Effect of Agriculture on Sustainable Financial Sector's Growth in Nigeria

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ABSTRACT: Plethora of studies has been concluded on the relationship between agriculture and economic growth, including a few other sectors of the economy. However, no attention has been accorded the relationship between agriculture and the financial sector in line with Demand-Following Hypothesis. Against this backdrop, this study examined the effect of agriculture on the sustainable growth of the Nigerian financial sector from 1999 to 2020. Data were collected from the secondary source and extracted from the Central Bank of Nigeria's Statistical Bulletin. Analysis of the data was carried out using Autoregressive Distributed Lags Model (ARDL). The result revealed that the variables were co-integrated in the long-run; in addition, credits granted to agricultural sector by the financial institutions (GCA), amount granted to agricultural sector under Agricultural Credit Guarantee Scheme (ACGS) were positively but insignificantly associated with the growth of the financial sector in the long-run with the coefficients: 0.008GCA (p-value = 0.1511>0.05), 0.002ACGS (p-value = 0.4452>0.05). The productivity of the agricultural sector (AGRPROD) however, with coefficient 1.002AGRPROD (p-value = 0.0001<0.05), was predominantly positive and statistically significant in influencing the sustainability of the Nigerian financial sector's growth in the long-run; this thus amounted to confirmation of Demand-Following Hypothesis. Furthermore, the lending interest rate maintained negative but insignificant effect on the growth of the financial sector in Nigeria. Based on the foregoing result, the study concluded that agriculture positively and significantly promoted the sustainability of the Nigerian financial sector, and recommended accordingly, that agricultural sector should be given top priority in terms of funds and other resources allocation as this culminates in stimulating financial sector's sustainable growth in Nigeria.

KEYWORDS: Agriculture, Forex utilized, Agricultural credits, financial sector, Sustainable growth.

INTRODUCTION

Nigeria, by nature and other climatic conditions is an agrarian country, and hence, agriculture is expected to be the mainstay of her economy. Agreeing with foregoing, Ogen (2004) argues that in the good old days, prior to the discovery of crude oil in commercial quantity in Nigeria, the major source of foreign exchange for the economy was agriculture; and that for about a decade after Nigeria had obtained independence, Nigerian economy was best described as agrarian economy because the growth and survival gimmick for the Nigerian economy was predicated on agriculture. During those periods for instance, the main sources of foreign exchange earnings on which Nigeria survived were the groundnut pyramids located in the Northern region, cocoa plantations in the Western region and palm plantations in the Eastern Nigeria.

Also, according to Alkali (1997), agricultural sector was the leading sector with respect to job provisions and contribution to Gross Domestic Product (GDP). This thus aligns with the submission of Charles, Onuchuku and Tamino (2018) that agriculture has the enormous potential to enhance economic growth, bring down poverty and generate job opportunities for large number of people in developing countries. Furthermore, during the period between 1960s and 1970s, Nigeria was adjudged globally as the second largest producer of cocoa, largest exporter of palm kernel and largest producer and exporter of palm oil. Equally, the leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins was Nigeria (Alkali, 1997). Corroborating the foregoing position, Lawal (1997) notes that despite the reliance of Nigerian peasant farmers on the use of traditional and non-sophisticated tools plus the traditional farming methods, agricultural sector contributed over 60% of the GDP in the 1960s and the peasant farmers were producing about 70% of the total exports and 95% of the food needs in Nigeria.

However, beginning from 1980s, Nigeria abandoned agriculture in pursuit of oil-boom, to the extent that agriculture has almost been relegated to the foot note of history in Nigeria. This is in spite of the fact that Nigeria has about 70.8 million hectares of agricultural lands. Out of these, only 34 million hectares are presently cultivated for agricultural purpose while the significant parts

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of the potential fertile agricultural lands remains uncultivated and the Nigerian populace continues to wallow perpetually in hunger and starvation. In fact, the decadence level in the agricultural sector is best illustrated and underscored by the paradoxical story that the Malaysian farmers came to learn the basic rudiments of how to cultivate palm plantations in Nigeria, and today, same Malaysians are exporting palm products to Nigeria; moreover, Malaysia is currently a leading exporter of Oil palm products, and remains the world's largest producer of the commodity (Kalu & Ifeanyi, 2013). Attesting to the submission of Kalu and Ifeanyi (2013), Ikpoto (2022) reports that Nigeria's agricultural imports in 2021 alone continues on the upward trend by reaching about N2.7tn in 2021. Furthermore, according to him, the major agriculture goods imported in the 4th Quarter of 2021 which cost about N300.21bn in total included Durum wheat from the United Arab Emirates (N174.80bn) and Lithuania (N57.21bn), next is crude palm oil from China valued at N20.28bn and from Malaysia (N16.49bn); palm Oil imported from Malaysia was worth N31.43bn. Agriculture and agricultural investment require finance; either commercial or subsistent agriculture, finance is required to procure seedlings, fertilizer, farm tools, agro-chemicals, etc. The foregoing is to imply that agriculture is depending on financial sector for survival just as the financial sector needs financial request from the agricultural sector for survival. However, the trends of research in the literature have been on the effect of finance on the growth of agriculture (Egbulonu & Nwokoro, 2016; Bada, 2017; Zakaria, Jun & Khan, 2019; Ademola, 2019; Atayi, Adekunle, Ojo & Nkire, 2020) without considerable research on the effect of agriculture on the financial sector. Meanwhile, Ikpoto (2022) notes that even though there has been upward trajectory in the agricultural imports, not less than N129.084bn has been spent on agriculture loans to farmers under Agricultural Credit Guarantee Scheme (ACGS) alone, while about N3.9tn according to Central Bank of Nigeria (2020) was disbursed by the Nigerian deposit money banks between 2005 and 2020. Also, the microfinance banks granted loans to the agricultural sector to the tune of N2bn in the same period. Loans and credits are not granted to agricultural sector for free but at a cost known as interest, which constitutes the primary income for the lenders. Also, insurance, is part of the make-up of the financial reduces the negative impacts of crop failure and livestock illness while equally improving the ability of a famer to access agric-related credit and make willing investment in labour and inputs possible. In return, insurance collects premiums from the farmers; hence, the lending and insurance activities to agricultural sector are expected to impact on the growth of the financial sector since the banks and other financial institutions granting these loans belong to the sector. In view of the foregoing, this study investigates agriculture in a bid to project it as a tool for achieving sustainable financial sector in Nigeria.

Research Question
The study poses the following question in filling the gap indentified:
i.   How does agriculture affect the sustainable growth of Nigerian financial sector?

Research Objective
The study generally aims to investigate the effect of agriculture on the Nigeria financial sector and specifically:
i.   evaluate the effect of agriculture affect the sustainable growth of Nigerian financial sector

Research Hypothesis
The research objectives are tested for significance using the following hypothesis:
i.   **H0**: Agriculture has no significant effect on the sustainable growth of Nigerian financial sector

LITERATURE REVIEW
Conceptual Review
Finance and Financial Sector Overview
From the view of Olayiwola, Okodua and Osabuohien (2014), finance involves the transfer of funds in exchange for goods, services, or promises of future return. At a deeper level, it involves the bundle of institutions that make up an economy's financial system performing key economic functions such as: mobilizing savings; allocating capital funds, notably to finance productive investment; monitoring managers so that the funds allocated are spent as envisaged; and transforming risk, that is, reducing it through aggregation and enabling it to be carried by those willing to bear it. Within the concept of finance for growth, financial sector must positively influence savings and investment before it will lead to economic growth. The system must perform five major functions: It must mobilize and pool savings; it must monitor investments and exert corporate governance after providing finance; it must facilitate the trading, diversification and management of risk; It must produce ex ante information about possible investments and allocate capital; and It must ease exchange of goods and services.

Financial sector in Nigeria comprises bank and non-bank institutions with designated core mandates that are divergent but in most cases convergent when it comes to mobilization of funds and savings from areas of surplus to areas of deficit for efficient use. Hence, Kalu (2009), cited in Mamman and Hashim (2014) avers that a typical capitalist or mixed economy is made up of surplus

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and deficit units. In performing their primary function of intermediation, banks collect deposit from the surplus unit of the economy and lend it out to the deficit unit in form of loans and advances. To Sanusi (2012), the role of the financial system in mobilizing and channeling of funds to the real sectors of the economy cannot be taken for granted. Sound financial system is recognized as a necessary and sufficient condition for rapid growth and development for every modern economy. From the foregoing, is understandable that one of the core activities connecting the financial sector is provision of finance to support various sectors of the economy that lacks finance, agriculture inclusive. This importance service however comes at a cost to the recipients of the finance in form of interest and other fees associated with the financial service provision; this is where the financial institutions derive their incomes, and by extension, their survival means from. Hence, this accounts for why this study focuses on measuring the effect of agriculture as one of the borrowing customers of the Nigerian financial sector.

The foregoing is confirmed by the submission of Galac (2001) and Honohan (1997) that if banks cannot grant loans to the deficit economic units within their immediate operational environment, the business sector will not grow while deposits will be limited and this will hinder the ability of banks to generate income, and this in turn, limit their own growth either. Consequently, Pagano (1993) and Levine (1997) assert that financial sector development is considered to be the principal input for economic growth and an important component that affects growth through adjustment in productivity growth and efficiency of capital. It affects the accumulation of capital through its impact on the savings rate by altering the proportion of savings. For most banks, loanable funds account for about 50% or even more of their total assets and about 50% to 66% of their revenue (Udoka & Effiong, 2006). This made lending the first and most important function of banks. The function is considered important due to number of reasons. First, the general public or customers use lending in assessing banks stability. Banks that are willing and able to give out loans are considered more stable than those that mostly reject loans proposals of their customers (Mamman & Hashim, 2014).

To underscore the importance of the financial sector in stimulating in stimulating growth in agriculture and other sectors of the economy, Otto, Ekine and Ukpere (2012) argue that financial sector offers the following services in returns for which they earn commensurate incomes:

➢ Savings function: The financial system provides a conduit for mobilizing public savings. Bonds, stocks, and other financial claims sold in the money and capital market provide a profitable, relatively low-risk outlet surplus spenders, which flow through the financial markets into investment, so that more goods and services can be produced thus, improving social welfare. When savings flows decline, investment and living standards begin to fall

➢ Payment function: The financial system also provides a mechanism, for making payments for goods and services. Certain financial assets including current accounts and Negotiable Order of Withdrawal (NOW) accounts, serve as a medium of exchange in making payments. Credit cards issued by banks, credit unions etc are also widely accepted as a convenient means of payment

➢ Risk protection function: The financial market offers its clients indemnity against life, health, property and other risks. This is achieved through the sale of insurance policies. The funds generated through the sale of policies also help to boost the activities in the money and capital markets in Nigeria.

➢ Liquidity function: For wealth stored in financial instruments, the financial system provides a means of converting those instruments into cash with little risk of loss. Thus, the word financial markets provide liquidity i.e immediately spendable cash for savers who hold financial instruments but are in need of money.

➢ Credit function: In addition to providing liquidity and facilitating the flow of savings into investment, to build wealth, financial markets furnish credit to finance consumption and investment spending. Credit consists of loan of funds in return for a promise of future payment. Consumers need credit to buy daily needs, houses, repair the faulty automobiles and retrieve outstanding debts

Furthermore, while appreciating the role of financial sector, Anaeto (2022) remarks that it is imperative to increase the robustness and resilience of Nigeria's financial sector to ensure availability of financial resources for economic growth and development. This is why the apex Bank is maintaining the stability and soundness of the banking institutions by enhancing its on-site and off-site supervision while encouraging banks and other financial institutions to channel credit to Agriculture and other critical sectors of the economy and increased efforts are targeted at building a robust payment system. Thus, these efforts have assisted in achieving the Bank's cashless policy, financial inclusion and digitisation of financial services, leveraging Fintechs and other financial agents.

Agriculture and Agricultural Productivity

Owonifari and Larinde (2020) view Agriculture as a compound word which describes various means through which crops, and animals sustain world human population through the provision of food products and other consumables. To them, Agriculture is known to be the bedrock for the growth and sustenance of so many economies, as well as a means of getting rid of poverty in developing nations. In most of the developing nations of the world in terms of economic growth and development, agriculture is

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known to be the bedrock of these nations. But how this route leads to economic prosperity is still an issue of debate among policymakers and economic development professionals. Tombofa (2004) cited in Olajide, Akinlabi and Tijani (n.d) notes that the state of agriculture is of paramount importance to the development process. He points out that agriculture provides the basis for the world's great civilization in the past and the increase in agricultural productivity in England laid the basis for, and sustained the first industrial revolution. The agricultural sector is known to employ over 75 percent of the labour force in developing countries and provide the purchasing power over industrial goods. Hence, according to Tombofa (2004) agricultural sector has the potential to be the industrial and economic springboard from which a country's development can take off. Indeed, more often than not, agricultural activities are usually concentrated in the less- developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socio-economic development.

Akinboyo (2008) defines Agriculture as the science of making use of the land to raise plants and animals. It is the simplification of natures food webs and the rechanneling of energy for human planting and animal consumption. Until the exploitation of oil reserves began in the 1980s, Nigeria's economy was largely dependent on agriculture. Nigeria's wide range of climate variations allows it to produce a variety of food and cash crops. Ikala (2010) describes that agriculture is the profession of majority of humans. The United Nations Organization (2008) estimated that the world as a whole, over 50% of the world population is engaged in agriculture or dependent of it for a living, this is a general description of the sector. On the other hand, it includes farming, fishing, animal husbandry and forestry. Oji-Okoro (2011), stated that agricultural sector is the largest sector in the Nigerian economy with its dominant share of the GDP, employment of more than 70% of the active labour force and the generation of about 88% of non-oil foreign exchange earnings. Its share of the GDP increased from an annual average of 38% during 1992 to 1996 to 40% during 1977-2001 compared to crude oil the GDP from which declined from an annual average of 13% in 1992-1996 to 12% during 1997-2001.

Woldemichael, et al. (2017), agriculture is the backbone of Africa's economy. For 70% of the population, it is the primary source of livelihood and accounts for about 25% of the continent's GDP. However, Africa's agricultural productivity and yields are among the lowest. Yields in African agriculture are less than half of those achieved in Asia. In Nigeria, agriculture has the following sector as its components, production of crops which involves growing various types of crops such as food or cash crops. Food crops such as tuber crops, cereal crops, vegetables etc. are majorly for consumption, while cash crops are mainly for sale locally or export to generate foreign exchange for the economy. Cash crops include cocoa, rubber, cotton, palm oil, palm kernel, groundnut etc. Livestock can be described as the rearing of domestic animals for human consumption. Such animals include goats, rams, hens, rabbits, cows, sheep etc. Forestry consists of the cultivation, preservation and maintenance of economic trees or plants, as well as the extraction of diverse form of resources related to the forest. A lot are being derived from these kinds of plants which include timber for plywood, furniture, the building of houses, boats, manufacture of papers, electric pole etc. Other resources like wildlife, roots and herbs. Majorly, many nations of the developing world specifically focus on this subsector as a means of generating revenue (Owonifari & larinde, 2020)

The systems of agriculture that are dominant in this part of the world include peasant farming. This type of agriculture involves cultivation on a small acre of land for the immediate family consumption with limited access to mechanized farming tools and a local market. It is also referred to as subsistence agriculture because it majorly meets domestic needs and survival of the immediate family. Crop yield in this type of farming is below the economic standard due to factors such as cultural, social, technological. Due to a lack of financial capability, farmers are unable to acquire modern farm inputs to aid their productivity (Aderibigbe 2006.)

LINK BETWEEN AGRICULTURE AND FINANCIAL SECTOR

On the symbiotic relationship between financial sector and agriculture, G20 Global Partnership for Financial Inclusion [GPFI] (2015) emphasizes that credit is critical to agricultural finance, whether to purchase inputs, like seeds, fertilizer, tools, or to cover ongoing operational costs prior to harvest time. Yet for smallholders, credit is relatively rarely drawn from financial institutions. The cost of assessment of the client risks and transactions costs of providing loans by conventional means is too high for most financial institutions. Credit can also be made accessible by e-warehousing, which enables the recording and transfer of information on crop storage that can be used as a warehouse receipt for loan collateral. In addition, International Institute for Sustainable Development (2015) states that aside from private sources of finance, governments are also important sources of finance for developing country agriculture. Public financing can focus on particular actors, such as small farmers or enterprises; on particular issues, such as environmental protection and organic agriculture; or on particular geographic locations . Other promising government initiatives include the creation of financial institutions in agriculture, whose regulations are usually defined by central banks.

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To World Bank (2020), agriculture finance empowers poor farmers to increase their wealth and food production to be able to feed 9 billion people by 2050. According to this Bank, demand for food will increase by 70% by 2050; at least $80 billion annual investments will be needed to meet this demand. Therefore, there is an ever increasing need to invest in agriculture due to a drastic rise in global population and changing dietary preferences of the growing middle class in emerging markets towards higher value agricultural products. From the foregoing, there is definitely going to be increase in demand for credits from the financial sector due to expected increase in the agricultural investment. This translates that more incomes would accrue to the financial institutions and this manifest in terms of improved performance and growth in their financial statement. However, financial sector institutions in developing countries lend a disproportionately lower share of their loan portfolios to agriculture compared to the agriculture sector's share of GDP. The development and commercialization of agriculture requires financial services that can support larger agriculture investments and agriculture-related infrastructure that require long-term funding.

The foregoing aligns with Ruiz (2014) that Farmers' decisions to invest and to produce are closely influenced by access to financial instruments. If appropriate risk mitigation products are lacking, or if available financial instruments do not match farmers' needs, farmers may be discouraged to adopt better technologies, to purchase agricultural inputs, or to make other decisions that can improve the efficiency of their businesses. Improving access to finance can increase farmers' investment choices and provide them with more effective tools to manage risks. According to CBN (2020), the trends of credits received by the agricultural sector from the deposit money banks move from N316.36m in 2012 to N449.31m in 2015. By 2018, there was uptick in agricultural credits by 35% from N449.31m in 2015 to about N610.15m in 2018; and by 2020, credits to agricultural sector hits N1.049bn, representing about 72% increase. In case of microfinance banks, agriculture credits grows form N1.70m in 1999 to about N4.7m in 2009, representing about 176% growth rate within a pace of 10years. By 2020 the total lending by the Nigerian microfinance banks to agriculture reaches 18.77m, representing about 299% increase from 1999. This connotes that there has been upward trajectory in the mobilizations of credits to the agricultural sector from the financial sector over the years; by implications, much incomes in forms of credit would have accrued to the lenders within the financial sector in form of interest nd other charges, thereby contributing to the growth of the sector. Consequently, there is need to evaluate the effects of these credits on the financial sector. This why this study measures the effect of the finance received by the agricultural sector on the growth of the financial sector in Nigeria.

THEORETICAL FRAMEWORK

This study is underpinned by the **Demand-following Hypothesis** which states that the changes that occur in the real sector affect the financial development (i.e financial sector growth). The Keynesian theory of financial deepening asserts that financial deepening occurs due to an expansion in government expenditure. In order to reach full employment, the government should inject money into the economy by increasing government expenditure. An increase in government expenditure increases aggregate demand and income, thereby raising demand for money (Mckinnon, 1973). Robinson (1952) reveals that it is the necessity from high economic growth that creates demand in the financial sector. Thus, in this view, it is the improvements in the economy that drive higher demand for the use of money, which consequently promotes financial development. In other words, financial markets develop and progress as a result of increased demand for their services from the growing real sector. Causality runs from economic growth to financial development, that is, an increase in economic growth causes a rise in demand for financial services and this results in the expansion of the financial sector (Goldsmith, 1969; Jung, 1986; Kar & Pentecost, 2000; Lucas,1988; Ndlovu, 2013; Omotor, 2007; Robinson, 1952). The foregoing attests to the fact that agriculture, which is classified as part of the real sector and constituent of aggregate economy has the potential to influence financial sector's growth because the Demand-following Hypothesis expostulates that as the real sector develops, there would be a rise in the demand for financial services arising from the expansion in the real sector and this spurs growth in the financial sector. This is the position canvassed by Robinson (1952) which was encapsulated as financial development follows economic growth, such that where enterprise leads, finance follows. This is further cemented by the Feedback Hypotheses which expostulates that that there is a mutual effect between financial development and economic growth according to Apergis and Levine (2007), cited in Akintola, Oji-okoro and Itodo (2020).

EMPIRICAL REVIEW

Fowowe (2020) evaluated the effects of financial inclusion on agricultural productivity in Nigeria by employing descriptive and inferential statistics by estimating panel data. The results revealed that financial inclusion, in all approaches used to measure it maintained positive and significant effect of the productivity of agriculture in Nigeria and hence suggested that efforts on financial inclusion should be stepped up to capture more households in a bid to improve agricultural productivity further in Nigeria.

Atayi, Adekunle, Ojo and Nkire (2020) collected and analyzed annual data from 1986 to 2019 in a bid to assess the effect of agriculture and economic growth on manufacturing sector in Nigeria. By analyzing these data, which was obtained from the

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Statistical Bulletin of CBN and Nigeria Bureau of Statistics, the study found that Agricultural output, government spending on agriculture, and real gross domestic product positively affected the manufacturing sector. Hence, it was suggested that more resources, which should be properly monitored to ensure judicious use should be devoted to the agricultural sector by Nigerian government while making efforts to incentivize the manufacturing sector to promote growth.

In South Asia, Zakaria, Jun and Khan (2019) examined the influence of financial development on productivity of agriculture by collecting and analyzed data collected over a period ranging from 1973–2015. The study carried out co-integration analysis on the data and found that with increasing financial development that agricultural productivity increased in the first instance and thereafter declined after certain level with increasing financial development. Furthermore, the study reported that increase in both physical and human capitals as well as openness and income level were directly related to Agricultural productivity while terms of trade has a negative effect on agricultural productivity.

In Nigeria, Ademola (2019) delved into impact of agricultural finance on the growth of Nigerian economy. The study collected and analyzed data collected from secondary sources by using Ordinary Least Square (OLS) multiple regression technique. The estimated model showed that the duo of agricultural credits and agricultural productivity had negative and insignificant effect on the Nigerian economy growth. To this extent, the study suggested that it is essential to put in place credible macroeconomic policies that can support agricultural sector's investment and debt-equity so as to bring about agriculture that is pro-economic growth.

Bada (2017) evaluated the effect of agricultural and manufacturing outputs on the Nigerian economy for the period covering 31 years from 1984-2014. Annual data were collected by this study from both Nigerian Bureau of Statistics and CBN's Statistical Bulletin. Analysis of the data was done by employing Vector Auto-regressive models while the result showed that banks' credits have the significant impact on the agricultural and manufacturing sector in Nigeria. Thus, it was recommended there should be allocation of more funds by the government to the real sector of Nigerian economy in order to boost their contributions growth of the Nigerian economy and bring down unemployment.

While examining the effect of agricultural and industrial outputs on Nigerian economic development, Egbulonu and Nwokoro (2016) obtained data from Central Bank of Nigeria's Statistical Bulletin and estimated the specified model using Ordinary Least regression (OLS). The result obtained showed that Nigerian economic growth was positively impacted by the outputs from both agriculture and industry. It was therefore recommended that more effective policy on agricultural development plan and implementation should be put in place by the government while provision of funds for the acquisition of modern agricultural tools should be a top priority of the government so as to make agriculture and industry contribute more to Nigeria economic growth.

Between 1970 and 2010, Olajide, Akinlabi and Tijani (n.d) appraised the association between Agricultural resources and economic growth in Nigeria by analyzing the collected data by Ordinary Least Square regression method. Finding of the study showed that the cause and effect relationship between gross domestic product (GDP) and agricultural output in Nigeria was positive, such that the study reported that Agricultural sector to contributed about 34.4% variation in GDP in the period covered by the study. Hence, the study recommended that farmers should be encouraged by providing them with adequate funds while enabling facilities like good roads, pipe borne water and electricity should be addressed by the government.

Mamman and Hashim (2014) examined the impact bank lending on economic growth in Nigeria between 1987 and 2012 by analyzing data collected from the primary sources, using regression technique. According to the finding of the study, lending by the banks accounted for about 83% of the variation in Nigerian economic growth; this led to the conclusion that bank lending significantly influenced Nigerian economic growth and the suggestion that CBN should position the Nigerian banks to make further inflows of credits to the various sectors of the economy possible.

In investigating of the financial sector development on economic growth in Nigeria, Akintola, Oji-okoro and Itodo (2020) collected and analyzed quarterly data from 2000 to 2019. The data were analyzed by Autoregressive Distributed Lags model while the result revealed that variables like financial deepening, banking system liquidity and all share index maintained positive and significant impact on the growth of Nigeria measured by real output in the long-run; also the exchange rate spread inversely affected the real output growth. It was thus suggested that priority should be given to the growth of both money and capital market by the monetary authority so as improve the aggregate out in Nigerian economy.

Using both quantitative and qualitative approaches, Owonifari and Larinde (2020) evaluated the impact of agriculture on Nigerian economy recovery and growth. The outcome revealed that agriculture was far from facilitating economic growth despite the fact that many people see it as a means of livelihoods and one of the major sources of their incomes. Hence, the study recommended that agriculture shouldbe accorded same level of attention given to the oil sector so that agriculture can occupy it rightful place in the Nigerian economy.

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METHODOLOGY

The design of this study is quantitative, as such; the study sought quantitative data and analyzed them in a bid to measure the effect of agriculture on the growth of financial sector in Nigeria.

Model Specification

The study specified and estimated linear model adopted from the study conducted by Ademola (2019) when he investigated the effect of agricultural financing on Nigerian economy. Thus, the model estimated in this study is specified as follows:

RGDPFS = f (GCA, AGPROD, ACGS, LINTR & FXAGR)…………………..Eq(3.1)

Eq(3.1) is transformed into stochastic equation thus:

RGDPFS = β_0 + β_1GCA + β_2AGPROD + β_3ACGS + β_4 LINTR +β_5FXAGR + Ut…….Eq(3.2)

In natural logarithm, Eq(3.2) can be expressed as:

RGDPFS = β_0 + $\beta_1$lnGCA + $\beta_2$lnAGPROD + $\beta_3$lnACGS + β_4LINTR+ $\beta_5$lnFXAGR + Ut……………………Eq(3.2)

The ARDL model form of Eq(3.2) is stated thus:

ΔlnRGDPFS$_t$ = β_{0i} + $\beta_1$lnGCA$_{t-1}$ + $\beta_2$lnAGRPROD$_{t-1}$ + β_3ACGS$_{t-1}$+ β_4LINTR$_{t-1}$ + $\beta_5$lnFXAGR$_{t-1}$ + $\sum_{i=1}^{p}$ $\theta_i\Delta$lnRGDPFS$_{t-1}$ +$_1$+ $\sum_{i=1}^{q}$ $\gamma_i\Delta$lnGCA$_{t-1}$ + $\sum_{i=1}^{q}$ $\lambda_i\Delta$lnAGRPROD$_{t-1}$ + $\sum_{i=1}^{q}$ $\varphi_i\Delta$lnACGS$_{t-1}$ + $\sum_{i=1}^{q}$ $\delta_i\Delta$lnLINTR$_{t-1}$ + $\sum_{i=1}^{q}$ $\acute{\omega}_i\Delta$lnFXAGR$_{t-1}$ + ΨECM$_{t-1}$ +Ut………………………………………..Eq(3.5)

Where:

RGDPFS: Gross Domestic Product of the financial sector, insurance inclusive.

GCA: Gross credits granted to the agricultural sector by both commercial and microfinance banks;

AGRPROD: Agricultural productivity measured by the gross domestic product of the agricultural sector;

ACGS: This the gross amount disbursed to agriculture under Agricultural Credit Guaranty Scheme

FXAGR: This the value of forex utilized by the agricultural sector in Nigeria;

RINTR: Real average prime lending interest rate in Nigeria;

B1 – β_5: These are the parameters to be estimated;

β_0: Regression constant

γ_i, λ_i, ϕ_i, δ_i, $\acute{\omega}_i$ = The short run coefficients or multipliers.

p = lag order of the endogenous variable

q = lag order of the exogenous variable

ΨECM$_{t-1}$ = The coefficient that measures the speed of adjustment to equilibrium by ΔlnRGDPFS when there is deviation; this coefficient is expected to be negative and statistically significant.

A priori Expectation

In line with Demand-Following Hypothesis, the explanatory variables are expected to behave in the following manners with respect to dependent variable:

GCA >0, AGPROD >0, ACGS>0, FXAGR>0, LINTR>/<0

Sources of Data

The study collected data from secondary source by extracting data from the Statistical Bulletin of the Central Bank of Nigeria for the period covering 22 years from 1999 being the beginning of the democratic government in Nigeria to 2020 based on data availability.

Estimation Technique

The test of stationarity conducted using Philips-Perron (1988) approach revealed that the study's variables were integrated of different order I(0) and order I(1) which led to the choice of Autoregressive Distributed Lags Models as the right estimation technique for the study.

FINDINGS AND DISCUSSIONS

The results of data analysis and its discussion are presented in this section.

Descriptive Statistics

The summary of the characteristics of the variables of interest in this study are displayed on Table 1.

Table 1: Summary of Descriptive Statistics

Descriptive Metrics	LRGDPFS	LGCA	LAGRPROD	LACGS	LINTR	LFXAGR

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Mean	7.427006	5.127438	7.296081	15.14019	17.76001	10.38469
Median	7.449054	4.959140	7.311578	15.43693	17.40751	10.33158
Maximum	7.762036	6.956239	7.648582	16.33773	24.85000	11.42494
Minimum	7.008810	3.435460	6.902041	12.39603	12.31933	8.992265
Std. Dev.	0.213531	1.100357	0.205744	1.141285	2.474652	0.682040
Skewness	-0.426181	0.062496	-0.383303	-1.122135	0.754054	-0.029726
Kurtosis	2.214267	1.580852	2.254857	3.122381	4.974219	2.086414
Jarque-Bera	1.231905	1.860469	1.047679	4.630751	5.657604	0.768326
Probability	0.540126	0.394461	0.592242	0.098729	0.059084	0.681021
Sum	163.3941	112.8036	160.5138	333.0841	390.7202	228.4631
Sum Sq. Dev.	0.957508	25.42648	0.888944	27.35315	128.6020	9.768759
Observations	22	22	22	22	22	22

Source: Author's Computation (2022)

From Table 1, the results of the estimated characteristics of the variables can be viewed at a glance. The Table shows clearly the mean values, standard deviations from the mean values, the normality as well as the thickness, flatness and symmetry nature of the variables are revealed on Table 1.

Unit Root Test
Generally, time series data are usually trended and contain unit roots, which if not taken care may bring about spuriousness of results. The study thus subjected the variables to unit root test using Philips-Perron approach and the results are displayed on Table 2a & b.

Table 2a: Philips Perron Unit root test at logarithmic levels
H0: Each variable has a unit root; **H1**: H0 is not true

Variables	Critical value @5%	Philips Perron test statistics	Order of Integration	Remarks
RGDPFS	-3.012363	-1.393806	-	Non-stationary
GCA	-3.012363	-0.059014	-	Non-stationary
AGRPROD	-3.012363	-1.364280	-	Non-stationary
ACGS	-3.012363	-3.709371*	I(0)	Stationary
LINTR	-3.012363	-2.347284	-	Non-stationary
FXAGR	-3.012363	-2.391408	-	Non-stationary

Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.
Source: Author's Computation (2022)

Table 2b: Phillips-Perron Unit root test results at first differences

Variables	Critical value @5%	Philips Perron test statistics	Order of Integration	Remarks
RGDPFS	-3.020686	-7.953521*	I(1)	Stationary
GCA	-3.020686	-7.977125*	I(1)	Stationary
AGRPROD	-3.020686	-8.032757*	I(1)	Stationary
ACGS	-3.020686	-	I(0)	Stationary
LINTR	-3.020686	-6.365976*	I(I)	Stationary
FXAGR	-3.020686	-4.793249*	I(1)	Stationary

Notes:*Denotes significance at the 5% level and the rejection of the null hypothesis of non-stationarity.
Source: Author's Computation (2022)

Table 2a presents the results of unit root test conducted in line with Pillips-Perron approach as proposed in 1988 for all the variables. The results showed that all the variables contain unit root at logarithm level and hence, not stationary, except the Agricultural Credit Guarantee Scheme (ACGS) which did not show unit root symptom at level. Hence, the remaining variables were subjected to first differencing and the results which can be confirmed on Table 2b showed that the variables were purged of their unit roots and then stationary at first order $I(1)$. The foregoing then connotes that the variables of this study are integrated of order $I(0)$ and $I(1)$, thereby satisfying the condition for choosing Autoregressive Distributed Lags Model (ARDL) as the appropriate estimation technique in this study pursuant to Pesaran, Shin and Smith (2001).

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ARDL Model Dynamic Stability Test

Figure 1 shows the result of the stability test conducted for the ARDL model. The inverse root of AR characteristic polynomial was estimated and the result reveals that majority the roots fell inside the unit circle with insignificant portion falling just on the circle boarder edge. We then concluded that the study's estimated model is stable and its dynamism determined.
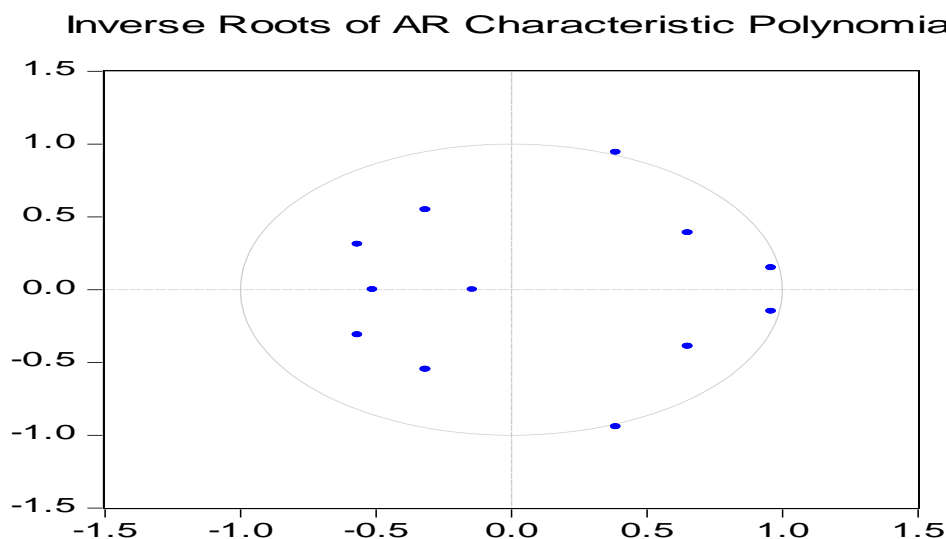

Figure 1: Model Dynamic Stability Result

Optimal Lag Length Selection

This study conducted VAR order lag structure test for all the variables to determine their optimal lag structure using Final prediction Error (FPE). The result, which is displayed on Table 3 shows the model that minimized FPE was at lag 2. Hence, the study settled for lag 2 as the optimal lag length for the estimated model.

Table 3: VAR Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-14.60406	NA	3.53e-07	2.168848	2.467092	2.219323
1	53.40898	85.91120	1.51e-08	-1.200945	0.886762	-0.847622
2	177.7107	78.50635*	6.97e-12*	-10.49586	-6.618692	-9.839691
3	2548.500	0.000000	NA	-256.2631*	-250.5965*	-255.3041*

* indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Cointegration Bound Test

To establish if there is existence of long-run co-integration relationship among the research variables, ARDL cointegrated bond test was conducted and the result is displayed on Table 3:

Table 4: Co-integration Bound Test Result

Test Statistic	Value	k
F-statistic	15.54959	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Author's Computation (2022)

H0: No long-run relationships exist;

H1: long-run relationships exist;

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From Table 4, the F-statistic is 15.55,which, at 0.05 and 0.001 significance levels, is greater than the critical values of both the lower bound (2.62, 3.41) and upper (3.79, 4.68); hence, the null hypothesis could not be accepted due to inadequate evidence. It was therefore concluded that there was existence of long-run cointegrated relationship among the variables, which is suggestive of the need to estimate long-run coefficients for the parameters.

Table 5a: Short-Run Coefficients with ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDPFS(-1))	-0.961742	0.158913	-6.052023	0.0091*
D(LGCA)	0.057889	0.010525	5.500250	0.0118*
D(LGCA(-1))	0.031399	0.007716	4.069149	0.0268*
D(LAGRPROD)	0.796990	0.028715	27.755366	0.0001*
D(LAGRPROD(-1))	0.681262	0.127029	5.363045	0.0127*
D(LACGS)	0.018888	0.004219	4.476264	0.0208*
D(LACGS(-1))	0.037203	0.007626	4.878451	0.0165*
D(LINTR)	0.000457	0.001116	0.409254	0.7098
D(LINTR(-1))	0.011955	0.002437	4.905820	0.0162*
D(LFXAGR)	-0.005889	0.005213	-1.129707	0.3408

*LRGDPFS: log of real gross domestic product of the financial sector; LGCA:log of gross credits granted to the agricultural sector by the banks; LAGRPROD: log of agricultural productivity; LACGS: log of credits granted to agricultural sector under agricultural credit guarantee scheme; LINTR: lending interest rate; LFXAGR: log of forex utilized in the agricultural sector. Notes: * 5% level of significance*
Source: Author's Computation (2022)

Table 5a reveals the short-run coefficients for the agricultural proxies as the predictors of the financial sector growth in Nigeria. Looking the result closely, it is observed that the current values as well as the first lags of all the proxies of agricultural sector were very positive and statistically significant with the growth of the financial sector; this is with exception for the forex utilization by the agricultural sector which, although negative, but maintained a statistically significant relationship the growth of the financial sector. Furthermore, the lending interest rate was positive but happened to be the only insignificant predictor in the result in the short-run considering its current value. Notwithstanding of this, the lending interest rate in its first lag was statistically significant in relationship with growth of the financial sector.

Table 5b: Error Correction Model (ECM) and Long Run Coefficients

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGCA	0.008472	0.004420	1.916904	0.1511
LAGRPROD	1.002147	0.028607	35.032077	0.0001*
LACGS	0.002100	0.002395	0.876699	0.4452
LINTR	-0.007626	0.001427	-5.342588	0.0128*
LFXAGR	0.000001	0.005134	0.000239	0.9998
ECM (-1)*	-1.425557	0.238052	-5.988438	0.0093*
C	0.177827	0.217492	0.817625	0.4735

LGCA, LAGRPROD, LACGS, LINTR, LFXAGR are the same as defined under Table 5a,
*ECM: Error Correction Mechanism. Notes: * 5% level of significance*
 Source: Author's Computation using E-view 10. 0 (2022)

Table 5b reveals the long-run coefficients for the agricultural proxies in relation to the growth of the financial sector. Hence, in the long-run, the variables of this study combined in the following linear fashion:
LRGDPFS = 0.1778 + 0.0085*LGCA + 1.0021*LAGRPROD + 0.0021*LACGS -0.0076*LINTR + 0.0000*LFXAGR − 1.4256*ECM
With respect to the above equation depicting the long-run relationship among the variables, the situation is the same with the short run relationship on Table 5a, except for interest rate which, in this case, reversed its relationship to negative as compared to positive relationship exhibited in the short-run. The speed of adjustment to equilibrium in the long-run according to the above equation is -1.43 i.e 143%.

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Diagnostic Tests

Table 6a: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	342.3689	Prob. F(2,1)	0.0882
Obs*R-squared	19.97083	Prob. Chi-Square(2)	0.0000

Source: Author's Computation (2022)

In conducting Auto-correlation test, the null hypothesis which states that the residuals are uncorrelated is usually tested against the Alternative hypothesis that the residuals are serially correlated. From Table 6a therefore, the F-stat value is 342.37 with p-value = 0.0882>0.05; hence, we could not reject the null hypothesis. We therefore concluded here that the residuals of the estimated model were free from auto-correlation problem.

Table 6b: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.932860	Prob. F(16,3)	0.1428
Obs*R-squared	19.08989	Prob. Chi-Square(16)	0.2640
Scaled explained SS	0.381591	Prob. Chi-Square(16)	1.0000

Source: Author's Computation (2022)

In testing for heteroskedasticity, the null hypothesis is that the residuals are homoskedastic while the alternate hypothesis states that the residuals are heteroskedastic. Looking at the p-value of the F-statistic which greater than the critical value i.e p-value = 0.14>0.05, the null hypothesis could not be rejected for lack of sufficient evidence; it was thus concluded that the residuals in the estimated models were free from heteroskedasticity complicity.

Test of Hypothesis

This study is premised on the following hypotheses:

H0: Agricultural productivity has no significant effect on the growth of Nigerian financial sector

H1: Agricultural productivity has no significant effect on the growth of Nigerian financial sector

A critical look at Table 5a and 5b reveals that that the p-values of the agricultural productivity are statistically significant at 0.05 significant level, both in the short-run and in the long-run i.e p-value = 0.0001< 0.05; hence, the null hypothesis was rejected for lack of enough evidence. This study thus concluded that agricultural productivity has significant effect on the growth of Nigerian financial sector.

DISCUSSION OF FINDINGS

The summarized result of the descriptive statistics on Table 1 revealed that lending interest rate (LINTR) had the highest mean value at 17.76, and this, in descending order is followed by the amount disbursed to the agricultural sector under Agricultural Credit Guarantee Scheme (ACGS) with 15.14, foreign exchange consumed by the agricultural sector (FXAGR) with 10.38, growth of the Nigerian financial sector (RGDPFS) with 7.42, productivity of the agricultural sector (AGRPROD) with 7.30 while the least mean value was obtained for the gross credits granted to the agricultural sector by the financial institutions (GCA) at 5.12. Also, a closer look at the mean values obtained revealed that they were all lying in-between the maximum and minimum obtainable mean values for each of the variables, thereby strengthening the reliability of the results. In addition, all the variables had low rate of deviation from their mean values judging from the obtained standard deviation; this further brings to fore the minimal error with which the results were obtained because each variable's observations clustered closely around their mean values.

With respect to skewness statistics, all the variables, except ACGS had zero (0) skewness value. This suggested that all the variables exhibited normal skewness and their distributions are symmetrical around their mean values; ACGS however with -1.1 exhibited negative skewness and this implied that its distribution curve would have long left tail with more of lower values than the sample mean. The Kurtosis result showed that ACGS with kurtosis value of 3 had normal distribution and mesokurtic. In addition, LINTR with 4.97 was positive and hence leptokurtic and its distribution is peaked curve and have the tendency to have more values higher than the sample mean. The other variables i.e AGRPROD, RGDPFS, GCA and FXAGR all had their kurtosis values lower than 3; consequently, they were platykurtic with flat curve distributions. The normality of the distributions of the variables employed in this study is underscored by the Jarque-Bera result. The Jarque-Bera values were accompanied with p-values that were more than 0.05 critical value across all the variables; this led to failure to reject the null hypothesis that the variable series are normally distributed and the conclusion that the distributions of all the variables employed in this study were distributed normally.

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The result of the ARDL showed on Table 5a showed that in the short run, increase in the current value of the gross credit granted to agricultural sector by 1% produced about 6% significant increase in the growth of the financial sector, but this reduced to about 3% significant increase in the previous year i.e first lag; this implies that gross credits granted to agriculture produced better effect on the financial sector in the year they are granted than in the previous years. Furthermore, should the current value of the agricultural productivity be stepped up by 1% in the short-run, there would be about 78% significant increase in the financial sector growth but this reduced to 68% in the first lag; this is also an implication that agriculture stimulated the financial sector in the current year than in the previous year. Also, both the current value and the first lag value of the agricultural credit guarantee scheme produced significant positive effect on the growth of the financial sector, such that 1% increase in each of its current and first lag value generated around 2% and 4% respective increase in the financial sector. In addition, the relationship exudates of the lending interest rate was not different as it positively affected the financial growth by its current value and first lag value to the tune of 4% and 0.05% respectively. The forex utilized in the agricultural sector however took a different turn from other agricultural proxies as it exhibited a negative and insignificant relationship with the growth of the financial sector in a manner that 1% uptick in the forex utilized by the agricultural sector was associated with about 0.6% decrease in the growth of the financial sector.

This study further found that the variables were combinable linearly in the long-run; this implies that agriculture is potent in sustaining financial sector and instrumental to achieving sustainable financial sector's growth. Hence, the long-run coefficients contained on Table 5b are more important because the focus of this study is on sustainability of the financial sector's growth in the long-run. Thus, from Table 5b, in gross credit granted to agricultural sector, agricultural productivity and agricultural credit guarantee scheme replicated the positive relationship exuded in the short-run. Hence, in the long-run, 1% increase in the gross credit granted to agriculture was associated with around 0.8% increase in the financial sector's growth; also 1% increase in agricultural productivity and credits granted under agricultural credits guarantee scheme produced about 100% and 0.2% respective increase in the financial sector's growth. However, lending interest rate and forex utilized in the agricultural sector reversed their relationships with financial sector's growth in the long-run. To this end, 1% increase in each of lending interest rate and forex utilization, in the long-run depleted the growth of the financial sector by about 0.8% and 0% respectively.

Consequently, by the finding of this study, increase in each of the proxies of agriculture propelled the growth of the financial sector in the short-run; hence, all the a priori expectations were met in the short-run. However, in the long-run, only the gross credits granted to agriculture by the financial institutions, credits granted under agricultural credit guarantee scheme and agricultural productivity featured as the drivers of the financial sector's growth and hence, a priori expectation was met in respect of these variables. Lending interest rate equally met a priori expectation as it was expected to either be positive or negative. Its negative sign thus connotes that in the long-run, increase in lending interest rate discourages borrowing by the agricultural investors and this will produce the multiplier negative effect on income accruing to the financial sector from interest charges, thereby scaling down the growth of the sector. The zero contribution of the forex utilization in the agriculture to the financial sector in the long-run cannot be dissociated from the ingrained culture of forex round-tripping, fraudulent acquisitions and diversions prevalent in the Nigerian foreign exchange market. This might have led to repeated and undetected diversions of forex meant for import of agricultural inputs, which would have boosted agricultural productivity to other non-agricultural related purposes.

Nevertheless, both in the short-run and the long-run, this study showed that agricultural productivity remained the star predictor and driver of the financial sector as it significantly predicted financial sector's growth to the tune of 80% and 100% respectively in the short-run and long-run. This led to the rejection of the null hypothesis that agricultural productivity has no significant effect on the sustainable growth of the Nigerian financial sector. Also, since this study is premised on Demand-Following hypothesis which states that the financial sector responds positively to expansion in the real sector of the economy, this study thus confirms the trueness of Demand-Following Hypothesis that expansion in the productive activities such as agriculture would lead to growth in the financial sector through increased demand for financial services. By implication, when there is an expansion in the agricultural activities, the demand for the financial services in form of credits, advice, insurances, etc increase and this in turn increase the revenues accruing to the financial sector in forms of interest, fees, premiums, commission and other charges concomitant with provision of financial services. Again, increase in the revenues accruing to the financial sector would culminate in the higher profit and growth of the sector, and by extension the financial sector would be better enhanced to grant more credits to the agriculture sector. Since agriculture sector is a sub-set of overall economic growth, this finding sharply disagrees with Ademola (2019) who reports that agricultural credits and agricultural productivity have negative and insignificant effect on Nigerian economic growth, but converges with Egbulonu and Nwokoro (2016) whose finding shows that Nigerian economic growth is positively impacted by the outputs from both agriculture. The study equally aligns with the existing finding by Olajide, Akinlabi and Tijani (n.d) that cause and effect relationship between gross domestic product (GDP) and agricultural output in Nigeria is

positive. Also, supporting the finding in this study are the findings by Mamman and Hashim (2014), Akintola, Oji-okoro and Itodo (2020) and Owonifari and Larinde (2020) who all find out that agriculture promoted economic growth and by implication, financial sector growth.

CONCLUSION AND RECOMMENDATION

Agriculture remains the main stay of a developing economy like Nigeria. This is because its potentials in generating employment opportunities and stimulating the growth of the different sectors of the economy cannot be overemphasized. The focuses of the existing scholars have been on the assessment of the effect of agriculture on aggregate economy with no consideration for financial sector. Consequently, this study evaluated the effect of agriculture on the sustainable financial sector's growth in Nigeria from 1999-2020. The result of the descriptive statistics showed that characteristically, the proxies of the agriculture were all normally distributed with low standard deviations from their mean values. Furthermore, the result of the estimated ARDL model revealed that both in the short-run and in the long-run, agriculture was a significant determinant of financial sector's growth at 0.05 significant level. As a result of the foregoing, the null hypothesis which states that agricultural productivity has no significant effect on the financial sector's growth in the period under study was rejected. Hence, this study concludes unambiguously that Demand-Following hypothesis theory is true and that agriculture is truly a driver of the sustainable financial sector's growth in Nigeria's context. Based on the foregoing conclusion, the study recommends as follows:

  i.   Since this study revealed that agricultural productivity was a significant driver of the financial sector, government should prioritize investment in the agricultural sector by increasing the amount made available to farmers under Agricultural Credit Guarantee Scheme and make the conditions for its accessibility less stringent.

 ii.   The banks and other financial institutions in the financial sector should be given special directive by the monetary authority to prioritize agricultural lending so as to further boost the productivity of the sector and by extension, the growth of the financial sector in the long-run.

iii.   Lending interest rate on agricultural credits should be critically looked into, and specially reviewed downward, such that it encourages borrowing for agricultural investments and eventually reverses the negative relationship trend the long-run.

 iv.   The monetary authority should critically look into the issue of foreign exchange allocation to agricultural sector, and set up a special monitoring squad, with mandate to curb the unproductive incidences of diversions and round-tripping of agricultural-bound foreign exchange in Nigeria

CONTRIBUTION TO KNOWLEDGE

Existing studies predominantly focus on the effect of agriculture on the aggregate economy and other sectors to the exclusion of the financial sector but this study brought novelty into existing studies by examining the effect of agriculture on the growth of the financial sector in Nigeria. Agricultural indicators like agricultural productivity, agricultural credit guarantee schemes, and gross credit to agricultural sector by the financial institutions are some of the proxies examined in relation to the financial sector's growth.

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