the estimation using stochastic frontier model for the selected economies of Nigeria, Brazil, India, Ethiopia and South Africa. However, it is important to first of all present the summary statistics of the variables used in the estimation to both ascertain their behavior and underscore the appropriateness of technique employed in the paper. The result of the summary statistics is presented on table 1 below.

Table 1 Summary Statistics of the Variables used in the Model

	BRAZIL			INDIA			ETHIOPIA			SOUTH AFRICA			NIGERIA		
	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3
Mean	99.83	38.15	97076.93	19.44	27.21	15.36	22.42	47.98	25.79	24.15	44.20	11.58	23.030	35.77	30.96
Median	99.81	33.58	33481.01	18.79	25.86	14.65	16.54	49.58	13.63	27.61	31.05	2.79	24.31	41.55	26.89
Maximum	99.99	83.33	836284.2	27.76	34.30	22.66	64.72	76.10	162.17	91.39	99.56	43.70	34.84	53.50	46.86
Minimum	99.55	26.08	13738.25	14.89	22.37	11.10	11.40	20.79	9.01	0.54	2.23	0.01	13.15	15.05	15.15
Std. Dev.	0.14	13.88	193262.5	3.17	3.21	2.98	14.96	15.52	39.20	24.01	33.98	13.94	5.63	11.04	10.06
Skewness	0.12	2.58	3.12	0.81	0.69	0.90	2.20	0.22	3.01	1.36	0.73	0.89	0.16	0.29	0.11
Kurtosis	1. 50	8.912	11.40	3.28	2.33	3.24	6.34	1.93	10.44	4.88	2.04	2.38	2.02	1.65	1.43
Jarque-Bera	2.60	69.46	123.29	3.07	2.70	3.74	34.31	1.51	102.94	12.28	3.39	4.06	1.53	3.14	3.66
Probability	0.27	0.00	0.00	0.22	0.26	0.15	0.00	0.47	0.00	0.02	0.18	0.13	0.46	0.21	0.16
Sum	2695	1029.94	2621077.	524.81	734.75	414.60	605.35	1295.35	696.47	652.12	1193.36	312.85	806.06	1251.88	1083.60
Sum Sq. Dev.	0.54	5009.81	9.71	261.25	267.98	231.13	5823.08	6259.66	39955.82	14989.75	30012.60	5047.83	1077.32	4143.93	3440.21
Observations	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27

Source: Authors' computation based on the data of each selected countries

From table 1, the mean values of all the measures of fiscal federalism, the proportion of sub national governments revenue to total government revenue (FDC1), the proportion of sub national governments' spending to total government spending(FDC2) and the proportion of sub national governments revenue to total government spending(FDC3) are positive. It is worth noting that out of the three measures of fiscal federalism,(FDC1) and (FDC3) account more for fiscal autonomy of the sub national governments than (FDC2). This is because; it is not possible to have fiscal autonomy without fiscal equivalence. To this end while FDC1 is having the highest value in Brazil, FDC2 is having the highest value in Nigeria, South Africa, India and Ethiopia. This implies that while there is revenue decentralization in Brazil, there are revenue centralization in Nigeria, South Africa, India and Ethiopia.

Also, the minimum and maximum values range from positive to positive in all cases for all the variables. The implication is that all the variables are increasing overtime. However, FDC1 overtime increases more than FDC2 in Brazil while FDC2 over time increasing more than FDC1 in other four selected economies. This implies that while the sub national governments revenue rises more than their expenditure in Brazil, in other four selected economies, the sub national governments expenditure rises more than their revenue. The skewness which measures the

asymmetry of the distribution of the series around the mean are positive. Although, the skewness of the normal distribution is zero, all the variables are positively skewed and greater than zero.

Jaque-Bera statistics showed that the null hypothesis that all variables are normally distributed cannot be accepted as all the variables are statistically insignificant at 5%. Therefore all the variables used in the study are not normally distributed. This implies that Ordinary Least Square estimator becomes inappropriate, thereby justifying our choice of stochastic frontier model.

Table2: Comparative Empirical Evidence of Efficiency Gains from Fiscal Federalism in Brazil, Nigeria, Ethiopia, India and South Africa.

dependent var. (GDP)	(1)	(2)	(3)	(4)	(5)
Independent var	Nigeria	Ethiopia	South Africa	India	Brazil
Labour	15,027**	11,213*	10,761**	17,247**	9,671*
	(8,532)	(5,321)	(4,782)	(9,732)	(3,890)
fdc1	-13,073*	-3,498***	0.034***	0.030	-0.53
	(6,784)	(908)	(0.0057)	(0.040)	(0.33)
fdc2	1,147	2,573***	0.00024	0.14***	-0.0021
	(4,477)	(425)	(0.0038)	(0.016)	(0.0032)
fdc3	6,183	1,269	-0.014	-0.011	9.207***
	(4,118)	(375)	(0.0090)	(0.041)	(2.3-07)
Constant	350,340**	-11,651	12.7***	10.9***	67.3**
	(169,638)	(40,897)	(0.52)	(0.66)	(33.3)
$\delta\mu$	0.64	0.64	0.007	0.68	0.003
δ_s^2	0. 98	0. 96	0.23	0.65	0.041
X^2	6.6	44	66.7	106	17
L.R	-471	-309	-18. 5	-915	4.8
T R	- 1.03	-1.07	6.4	-1.01	14. 7
Observations	27	27	27	27	27

Source: Author's computation based on the results, where $\delta\mu$ = inefficiency component, $\boldsymbol{\delta_s^2}$ = gamma parameter, X_2 = chi square, LR = Likelihood Ratio, TR= Time Ratio and Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results of Table 2 on the efficiency gains from fiscal federalism provide not only an interesting insight on how fiscal federalism is practiced in developing federal economies but revealed widely deviating results. As stated in the summary statistics, of all the three measures of fiscal federalism, Revenue measure (that is the proportion of sub national governments revenue to total government revenue (FDC1) and Simultaneity measure (that is the proportion of sub national governments revenue to total government spending (FDC3) account more for fiscal autonomy of the sub national governments and consequently on efficiency gain than the Expenditure measure that measures the proportion of sub national governments' spending to total government spending. This is because fiscal autonomy is not achievable without fiscal equivalence. However, the evidence from the selected developing federal economies revealed diverging results. This is so as the gamma parameters ($\boldsymbol{\delta_s^2}$) that measure the percentage of the disturbance term due to inefficiency is 0. 98 , 0. 92 and 0.65 in Nigeria, Ethiopia and India respectively meaning that about 98%, 92% and 65% of the disturbance terms (μ) are due to allocative and economic inefficiencies in fiscal federalism in these economies. Also, the examination of the likelihood ratio test result using chi square (X^2) distribution confirmed the presence of allocative inefficiencies. Furthermore, the linear trend coefficients are negative and insignificant at conventional 5% level. The implication of these findings is that in Nigeria, Ethiopia and India efficiency gains from fiscal federalism remains elusive. The major reason why efficiency gains from fiscal federalism is elusive in Nigeria, Ethiopia and India is because of vertical fiscal imbalance resulting from top – bottom

approach to fiscal federalism orchestrated by the delay in the time that money and services take to reach the local beneficiaries.

Naturally, efficiency gain is guaranteed if most of the public goods and services are produced and delivered at the level closer to the beneficiaries. However, this is only achievable where there is sub national governments' fiscal equivalence.

On the other hand, in Brazil and South Africa only 0.041 and 0.23 representing 4% and 23% disturbance terms are due to allocative and economic inefficiencies in fiscal federalism. Also, the results of the likelihood ratio test results using chi square (X^2) distribution confirmed the presence of allocative efficiencies in these economies. Also, the linear trend coefficients are positive and significant at conventional 5% levels. The implication of this finding is that there is evidence of efficiency gains from fiscal federalism in Brazil and South Africa.

To underscore this, while in India, the two revenue measures (FDC1 and FDC3) are insignificant at 1%, 5% and 10% respectively. in Nigeria and Ethiopia The case is even worse in Nigeria and Ethiopia as FDC3 is insignificant with FDC1 appearing negative and significant. This is surprising in the light of the conventional expectation that sub national governments' revenue to total government revenue is usually associated with positive economic growth that culminates into high efficiency gains. The result suggests that fiscal federalism in Nigeria, India and Ethiopia does not yield a clear pattern of fiscal decentralization on the revenue side. The implication of this, is that the principle of fiscal equivalence is highly compromised thereby preventing the sub national governments from efficiently delivering on their constitutionally assigned responsibilities that will bring about technical, allocative and economic efficiency.

This findings, suggest that the dominance of the federal government in these three federal economies contradicts the fiscal federalism theorem that local outputs targeted at local demands by respective local jurisdictions clearly provide higher social welfare and efficiency than central provision that believe in one cap fit all syndrome.

On the other hand, in Brazil and South Africa, the revenue measures are highly significant at 1%. This is so because, in Brazil the sub national governments control one of the major revenue yielding items in constitution (Value Added Tax (VAT) while in South Africa fiscal imbalance at the sub national levels are bridged by the transfer equivalent that accounts for the bulk of the sub national governments' revenue.

Therefore, the fiscal federalism experience of Brazil and South Africa validates the mainstream theoretical insight behind fiscal federalism that sub national governments allocate resources better than the central government which usually results in technical, allocative and economic efficiency. Finally the general implication of this result is that although theoretical justifications for fiscal federalism may be the same, its practicability and associated efficiency gain differ in federal systems based on institutional framework.

5.0 Conclusion and Recommendations

From the findings, it can be concluded that lack of fiscal equivalence orchestrated allocative and technical inefficiencies of fiscal federalism is the major cause of truncated economic growth in some of the selected federal economies. On that note, this paper recommends the need for most developing federal economies to adopt Bottom – Top approach to fiscal federalism as opposed to Top – Bottom approach. This will ensure that sub national governments are coordinates not subordinates to federal government revenues. It is also recommended that there is need to chart a new direction in fiscal development among the developing fiscal countries by encouraging front loading (more revenue drive) as against back loading (expenditure drive).

REFERENCES

Anit, N. (2014) Fiscal Federalism and Intergovernmental Transfers for financing Health in India, Centre for Global Development working paper, India.

Asatyan, Z and L.P Feld (2015) Revisiting the link between growth and federalism: A Bayesian model Averaging Approach, Journal of comparative economics, 43(81), 772-791

Alade S. (2003), Fiscal Federalism and Macroeconomic Governance, CBN Journal of applied statistics, 24(18), 13-54.

Abu, G.M. (2005) An Economic Analysis of Fiscal Federalism in Ethiopia, World Bank Policy Research Working Paper No.1387, Washington. D.C.

Anyanwu, J. C (1999) Fiscal Relations among the various Tiers of Government in Nigeria, In Fiscal Federalism and Nigeria's Economic Development, Proceedings of the 1999Annual Conference of the Nigerian Economic Society, 119-114.

Ariyo, A. (1993) An Assessment of the Sustainability of Nigeria's Fiscal Deficit: 1970-1990, Journal of African Economics, 98(34),263-282.

Akai, N. and M. Sakata (2002), Fiscal Decentralization Contributes to Economic Growth: Evidence from State- Level Cross Section data for the United States, Journal of Urban Economics, 52, (49) 93-108.

Baskaran, T.B, P.F, Lars and S. Jan (2016) Fiscal federalism, Decentralization and economic growth: A Meta-Analysis, Economic Inquiry 54(3) 1445-1463

Bird, R.M. (2009), Taxation in Latin America: Reflections on sustainability and the balance between efficiency and equity, working paper, Rotam School of Management, University of Toronto.

Bruecker, J. K. (1999), Fiscal Federalism and Capital Accumulation, Journal of Public economic Theory,23(1), 205-224.

Dare, A. (2011) Fiscal federalism in Nigeria: Theory and Dimensions, Afro Asia Journal of Social Sciences, 2(.22), 1-21.

Davoodi, H. and H. Zou (1998), Fiscal Decentralization and Economic Growth: A Cross-Country Study, Journal of Urban Economics, 43(12), 244-257.

Egwaikhinde, F.O. (1994) Intergovernmental fiscal relations in Nigeria, PEFS publisher, Ibadan.

Eric, E. (2009) Fiscal Federalism, Sub-national Governments and MDGs in Nigeria, African Institute for Applied Economics,128 park Avenue, GRA, Enugu, Nigeria, Paper 4, 1-61.

Federico G and Elliot, P. (2012) The Effect of Federal Government size on Long-Term Economic growth in the United States, Modern Economic Journal, 3(5), 949- 957.

Gemmell, N.R, R. Kneller and I. Sanz (2013) Fiscal decentralization and economic growth in OECD countries, spending versus revenue decentralization, Economic Inquiry 51(31) 1915 - 1931.

Hatfield, J.W and K. Kosec (2013) Federal competition and economic growth, Journal of public Economics, 97(59), 144 -162.

Ibi, E.E , Ajaude, E and Nkamare, S.E (2016) The Impact of Fiscal Policy Measures on the Development of the Nigerian Economy, Social Science and Humanities Journal, 1(3) 87-101.

Jose, C.C(2003) Fiscal federalism in Brazil: historical trends present controversies and future challenges, VIII Congreso Internacional del CLAD sobre la Reforma del Estado de la Administración Pública, Panamá, 28-31.

Musgrave, R.A. (1997) The Theory of Public Finance, McGraw-Hill, New York.

Lin, J. Y. and Z. Liu. (2000) Fiscal Decentralization and economic Growth in China, Economic Development and Cultural Change, 49(5),1-21.

Ogbonna,K.S and Osadume,R.C (2017), Causal relationship between revenue allocation and economic growth of Niger Delta, International institute of Academic research and development, 3(1), 1-14.

Owolabi, U (2011) Fiscal Federalism and Economic Growth Process in Nigeria, European Journal of Business and Management 3(4) 1-11.

Ojide, M.G and J.C. Ogbodo (2014) Fiscal Federalism in Nigeria: Implication for Growth, British Journal of Economics, Management and Trade, 5(4) 442-449.

Qates. W.E. (2006) The many faces of Tiebout model, MA Lincoln Institute of land policy, Cambridge.

Ugwu, S.C, O.I Eme, and I.J Emeh, (2012) Issues in Nigerian Fiscal Federalism; The Relationship between the Principle of Derivation and Resource control, Kuwait Chapter of Arabian

Wibbles,E. 2006) Federalism and the Politics of Macroeconomic Policy and performance. American Journal of Political Science, 44 (4), 687-702.

Yilmaz, S. (1999) The impact of Fiscal Decentralization on Macroeconomic Performance: Prepared for the 92nd Annual Conference on Taxation, Atlanta, GA, 24-26 October .

Capital Adequacy Requirement and Bank Behaviour in Nigeria

Baba N. Yaaba (Ph.D)
Statistics Department, Central Bank of Nigeria

Lailah Sanusi
Statistics Department, Central Bank of Nigeria

Abstract

The divergent views on the usefulness of capital adequacy ratio (CAR) in controlling the risk appetite of banks necessitates further research on its efficiency and effectiveness. Whereas proponents of CAR believe that it enhances the soundness and stability of the banking system, opponents contend that it can impedes on the intermediating capabilities of banks and possibly ignites credit crunch that could induce fall in the level of output. This study empirically verifies the influence of CAR on the behavior of banks in Nigeria. The study adopts a system of simultaneous equation, in the tradition of Maraghni (2017) using Generalized Method of Moment (GMM) approach on micro-level annual data of banks in Nigeria from 2007 to 2018. The results reveal, amongst others, that capital adequacy ratio indeed moderates bank appetite for risk and, as a feedback, risk taking behavior of banks in-turn enhances capital adequacy ratio. The study concludes that there is the strong need for regulatory authorities to often monitor banks appetite for risk, particularly in period of economic booms to avoid excessive risk that could erode their capital during burst that could aggravate loan default.

Key words: Basel accord, capital adequacy, bank behavior, depositors, risk, Panel, GMM.

JEL Classification: G18, G21, G28

INTRODUCTION

There is still divergence of opinion, amongst researchers, analysts and bank regulators, on the efficiency of the formalized Capital Adequacy Requirement (CAR) decades after its adoption following the first Basel Accord of 1988. While some are of the view that the framework helps strengthens the banking system stability and soundness, as well as reduce competitive inequality, others opined that it has the capability of impacting negatively on intermediation that could lead to credit crunch with the consequences of declining output (BCBS, 1999). The advocates of CAR usually support their argument with the surge in risk-based capital ratios in developed countries few years after the adoption of the Basel 1 Accord. The industry capital to risk-weighted assets ratio of the Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the UK and the US, on the average rose remarkably from 9.3 per cent in 1988 to 11.2 per cent in 1996[1]. Opponents, on the other hand, argued that the rise in CAR could be a function of adjustment in the denominator – risk weighted assets or a consequence of market discipline. They supported their argument with the coincidental decline in output in the industrialized countries of the world during the period of improved CAR. For instance, between the same period, 1989 to 1991 when the US recorded appreciable CAR, it also witnessed output decline from 4.18 per cent in 1988 to 3.67, 1.89 and -0.42 per cents in 1989, 1990 and 1991, respectively[2].

The Basel Accord set a minimum standard risk-based capital requirement for banks to serve as an instrument of limiting risk and or losses, hence protecting financial beneficiaries particularly the depositors. Although, the CAR requirement as endorsed by the G10 countries was intended for internationally active banks, but realizing the usefulness of the concept of measuring the strength of banks as well as its potential efficacy as an early warning signal for bank regulators, it was endorsed by many other countries and applied to many banks including those outside the intended bracket.

The Central Bank of Nigeria (CBN) adopted the risk-based capital adequacy requirement for Deposit Money Banks (DMBs) setting the domestic standard

[1] Although some analysts are of the view that the surge in CAR during the period could also be attributed to the fact that bank regulators set CAR relatively higher than that Basel minimum requirement. This is particularly true for the US and the UK.
[2] See https://www.worldometers.info/gdp/ for the US data.

far above the international minimum requirement of 8.0 per cent as provided for by Basel I Accord. As a fall out of the global financial crisis (GFC) that started from the mortgage sector of the US in 2007, the Basel Committee on Banking Supervision (BCBS) and the Financial Stability Board (FSB), developed a framework for monitoring Domestic Systemically Important Banks (D-SIBs) besides that of the Global Systemically Important Financial Institutions (G-SIFIs). Thus, the Central Bank of Nigeria in collaboration with the Nigerian Deposit Insurance Corporation (NDIC) followed suit by designing a supervisory framework for D-SIBs in Nigeria. The systemically Important Banks (SIBs) were then required to keep a minimum of 16.0 per cent, while it was set at 15.0 per cent for international banks and 10.0 per cent for national and regional banks. Despite the adoption as well as stringent requirements set for CAR, the country still witnessed crisis in the banking system leading to intervention of the CBN through capital injection in form of Tier 2 capital, nationalization and outright sale. To these effects, researchers, market players and participants wonder the efficacy claim of risk-based capital requirement through its acclaimed capacity to moderate the appetite for risk of bank and thus improving their financial health and soundness.

It is in this regard that this paper, seeks to investigate the capital-lending relationships of banks in Nigeria using micro level data. To achieve this, the paper is structured into five sections, including this introduction. Section two details the evolution of capital adequacy requirement as well as relevant empirical review while section three explains the empirical technique used for the analysis. Section four analyses the results and the last section concludes the study as well as proffer some policy advice.

2 Theoretical Underpinning and Review of Empirical Literature

2.1 Theoretical Underpinning

The need for the regulation stems from the possibility of market failure arising either from externalities, market power or information asymmetry among participating agents. Specifically, the need for regulating banks is justified based on two key hypotheses: The systemic risk hypothesis and the depositors' representative hypothesis.

2.1.1 Systemic Risk Hypothesis

The issue of liquidity mismatch constitutes an enormous risk to the banking business. Banks contend with the mobilization of short-term deposit liabilities to create long-term assets. The provision of liquidity services leaves banks expose to runs (Diamond and Dybvig, 1983). Given this scenario and considering that the expectations of depositors on their deposits is a function of place and time of withdrawal, in line with the principle of first come, first serve, a run can occur on banks assets even if there is sufficient information to the depositors about the quality of banks assets. Any panic, for instance, arising from whatever reason, could induce competitive withdrawal by depositors in order to outsmart each other so as never to be cut-off by the run. This could lead to premature bankruptcy of even financially sound banks. More so, information asymmetry about asset of a bank, could make the bank susceptible to more runs.

If crisis or run on a bank is ignited by information about its poor asset quality or performance, it can then be argued that it is beneficial to the system by submitting to the functionality of the concept of market discipline, but if the crisis or run is a function of panic arising from wrong signals, then it is detrimental to the system. This is because the run or crisis becomes highly costly due to the premature exit of the bank and the consequent disruption to the system, arising from contagion effect (Santos, 2000).

2.1.2 Depositors' Representative Hypothesis

The depositors' representation hypothesis ensued from the corporate governance problem of Principal-Agent hypothesis, arising from the separation of ownership from management of business. The separation of ownership from management of business induces moral hazard and adverse selection problem, hence necessitates monitoring of business managers. However, it requires numerous things to effectively monitor managers including access to adequate information about their behavior which is costly to come-by, thereby making monitoring not only expensive but also difficult and complicated.

The situation of monitoring become even more daunting and challenging, if we recognize the fact that most of the depositors are not only small holders but also either uninformed or not informed enough to access the required information or process it meaningfully. Worse still, individual depositors monitoring could tantamount to waste of effort and resources. These complexities that is capable of rendering useless, monitoring by depositors, necessitates the need for coordinated monitoring by a representative, be it either private or public (see Dewatripont and Tirole, 1993b).

2.1.3 Why Emphasis on Capital

Modigliani and Miller (1958) had long before the birth of Basel Accords steered debate on the consequences of a firm deviating from an optimal capital structure which they opined to be the determinants of the value of a firm, in a world assumed to be frictionless with perfect information. In the banking sector, two key issues were considered in this regard, namely: access to safety nets such as deposit insurance and the quality of bank capital.

Deposit insurance attract less attention, due to its inherent consequences of incentivizing appetite for risk by bank managers. For instance, bank managers are likely to take more risk, if they know that in case of run, insurance will take care of the depositors. The possibility of shifting risk to insurance by managers and other possible externalities that could lead to crisis in the banking sector necessitates the choice and emphasis on capital regulation.

2.2 Evolution of Capital Adequacy Requirement

The Basel Committee on Banking Supervision (BCBS) was a formation of the central banks of the Group of 10 (G10) countries of Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, the UK and the US. The idea of the formation of BCBS arose due to the strenuous concern, in the early 1980s, about the financial health of international banks and unfair competition among them.

Basel, I Accord of 1988 focused largely on credit risk, hence the introduction of CAR derived as regulatory capital to risk-weighted assets. The Basel I accord requires international banks to keep a minimum risk-adjusted capital of 8.0 per cent. The Accord requires that at least half of the capital should be from Tier 1 sources which consist mainly of equity capital and disclosed reserves, while Tier 2 capital should consist of hybrid debt capital instruments, amongst others. Recognizing risk-adjusted assets as the total sum both from the risk adjusted assets on and off-balance sheet, the Accord assigned the weights of 0, 20, 50 and 100 per cents to one of four risk buckets using the bucket weight. It however encourages the conversion of off-balance sheet contingent contracts to credit equivalent and then subject them to relevant risk-weights. Off-balance sheet contingent contracts include letter of credit, derivative instruments and loan commitments.

Although, due to some apparent deficiencies either arising from oversight of some risk or subsequent innovations in the financial system, the Basel I Accord was modified several times. The first amendment occurred in 1996 when banks were mandated to set aside sufficient capital to cover market risk arising from variations in interest rate and equities, foreign exchange risk and commodities risk.

Despite these modifications to Base I Accord, market analysts continued to argue that the CAR was of no economic foundation, as the risk weights were neither in consonance with the risk of the obligor nor encompass the benefits arising from diversification (Santos, 2000). More so, innovations in the financial system paved way for managers to polish their books in such a way that the resultant CAR only improves without the intended corresponding improvement in the financial soundness of the banks (Jones, 2000). This development necessitated the introduction of Basel II in June 2004.

The Basel II consist of three pillars, namely: minimum capital requirements that intends to develop, expand and further standardized the key rules set out in the 1988 Accord, the review of capital adequacy and assessment of internal process, and effective disclosure to serve as a means to strengthen market discipline device as well as enhance sound banking practices.

This however was not sufficient to avert the 2007/08 global financial crisis (GFC) that started from the mortgage sector of the US, hence the need for additional measures, thus, the introduction of Basel III which was agreed upon by the BCBS members in 2010–2011. Basel III was mostly aimed at strengthening bank capital requirements via increasing the liquidity of banks and reducing their leverage. The guidelines of the Basel III are built on three key pillars, namely: minimum capital requirement, supervisory review and market discipline.

2.3 Review of Empirical Literature

Using logit regression technique, Dhumale (2000) investigated the sufficiency of capital adequacy standards in Thailand, Korea and Indonesia using annual data from banks and finance companies for the period 1996 – 1997. The results showed that bank portfolios were not up to the standards of Basel capital requirements and might have utilized cosmetic adjustments to increase capital ratios.

Olokoyo (2011) using regression analysis on secondary data of 89 banks in Nigeria for a period

between 1980 – 2005 tested the effectiveness CAR on lending behavior of commercial banks in Nigeria. The results showed that there was a unique long-run relationship between banks' lending, volume of deposit, investment portfolio, interest rate, minimum cash requirement ratio, liquidity ratio, foreign exchange and gross domestic product. It also revealed that monetary policy instruments such as liquidity requirement and cash requirement ratio do not impact negatively on banks' lending behavior.

Olalekan (2013) examined the effect of capital adequacy on profitability of deposit-taking banks in Nigeria using linear regression for data gathered from cross sectional research design and panel data from published financial statement of banks for the period 2006 – 2010. The result indicated that there was no significant relationship between banks capital adequacy and their profitability. The paper recommended that the regulatory authority should ensure that the gains of banking reforms were sustained and that the Central Bank of Nigeria should take more decisive measures to tightened the risk management framework of the Nigerian banking sector so as to positively affect their profitability.

Multiple regression analysis was applied by Abba (2013) to data sourced from the Nigerian banking industry between 2007 and 2011 to empirically examine the relationship between capital adequacy and banking risks. The results of the study revealed that total assets in Nigerian Banks were highly risky, and that capital adequacy ratio reduces with increase in deposits, and finally, that there was a negative relationship between capital adequacy ratio and risk-weighted assets. The study recommended that Nigerian banks should adopt a risk-based approach in managing capital and the regulators should make every possible effort to guarantee the safety of depositors' money since increase in deposits does not necessarily result to increase in capital adequacy ratio.

Ikpefan (2013) investigated the impact of bank capital adequacy ratios, management and performance in the Nigerian commercial banks from 1986 to 2006 using ordinary least square regression method. The result indicates that shareholders Fund/Total Assets which measures capital adequacy of banks have negative impact on return on assets. In additions the result also revealed that efficiency of management measured by operating expenses is negatively related to return on capital. The paper recommended that regulatory agencies should put in place measures to raise the level of shareholders' fund to Total Assets ratio to avoid future bank collapse.

Ugwuanyi (2015) adopted a simultaneous linear regression to assess the relationship between banks' capital and their risk-taking behavior in Nigeria using annual data of quoted banks covering the period 2009-2013. The results indicate that past risk, size of the bank, interest margin and capital adequacy are positively related to variations in current risk, implying that bank size and capital fuels banks' appetite for risk.

Moussa (2015) studied the relationship between capital and bank risk in Tunisia from 2000 – 2010. The author found that capital and risk were two important variables and that there was a negative relationship between capital and bank risk.

Ugwuanyi (2015) examined how regulation of bank minimum capital base in Nigeria interacts with the bank risk taking behavior using simultaneous linear regression. The study covered all quoted banks on the Nigerian Stock Exchange (NSE) from 2009 – 2013. The result revealed that regulation pressure has a negative correlation with capital adequacy and risk-taking appetite but does not significantly affect the capital adequacy as well as risk taking behaviors of Nigerian Banks.

Alkadamani (2015) investigated the impact of capital requirements on bank risk-taking during the period 2004 to 2014 for 46 commercial banks operating in four countries of Jordan, UAE, Saudi Arabia and Kuwait using the simultaneous equations model. The results revealed that there was a positive correlation between banks profitability and increase in capital, indicating that profitable banks can more easily improve their retained earning rather than issuing new securities.

Umoru (2016) assessed the significance of the capital adequacy ratio in influencing the financial deeds of Nigerian banks by applying generalized least square (GLS) estimation technique for the period 2007 to 2015. The results showed an overriding effect of capital adequacy ratio and liquidity in enhancing the deeds of Nigerian banks.

Tobichukwu (2016) employed pooled regression analysis model to check the capital adequacy-risk management outcomes of the banks during the period between 2009 and 2015. The results showed

that risk management variables exerted differing degrees of negative effects on capital adequacy. The paper recommended objective-oriented deposit drive by the banks to attract more deposits and that loans should be adequately secured to reduce the incidence of non-performing loans.

Using a structural model of two different simultaneous equations, Maraghni (2017) examined the impact of changes in capital adequacy ratio to the risk-taking incentive of Ten (10) Tunisian banks between the period 1990 to 2012. The results indicated that changes in CAR was a consequence of regulatory pressure and both institutional and legal framework also affects CAR. They submitted that regulatory pressure relating to CAR requirements induces the desired discipline on banks in Tunisia during the study period. The presence of safety-net and guarantees by the Tunisian central bank, according to the authors, leads to moral hazards.

3. Methodology, Assumptions and Estimation Procedure

3.1 Methodology

The study utilizes a system of simultaneous linear equation to assess how the banks appetite for risk responds to risk weighted capital adequacy requirement of the regulatory authorities and vice versa. We are of the view that for banks to meet the CAR requirement, they have two options. They can either increase the sum of Tier 1 and Tier 2 holdings (the numerator) or reduce the risk weighted assets (the denominator). To be able to effectively capture the preference of the banks, there is the need to develop a model that can consider both options as the objective function, hence the preference for simultaneous equation. Alternatively, and in line with Maraghni (2017) both objective functions vary simultaneously such that changes in one induces changes in the other. In a clear term, changes in regulatory capital requirement induces changes in the risk appetite of banks and the reverse is also true. Thus, the estimated equation becomes:

$$\Delta car_{i,t} = \alpha + \theta car_{t-1} + \delta risk_{i,t} + \gamma s_{i,t} + \omega td_{i,t} + \lambda roa_{i,t} + \xi pr_{i,t} + \beta la_t + \Psi mf_t + \mu_{i,t} \quad (1)$$

$$\Delta risk_{i,t} = \alpha + \delta risk_{t-1} + \theta car_{i,t} + \gamma s_{i,t} + \omega td_{i,t} + \lambda roa_{i,t} + \xi pr_{i,t} + \beta la_t + \psi mf_t + \mu_{i,t} \quad (2)$$

Where risk stands for risk appetite of banks proxy by two different variables: the first considers credit to private sector (cps) and the second the ratio of total loan to total asset (tl/ta). Car is the risk adjusted capital adequacy ratio, s stands for size of the bank, td denotes to total deposit liability of a bank, or connotes other regulatory requirement, hence it is a vector of variables including monetary policy rate (mpr), cash reserve requirement (crr) and loan loss provisioning (llp), while roa and bf are return on assets and borrowed funds, respectively.

3.2 Assumptions

The model is built on the assumption that it is capable of explaining the direct as well as simultaneous endogenous impact of changes in risk (Δrisk) and capital requirements (Δcar) as exogenous variables so as to facilitate the joint identification of their potential impacts. Other three prominent assumptions surrounding the models are:

Assumption One:

$$\Delta risk_{i,t} \propto \frac{1}{\Delta \text{car}_{i,t}}$$

Where Δ is first difference, risk represents the risk appetite of banks proxy by total loans, car stands for capital adequacy ratio, and i and t are banks and time respectively.

Assumption Two:

$$s_{i,t} \propto \frac{1}{\Delta \text{car}_{i,t}}$$

Where s stands for size of a bank in assets term, while all other variables are as defined earlier. It is largely assumed that as banks consumed their capital, at the outset, to grow their assets. However, the interaction of the size of a bank and her capital level exert negative pressure on risk. As the banks grows in assets and the capital follows suit in the long run, there is the probability that the risk profile of the bank will decline.

Assumption Three:

$$car_{i,t} \rightarrow car^*_{i,t} \ \therefore \ (car < car^*)_{i,t} \rightarrow \downarrow risk_{i,t+1} \textbf{ but } (car > car^*)_{i,t} \rightarrow \uparrow risk_{i,t+1}$$

All banks are expected to strive to achieve the required level of car (i.e. car*). In this case, car always moves towards car*. However, for banks with car less than car* are expected to take less risk so as attain car*. Banks with car above car* tends to either feel safe and sometimes takes more risk. We are however not oblivious of the fact that; other studies are of the view that banks with car above car* tends to play safe comparatively to others. This, according to those studies is to prevent them from experiencing regulatory sanctions as other banks as well as maintains their reputation with customers.

3.3 Estimation Procedure

Considering a structural model of the form of simultaneous equation and the panel nature of the data, our estimation will follow the tradition of Maraghni (2017), which is in-turn based on the framework of Shrieves and Dahl (1992) and Arellano and Bond (1991). Thus, the regression is a Generalized Method of Moment (GMM) approach.

Since the model is built in such a way that the problem of endogeneity can hardly be ruled out, we started the implementation by conducting a Durbin-Wu-Hausman test[3] also known as regressor endogeneity test.

In conducting Durbin-Wu-Hausman test, we first implement equations 1 and 2 without the autoregressive components. At the end of every implementation, the residuals are generated and included in the original model. We then generate the Fisher statistics. The decision on endogeneity is taken either by comparing the Fisher statistics with the critical value as tabulated in the Fisher table or using the probability value of the Fisher Statistics. If the probability is less than 0.05 the null of the presence of endogeneity is rejected and the reverse is also true. Or the null hypothesis is rejected at any given level where the Fisher statistics is greater than the tabulated statistics and the reverse also applies.

4. Presentation of Results and Discussion of Findings

Considering the structure of the data, the regression is done commencing with some pre-estimation diagnostic tests to determine the presence or not of endogeneity, as well as to explore the statistical properties of the data and thereafter the main regression was carried out. Thus, this section is structured in line with the implementation procedure.

4.1 Statistical Properties of the Variables

4.1.1 Descriptive Statistics

Table 1 presents the summary statistics of the variables used for the estimation. A cursory look at the table shows that there are twelve (12) observations per each variable across eighteen (18) banks over the period 2007 to 2018 yielding a total of two hundred and sixteen observations. The industry data is largely skewed to the right except for return on assets (ROA) which is positively skewed (Figure 1).

Table 1: Descriptive Statistics

Variables	*N*	*T*	*Obs.*	*Mean*	*Median*	*Max.*	*Min.*	*SD*	*Skewness*	*Kurtosis*	*Prob.*
lrisk	18	12	216	26.45	26.55	28.31	22.91	0.99	-0.29	2.47	0.00
car	18	12	216	13.62	16.95	47.57	-174.30	20.02	-4.88	39.60	0.00
ls	18	12	216	27.38	27.48	29.25	25.35	0.86	-0.06	2.26	0.00
ldp	18	12	216	11.68	11.72	12.44	10.65	0.39	-0.18	2.39	0.00
roa	18	12	216	0.36	0.38	177.76	-100.57	7.37	13.20	444.09	0.00
lpr	18	12	216	23.32	23.38	26.40	19.44	1.16	-0.27	3.32	0.00
lla	18	12	216	24.81	25.01	27.33	20.47	1.34	-0.28	2.22	0.00
lry	18	12	216	6.70	7.19	7.27	5.13	0.86	-1.12	2.28	0.00
lcpi	18	12	216	2.14	2.15	2.44	1.87	0.16	0.04	2.01	0.00

Regulatory capital to risk weighted assets for one of the sampled banks recorded a minimum of -174.30 while the maximum of another stands at 47.57 per cent, thereby yields an average of 13.62 per cent with a standard deviation of 20.02 per cent. The extra-ordinary low solvency level of banks during the sampled period is traceable to the period of global financial crisis (GFC) which escalated the risk weighted assets and non-performing loans (NPL) arising from the recklessness of bank managers during the period. Return on assets (ROA) averaged 0.36 per cent, with a minimum and maximum of -100.57 and 177.76 per cents, respectively. The standard deviation of ROA is 7.37 during the observation period.

4.1.2 Correlation Matrix and Unit Root Test

The result of the correlation Matrix is presented as Table 2. The correlation coefficients are reported for the variables both at levels and natural logarithms. Interestingly, the signs of the coefficients are, in most cases, the same as their magnitude are close.

Coincidentally, the correlation between the level of risk appetite of banks and its predictor variables are positive in case of both level and natural logarithms data, except for ROA. Interestingly, the magnitude of the coefficients is highly close. For instance, while Risk and CAR recorded a positive coefficient of 0.094 for level data, Lrisk and CAR stands at 0.078 for logarithmic transformed data. Risk and Size (s), Lrisk and Ls were 0.962 and 0.938 respectively[4].

[3] The alternative approach would have been to fully adopt Arellano and Bond (1991) which applies a first order differentiation.

[4] CAR and ROA were not logged due to the presence of negative numbers in the series.

Table 2: Correlation Matrix (at Levels and Natural Logarithms)

At Levels									
Variables	*risk*	*car*	*s*	*dp*	*roa*	*pr*	*la*	*ry*	*cpi*
risk	1.000	0.094	0.962	0.938	-0.010	0.490	0.865	0.393	0.490
car	0.094	1.000	0.108	0.097	0.009	-0.040	0.069	-0.005	-0.026
s	0.962	0.108	1.000	0.958	0.008	0.388	0.879	0.375	0.472
dp	0.938	0.097	0.958	1.000	0.003	0.377	0.880	0.390	0.400
roa	-0.010	0.009	0.008	0.003	1.000	-0.200	-0.002	-0.057	-0.030
pr	0.490	-0.040	0.388	0.377	-0.200	1.000	0.322	0.214	0.327
la	0.865	0.069	0.879	0.880	-0.002	0.322	1.000	0.450	0.537
ry	0.393	-0.005	0.375	0.390	-0.057	0.214	0.450	1.000	0.755
cpi	0.490	-0.026	0.472	0.400	-0.030	0.327	0.537	0.755	1.000
At Natural Logarithms									
Variables	*lrisk*	*car*	*ls*	*ldp*	*roa*	*lpr*	*lla*	*lry*	*lcpi*
lrisk	1.000	0.078	0.938	0.913	-0.015	0.667	0.796	0.400	0.494
car	0.078	1.000	0.093	0.069	0.009	0.012	0.014	-0.002	-0.029
ls	0.938	0.093	1.000	0.974	0.007	0.597	0.868	0.428	0.519
ldp	0.913	0.069	0.974	1.000	-0.005	0.583	0.868	0.485	0.520
roa	-0.015	0.009	0.007	-0.005	1.000	-0.070	-0.018	-0.061	-0.032
lpr	0.667	0.012	0.597	0.583	-0.070	1.000	0.460	0.314	0.411
lla	0.796	0.014	0.868	0.868	-0.018	0.460	1.000	0.521	0.676
lry	0.400	-0.002	0.428	0.485	-0.061	0.314	0.521	1.000	0.784
lcpi	0.494	-0.029	0.519	0.520	-0.032	0.411	0.676	0.784	1.000

The correlation between CAR (another endogenous variables) and the exogenous variables were similar to that of Risk and its independent variables, except that CAR and PR recorded positive coefficient as against CAR and LPR.

4.1.3 Durbin-Wu-Hausman Test for Endogeneity

The results of the Durbin-Wu-Hausman test are presented as Table 4. From the results, the probability of Fisher statistics is in both cases significant at 1.0 per cent, implying that there is no evidence of endogeneity in both models.

Table 4: Endogeneity Test

Test Statistic	Value	df	Probability
Risk Equation			
t-statistic	4.73E+12	833	0.0000
F-statistic	2.24E+25	(1, 833)	0.0000
Chi-square	2.24E+25	1	0.0000
Capital Adequacy Equation			
t-statistic	1.04E+14	833	0.0000
F-statistic	1.08E+28	(1, 833)	0.0000
Chi-square	1.08E+28	1	0.0000

[2] See CBN Guidelines on mobile money services in Nigeria.

4.2 Inferential Results

The results of the estimated equations are presented as Table 5. The table is structured into three broad columns, with the first conveying the notations for the regressors, the second contains the results of the risk equation and third, that of the capital adequacy equation. For the risk equation, the one period lag of risk returns positive and statistically significant coefficient, signifying that past risk fuels further risk. This is theoretically coherent considering that risk variable is a stock variable. Capital adequacy ratio returns negative and statistically significant coefficient implying that as banks strive to upgrade their capital to risk weighted assets ratio, their appetite for risk is curtailed. This is also in line with theory and agrees largely with conventional wisdom. And this form the basis why most financial economists are of the view that high regulatory capital requirement impedes on profitability.

The size of the banks, proxy by the log of total assets (TA) tends not to influence the risk level. This could probably be due the huge component of fixed assets in total assets. Ability to alter risk level is in no way a function of the total assets but the portion of assets that is not only liquid but also available for lending. With positive and statistically significant coefficient of deposit portfolio (TD), it means that the quantum of deposit has a tendency to heighten or lessen banks willingness to take risk. In which case, as the deposit portfolio rises, banks risk portfolio follows suit and the reverse is also true.

Table 5: Result of the Estimated Model

Exogenous Variables	**Capital Adequacy Equation**		**Risk Equation**	
	Coefficient	***Std. Error***	***Coefficient***	***Std. Error***
C	66.2461	41.7942	-1.1683	0.4284
	(1.585056)		(-2.7269)*	
risk(-1)	0.0000	0.0000		
	(0.954671)			
risk(-1)			0.73357	0.0206
			(35.6883)*	
car			-0.007107	0.0022
			(-3.233480)*	
car(-1)	0.3204	0.1194		
	(2.682203)**			
s	-1.82E-11	0.0000	0.0000275	0.0137
	(-1.576426)		(0.002004)	
td	0.000000	0.0000	0.234639	0.1178
	(0.55805)		(1.991516)***	
roa	-0.121368	0.0950	-0.001002	0.0009
	(-1.277073)		(-1.066628)	
pr	-2.47E-10	0.0000	0.026634	0.0088
	(-3.532561)*		(3.029587)*	
la	0.000000	0.0000	0.384400	0.0434
	(-3.020581)*		(8.847389)*	
ry	0.313889	0.2109	0.157201	0.0633
	(1.488516)		(2.483786)*	
cpi	0.027691	0.0870	-0.188028	0.1518
	(0.318435)		(-1.238547)	
R^2	0.55		0.96	
Adjusted R^2	0.45		0.96	
S.E. of Regression	3.073		0.199	
DW Statistics	1.542		1.501	
Instrument	10		10	
J-statistics	5.218		815	
Prob (J-statistic)	0.074		0.000	
N	216		216	

Note: **, ** and *** implies signicant at 1.0, 5.0 and 10.0 per cent, respectively; t- statistics in paranthesis and N is number of observation*

Return on assets, although not significant, yields a negative coefficient. Total provisioning recorded a positively statistically significant coefficient in relation to risk profile. This goes to say that, as provisioning surges, so do the banks risk profile and as it declines, the banks risk profile follows suit. Liquid assets (LA), broadly defined, intensifies banks quest to carry more risk and vice versa. So do the level of economic activities, in real terms (RY). A robust economy puts pressure on banks to create assets to finance economic activities, while a weak economy is likely to dampen demand for loans, hence reduces not only the banks appetite for credit creation but also the demand for loans, such that with ineffective demand, banks funds become idle. The level of prices is however reported to play insignificant role in the risk-taking capabilities of banks in Nigeria.

The capital adequacy (CA) results, reported in the third quadrant of Table 4 shows that the one period lag of CA itself, provisioning (PR), and liquid assets (LA) are the determinants of the level of capital to risk weighted assets ratio. While the one lag period of CA is positively related to the current level of capital, PR yields a negative coefficient and liquid assets (LA) is positive.

The impulse of the result of CA is an indication that bank characteristics and macro-fundamentals do not dictate the level of capital to risk weighted assets of banks in Nigeria. This is consistent with theory. The level of regulatory capital, going by the strict international regulations, as dictated by the Basel Committee on Banking Supervision (BCBS) and the regulatory authority in Nigeria – the Central Bank of Nigeria, is a function largely of owner's fund and a small portion of long-term investment funds.

5. Conclusion and Policy Issues

This paper was an attempt to join the debate on capital-lending relationships of banks in Nigeria. The study adopted a system of simultaneous equation, in the tradition of Maraghni (2017) and adopted Generalized Method of Moment (GMM) approach to run the regression. This is to enable us use two different variables as objective function considering that changes in one objective function is capable of inducing changes in the other. A Durbin-Wu-Hausman test also known as regressors endogeneity test is then used to test for endogeneity.

The results show that capital adequacy ratio is a function of the level of risk appetite, size, total deposit liabilities, return on assets, provisioning and inflation. Whereas the level of risk, total deposit and inflation positively affects capital adequacy ratio, size of the bank in term of total assets, return on assets, and provisioning exert negative influence on the level of CAR. The risk appetite of banks, on other hand, is determined by the level of past risk, capital adequacy ratio, total deposit liabilities, provisioning, liquid assets and the level of economic activities. The level of risk in the previous period, total deposit, provisioning, the quantum of liquid assets and the level of economic activities are positive influential' whereas capital adequacy ratio impedes on banks' ability to develop further appetite for risk. From the foregoing, therefore, it is convenient to submit that capital adequacy ratio indeed moderates bank appetite for risk and, as a feedback, risk taking behavior of banks in-turn enhances capital adequacy ratio.

The study, therefore, recommends the strong need for the regulatory authorities to closely monitor the determinants of the potential direction of banks capital vis-à-vis their risk weighted assets, to serve as additional mechanism to predict happenings in the banks and possibly kindle further dig by the supervising departments of the regulatory institutions so as to proactively forestall the possibly of crisis.

REFERENCES

Abba, G. O. (2013) "Capital Adequacy Ratio and Banking Risks in the Nigeria Money Deposit Banks", Research Journal of Finance and Accounting, 4(17), 17 – 25.

Alkadamani, K. (2015). "Capital Adequacy, Bank Behavior and Crisis: Evidence from Emerging Economies", European Journal of Sustainable Development, 4(2), 329 – 338.

Arellano, M. and Bond, S. (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", The Review of Economic Studies, 58(2), 77-297.

BCBS (1999). "Core Principles Methodology, Basel Committee on Banking Supervision.

Available at https://www.bis.org/publ/bcbs61.pdf Dewatripont, M. & Tirole, J. (1993). "Efficient Governance Structure: Implications for Banking Regulation", in Capital Markets and Financial Intermediations, C. Mayer and X. Vives ed. Cambridge University Press, Cambridge, 12-35.

Diamond, D. W. & Dybvig, P. H. (1983). "Bank Runs, Deposit Insurance and Liquidity", Journal of Political Economy, 91, 401- 419.

Dhumale, R. (2000). "Capital Adequacy Standards: Are they Sufficient, ESRC Centre for Business Research, Working Paper No. 165.

Ezike, J. E. (2013). "Capital Adequacy Standards, Basle Accord and Bank Performance: The Nigerian Experience (A Case Study of Selected Banks in Nigeria)", Asian Economic and Financial Review, 3(2), 146 – 159.

Ikpefan O. A. (2013). "Capital Adequacy, Management and Performance in the Nigerian Commercial Bank (1986 – 2006), African journal of Business Management, 7 (30), 2938 – 2950. Jones, D. (2000). "Emerging problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues," Journal of Banking and Finance, 24(1-2), 35-58.

Maraghni, H. (2017). "Bank Regulation, Capital Ratio Behaviour and Risk Taking in a Simultaneous Approach", International Journal of Financial Research, 8(1), 43-64.

Modigliani, F. & Miller, M. (1958), "The Cost of Capital, Corporate Finance and the Theory of Investment", American Economic Review, 48, 261-297.

Moussa, M. A. B. (2015). "The Relationship between Capital and Bank Risk: Evidence from Tunisia", International Journal of Economics and Finance, 7(4), 223 - 232.

Olalekan, A. and Adeyinka, S. (2013). "Capital Adequacy and Banks' Profitability: An Empirical Evidence from Nigeria", American International Journal of Contemporary Research, 3(10), 88- 93.

Olokoyo, F. O. (2011). "Determinants of Commercial Banks' Lending Behaviour in Nigeria", International Journal of Financial Research, 2 (2), 61 – 72.

Ozili P. K. (2015). "Determinants of Bank Profitability and Basle Capital Regulation: Empirical Evidence from Nigeria", Munich Personal RePEc Archive, Paper No. 61048.

Saheed, A. M. (2018). "Determinants of Listed Deposit Money Banks' Profitability in Nigeria", International Journal of Finance and Banking Research, 4(3), 40-56.

Santos, J. A. C. (2000). "Bank Capital Regulation in Contemporary Banking Theory: A Review of Literature", BIS Working Paper No. 90.

Shrieves, R.and Dahl, D. (1992). "The Relationship between Risk and Capital in Commercial

Banks", Journal of Banking & Finance, 16(2), 439-457

Tobichukwu, O. R. (2016). "Capital Adequacy and Risk Management: A Study of the Nigerian

Banking Sector", International Journal of Innovative Science, Engineering and Technology, 3(7), 342 – 354.

Ugwuanyi, G. O. (2015). "Regulation of Bank Capital Requirements and Bank Risk-Taking

Behaviour: Evidence from the Nigerian Banking Industry", International Journal of Economics and Finance, 7(8), 31-37.

Umoru, D. and Osemwegie, J. (2016). "Capital Adequacy and Financial Performance of Banks in

Nigeria: Empirical Evidence Based on the FGIS Estimator", European Scientific Journal, 12(25), 295 – 305.

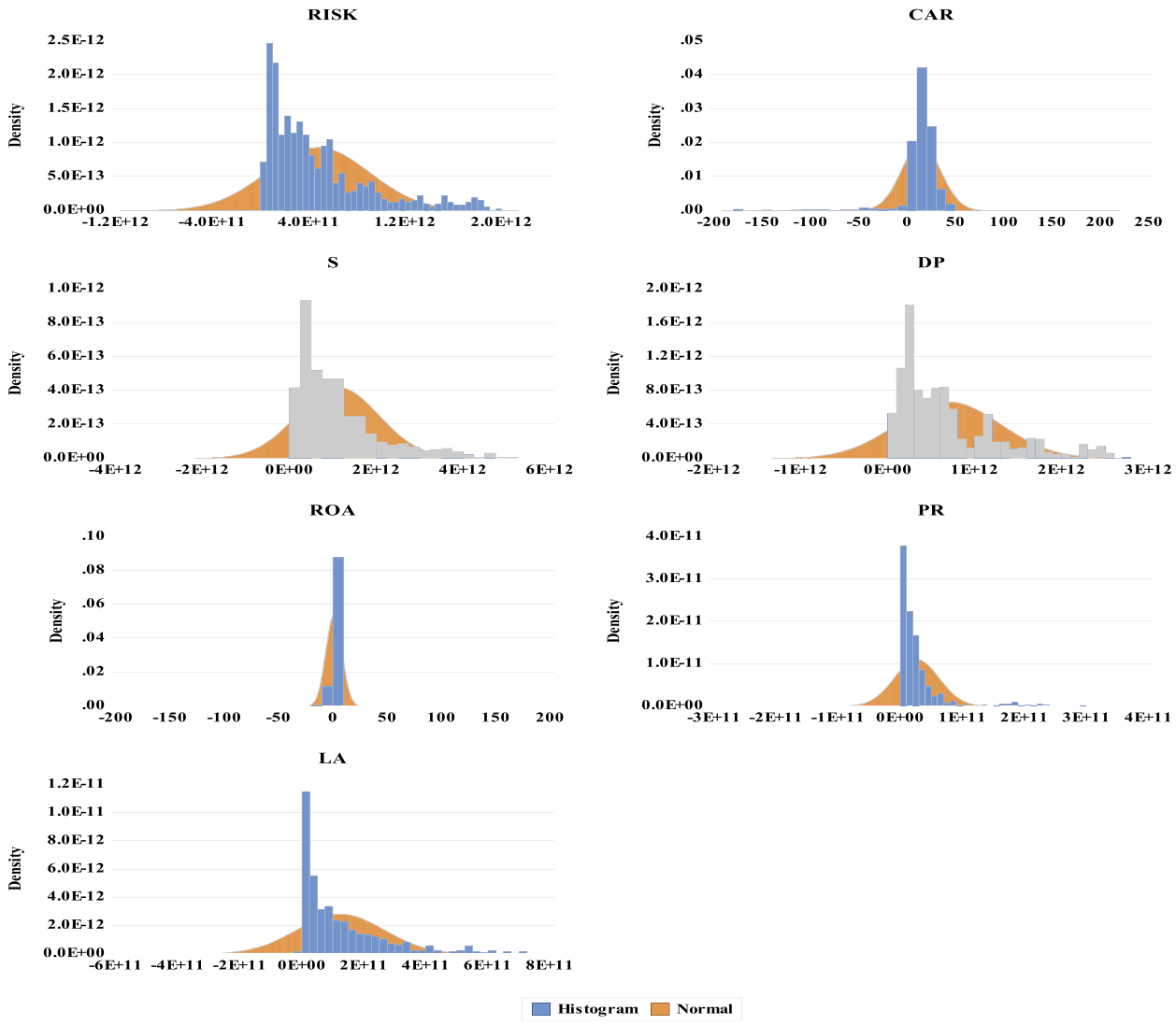


Figure 1: Theoretical Density of the Distribution

The Impact of External Debt on Agricultural Production in Nigeria (1980-2016): Autoregressive Distributed Lag Modelling

Aishatu U. Yerima
Department of Economics, Bauchi State University, Gadau, Bauchi State.

Hussaini M. Tahir
Department of Economics, Bauchi State University, Gadau, Bauchi State
mairiga2013@gmail.com

ABSTRACT

The study analyzed the impact of external debt on Nigeria's agricultural production from 1980 to 2016 using secondary data obtained from Central Bank of Nigeria (CBN) statistical bulletin and the World Development Indicators (WDI). Augmented Dickey-Fuller unit root test and the autoregressive distributed lag (ARDL) bound testing approach to co-integration were utilized, to achieve the objectives of the study. Empirical results revealed that the variables were cointegrated, indicating that they exhibited long run relationship, both in the short and the long run. External debt stock (EDS) had a significant positive impact on agricultural production (AGP), indicating that EDS positively impacted agricultural growth. i.e. higher EDS accelerated agricultural growth in the long run. To be precise, a 1 % increase in EDS led to 0.96 % increase in AGP. The remaining variables indicated negative and significant relationships with AGP. The findings further showed that there was no positive impact of EDSP on agricultural production in Nigeria. Government should aggressively pursue the process of diversification of the economy through agricultural production. There is the need to diversify the source of external debt service especially to the non-oil sectors such as agriculture, mines, industry and manufacturing, to reduce the burden and the negative consequences of over dependence on foreign exchange from oil and the volatility in its price on Nigerians.

Key Words: *External debt stock, ARDL bound testing approach, lag length selection, long-run coefficients, error correction term.*

1.0 INTRODUCTION

No government is an island. It would require some form of external support to perform effectively. One major source of external support is foreign borrowing. The motive behind external debt is that countries, especially developing economies, lack sufficient internal financial resources and this activates the need for foreign aid. It is generally the case that developing countries facing a scarcity of capital require external loans to supplement domestic saving. To meet national wants amidst limited resources, nations might resort to borrowing. Borrowing creates debt (Olukunmi, 2007) Debt could be from within a nation's boarder (Internal) or from outside (external). External debt may be defined as debt owed to non-residents and repayable in terms of foreign currency, food or service (World Bank, 2004).

The origin of Nigeria's external debt can be traced to 1958 when US$28 million was contracted from the World Bank for railway construction. Between 1958 and 1977, the need for external debt was on the low side. However, due to the fall in oil prices in 1978 which exerted a negative influence on government finances, it became necessary to borrow to finance projects and correct balance of payment difficulties. The first major borrowing of US$1billion, referred to as Jumbo loan, was contracted from the international capital market (ICM) in 1978, increasing the country's total external debt to US$2.2 billion (Adesola, 2009). The spate of borrowing increased thereafter with the entry of the state governments into external loan contractual obligations. According to the Debt Management Office (DMO 2003), Nigeria's external debt outstanding stood at ₦17.3 billion. In 1986, Nigeria had to adopt a World Bank/International Monetary Fund (IMF) sponsored Structural Adjustment Programme (SAP), with a view to revamping the economy, making the country better-able to service her debt (Ayadi and Ayadi, 2008).

External borrowing has a significant impact on the agricultural growth of a nation up to a point where

high levels of external debt servicing sets in and affects the growth as the focus moves from financing private investment to repayments of debts. Pattilo, Poirson and Ricci (2002) assert that, at low levels, debt has positive effects on agricultural growth. But, above particular points or thresholds, accumulated debt begins to have a negative impact on growth. Furthermore, Fosu (2009) observed that high debt service payments shift spending away from health, educational and social sectors. This obscures the motive behind external borrowing, which is to boost growth and development, rather than to get drowned in a pool of debt service payments which drains national resources due to high interest payments, thereby hindering growth. Gohar and Butt (2012) opine that accumulated debt service payments create a lot of problems for especially the developing nations, because debt is serviced for more than the amount it was acquired and this could slows down economic growth in such nations.

Prior to the discovery of oil in commercial quantity in the years immediately before and after independence, agriculture was the backbone of the economy, contributing about 60 - 65% of GDP. Although its contribution had reduced to 20%, 21%, 36%, 24% and 21%, in 1980, 1990, 2000, 2010 and 2016, respectively, it is the single most important sector in Nigeria, and indeed in some other African countries, providing livelihoods for at least 53 percent of the economically-active labour force (Akpaeti et al, 2014). There have been arguments on whether external debt is a veritable instrument for promoting agricultural growth in debtor nations. Empirical findings in this area have been mixed. This research, therefore, seeks to determine the effect of external debt on agricultural growth in Nigeria.

The main objective of the study is to determine whether external debt has significant relationship with agricultural growth in Nigeria, while the specific objective is to establish the effect of external debt servicing and exchange rate on agricultural growth in Nigeria.

2.0 LITERATURE REVIEW

2.1 CONCEPT OF EXTERNAL DEBT

The act of borrowing creates debt, and this debt may be domestic or external. According to the World Bank (2004), external debt is defined as a debt owed to non-residents repayable in terms of foreign currency, food or service. External debt describes the financial obligation that ties one party (debtor country) to another (lender country). It usually refers to incurred debt that is payable in currencies other than that of the debtor country. Arnone, Bandiera and Presbitero (2005) describe external debt as that part of a country's debt borrowed from foreign lenders including commercial banks, governments or international financial institutions. Ogbeifun (2007) asserts that external debt arises as a result of the gap between domestic savings and investment. As the gap widens, debt accumulates and this makes the country to continually borrow increasing amounts to stay afloat.

Debt crisis occurs when a country has accumulated a huge amount of debt such that it can no longer effectively manage the debt, leading to several crises in the domestic political economy (Adejuwon *et al., 2010*). Mimiko (1997) defines debt crisis as a situation whereby a nation is severely indebted to external sources and is unable to repay the principal of the debt. Likita (2000) defines it as a contractual obligation of owing or accumulated borrowing with a promise to payback at a future date. The Debt Management Office of Nigeria (DMO 2012) highlighted the factors that led to Nigeria's external debt burden to include inefficient trade and exchange rate policies, adverse exchange rate movements, adverse interest rate movements, poor lending and inefficient loan utilization, poor debt management practices and accumulation of arrears and penalties. The effect of external debt on a nation's economy has been a subject of controversy among academics; were of the view that external debt accelerates economic growth (Hameed, Ashraf and Chandhary, 2008).

2.2 CONCEPT OF AGRICULTURAL GROWTH

Agriculture encompasses all aspects of production including horticulture, livestock rearing, fisheries; forestry, etc. It is defined as an art, science and business of producing crops and livestock for economic purposes. Agriculture may also be defined as the biological exploitation of soil for production but, in a broad sense, agriculture is the branch of applied science which deals with production, improvement, protection, processing, marketing, extension, etc. of crops, livestock and fishery, by proper utilization of natural resources. The natural resources are soil, sunlight, air, water, temperature etc.

Growth in agricultural output can fuel growth in the non-agricultural economy through a variety of mechanisms, some directly and others indirectly. Promoting agricultural growth of the rural economy may lead to sustainable increase in employment in rural areas, reducing regional income disparities, stemming pre-mature rural-urban migration, and ultimately, reducing poverty at its very source (Anríquez and Stamoulis, 2007). Agriculture is critical to achieving global poverty reduction targets and it is still the single most important productive sector in low

income countries, often in terms of its share of gross domestic product and almost always in terms of the number of people it employs (IDA, 2009). With 75% of the world's poor population in rural areas and most of them dependent on farming, agriculture must be part of the world economic growth, poverty reduction, and environmental sustainability strategy (UNDP, 2012). In countries where the share of agriculture in employment is large, broad-based growth in agricultural incomes is essential to stimulate growth in the economy. Hence, the ability of agriculture to generate overall GDP growth and its comparative advantage in reducing poverty will vary from country to country (FAO, 2012). The majority of the poor and food insecure populace in Africa live in rural areas, and most of them depend on agriculture for their livelihoods. To support broad-based poverty reduction and food security in Africa, smallholder agriculture must be a central investment focus (Garvelink et al., 2012). The potential of agriculture to generate a more pro-poor growth process depends on the creation of new market opportunities that mostly benefit the rural poor (Hanjra and Culas, 2011).

Despite the myriads of existing literature on the nexus between agriculture and economic growth across the globe and, in particular, Sub-Saharan Africa, there exists mixed empirical result on the relationship between agriculture and economic growth in Nigeria, it is imperative to add value to the existing literature by extending study period and adding other variables in the study. In spite of many years of neglect, the agricultural sector remains significant and, without its sustained development, Nigeria's growth and development aspiration will continue to be a mirage. Therefore, it is important to examine the impact of external debt on agricultural sector in Nigeria.

2.3 THEORETICAL FRAMEWORK

2.3.1 SOLOW GROWTH MODEL AND EXTERNAL DEBT

The Solow growth model is built on a closed economy which makes use of labour and capital as its means of production. Under this scenario, the implication of external debt on growth can be seen through its effect on the domestic saving which, in turn, is used for investment, in a closed model. The general effect of external debt on the Solow growth model can be analyzed by looking at the individual effects of the debt overhang and debt crowding out theories on the model.

According to the debt overhang hypothesis, the government, in an attempt to amortize the accumulated debt, will increase tax rate on the private sector (as means of transferring resources to the public sector). This will discourage private sector investment and reduce government expenditure on infrastructure as the resources are used to pay up huge debt service payments instead of being put into other use. This will lead to a reduction of total (private and public) investment in the economy and a shift downward of both the investment and production function curves in the Solow growth model.

In the case of debt crowding out effect, on the other hand, governments, in a bid to clear their outstanding debts, use their revenue from export earnings and in some cases transfer resources, including foreign aid and foreign exchange resources, to service their forthcoming debt. Those countries that transfer revenue from export earnings which can be used in investment in the economy to avoid huge debt payments will discourage public investment. This, in turn, will decrease economic growth and will shift both the investment and production function curves in the Solow growth model downward (Dereje, 2013).

2.3.3 THE DEPENDENCY THEORY

Momoh and Hundeyin, 1999) see the under-development and dependency of the third world countries as being internally inflicted rather than externally afflicted. To this school of thought, a way out of the problem is for third world countries to seek foreign assistance in terms of aid, loan, investment, etc, and allow undisrupted operations of the Multinational Corporations (MNCs). Due to the underdeveloped nature of most Least Developed Countries (LDCs), they are dependent on the developed nations for virtually everything including technology, aid, technical assistance, etc. This theory is based on the assumption that resources flow from a "periphery" of poor and underdeveloped states to a "core" of wealthy states thereby enriching the latter at the expense of the former. The phenomenon associated with the dependency theory is that poor states are impoverished while rich ones are enriched by the way poor states are integrated into the world system (Todaro, 2003; Amin, 1976). The theory indicates that the poverty of the countries in the periphery is not because they are not integrated or fully integrated into the world system as is often argued by free market economists, but because of how they are integrated into the system.

From this standpoint, a common school of thought is the bourgeoisie scholars who to them, the state of underdevelopment and the constant dependence of less developed countries on developed countries are a result of their domestic mishaps. They believe that this issue can be explained by their lack of close integration, diffusion of capital, low level of technology, poor institutional framework, bad leadership, corruption, mismanagement, etc. The dependent position of most underdeveloped

countries has made them vulnerable to the products of the western metropolitan countries and Breton Woods institutions (Ajayi, 2000).

2.4 REVIEW OF EMPIRICAL STUDIES

Mohammed, (2005) investigated the impact of external debt on agricultural growth of Sudan for a period spanning 1978 – 2001. The study showed that export earnings had a significant positive impact while external debt and inflation had negative impact on Sudan's agricultural growth.

Ayadi and Ayadi (2008) examined the impact of the huge external debt, with its servicing requirements, on agricultural growth of the Nigerian and South African economies. Neoclassical growth model which incorporates external debt, debt indicators, and some macroeconomic variables, was employed and analyzed using both Ordinary Least Square (OLS) and Generalized Least Square (GLS) techniques of estimation. Results revealed that debt and its servicing requirement has a negative impact on the agricultural growth of Nigeria and South Africa.

Hameed *et al*. (2008) analyzed the long run and short run relationships between external debt and agricultural growth in Pakistan. Annual time series data from 1970 to 2003 was examined to determine the dynamic effect of GDP, debt service, capital stock and labour force on the country's agricultural growth. The study concluded that debt servicing burden had a negative effect on the productivity of labor and capital, thereby adversely affecting agricultural growth.

Malik, Hayat, and Hayat (2010) explored the relationship between external debt and agricultural growth in Pakistan for the period 1972 – 2005, using time series econometric technique. The study showed that external debt was negatively and significantly related to agricultural growth and suggested that an increase in external debt will lead to a decline in agricultural growth.

Ogunmuyiwa (2011) examined whether external debt promotes agricultural growth in Nigeria, using time series data from 1970-2007. Results revealed that causality does not exist between external debt and agricultural growth in Nigeria.

Wamboye (2012) evaluated the impact of external debt on long term agricultural growth of fourteen (14) LDCs using unbalanced panel data from 1975 – 2010. Findings indicated that high external debt depressed agricultural growth, regardless of the nature of the debt. In addition, debt relief initiatives were crucial as evidenced in the lower negative debt effects on growth in HIPCs sub sample relative to non HIPCs.

3.0 RESEARCH METHODOLOGY

3.1 DATA AND DATA SOURCE

This research utilized secondary data obtained from Central Bank of Nigeria (CBN) statistical bulletin and World Development Indicators database covering the period 1980 -2016 which formed the basis for analysis. To examine the impact of external debt on agricultural growth in Nigeria, external debt stock (EDS), external debt service payments (EDSP), official exchange rate (EXR) and inflation rate (INFR); proxies for external debt, were the explanatory variables while agricultural production as percentage of GDP i.e. Agricultural GDP (AGP) was the dependent variable.

3.2 MODEL SPECIFICATION

To model the relationship between agricultural growth and external debt, a functional form model is constructed as:

$$AGP_t = f(EDS_t, EDSP_t, EXRT_t, INF_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Expressing the above equation in linear estimation form:

$$AGP_t = \beta_0 + \beta_1 EDS_t + \beta_2 EDSP_t + \beta_3 EXCR_t + \beta_4 INF_t + \mu_t \ldots\ldots\ldots (2)$$

Where;

β_0 is the intercept

β_1, β_2, β_3 and β_4 are the coefficients of the explanatory variables and

μ is the stochastic error term.

Following Katircioglu, (2010), equation 2 was further converted into natural log to enable efficient estimation as shown below.

$$\ln AGP_t = \alpha + \beta_1 \ln EDS_t + \beta_2 \ln EDSP_t + \beta_3 \ln EXRT_t + \beta_4 INF_t + \mu \ldots\ldots\ldots (3)$$

Where: lnAGP, lnEDS, lnEDSP, lnEXRT and lnINF represent the natural logs of the variables while μ stands for error term in the long term growth model.

3.3 METHOD OF DATA ANALYSIS

3.3.1 UNIT ROOT TEST

To determine the order of integration of the variables of study, i.e. to check for the presence of unit root in the variables, the Augmented Dickey Fuller (ADF) technique was employed. The null hypothesis is that there is no unit root and the rule is that if the ADF test statistic is greater than the 1%, 5% and 10% critical values, we accept the null hypothesis i.e. the variable

is stationary. However, if the ADF test statistic is less than the 1%, 5% and 10% critical values, we reject the null hypothesis and go ahead to difference i.e. the variable is non-stationary.

i. Decision Rule

Ho: δ = 0, ρ = 1 (presence of unit root, the data is non-stationary)
H_1: δ < 0, ρ ≠ 1 (the data is stationary and does not need to be differenced)

ii. Unit Root Equation

The test was conducted by "augmenting" the preceding three equations by adding the lagged values of the dependent variable, Y_t. The ADF test here consists of estimating the following regression:

$$\Delta AGP_t = \beta_1 + \beta_{2t} + \delta AGP_{t-1} + \sum_{i=1}^{m} + \alpha i \Delta AGP_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots (4)$$

Where εt is a pure white noise error term, t is the time or trend variable and where $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3}$ etc. The number of lagged difference terms to include is often determined empirically, the idea being to include enough terms so that the error term in Eq. (4) is serially uncorrelated, so that we can obtain an unbiased estimate of δ, the coefficient of lagged Y_{t-1}.
The other regressors of the equation are as follows:

$$\Delta EDS_t = \beta_1 + \beta_{2t} + \delta EDS_{t-1} + \sum_{i=1}^{m} + \alpha i \Delta EDS_{t-1} + \varepsilon_t$$

$$\Delta EDSP_t = \beta_1 + \beta_{2t} + \delta EDSP_{t-1} + \sum_{i=1}^{m} + \alpha i \Delta EDSP_{t-1} + \varepsilon_t$$

$$\Delta EXRT_t = \beta_1 + \beta_{2t} + \delta EXRT_{t-1} + \sum_{i=1}^{m} + \alpha i \Delta EXRT_{t-1} + \varepsilon_t$$

$$\Delta INF_t = \beta_1 + \beta_{2t} + \delta INF_{t-1} + \sum_{i=1}^{m} + \alpha i \Delta INF_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots (5)$$

3.3.2 COINTEGRATION TEST

Cointegration test is used to check if a long run relationship exists among the variables in a model (Banerjee& Carrion-i-Silvestre, 2015) This was carried out using the autoregressive distributed lag (ARDL) bounds testing to cointegration technique.

I. Decision Rule

Ho: $a_1 = a_2 = a_3 = a_4 = a_5 = 0$ (there is no co-integration among the variables)

H_1: $a_1 \neq a_2 \neq a_3 \neq a_4 \neq a_5 \neq 0$ (there is co-integration among the variables)

If the value of the F-test statistics is below the I(0) we cannot reject Ho. However, if the F value is higher than the I(1) bound, then we reject Ho and accept the H_1, indicating that there is co-integration among the variables of study.

3.3.2.1 LAG Length for the ARDL Model

If a long-run relationship exists between the underlying variables, while the hypothesis of no long-run relations between the variables in the other equations cannot be rejected, then ARDL approach to cointegration can be applied. Finding the appropriate lag length for each of the underlying variables in the ARDL model is very important because we want to have Gaussian error terms (i.e. standard normal error terms that do not suffer from non-normality, autocorrelation, heteroskedasticity etc, etc.). To select the appropriate model of the long run underlying equation, it is necessary to determine the optimum lag length (k) by using proper model order selection criteria such as: the Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC), Hannan-Quinn Criterion (HQ) or Likelihood Ratio Criterion (LR). To use annual time series data, inclusion of time trend in the equation will produce better-approximated outcomes (Pesaran et al., 2001).The values of AIC, SBC and LP for model 4.3 are given by:

$$AICp = -n/2(1+\log 2\pi) - n/2 \log \delta 2 - P$$
$$SBCp = \log(\delta 2) + (\log n/n)\, P$$
$$HQC = \log \delta + (2 \log\log n/n)\, P$$
$$LRp,p = n(\log[\Sigma p] - \log[\hat{}\Sigma p]) \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where δ2 is Maximum Likelihood (ML) estimator of the variance of the regression disturbances, ^Σp is the estimated sum of squared residuals, and n is the number of estimated parameters, $p = 0,1,2\ldots\ldots P$, where P is the optimum order of the model selected.

The model with the smallest AIC, SBC and HQC estimates or small standard errors and high R^2 performs relatively better. The estimates from the best performing model become the long run coefficients. It is appropriate to embark on further analysis if it is determined that there is long-run relationship between the underlying variables to avoid spurious regression.

The ARDL model was estimated with the variables in their levels (non-differenced data).

3.3.3 AUTOREGRESSIVE DISTRIBUTED LAG TEST

This study employed the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration proposed by Pesaran, Shin and Smith (2001) to estimate the relationship between external debt and agricultural growth. The ARDL approach offers some desirable statistical advantages over other co-integration techniques. While other co-integration techniques require all the variables to be

integrated of the same order, ARDL test procedure provides valid results where the variables are integrated of different orders or are mutually cointegrated, and provides very efficient and consistent estimates in small and large sample sizes (Pesaran, Shin & Smith, 2001). This approach, therefore, becomes relevant to this study as some series are I(0) while others are I(1).

The generalized ARDL (p, q) model is specified as:

$$Y_t = \gamma_{0i} + \Sigma_{i=1}^{p}\delta_i Y_{t=l} + \Sigma^{q}_{i=0}\beta_i X_{t=l} + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(7$$

Where **Y** is a vector and the variables in (**X**) can be purely I(0) or I(1) or cointegrated; β and δ are coefficients; γ is the constant; i=1, k; p, q are optimal lag orders; μ is a vector of error terms unobservable zero mean white noise vector process (serially uncorrelated or independent).

3.3.3.1 Cointegration model/equation.

Bounds test methodology takes its starting point in the auto-regressive distributed lag model (ARDL) of order (p, q_1, q_2, q_3, q_4) model with the five variables in this study. Hence, the ARDL model of the study takes the form:

$$\Delta \ln AGP_t = a_0 + a_1 \ln AGP_{t-i} + a_2 \ln EDS_{t-i} + a_3 \ln EDS_{t-i} + a_4 \ln EXRT + a_5 In \ln INF_{t-i} + \beta 0 + \Sigma^{p}_{t=1}\beta_1 \Delta \ln AGP_{t-i} + \Sigma^{q}_{t=1}\beta_2 \Delta \ln EDS_{t-i} + \Sigma^{q}_{t=1}\beta_3 \Delta \ln EDSP_{t-i} + \Sigma_{t=1}\beta_4 \Delta \ln EXRT_{t-i} + \Sigma_{t=1}\beta_5 \Delta In \ln INF_{t-i} + \mu \ldots\ldots\ldots (8)$$

The test involved conducting F-test for joint significance of the coefficients of lagged variables for the purpose of examining the existence of a long-run relationship among them.

3.3.3.2 Short-Run Estimation from Error Correction Model

The error correction model for the estimation of the short-run relationships is specified as; $\Delta \ln AGP_t = \beta_0 + \Sigma_{t=1}\beta_1 \Delta \ln EDS_{t-1} + \Sigma_{t=1}\beta_2 \Delta \ln EDSP_{t-1} + \Sigma_{t=1}\beta_3 \Delta \ln EXRT_{t-1} + \Sigma_{t=1}\beta_4 \Delta INF_{t-1} + kECM_{t-1} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$

Where;

$KECM_{t-1}$=residual of the long run

A negative and significant ECM_{t-1} coefficient, (*k*), implies that any short-term disequilibrium between the dependent and explanatory variables will converge back to the long-run equilibrium relationship.

3.4 STATISTICAL CRITERIA

The statistical criteria are determined by statistical theory and aimed at evaluating parameters of the model. Under the criteria, we test for the goodness of fit, the individual significance of each regressor using the t-test, and the significance of the regression model using the F-test.

3.5 ECONOMETRIC CRITERIA

The econometric criteria determine the reliability of the statistical criteria, and in particular, the standard errors of the parameter estimates. Econometric tests were used for empirical verification of the model. The tests were for autocorrelation, normality, heteroscedasticity and stability.

To validate the stability of the estimates, the CUSUM test, the histogram normality test and the Breusch-Godfrey serial correlation LM tests were applied.

4.0 DATA PRESENTATION AND ANALYSIS

4.1 UNIT ROOT RESULT

The study employed the Augmented Dickey Fuller test (ADF) unit root test to identify the order of integration of the variables under consideration. The result of the unit root test is presented in Table 4.1.

Table 4.1
Unit Root Test Result

Variables	Order of Integration	Critical Values			ADF Statistics	Prob.
		1%	5%	10%		
Δ(AGP)	I(1)	-3.639407	-2.951125	-2.614300	-6.219001	0.0000
Δ(EDS)	I(1)	-3.632900	-2.948404	-2.612674	-4.827672	0.0004
(EDSP)	I(0)	-3.636784	-2.945842	-2.611531	-4.252022	0.0019
Δ(EXRT)	I(1)	-2.632688	-1.950687	-1.611059	-4.068291	0.0002
Δ(INF)	I(1)	-2.632688	-1.950687	-1.611059	-6.119881	0.0000

Source: (Author's computation using E-views 9

1. Δ=Difference operator 2. I(d)=Number of times of integration
3. Level=10%, 5%, 1% levels of significance

Result of the unit root test shows that external debt service payment (EDSP) was integrated of order zero i.e. I(0), whereas, other variables were stationary at first difference i.e. I(1). The mixture of order of integration among the series validates ARDL approach to co-integration as more appropriate to be applied for the study.

To test for co-integration, it is also paramount to determine the optimal lag. The lag is selected rightly such that the error terms in the equation are not serially correlated. Result of the optimal lag selection criteria is presented on table 4.2.1

Table 4.2.1
Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6.926172	NA	0.052221	-0.116738	0.110006	-0.040445
1	17.32421	17.01498	0.029596	-0.686316	-0.414224	-0.594765*
2	17.59054	0.419659	0.031018	-0.641851	-0.324410	-0.535041
3	19.63727	3.101118	0.029208	-0.705289	-0.342500	-0.583222
4	19.85942	0.323121*	0.030750*	-0.658147*	-0.250008*	-0.520821

Note: *indicates lag order selected by the criterion

From table 4.2.1, the LR, FPE, AIC and the SC showed that the optimum lag is lag 4. Result of the bound test approach to cointegration is presented on table 4.2.2

Table 4.2.2
Bound Test Cointegration Result

Model	F-statistics	Lag	Level of significant	Bound test critical values(constant level)	
				I(0)	I(1)
F(lnAGP,lnEDS,inEDSP,lnEXRT,lnINF)	6.247149	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06

Source: (Author's computation using E-views 9)

Cointegration test result on table 4.2.2 reveals that there exists long run relationship among the variables of study as the calculated F-statistics (6.247147) is greater than the upper bound critical value at all significance levels, thereby indicating that, we can safely reject the null hypothesis of no cointegration among AGP, EDS, EDSP, EXRT, and INF. Result of the estimated long run coefficients is presented on table 4.3.1

Having found a long run relationship between our series, we estimated the long run model (Eq.9) to obtain the long run coefficients whose results are presented on Table 4.3.

Table 4.3.1
Estimated Long Run Coefficient Results

Dependent Variable, AGP				
Regressors	Coefficient	Std. Error	t-Statistic	Prob.
LEDS	0.962132	0.255202	3.770085	0.0017
LEDSP	-0.199860	0.160386	-1.246122	0.2307
LEXRT	-0.224536	0.055938	-4.014007	0.0010
LINF	-0.537291	0.162595	-3.304470	0.0045
C	-12.886092	5.021978	-2.565940	0.0207

Source: (Authors computation using E-views 9)

The results denote that external debt stock (EDS) coefficient is positive and statistically significant at 5 % indicating that (EDS) has significant positive impact on agricultural growth. i.e. a unit increase in (EDS) leads to 0.96 % increase in agricultural growth hence, higher (EDS) accelerates agricultural growth in the long run. External debt service payment (EDSP), on the other hand, has been found to have negative and insignificant impact on agricultural production in the long run, which implies that (EDSP) does not significantly determine agricultural growth in the long run. The results further indicate that exchange rate (EXRT) coefficient is negative and statistically significant at 5% indicating that EXRT has significant negative impact on agricultural production; i.e. a unit increase in EXRT leads to 0.19% decrease in agricultural production thus implying that, an increase in EXRT would lead to a slight decrease in agricultural growth in the long run. Also, the result indicates that inflation rate (INF) has significant negative impact on agricultural production i.e. a unit increase in (INF) would lead to 0.54% decrease in agricultural production which implies that as inflation rate increases, agricultural production decreases. Result of the short run estimates of the error correction model is presented on table 4.3.2 below.

Table 4.3.2
Short run Estimates from ECM

Dependent variable AGP				
Regressors	Coefficient	Std. Error	t-Statistic	Prob.
D(LEDS)	-0.127940	0.163999	-0.780125	0.4467
D(LEDS(-1))	-0.129771	0.202007	-0.642411	0.5297
D(LEDS(-2))	0.069808	0.187263	0.372780	0.7142
D(LEDS(-3))	-0.314036	0.120273	-2.611030	0.0189
D(LEDSP)	-0.124263	0.064862	-1.915802	0.0734
D(LEDSP(-1))	-0.064539	0.059037	-1.093197	0.2905
D(LEXRT)	-0.340546	0.109953	-3.097196	0.0069
D(LEXRT(-1))	-0.312357	0.099913	-3.126277	0.0065
D(LINF)	-0.092707	0.049514	-1.872340	0.0796
D(LINF(-1))	0.107498	0.061349	1.752241	0.0989
D(LINF(-2))	0.116283	0.055555	2.093101	0.0526
ECM(-1)	-0.592810	0.137735	-4.303984	0.0005

R^2= 0.849852 Adjusted R^2=0.699704 F-statistic= 5.660092 Prob(F-statistic) = 0.000614

Source: (Authors computation using E-views 9)

The short-run results presented in Table 4.3.2 indicate that exchange rate has significant negative impact on agricultural production which implies that, an increase in exchange rate with 1% would lead to decrease in agricultural production by 0.29% in the short run. Also, the lag values of exchange rate and external debt stock indicate a significant negative impact on agricultural production leading to 0.31% decrease in agricultural production as a result of 1% increase in D(LEXRT(-1) and 0.31% decrease in agricultural production as a result of 1% increase in D(LEDS(-3)) respectively. Also, inflation rate has an insignificant and negative impact on agricultural production thereby indicating that (INF), (EDS) and (EDSP) do not significantly determine economic growth in the short run in the case of Nigeria.

The R^2 and the adjusted R^2 are 84% and 70% respectively implying that about 84% of the proportion of total variation in agricultural production is explained by the explanatory variables, while only 16% of the variation is caused by the error term in the model. The P-value of the F-statistics is less than 5% (i.e. 0.00614<0.05). This means the F-statistics is significant we therefore reject the null hypothesis and conclude that the explanatory variables are jointly significant in influencing the dependent variable AGP. The error correction term depicts a fast speed of adjustment towards the long-run equilibrium at 59%. Being negative, less than one and significant, the coefficient of the error term confirms the co-integration relationship among the variables. Results of diagnostic tests are presented on table 4.4 below.

Table 4.4
Diagnostic Test

SN	TYPES OF TEST	X^2	PROBABILITY
A	Autocorrelation	0.4481	0.7764
B	Hetroscedasticity	0.3029	0.3313
C	Normality	1.421523	0.491270
D	Stability	Stable	Stable

Level: 1%, 5% and 10% levels of significance respectively.

A: Langrange multiplier test of residual serial correlation
B: Ramsey's RESET test using the square of the fitted values
C: Based on a test of skewness and kurtosis of residuals
D: Based on the regression of squared residuals on squared fitted values

The results reveal that the model passed serial correlation, normality and heteroscedasticity tests as we could not reject their respective null hypotheses.

Furthermore, as recommended by Pesaran and Pesaran (2001), the study employed the cusum and cusumSQ tests for stability of the model along the sampled periods. The plots illustrated in Figure 1 & 2 show that the residuals lie within the critical bounds at 5% level of significance, which connotes the stability of the model.

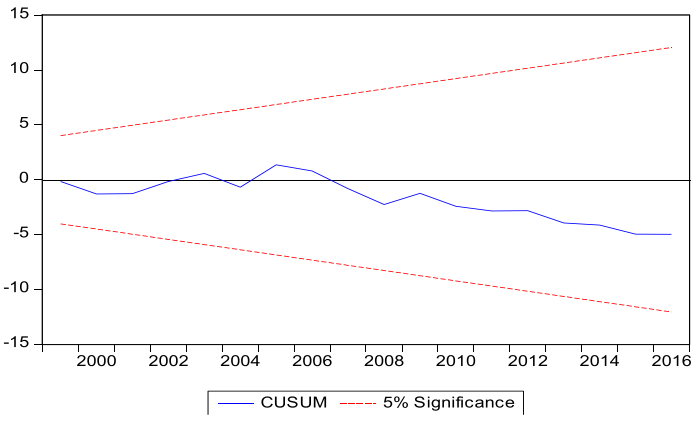


Fig. 1
Cusum Stability Test Result

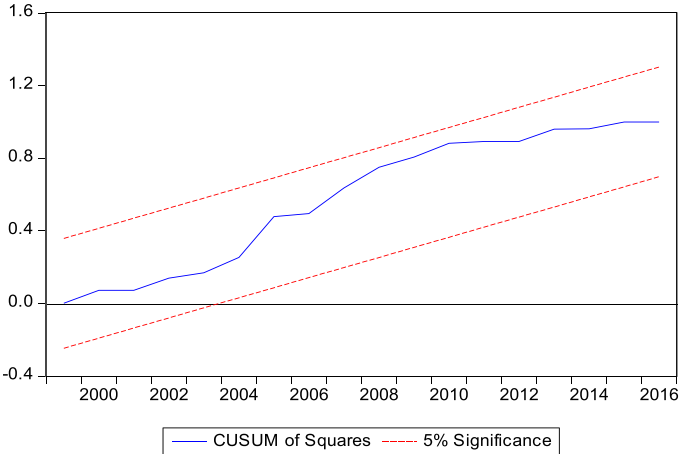


Fig. 2
Cusum of Squares

4.5 DISCUSSION OF FINDINGS

The discussions of findings were done in line with objectives of the study.

Objective 1: To establish the impact of external debt on Agricultural growth in Nigeria.

Our findings indicate that external debt had a positive significant relationship with agricultural growth in the short run and a negative relationship with agricultural growth in the long run. This means that in the short run, as debt increases, agricultural growth increases while the reverse holds in the long run. The a priori expectation is that debt would enhance agricultural growth in line with the postulate of Keynesian theory. Instead, debt had negative impact on agricultural growth. This is in line with the

findings of Atique and Malik (2012), Patilloet al (2004), and Ezeabasili et al (2011). However, this was in contrast to the views of Amooteng and Amoako(1996), Iya et.al (2013),; and Sulaiman and Azeez (2012) who found that external debt had a positive relationship with economic growth. But as Momodu, (2012) asserts,the positive correlation of debt and agricultural growth could be due to good debt utilization and management as seen in Asian Tigers – Malaysia, Singapore, Indonesia and Taiwan.

Objective 2: To determine the effect of external debt servicing on Agricultural growth in Nigeria.

It was found that debt service payment had a negative relationship with agricultural growth which is in line with the result of most other researches as seen in the works of Kasidi and Said (2013), Amootang and Amoako (1996), Momodu (2012) and Ezeabaili et al (2011). This means that an increase in debt service payments leads to a reduction in agricultural growth. Debt servicing could be described as proboscis of a mosquito for sucking out blood from its victim. It is a tax on unearned income/resources. It is so in that a debtor nation has to service its debt with attendant depletion of resources which may result in debt overhang and uncertainty. Uncertainty occasioned by excessively large debt makes the macro environment (interest rate, exchange rate and inflation) unstable with disastrous economic consequences such as scarce investment, reduced access to international financial market and capital flight.

Objective 3: To determine the impact of exchange rate on agricultural growth in Nigeria.

The result shows that exchange rate had a negative relationship with agricultural growth. This means that an increase in exchange rate brings about a decrease in agricultural growth. This is in line with the findings of Slottje et al (2000), Eme and Johnson (2012). Furthermore, Eme and Olugboyega (2012) found that there is no evidence of a strong direct relationship between changes in exchange rate and GDP growth.

5.0 CONCLUSION AND RECOMMENDATION

In view of our findings, the following recommendations should be considered to ensure effective and efficient management of Nigeria's external debt towards achieving growth in the agricultural sector.

Government should aggressively pursue the process of diversification of the economy through increased agricultural production and promotion of other non-oil sectors.

There is the need to diversify the source of external debt service especially to the non-oil sectors such as agriculture, mines, industry and manufacturing to reduce the extreme burden and the negative consequences of over dependence on foreign exchange from oil and the volatility in its price on Nigerians.

Anti-corruption agencies like Economic and Financial Crimes Commission (EFCC), Independent Corrupt Practices and other Related Offences Commission (ICPC) and Code of Conduct Bureau should be strengthened and the laws establishing them reviewed by government to make them more functional and efficient. This will reduce the incidences of misappropriation and embezzlement of funds from external debt.

REFERENCES

Adejuwon, K.D., James K.S. and Soneye, O.A. (2010)."Debt Burden and Nigerian Development".*Journal of Business and Organisational Development*.Vol.2.

Adesola, W.A. (2009). Debt Servicing and Economic Growth in Nigeria: An Empirical Investigation, *Global Journal of Social Sciences,* Vol. 8, No. 2, 1-11.

Akpaeti AJ, Bassey NE, Okoro US, Nkeme KK (2014) Trends and Drivers of Agricultural Investments and Growth in Nigeria: The Pre and Financial Sector Reforms Experience. Asian Journal of Economic Modelling 2(3): 115-127.

Arnone, M, Bandiera, L. and Presbitero, A. (2005). External Debt Sustainability: Theory and Empirical Evidence, Retrieved from http://www.unicatt.it/dipartimenti/DISES /allegati/arnoneBandierapresbite ro.pdf

Anríquez, G. and K. Stamoulis (2007): Rural Development and Poverty Reduction: Is Agriculture Still the Key? ESA Working Paper No. 07-02. FAO, Rome.

Arokoyo, *T. (2012):* Challenges of Integrating Small Scale Farmers into the Agricultural Value Chains in Nigeria. Being a Lead Paper Presented at the 2012 edition of the Annual National Agriculture Show tagged Promoting Sustainable Investment in Agriculture in Nigeria. Abuja. Unpublished.

Audu, I (2004). "The Impact of External Debt on Economic Growth and Public Investment: The Case of Nigeria". *African Institute for Economic Development and Planning (IDEP) Dakar Senegal. Retrieved from* http://www.unidep.org.

Ayadi, F.S and Ayadi, F.O (2008). The Impact of External Debt on Economic Growth: A Comparative Study of Nigeria and South Africa, *Journal of Sustainable Development in Africa,* Vol. 10, No.3, 234-264.

Ayadi, F.S (2009). The Impact of Debt Servicing Requirements on Nigeria's Economic Development. *A dissertation submitted to the University of Lagos, in Partial Fulfilment of Masters of Science Degree, Lagos, Nigeria.Unpublished.*

Banerjee A. and Carrion-i-Silvestre (2015) Cointegration in Panel Data with Structural Breaks and Cross-section Dependence. Journal of Applied Econometrics Vol. 30, No 1, pp 1-23

Bruce F. Johnson and John W. Mellor (1961), The Role of Agricultural in Economic Development. The American Economic Review Vol.51, No (4), pp 566-593.

Campbell,K.A. (2009). The Economic Role of Government: Focus on Stability, not Spending. The heritage foundation. Retrieved from www.heritage.org/Economy/bg2316.cfm

Central Bank of Nigeria (2013).*Statistical Bulletin*.vol 24.December.

Clements, B., Bhattacharya, R., and Nguyen, T. Q. (2003).External Debt, Public Investment and Growth in Low-Income Countries.IMF Working Paper. No. WP/03/249, pp. 21-24.

Dereje, A.E and Joakim, P.(2013) The Effect of External Debt on Economic Growth: A Panel Data Analysis on the Relationship between External Debt and Economic Growth.

Debt Management Office of Nigeria (DMO) (2003). www.dmo.gov.ng

Debt Management Office of Nigeria (DMO) (2012). www.dmo.gov.ng

Elbadawi, A. I., Ndulu, J. B. and Ndung'u, N. (1996).Debt overhang and economic growth in Sub-Saharan Africa. A paper presented to the IMF/World Bank Conference on External Financing for Low Income Countries, Pp. 23-24.

Food and Agriculture Organization (FAO) (2012): The State of Food Insecurity in the World. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition. FAO, Rome, Italy.

Federal *Ministry of Agriculture and Rural Development (2000) Agriculture in Nigeria: the New Policy Thrust.*

Fosu A. K. (October, 2009). *The External Debt-Servicing Constraint and Public-Expenditure Composition in Sub-Saharan Africa*. Retrieved on 12 January, 2014, from:http://www.uneca.org/sites/default/files/page_attachments/aec2009theexternaldebt-servicingconstraint.pdf

Garvelink, .J., K. Wedding and S. Hanson (2012): Smallholder Agriculture: A Critical Factor in Poverty Reduction and Food Security in Africa. Center for Strategic and International Studies, Washington, D.C.

Hameed, A., Ashraf, H. and Chandhary, M. A. (2008). External Debt and its Impact on Economic Business Growth in Pakistan, *International Research Journal of Finance and Economics*, ISSN 1450 – 2887, issue 20:132 – 140.

Hanjra, M.A. and R.J. Culas (2011): The Political Economy of Maize Production and Poverty Reduction in Zambia: Analysis of the Last 50 Years. In: Journal of Asian and African Studies 46 (6): 546-566.

IDA (International Development Association) (2009): Agriculture: An Engine for Growth and Poverty Reduction. Available at: http://www.worldbank.org/ida. Accessed 20 October 2012.

Iyoha, M.A., (2000). The impact of external debt reduction on economic growth in Nigeria:Some simulation results. Nig. J. Econ. Soc. Stud., Vol. 42.

Jhingan, M. L. (2004). *Public Finance and International Trade*. 2nd Edition, Delhi: Vrinda Publications Ltd.

Karagol, E. (2002). The Causality Analysis of External Debt Service and GNP: The Case of Turkey, *Central Bank Review*, 2(1), 39-64.

Likita, O. (2000). Elements of Public Finance, T. O. Abayomi Industrial Packaging Ltd, Lagos.

Malik, S., Hayat, M.K. & Hayat, M.U (2010).External Debt and Economic Growth:

Empirical Evidence from Pakistan", *International Research Journal of Finance and Economics,* ISSN 1450-2887, Issue 44, 88-97.

Mimiko, O.M. (1997). "The Global Village: Selected Topics on International Relations". Akure: *ABM Research and Services.*

Mohammed, M. A. (2005). The Impact of External Debt on Economic Growth: Empirical Assessment of the Sudan: 1978 – 2001, *Eastern Social Science Research Review,* Vol. 21(2), 53-66.

Momodu, A. A. (2012). Effect of Debt Servicing on Economic Growth in Nigeria *Reikojournals*.org

NBS (2017) Labour Productivity Report Q3 2016. National Buraeu of Statistics.

Ogbeifun, M.I. (2007). "The Politics of External Debt Relief: Nigeria's Unique Experience". *African Journal of Stability and Development.*1(1).

Ogunmuyiwa, M.S. (2011). Does External Debt Promote Economic Growth? *Current Research Journal of Economic Theory* 3(1), 29 – 35.

Oke M.O, Sulaiman LA (2012) External Debt, Economic Growth and Investment in Nigeria. European Journal of Business and Management 4(11): 67-76.

Olukunmi,O. (2007). *Easy to Understand Economics For Schools and Colleges.*

Revised Edition. Ibadan: Rasmed Publications Limited. Washington DC: Heritage Foundation.

Omotoye, O.R., Sharma, H.P., Ngassam, C. & Eseonu, M.C ., Sanusi, J.O (2003). Management of Nigeria's Domestic Debt. Key Note Address by the Governor of the Central Bank of Nigeria at the 7th Monetary Policy Forum organized by the Central Bank of Nigeria, Abuja.

Omotoye, R., Sharma, H., Ngassam, C. and Eseonu, M. (2006), Sub-Saharan Africa's Debt Crisis: Analysis and Forecast Based on Nigeria, *Managerial Finance,* Vol. 32, No.7,pp 606-602.

Pesaran, M.H., Y. Shin and R. Smith (2001): Bounds testing approaches to the analysis of level relationships. In: Journal of Applied Econometrics 16 (3): 289-326.

Pattilo, C., Helen, P. & Luca, R (2004). What are the channels through which External Debt affects growth. International Monetary Fund (IMF) working paper, Africa, Asia and Pacific department. w.p/04/15.

Pattillo, C.; Poison, H,; and Ricci, L. (2002), External Debt and Growth, Finance and Development, 39(2), Retrieved from http://www.imf.org/external/pubs/ft/fandd/2002/06/pattillo.htm, 13/03/2017

Romanus, O. O. (2014). External Debt Crisis, Debt Relief and Economic Growth: Lessons from Nigeria. *European Journal of Business and Management*, Vol.6, No.33, p. 110.

Salawu, R.O. (2005). Essentials of Public Finance. Obafemi Awolowo University Press. Ltd. Ile-Ife.

Sulaiman, *L.A. and Azeez, B.A. (2012).*"*Effect of External Debt on Economic Growth of Nigeria*". *Journal of Economics and Sustainable Development.vol.(3), No 8*

Todaro, MP (2003). "Economic Development, 8th low prize edition, Pearson Education". New Delhi.

Ukeje, E. (2007). Modernizing small holder agriculture to ensure food security and gender empowerment: Issues and policy. *International Food Policy Research* Institute, Brief, 5:16-26

UNDP (United Nations Development Programme) (2012): Africa Human Development Report 2012. Towards a Food Secure Future. New York.

Wamboye, E. (2012). External Debt, Trade and FDI on Economic Growth of Least Developed Countries. *Cambridge Business & Economics Conference*, Cambridge, UK.

Were, M. (2001). The Impact of External Debt on Economic Growth in Kenya: An Empirical Assessment, *UNU-WIDER Research Paper,* DP2001/116.

World Bank Publications (2004).World Development Indicators. World Bank: World Bank International Debt Statistics.

GUIDELINES FOR SUBMISSION OF ARTICLES

1. *Two (2) hardcopies and a softcopy of the original manuscript should be addressed to the:*

Editor
BULLION
Corporate Communications Department
Central Bank of Nigeria
33, Tafawa Balewa Way, Central Business District,
P.M.B.0187, Garki, Abuja

The softcopy of the papers should also be submitted via email as electronic document, preferably Microsoft word document to either of the following email addresses:
saokogbue@cbn.gov.ng(samokogbue@yahoo.com); innocent.edozie@aol.com
publicationsoffice@aol.com

Areas of emphasis should be on topics within the following broad themes:

* *Economic Growth and Development*
* *Monetary Policy*
* *Development Finance*
* *Issues in the Financial system*
* *Public Policy Analysis*
* *Development Studies*
* *Economic Diversification studies*
* *Issues in Real Sector Development*
* *Regulatory and Supervisory Development*
* *Foreign exchange management*

**** Other areas of research interest for BULLION include developments in:***

- *FSS 2020*
- *Payment Systems*
- *Financial Inclusion*
- *Currency Management*
- *Internet Banking*
- *Mobile Money*

The essence of this guideline is to help focus on areas we want covered. Note, this is not exhaustive. Please feel free to address all other issues you consider pertinent to the mandate of the Central Bank of Nigeria.

2. *The article **should not be more than twenty-five (25) pages** of **4000 – 7000 words in length**. It should be typed with 1.15 line spacing option, with a margin of 1.25 and 1.13 inches on the left and right sides, respectively. The font type to be used is **"Arial"** with font **size "14" for headings** and **size "12" for the body** of the article.*

3. *The manuscript must be accompanied with a letter of submission written in English. Submission of a paper is assumed to imply that its contents represent original and unpublished work and is not under consideration elsewhere for publication. Normally, the review process is expected to take not more than two months. There is neither a submission charge nor page fee. The complete names and address (postal and email) of the author or lead author in the case of co-authored papers should be clearly indicated.*

4. *Papers may be rejected, accepted or returned for specified revisions. A paper is expected to be published approximately six months from the date of acceptance.*

5. *All submitted manuscripts are referred to an Editorial Board comprising of an in-house editorial committee and external referees for peer-review of the paper. All comments by the referees will be sent to the author(s), including a decision of the Editorial Board to publish or not to publish the paper.*

6. *The purpose and scope of the article should be clearly stated in an abstract summarising the article's essential findings. The abstract should be typed on a separate page and should be **italicised** and **not more than 100 words in length**. In addition, the JEL classification code (s) as well as keywords should be clearly indicated on the abstract page.*

7. *The author's institutional affiliation and necessary background information on the article should appear at the foot of the first page. Footnote to the text should be listed at the end, followed by the list of references*

8. *The honorarium for authors of accepted papers in the Bullion is ₦80,000 per paper and for reviewers ₦30,000 per paper.*

9. *References for quotations or statements should be in parentheses in the text, not as notes. e.g. Mordi (2010:20) or Mu'azu (2014). Where more than two authors are involved, cite senior author and use et al., for example, Johnson et al. (1988).*

10. *Citations listed under the reference sections must begin on a new page. All entries must be typed double-spaced, listed alphabetically by last name of senior author and chronologically for two or more articles by the same author. The typed layout must conform to the Havard style, as follows:*

Mordi, C. N. O. (2010). "The Nigerian Financial Crisis: Lessons, Prospects and Way Forward", CBN Bullion. Vol. 31 No. 3, July – September, pp. 1-10.

Adenuga, A. O. and O. Evbuomwan (2011). "Understanding the Bretton Woods Institutions (BWIs) with Particular Reference to the International Monetary Fund (IMF)" CBN Bullion. Vol. 35 No. 4, October – December, pp. 10-15.

11. *All tabular materials should be separated from the text in a series of tables numbered consecutively in Arabic numerals preferably in Microsoft Excel. Each table should be typed double-spaced and identified by a short title at the top. Notes for table should be at the bottom of each table, before the source, and marked by lower case superscript letters. Appropriately placed tables should be indicated in the text.*

12. *Diagrams, graphs, charts, etc. must be separated from the text and clearly plotted on a white paper with all axes clearly positioned. They should be inserted appropriately in the text.*

13. *Where mathematical equations and formulae are used, they should be typed clearly, using MathType or Microsoft Equation Editor. The equations should be numbered consecutively in Arabic numerals.*

14. *All submissions should be accompanied with a clear digital soft copy passport size photographs of the author(s).*

Your passport photo must be:

- *clear and in focus*
- *in colour*
- *unaltered by computer software*
- *at least 600 pixels wide and 750 pixels tall*
- *at least 50KB and no more than 10MB*
- *contain no other objects or people*
- *be taken against a plain light-colored background*
- *be in clear contrast to the background*
- *not have 'red eye'*

In your photo you must:

- *be facing forwards and looking straight at the camera*
- *have a plain expression and your mouth closed*
- *have your eyes open and visible*
- *not have anything covering your face*
- *not have any shadows on your face or behind you*

Do not wear sunglasses or tinted glasses. You can wear other glasses if you need to, but your eyes must be visible without any glare or reflection.

Digital Passport photos is a mandatory requirement to be published

Thank you.

COMMITTEE OF GOVERNORS

Godwin I. Emefiele	-	**Governor** *(Chairman)*
Aishah N. Ahmad	-	**Deputy Governor** *(Financial System Stability)*
Edward L. Adamu	-	**Deputy Governor** *(Corporate Service)*
Folashodun A. Shonubi	-	**Deputy Governor** *(Operations)*
Kingsley Obiora	-	**Deputy Governor** *(Economic Policy)*

CENTRAL BANK OF NIGERIA