Agricultural Sector Credits, Exchange Rate Volatility and Agricultural Sector Performance in Nigeria

Ini-mfon Vincent Patrick[1], Elizabeth Atairet Atairet[2] & Aniekan Edwin Sunday[3]

1 & 2. Department of Agricultural Economics and Extension, Akwa Ibom State University
3. Department of Economics, College of Education, Afaha Nsit-Nigeria

Abstract

This study examines the impacts of credits to Agricultural sector and Exchange rate volatility on Agricultural performance in Nigeria. The study adopts a quantitative econometrics analysis using the Scientific Method of Ordinary Least square (OLS) regression technique to analyzed the annual time series data in a multiple regression model, which is based on the Solow growth theory. From the result of the Engel Granger co-integration test, it was confirmed that there is a long run relationship between the macroeconomic variables in the estimated model as the residuals of the OLS regression of the model was integrated at level at 5 per cent level of significance. The estimated results revealed that exchange rate volatility in Nigeria has a significant negative impact on agricultural sector performance. It also indicated that agricultural credit guarantee scheme fund has a negative impact on agricultural output in Nigeria while commercial bank credits to agricultural sector has a positive impact on agricultural output in Nigeria. Based on these findings, the study recommends that monetary authority should ensure the stability of the country's exchange rate (Naira) since exchange rate depreciation affects agricultural output negatively. Also, in order to achieve a high level of growth in the agricultural output, the Nigerian government should encourage commercial banks to increase credit to agricultural sector as these credits promotes agricultural output growth in Nigeria.

Keywords: Agricultural output, Agricultural credits, Exchange Rate, Volatility

1.0 INTRODUCTION

Agricultural Production in Nigeria is progressively on the decline in terms of its contribution to the Gross Domestic Product (GDP) as well as satisfying the country's food requirement, Nigerian Bureau of statistics (2022) maintain that the value of food imports in the second quarter of 2022 stood at N464.45 billion naira, showing an increase of 21.09 billion naira when compared to the value recorded in the first quarter of 2022 of about N443.36 billion. This is despite the fact that about 70 per cent of the populations are engaged in agriculture. Agricultural development is an aspect of economic development; it suggests improvements in the principles and practice of agriculture and subsequent improvements in materials, resources and wellbeing of farmers. (Anwana, Akpan & Okon, 2019). A number of reasons are attributed to the poor performance of the agricultural sector in Nigeria. These include; inadequate agricultural credits, exchange rate, land policy etc. Though government initiated programmes like agricultural credit guarantee scheme fund, commercial agricultural credit scheme, and establishment of bank of agriculture, insufficient credit still persists as one of the

challenges affecting the sector. More so, exchange rate fluctuation has continued to hinder growth in the sector as farmers find it difficult to import new farm tools due to exchange rate instability.

However, there is a growing recognition by the Nigerian farmers of the effect of improved inputs and new technologies on agricultural performance but with these constraints mounting, little or nothing can be done. With the realization of the need for stimulating agricultural performance in the economy, the use of new farming inputs and the adoption of high yielding techniques have given rise to an increased need for agricultural credit since majority of Nigerian farmers are small-scale farmers and are often limited by unfavorable economic, social, cultural and institutional conditions (Olubiyo & Hill, 2000). Insufficiency of capital has been a major constraint to agricultural development (Agu, 1998) in order to improve agricultural production, modern farm inputs such as fertilizers, improved seed, feeds and plant protection chemicals and agricultural machineries are needed over the hoe and machete technology. Most of these technologies have to be purchased, yet very few farmers have the financial resources to finance such purchases (Adeniji & Joshua, 2008).

Essentially, Agriculture is composed of crop production, livestock, forestry, and fishing. It involves the production of food, feed, fibre and other goods by the systematic growing and harvesting of plants and animals (Iganiga & Small Unemhilin, 2011). Agriculture can be operated at a peasant small scale or large-scale level. Peasant or small-scale farming is defined as the cultivation of crops and rearing of animals on a small scale. Peasant farmers operate mainly in the rural environment of the country. They operate on very small holdings using mostly traditional methods because, their income is relatively low and the capacity to save is poor (Asogwa, Abu & Ochoche, 2014).

Credit plays a crucial role in facilitating the modernization of agriculture and in promoting the participation of farmers in the development process. Not only credit can eliminate financial constraints but it can provide the incentive to adopt new technologies that would otherwise be more slowly accepted (Mohsin, Ahmad& Anwar, 2011). Credit is the use of or possessing of funds and services without immediate payment. It can be in form of money borrowed or agricultural credit which includes trade credit and bank credit. Agricultural credit therefore can be in various forms for example seed, fertilizer with deferred payment, use of tractors, labours, storage facilities and so on. The term credit also means the capacity to borrow (Mgbakor, Patrick & Divine, 2014), and it has a role to play as far as improvement in activities of the agricultural sector is concern.

Apart for credit, the agricultural sector like any other sector remains largely affected by exchange rate fluctuations. This is usually in respect of the sector's importation of raw materials and other modern farm implements, and the exportation of its output. Changes in exchange rate policy, therefore, have significant consequences for a country's domestic relative prices and economic growth through their effects on the real exchange rate. The real rate is a measure of the terms of trade between the traded and non-traded sectors of the economy, which provides the signal for resource movements (Oyejide, 1986).

In Nigeria, exchange rate has changed within the time frame from regulated to deregulated regimes. Adeniran, Yusuf, and Adeyemi (2014) agreed that the exchange rate of the naira was relatively stable between 1973 and 1979 during the oil boom era and when agricultural products accounted for more than 70% of the nation's gross domestic products (GDP). In 1986 when Federal government adopted Structural Adjustment Policy (SAP) the country moved from a peg regime to a flexible exchange rate regime where exchange rate is left completely to be determined by market forces but rather the prevailing system is the managed float whereby monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives (Ismaila, & Imoughele, 2015). This inconsistency in policies and lack of continuity in exchange rate policies aggregated unstable nature of the naira rate (Ismaila, 2016). Benson and Victor, (2012) and Aliyu, (2011) noted that despite various efforts by the government to maintain a stable exchange rate, the naira has depreciated throughout the 80's till date and with an associated effect on agricultural sector performance.

1.1   Statement of problem

Agricultural credit is expected to play a critical role in enhancing agricultural sector performance in countries were such credits are sufficient and well utilized (Duong & Izumida, 2002). In Nigeria, agricultural credit has for long been identified as a major input in accelerating the performance of the agricultural sector and Agricultural

export (Utuk, Akpan, Eduno & Udo, 2023). But with the decline in the contribution of the sector to the Nigeria economy especially with the emergence of oil as major revenue earner, as the share of Agricultural products in Nigeria's total export earnings remained small compared to crude oil earnings (Utuk. Akpan, Eduno & Udo; 2023,) For instance, in 2019, Agriculture accounted for less than 2 % of total export. Its dwindling performance has been attributed by many to the lack of a formal national credit policy, paucity of credit institutions and exchange rate instability which has affected the output of the sector.

Credit is viewed as more than just another input in the agricultural sector but rather it is considered a stimulant since it connects other factors such as labour, land, equipment and raw materials etc. together. Hence, it determine access to all of the resources on which farmers depends on (Shephard, 1979). In an attempt to ensure the availability of agricultural the Federal credit as a mean of providing the needed capital in the sector, government introduced agricultural credit institutions as well as policies and programmes. Some of these agricultural credit schemes include Nigerian Agricultural and Cooperative Bank (NACB), Agricultural Credit Guarantee

Scheme Fund (ACGSF), Commercial Agricultural Credit Scheme (CACS), and Nigerian Incentive-based Risk Sharing for Agricultural Lending (NIRSAL) as well as the deregulation of the foreign exchange market.

However, despite these efforts, the agricultural' sector performance did not improve substantially. The contribution of agriculture to the gross domestic product (GDP) continued to dwindle. Its contribution, which about 40 per cent in 1986, went down to about 20 per cent in 1990 (CBN, 2021). Although it increased afterwards to 31 per cent in the year 2000 and 36 per cent in 2015 and 37 per cent in 2019, its share never exceeded 40 per cent thereafter, with different sub-sector's contribution changing regularly and food importation rising thereby putting pressure on exchange rate. This study therefore intends to investigate the impact of agricultural sector credit exchange rate instability and agricultural sector performance in Nigeria.

1.2   Objectives of the study

The main objective of the study is to investigate the impact of agricultural sector credit, exchange rate instability on agricultural sector performance in Nigeria. Specifically, the objectives are to:

i) Determine the relationship between agricultural credit guarantee scheme fund and agricultural sector performance in Nigeria.

ii) Examine the effect of exchange rate on agricultural sector performance in Nigeria.

ii) Determine the effect of commercial bank loan to agricultural sector on agricultural sector performance in Nigeria.

2.0 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Conceptual issues

2.1.1 Agricultural credit

Finance is the lifeblood and nerve center of a business, just as circulation of blood is essential in the human body for maintaining life. It has been rightly termed as the universal lubricant that keeps the enterprise dynamic (Pandey, 2001). Agricultural credit is the provision of loans and advances for the development of agriculture. Agriculture needs financial services for its development in the form of saving accounts, loans and insurance: health, life, credit insurance and leasing. Although the issue of accessing finance by small-scale farmers has been one of the most extensively discussed topics in recent decades within finance-growth community, many micro-finance operators have achieved only varying degrees of success in their attempts to develop methodologies for agricultural financing due to constraints related to the very nature of agricultural activities. Credit is expected to

play a critical role in agricultural development (Duong and Izumida, 2002). Farm credit has for long been identified as a major input in the development of the agricultural sector in Nigeria.

2.1.2   Agricultural performance

Agricultural Sector plays a strategic role in the process of Economic development of a country. It has already made significant contributions to the Economic Prosperity of advanced countries and its role in the development of less developed countries is of vital importance.(Utuk, Aniefiok, Boniface, Ededet & Enobong 2024). Agricultural performance is measured by the contribution of the agricultural sector to the gross domestic product of the country. Agricultural productivity is commonly defined as the ratio of the measure of output to input used in the agricultural sector" (Organization of Economic Cooperation and Development, 2001). It shows the level of increase in agricultural output compare to the total output of an economy within a particular period usually a year. However, this study intends to measure agricultural performance by using the ratio of agricultural output to gross domestic product.

2.1.3   Exchange rate instability

Exchange rate is the price of a country's currency in relation to another country's currency (Akpan, B. L. & Udo, A. B. 2023). Exchange rate instability is defined as the risk associated with unexpected movements in the exchange rate of country. Diala, Kalu and Igwe-kalu (2016) maintained that exchange rate instability is the movements (appreciation and depreciation) in the value of one currency to another. In the context of study exchange rate instability is seen as the upward and downward movements between the currencies of one country as it exchanges for another country's currency. The Nigerian Exchange rate has been highly volatile and have fluctuated widely over the years virtually in all segments of the foreign exchange market (official, Bureau de change and parallel markets). According to Akpan, B. L and Udo, A.B (2023), in the official Market, the exchange rate depreciated from ₦11.08 per US dollar in 1987 to ₦22 in 1994, and was later fixed by federal Government at ₦21.7 per Dollar between 1994 and 1998. It depreciated to ₦ 97.95 per US dollar in 1999, ₦125 between 2000 and 2006, and appreciated slightly to ₦117.97 per US dollar as a result of global financial crisis coupled with the decline in international oil price in 2012. It depreciated further to ₦158.55 in 2014 and to ₦196.49 in 2015, ₦253.19 in 2016, ₦305.30 in 2017 and ₦350 and ₦360 in 2018 and 2019 respectively. In 2020, the exchange rate was N358.8 per US dollar. The exchange rate of the Naira increased from N0.7 in 1971 to N358.per dollar in 2020, growing at an average rate of 19.03%. In October 2021, the exchange rate was N413.7 per dollar.

2.2   Theoretical framework

2.2.1   Lewis growth theory of unlimited supply of labor

Like the classical economists, Lewis (1954) believed that in many underdeveloped economies, an unlimited supply of labor is available at subsistence wage. Economic development takes place when capital accumulate as a result of the withdrawal of surplus labor for the subsistence sector to the capitalist sector. Lewis however, rejected the neo-classical assumption of full employment, market clearance and perfect competition, even though he saw it as a distant goal. He explicitly recognized that not only the owner-operated agriculture but also the urban informal sector, lacking cooperating capital instead of land, was characterized by a system of bargaining rather than cooperative wages.

This theory has undergone several modifications by Ranis and Fei (1961). They have pointed out that Lewis contribute a major way to transit growth theory, to the notion of development phases and sub-phase, en-route to modern economic growth. The Lewis theory is applicable to overpopulated developing countries under certain assumption. But, the model assumption of constant wage rate in capitalist sector until the supply of labor is exhausted from the subsistence sector was refuted. This is unrealistic assumption because the wage rate continues to rise overtime in the industrial sector. However, the most challenging of the assumptions of Lewis growth model is the notion that "labor surplus was interpreted as zero marginal productivity of agricultural labor, a highly unlikely event, statistically or conceptually, and one which was subjected to rigorous attacked by Schultz (1964), who introduced evidence from India to show the withdrawal of a large portion of the agricultural

output. As the industrial sector develops with the transfer of surplus labor, the demand for food and raw materials will rise which will, in turn, lead to the growth of the agricultural sector.

2.2.2 Solow growth theory

Solow (1956) theory of economic growth provides more useful framework for analyzing growth determinants in the agricultural sector. According to Spence (2010), this theory relates to the explanation of the determinant of growth in the production side of the economy. Starting with the idea of production function, where, the quantity of output (Q) in any sector of the economy is a function of the quantity of inputs. These are land and natural resources (NR), Labor (L) and physical capital such as buildings and machines (K).

Q-f (NR, L, K)

This theory goes further to postulate that with detailed data for economy's sub-sectors, it should be possible to explain the growth of output by the increase in quality and quantity of factor inputs. Any residual is attributed to technological change" which this can be attributed to shift in the production function not due to factor inputs. Solow's result challenged previous scholars who had seen savings and capital accumulation as the main determinants of economic growth. Spence (2010) further explains that there are many factors that influence economic growth, and this number increase as the view is expanded from economic growth to include equitable growth and wellbeing. Some of such factors are savings and investment, technological change, human development, innovation systems, economic efficiency, trade and exports, infrastructural and services, governance and security as well as the growth of the agricultural sector.

2.2.3 The rational choice theory

The rational choice theory is propounded by neo-classical economists. The theory, generally, starts with the consideration of the choice behavior of the individual farmers making the decision. The proponents of the rational choice theory believe that the individual making the decision is representative of a group in a financial market, such as farmers. The analysis of rational choice theory of demand for financial services generally); involves a description of the following: (i) the desire for financial services (savings, credit, and the money transfer services) (ii) nature and type of services provided by the financial institutions: (ii) the condition under which these services are provided. The individuals face the problem of choice among services provided by the intermediaries. The approach of the rational choice theory is based on the fundamental principle that the choices made by the individual are the best choice to help him/her to achieve their objectives in the light of all the uncontrollable factors.

This theory has been heavily criticized on the basis that the assumptions made under the rational choice theory fail to take account of the fact that the success of the outcome of a decision is also influenced by the conditions that are not within the control of the individual making the decision. Despite this criticism, the theory has demonstrated a good basis in explaining how individual economic decisions are affected by their attributes. In this regard, this theory is important in explaining access to financial services as the attributes of the individual heavily influence both the demand and supply dimensions of access to financial services.

2.1.4 The Monetary Approach to exchange rate determination

In contrast with the BOP theory of foreign exchange, in which the rate of exchange is determined by the flow of funds in the foreign exchange market, the monetary approach postulates that the rates of exchange is determined by balancing the total demand and supply of the national currency in each country through it balance of trade. According to this approach, the demand for money depends upon the level of real income, the general price level and the rate of interest. The demand for money is the direct function of the real income and the level of prices. On the other hand, it is an inverse function of the rate of interest. As regards, the supply of money, it is determined autonomously by the monetary authorities of different countries.

It is assumed that initially the foreign exchange market is in equilibrium or at interest parity. It is further supposed that the monetary authority in the home country increases the supply of money. This will lead to a proportionate increase in price level in the home country in the long run. It will also cause depreciation in the

home currency as explained by the PPP theory. According to Bailliu and King (2005), the monetary approach to EXCH determination emerged in the literature in the 1970s when industrialized nations began to allow their currencies to float. The first variant of this approach is the flexible price monetary approach which defines EXCH as the relative price of two currencies and posits that EXCH is determined by relative money demand and money supply between the two countries. Key assumptions of this approach include that prices are perfectly flexible, domestic and foreign assets are perfect substitutes, purchasing power parity holds at all times which implies uncovered interest rate parity (UIP) conditions hold, and there is no foreign exchange risk premium.

2.3 Empirical literature

2.3.1 Agricultural credit and agricultural sector performance

Ijaija and Abdulraheem (2000) used regression analysis to investigate the effect of commercial bank credit on the agricultural sector growth in Nigeria using time series spanning data (1980-1996). Bank Credit to Agricultural Sector and Demand Deposit were used as variables for the study. The study shows a positive significant effect on commercial bank credit on the agricultural sector growth in Nigeria.

Ogbanje, Yahaya and Kolawole (2012) evaluated the effect of commercial banks? loan on agricultural Gross Domestic Product (GDP) in Nigeria using time series spanning data (1981- 2007). Ordinary Least Square (OLS) method was used for the analysis. Gross Domestic Product, Agricultural Bank Loan, Broad Money Supply, Interest Rate and Inflation Rate were used as variables. The study shows that commercial banks' loan to the agricultural sector significantly and positively affects agricultural Gross Domestic Product in Nigeria. It recommends that improvement in the agricultural sector will add value to the Gross Domestic Product in Nigeria.

Sunny (2013) used a linear regression model to examine the impact of commercial banks' credit on agricultural development in Nigeria using data for a period of 25 years, (1978-2002). Agricultural Production Index, Commercial Bank Credit to the Agricultural Sector, Agricultural Credit Guarantee Scheme and Agricultural Product Price were used as the variables.

The study shows a positive relationship between government financial allocation to the agricultural sector and agricultural sector growth. It also found that government fund allocation to the agricultural sector has led to a significant positive growth in agricultural sector performance.

Ogbonna and Osondu (2013) employ Two-Stage Least Square regression model to ascertain the determinants of supply of funds and agricultural sector growth in Nigeria for a period of 2 1 years (1992-20 12). Minimum Rediscount Rate, Exchange Rate, Liquidity Rate and Index of Agricultural Gross Domestic Product were used as variables. The findings reveal inconsistent relationship between supply of bank funds and agricultural sector growth.

Aliyu and Yusuf (2013) employed a multiple regression analysis to ascertain the impact of private sector credit on the real sector growth in Nigeria over the period of (1986-20 10). Gross Domestic Product, Demand Deposit, Credit to the private sector and Lending Rate were used as the variables for the study. The study shows a positive significant impact of credit to private sector on the real sector growth in Nigeria.

Oladapo and Adefemi (2015) investigated the sectoral allocation of bank credit and private sector growth in Nigeria over the period, 1986-2010. The study used six variables namely: Gross Domestic Product, Deposits, Investments, Advances, Profitability and Interest Earning: using multiple regression analysis. The results show that only credit allocated to government, personal and professional sectors have significant positive effect on private sector growth in Nigeria.

Fapetu and Obalade (2015) investigated the impact of sectoral allocation of Deposit Money Banks' (DMBs) loans and advances on economic growth in Nigeria. The study covered the intensive regulation, deregulation and guided deregulation regimes. The results obtained showed that only the credit allocated to government, personal and professional had significant positive contributions on economic growth during the regime of intensive regulation. It was discovered however that during the regime of regulation, bank credits generally do not

contribute significantly to economic growth. The introduction of guided deregulation in the economy appears to have been a success as BMBs' loans and advances to production and other subsector were discovered to be both positive and significant in determining growth.

Udoka et al. (2016) examined the effect of commercial banks' credit on agricultural output in Nigeria. Estimated results showed that there was a positive and significant relationship between agricultural credit guarantee scheme fund and agricultural production. This means that an increase in agricultural credit guarantee scheme fund could lead to an increase in agricultural production in Nigeria; there was also a positive and significant relationship between commercial banks credit to the agricultural sector and agricultural production in Nigeria. In addition, the study also confirmed a positive and significant relationship between government expenditure on agriculture and agricultural production. However, the study also showed negative relationship between interest rate and agricultural output in line with theoretical postulations. This is because an increase in interest rate discourages farmers and other investors from borrowing and thus less agricultural investment and output.

Olorunsola, Adeyemi, Valli, Kufre and Ochoche (2017) this paper investigates the relationship between credit to agriculture and agricultural output in Nigeria by means of nonlinear autoregressive distributed lag (NARDL) model using a time series data from 1992Q1 to 2015Q4. Results show no evidence of asymmetry in the impact of credit to output growth in the agricultural sector (positive and negative changes) in the short-run, but different equilibrium relationships exist in the long-run. The dynamic adjustments show that the cumulative agricultural output growth is mostly attracted by the impact of the positive changes in credit to agriculture with a lag of four quarters of the prediction horizon. This calls for the need for a policy on moratorium on credit administration to agricultural sector.

Werigbelegha and Avery (2018) examined the relationship between bank credit and agricultural sector growth in Nigeria using time series data for the period, (1990-2016). Secondary data were used and obtained from Central Bank of Nigeria Statistical Bulletin. Agricultural sector output as proxy for agricultural sector growth and used as the dependent variable; whereas, Broad Money Supply, Credit to the Private Sector, Interest Rate and Inflation Rate as the explanatory variables. The study revealed that all the variables of the study are stationary at first difference. The study showed the existence of at least one co-integrating relationship at 5% level of significance. The study revealed a short-run equilibrium significant relationship between bank credit and agricultural sector growth in Nigeria.

There is no causal relationship between bank credit and agricultural sector growth in Nigeria. The study concluded that bank credit has not significantly contributed to agricultural sector growth in Nigeria. The study recommended that for the economy to grow, the private sector should be encouraged in form of concessional and reduced interest rate. Regulatory authorities should stabilize the interest rate which is capable of ensuring price stability and maintaining inflation to a single digit. This may build confidence in the banking institutions and will enable them to introduce innovations to boost agricultural sector output in the economy. The policy makers should adopt vibrant economic policies such as interest rate stability, flexible exchange rate, indigenization and economic diversification which will encourage the banks in financing the sector.

Adewale, Lawal, Aberu, and Toriola (2022) examined the effect of farmer's credit on agricultural productivity from 1981 to 2016 using data from World Bank Development Index (WDI). The result of the Ordinary Least Squares (OLS) estimation shows that agricultural bank credit exerts a significant positive effect on agricultural output. Bank lending rate and foreign exchange rate do not show a significant effect on agricultural output. It was submitted that bank credit has a significant positive effect on agricultural productivity in Nigeria. The need for government to promote savings and bank credit to farmers was recommended.

2.3.2 Exchange rate instability and agricultural sector performance

Yaqup (2013) investigated the effect of the exchange rate changes on the components of agricultural output using the two-stage least- squares techniques for the period between 1970 and 2008. The obtained result integrating equation at 1%; implying the existence of long run relationship between coca export, agricultural export, exchange rate, trade openness and world price of cocoa. The positive sign of the error correction mechanism of 0.07 suggested that deviation from the long run equilibrium is adjusted over the following time

period by 7%. The t-test showed direct relationship between cocoa export and Exchange rate cum agricultural export, but inverse relationship with trade openness and world cocoa price. The diagnostic test revealed nonexistence of heteroskedasticity and serial correlation in the error term. The paper concluded that agricultural export, exchange rate, trade openness and world price of cocoa taken together affected cocoa export in Nigeria.

Wasiu, and Ndukwe, (2018) investigated the possible asymmetric effect of real exchange rate dynamics on agricultural output performance in Nigeria over the period of 1981 to 2016. The study employed a combination of stationary and non-stationary variables as was found out through the ADF unit root test. Based on the Bounds test for cointegration, a long-run relationship was absent between real exchange rate and agricultural output, irrespective of specifications. The result of model estimation showed that the significant drivers of agricultural output are real exchange rate (log-levels), real appreciation and depreciation (after some lags), industrial capacity utilization rate, and government expenditure on agriculture (after some lags). ACGSF loan exerted positive and insignificant influence on agricultural output.

Adekunle and Innocent (2018) investigated the possible asymmetric effect of real exchange rate dynamics on agricultural output performance in Nigeria over the period of 1981 to 2016 by collecting data from secondary sources. The study employed a combination of stationary and non- stationary variables as was found out through the ADF unit root test. Based on the Bounds test for cointegration, a long-run relationship was absent between real exchange rate and agricultural output, irrespective of specifications.

Generally, the result of model estimation showed that the significant drivers of agricultural output are real exchange rate (log-levels), real appreciation and depreciation (after some lags), industrial capacity utilization rate, and government expenditure on agriculture (after some lags). ACGSF loan exerted positive and insignificant influence on agricultural output. In addition, though the effect of real appreciation was larger than that of real depreciation, the present study could not find any evidence in support of the asymmetric effect of real exchange rate dynamics on agricultural output performance in the Nigerian economy. It is therefore suggested that fiscal and monetary authorities in Nigeria should work in unison at ensuring that the full potentials of the agricultural sector are harnessed for the growth and development of the country.

Gatawa, and Mahımud (2019) analyzed short and long-run impacts of exchange rate fluctuations on agricultural exports volume in Nigeria. ARDL was used as the method of analysis; the independent variables include official exchange rate, agricultural loans and relative prices of agricultural exports while the dependent variable is agricultural export volume. GARCH was used to estimate the volatility of exchange rates, and other diagnostic tests.

The short-run results revealed that official exchange rate and agricultural loans have significant positive impact on agricultural export volumes which has the effect of expanding the dependent variable while, relative prices of agricultural exports have significant negative impact on agricultural exports volume which also has the effect of contracting the dependent variable. The long-run results revealed similar findings with the exception of official exchange rate which has statistically significant negative impact on agricultural exports volume. i.e. contrary to normal expectations.

Charles and Fortune (2019) examined the effect of exchange rate variation on Nigeria economy. The objective was to investigate how Naira exchange rate variations against key currencies affect the country's real gross domestic product. The ordinary least square method was used as data analysis techniques. The study used cointegration, unit root, and granger causality test and error correction estimate to study the dynamic effects of commodity currencies on financial market. The study found that naira exchange rate variation with the currencies can explain 65 percent variation on Nigerian real gross domestic products while the remaining 35 percent estimation can be traced to external variables not included in the model.

Adejumo (2020) structured Nigerian economy has into five interrelated sectors; the agriculture, Industry, construction, trade and services and examine the influence of exchange rate (CBN 2016). Some of these sectors have contributed to the national output and government revenue at different point in time. Different exchange rate regimes implemented in the country have had varying degrees of impact on the performance of the economic sectors. Depending on the foreign exchange component of inputs into the various sectors and the

export earning potential of each sector, sectoral performance has shown high level of sensitivity to exchange rate fluctuations. Fluctuations in exchange rate affect the cost of production in the various sectors of the economy. It is, therefore, not surprising that exchange rate is among the most watched, analyzed and government manipulated macroeconomic indicator as it plays a vital role in a country's level of trade, which is critical for every free market economy in the world. This paper is a review of the performance of the Nigerian economy in the light of the volatility of exchange rates in Nigeria.

Ibekwe (2020) examine the effects of exchange rate on agricultural sector output in Nigeria. The specific objectives are to: Determine the effect of nominal exchange rate on agricultural sector output 'in Nigeria; Examine the effect of money supply on agricultural sector output in Nigeria; Analyze the effect of interest rate on agricultural sector output in Nigeria and determine the effect of inflation rate on agricultural sector output in Nigeria.

To analyze the data, econometric techniques involving Augmented Fuller tests for Unit Roots and the Ordinary Least Square (OLS) were used. The result of regression indicate that nominal exchange rate and money supply has positive and significant effect on agricultural sector output while interest rate and inflation rate had negative and insignificant effect on agricultural sector output. The study therefore concludes that exchange rate have adverse effect on the performance of agricultural sector output and have not helped to improve the rate of investment in agriculture in N Nigeria. The study recommends that; there is need for government to ensure the implementation of policies that growth in will encourage local agricultural order to reduce import, by providing price policy, perfect market and credit facilities to work side by side with crude oil production. Policy makers should make effort to invest heavily to meet local on agriculture in order consumption and export to compete with crude oil for foreign exchange agriculture related input thereby earnings, because a time will come when agriculture will be more viable than Crude oil. To boost agricultural export volume, policy makers should take measures in stabilizing exchange rate from present downward trend since appreciation of exchange rate stimulate (increase) agricultural export output.

Government should also reduce price of agricultural exports (mostly cash crop) indirectly through the provision of fiscal incentives examples, tax free on import of agricultural processing equipment and tax holidays for other reduced the cost of production and price of the products.

2.4   Summary of literature/ research gap

From the review of literature, some of the studies were interested in how agricultural credit impact on agricultural sector performance (Oladapo and Adefemi, 2015 and Adewale, et. aL, 2022), while others were interested in the impact of exchange rate on agricultural sector performance (Gatawa, and Mahmud, 2019 and Ibekwe, 2020). However, none of this study considered the effect of both agricultural sector credit and exchange rate in the same equation, this study intends to achieve that as well as expand the current period to capture happenings in the agricultural sector.

3.0 RESEARCH METHOD

3.1   Research design

This study adopted an ex post facto (after the fact) design. This is because the events had already taken p place before the investigation is carried out. The choice of this design is made because the researcher has no control of the independent variables and inferences about the relationship among the variables (Ndiyo, 2005). A multiple regression analysis is used which is predicated on various econometric techniques such as correlation matrix, descriptive statistics and the Classical Ordinary Least Squares (OLS).

3.2   Model specification

This model is based on the Solow's neoclassical growth theory. The Solow's neoclassical growth model is an extension of the theory of Cobb Douglass explaining that the output or gross domestic product (GDP) depends

on the technology, number of employees, amount of physical capital, the amount of human capital, as well as the amount of natural resources. The theory seeks to explain the relationship that exists between agricultural credit, exchange rate instability and agricultural performance in Nigeria. So, it can be written by the following equation

$$Y = A\, f(L, K, H, N) \qquad\qquad 3.1$$

Where;

f is the function that shows how the inputs are combined to produce output.

A is a variable that indicates the availability of production technology and exchange rate instability. L is the amount of labor. K is the amount of physical capital. H is the amount of human capital, and N is the number of natural resources.

$$AGDP = f(ACGSF, CBCA, EXR, ARLAND, GEXP, LAB) \qquad 3.2$$

The models in equation 3.1 can be written in a linear form as follow.

$$AGDP, = \beta_0 + \beta_1 ACGSF + \beta_2 CBCA + \beta_3 EXRr + \beta_4 ARLAD, + \beta_5 GEXP +$$

$$\beta_6 LAB: + u \qquad\qquad 3.3$$

In the log-form, the model is present as;

$$Log(AGDP) = \beta_0 + \beta_1 log(ACGSF) + \beta_2 Log(CBCA) + \beta_3 Log(EXRr) + \beta_4 Log(ARLAD) + \beta_5 Log(GEXP) + \beta_6 Log(LAB) + u \;\; 3.4$$

Where;
AGDP   =   Agricultural performance (measured as the ratio of agricultural output to   GDP)
ACGSF   =   Agricultural credit guarantee scheme fund.
CBCA   =   Commercial bank credit to agriculture
EXR   =   Exchange rate measured in percentages
ARLAD   =   Agricultural arable land
GEXP   =   Government expenditure measured in billion naira
LAB   =   Labour force measured in millions
U   =   Error term
Bo, B1, B2, B4 and Bs >0 while B3,Bo <0

3.3 Description of variables and a priori expectation

Agricultural sector performance (AGDP): Agricultural sector performance is the value of production at constant prices and at current prices. It focuses on the measurement of the whole sector (agriculture) and its sub-commodity groups (crops, livestock, poultry and fisheries) and commodities. It is the dependent variable in the study.

Agricultural credit guarantee scheme fund (ACGSF): The ACSS is an initiative of the Federal Government and the Central Bank of Nigeria with the active support and participation of the Bankers Committee. The Scheme has a prescribed fund of N50.0billion. ACSS was introduced to enable farmers exploit the untapped potentials of Nigeria's agricultural sector, reduce inflation, lower the cost of agricultural production (i. e. food items), generate surplus for export, increase Nigeria's foreign earnings as well as diversify its revenue base. At national level, the scheme operates through a Central Implementation Committee (CIC) while at the Federal Capital Territory (FCT) and State levels, the Scheme operates through State Implementation Committees (SICs) instituted to ensure that the objectives of the scheme are realized without hindrance. It is expected to have a positive impact on agricultural sector performance in Nigeria.

Commercial bank credit to agricultural sector (CBCA): Commercial bank Credits are loans obtained by a farmer from the commercial banks start or expand his farming business. It may be in kind or cash. Credits are payable over a period of time with some interest determined by the source of the credits. Before credit is given

out to a farmer, the lender needs detailed information about the borrower. It is expected to have a positive impact on agricultural sector performance.

Exchange rate (EXR): An exchange rate is a rate at which one currency will be exchanged for another currency. Most exchange rates are defined as floating and will rise or fall based on the supply and demand in the market. Some exchange rates are pegged or fixed to the value of a specific country's currency. In Nigeria, exchange rate continuously fluctuates and is unstable, this shows the instability in Nigeria's exchange rate. Its impact on dependent variable is either positive or negative in Nigeria.

Agricultural arable land (ARLAD): Arable land is the land under temporary crops, temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (for less than five years); and land under permanent crops is the land cultivated with crops that occupy the land for long periods and need not be replanted after. Its impact on the dependent variable is positive.

Labour force (LAB): Labour force comprises all persons who fulfil the requirements for inclusion among the employed (civilian employment plus the armed forces) or the unemployed. Large population will have a large labor force in producing goods and services. Its impact on agricultural sector performance may either be positive or negative.

3.4 Estimation techniques

The study adopts the Quantitative Econometrics Analysis using the Scientific Method of Ordinary Least square (OLS) regression technique to determine the impact of agricultural credits and exchange rate instability on Economic development in Nigeria using time series data from 1981-2019.The reason for employing the classical Ordinary Least Squares (OLS) is that of all classes of estimators, the Ordinary Least Squares (OLS) is the Best Linear Unbiased Estimator (BLUE) and it has minimum error. Therefore, the empirical findings of this study will be analyzed using three criterions, namely, economic a priori criterion, statistical criterion and econometric criterion:

3.4   Data and Source

Data used for this study were sourced from Central Bank of Nigeria Statistical bulletin and National Bureau of Statistics from 1981-2021. These are time series data of macroeconomic variables defined in the specified model in equation 3.1.

4.0 Empirical Results
4.1 Presentation and Analysis of Estimated Results
4.1.1 Unit Root Results
Table 4.1: ADF Unit Root Results

S/N	Variable	T-Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Level of Integration
1	AGDP	13.51822	-3.605593	-2.936942	-2.606857	I(0)
2	EXCH	2.714011	-3.605593	-2.936942	-2.606857	I(0)**
3	ACGSF	-7.157253	-3.610453	-2.938987	-2.607932	I(I)
4	ARLAD	-3.647836	-3.605593	-2.936942	-2.606857	I(0)
5	LAB	3.351885	-3.615588	-2.941145	-2.609066	I(0)
6	CBCA	6.165431	-3.639407	-2.951125	-2.614300	I(0)

Source: computed by the Author, 2023

The result of unit root test shown in Table 4.1 shows that all the macroeconomic variables in the estimated model are integrated at same level except Agricultural Credit Guarantee Scheme Fund (ACGSF) which is integrated at first difference I(I). Since all the variables are not integrated at the same level of integration then the study can't make used of Johansson co-integration method for co-

integration analysis. Rather, we make use of the Engel Granger two stage procedures for determining if there is a long run relationship existing among the variables in the specified model. Table 4.2 presents the result of the co-integration analysis.

4.1.2 Co-Integration Test
Table 4.2: Engel Granger Co-Integration test Result

Variable	T-Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Level of Integration
ECM	-3.073402	-3.605593	-2.936942	-2.606857	I(0)

Source: computed by the Author, 2023

From the result of the Engel Granger co-integration test, it is shown that there is a long run relationship between the variables in the estimated model as the residuals of the OLS regression of the model is integrated at level at 5 per cent level of significance. Therefore, the macroeconomic variables in the model are co-integrated. The next analysis is to estimate the specified equation using ordinary least square (OLS) method. The result of this analysis is presented in Table 4.3.

4.1.3 Regression Result

Table 4.3: OLS Estimated Result
Dependent Variable: LOG(RGDP)

VARIABLE	COEFFICIENT	T-VALUE	PROBILITY
C	-161.7349	-5.114985	0.0000
LNLAB	8.975809	4.739313	0.0000
EXCH	-0.005470	-3.747790	0.0006
LNCBCA	0.111117	0.697119	0.4903
LNARLAD	0.724424	1.787846	0.0825
LNACGSF	-0.021943	-0.244976	0.8079
R^2	0.991465	F-STATISTIC	813.1609
ADJUSTED R^2	0.990246	DW	1.901792

4.2 DISCUSSION OF FINDINGS
The estimated regression result presented above indicates that the estimated regression line has a negative intercept represented by the constant term. This means that holding all other factors constant there will be an autonomous decrease in the level of agricultural performance in terms of agricultural output in the Nigerian economy.

The sign of the coefficient of exchange rate shows that there is an indirect relationship between exchange rate and agricultural output in Nigeria. This implies that an appreciation of the exchange rate in the international market will cause an elastic decrease in the level of agricultural output in Nigeria by 0.005. This is shown in the negative coefficient of exchange rate (EXCH) in the estimated model. According to the estimated result labour force (LAB) has a positive coefficient with agricultural output. This means that when there is increase in the work force, this will cause the agricultural output to increase by 8.98 per cent. This is in line with the economic theory of production. According to the theory of production, an increase in the labour force as one of the factors of production will cause a corresponding increase in the level of total productivity. Also, from the estimated result it is revealed that commercial bank credit to agricultural sector (CBCA) has a direct effect with the level of agricultural output in the Nigerian economy. However, agricultural credit guaranty scheme fund in the estimated result has an indirect effect on the level of agricultural output in Nigeria. The coefficient of

agricultural arable land (ARLAD) has a positive impact on agricultural output in the country. This explains that when an increase in agricultural arable land will cause an elastic increase in the agricultural output by 0.7.

The t-statistic values in the estimated result show that only two of the explanatory variables in the model are statistically significant given that their t-statistics values are greater than 2, while three others are not statistically significant in the estimated model.. The adjusted R^2 value of 0.99 indicates that about 99 per cent of the total variation in the Nigerian agricultural sector is explained by the estimated model while only 1 per cent of the changes in the sector are cause by variables outside the model (ie error term). This shows a very high coefficient of determination and hence goodness of fit on the data and high explanatory power. The F-statistic value of 813.16 at 5 per cent level of significance shows that the overall model is statistically significant.

Also, the Durbin-Watson statistical value of 190 falls within the region of negative autocorrelation. This implies that there is no autocorrelation existing within the variables in the estimated model. Therefore, the result can be used for policy formulation in the economy.

5.0 SUMMARY, RECOMMENDATION AND CONCLUSION
5.1 Summary
This study was conducted to examine the impact of agricultural sector credit, exchange rate instability on agricultural sector performance in Nigeria. The time scope of the study was from 1981 – 2021. In examining these nexus, this study formulated three research objectives which are;
i) Determine the existing relationship between agricultural credit guarantee scheme fund and agricultural sector performance in Nigeria.

ii) Examine the effect of exchange rate on agricultural sector performance in Nigeria.

ii) Determine the effect of commercial bank loan to agricultural sector on agricultural sector performance in Nigeria.

In order to achieve these objectives a multiple regression models was estimated using the ordinary least square (OLS) method. The model had agricultural output as a proxy for agricultural sector performance as the dependent variable while commercial bank credit to agriculture, exchange rate, agricultural credit guarantee scheme fund, and labour force as well as agricultural arable land were the independent or explanatory variables.
The study found that exchange rate has a negative impact on agricultural performance in Nigeria. Agricultural credit guarantee scheme fund also had a negative impact on agricultural output in Nigeria. This could be attributed to corruption in the country's institutions. However, commercial bank credit to agriculture has a positive impact on agricultural performance in Nigeria.
5.2 Conclusion
The study was to investigate the relationship agricultural sector credit, exchange rate instability on agricultural sector performance in Nigeria within the period 1981-2021 using a quantitative approach. The analysis showed that the macroeconomic variables employed have high and obvious effect on economic growth proxy by real gross domestic product in the model specified. This is seen in the high coefficient of determination and the F ratio of the entire model specified. The D.W shows that the functions are stable and therefore good for economic policy making
The analyses have shown that exchange rate in Nigeria has a significant negative impact on agricultural sector performance. It also shows that agricultural credit guarantee scheme fund has a negative impact on agricultural output in Nigeria while commercial bank credits to agricultural sector has a positive impact on agricultural output in Nigeria.

5.3 Recommendations

Based on the findings of this work the following recommendations have been made:

    i.   Monetary authority should ensure the stability of the country's exchange rate (Naira) since exchange rate depreciation affects agricultural output negatively..

  ii. There is also need for a policy on moratorium on administration of Agricultural credit guarantee scheme fund to agricultural sector. In other word, beneficiaries of agriculture credit should be given a one year grace period before commencement of repayment.

iii. In order to achieve a high level of growth in the agricultural output, the Nigerian government should encourage commercial banks to increase credit to agricultural sector as these credits promotes agricultural output growth in Nigeria.

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APPENDIX

Dependent Variable: LOG(AGDP)
Method: Least Squares
Date: 10/10/23   Time: 12:09
Sample: 1981 2021
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(ACGSF)	-0.021943	0.089573	-0.244976	0.8079
LOG(ARLAD)	0.724424	0.405194	1.787846	0.0825
LOG(CBCA)	0.111117	0.159395	0.697119	0.4903
EXCH	-0.005470	0.001459	-3.747790	0.0006
LOG(LAB)	8.975809	1.893905	4.739313	0.0000
C	-161.7349	31.61982	-5.114985	0.0000

R-squared	0.991465	Mean dependent var		7.300383
Adjusted R-squared	0.990246	S.D. dependent var		2.535542
S.E. of regression	0.250418	Akaike info criterion		0.203092
Sum squared resid	2.194829	Schwarz criterion		0.453859
Log likelihood	1.836610	Hannan-Quinn criter.		0.294408
F-statistic	813.1609	Durbin-Watson stat		1.901792
Prob(F-statistic)	0.000000			