FARM CREDIT INFLUENCE ON AGRICULTURAL SECTOR PERFORMANCE IN NIGERIAN ECONOMY

By

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ABSTRACT

Agriculture is the dominant sector and main stay of Nigerian economy. Farm credit is considered as a factor of production that could facilitate production in the sector. The study examines the dynamic relationship between farm credit and agricultural sector. Time series data (1987 – 2016) for the study was obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and Annual reports, National Bureau of Statistics (NBS), World Bank Statistics and International Institute for Tropical Agriculture (IITA Ibadan). The sample points (1987-2016) were purposively chosen for the study because 2016 was a year of recession for the economy particularly agricultural sector. Data collected were analyzed using single equation regression (bivariate) model to estimate the parameters. Descriptive and inferential statistics were used to analyze the data. The coefficients of determination R^2 for linear and log linear (exponential) were 40% and 27% to explain variability in the variables. The correlation coefficient $(r = -0.46, p = 0.01)$ reflected a negative relationship between farm credit and agricultural real gross domestic product. The findings indicated that agricultural real gross domestic product had a sluggish average growth rate of 31.86% and output expansion path in the sector remained inelastic. Conclusively, farm credit had negative impact on the agricultural sector performance, therefore the study recommended that supply, allocation, and disbursement of farm credit to agricultural sector must be monitored. Delay effect in the delivery of farm credit must be avoided. Moreover, cost of borrowing funds by operators in the sector must be mitigated with low interest rate regime and less conditionalities.

Key words*:* Agriculture, Farm credit, Gross Domestic, Product, Value-added.

Introduction

The importance of agricultural sector to national economy cannot be over emphasized. Successive governments in Nigeria since independence in 1960 have pursued the policy of structural transformation of agricultural sector by altering the pattern of production and consumption in the sector through agricultural credit financing. Fakayode et al. (2009) reported that the crucial role of credit in farming made successive governments in the country to implement several agricultural credit programs under

Development Finance Institutions (DFIs) such as Nigerian Agricultural Cooperative and Rural Development Bank and other credit schemes. Khan (2018) claimed that farmers in developing world are very poor and without credit agricultural development is impossible. That there should be increased supply of credit in developing world, free interest loans for farmers and tight monitoring cell for credit checking by government. Semin (2018) posited that importance of farm credit is seen as a way of increasing investments, attractiveness of industries and businesses in agro-industrial production.

Agricultural Gross Domestic Product (AGDP) has been on decline due to the overbearing influence and near absolute dependency of the economy on the oil sub sector. NBS (2013) and CBN (2014b) reported that the sectoral growth rate of agricultural sector to Gross Domestic Product (GDP) at (1990=100) and 2014 rebase figures at constant prices rose from 3.0% in 1990to 7.4% in 2007. NBS (2016), CBN (2016b) and (CBN, 2016e) reported that agricultural sector net percentage contribution to real GDP in 2014 was 24.18% dropped to -0.65% in 2015 but rose to 20.48% in 2016 and 28.8% in 2017. This showed a sluggish performance of the sector in terms of output and value chain to the Gross Domestic Product (GDP). Nwankwo (2013) observed that the index of real agricultural sector GDP showed a complete absence of any substantial growth to the national economy (i.e. real GDP) in recent time. This is because economic growth is the measurement of the annul percentage increase in real gross domestic product over a certain period, which is the long run productive capacity of the economy (Olowofeso et al, 2015).

Governments in Nigeria have become grossly disturbed about the level of gyration in agricultural output which is characterized with boom-burst cycle in the level of seasonal output (Sanusi, 2010). The recent downturn in the oil subsector of the economy Nigerian agriculture presents alternative option and signpost for economic diversification (Shitu, 2017). Farm credit is the central key and forms an integral part of the process of modernization of agriculture and commercialization of the rural economy (Abdullah et al., 2009). Decline in agricultural production in Nigeria began with advent of the petroleum boom in the early 1970s and the inconsistencies of government policies have turned agriculture unattractive. Therefore, credit is an important aspect of financial intermediation that provides funds to those economic entities that can put them into the most productive use (Bada, 2017). Overall, most governments in tropical African countries have been compelled to intervene in the economy with a view to fostering

agricultural growth and development. Downey (2021) stressed that farm credit is crucial and essential sources of fundings for agribusiness and agricultural industry. To ensure sustainable and profitable farming system, successive governments in Nigeria have been very supportive of farm credit system in agriculture and establishment of research institutes and Development Finance Institutions (DFIs) such as Funds for Agricultural Finance in Nigeria. Bada (2017) indicated that total banks' credit to agricultural sector from 2001 to 2010 and 2014 rose from N55.8 billion naira to N128.4 billion naira in 2010 and to N1, 212.80 billion naira in 2014. According to MBP (2016) and BUDGIT (2016) observed that economic recovery and growth plan of the Federal Government incentivized agricultural sector in the national budgets towards increased output and value chain to the tune of N68.15 billion naira in 2015 and 2016 respectively. The total recurrent expenditure including farm credit/supplies was to the tune of N53.81 billion naira and capital expenditure to N263.1billion naira in 2017 national budget (NBS, 2017). Olowofeso et al. (2017) said commercial banks are used by government as the main driver of the steady growth of credit to agricultural sector.

Despite the huge investment in Nigerian agriculture by government in form of farm credit for farmers, how much of these funds have translated into increased food security for the nation, enhancing local consumption, produce for exports, employment, wealth for citizens and beefing up agricultural sector net contribution to Gross Domestic Product (GDP)? The challenges of the sector have been the unparallel increase in food importation to meet domestic consumption due to neglect of the sector. Nigerians have more concern for imported food items than local production. Food importations in Nigeria are majorly staple food items ranging from rice, wheat, fish, and poultry products to sugar, milk and tomato paste. Thibiebi (2018) reported that Nigeria government spends a whopping sum of$22 billion (U.S.A Dollars) annually on food importations. Emefiele (2018) also reported that $665.4million (U.S Dollars) was spent monthly on rice, fish, milk, sugar and wheat as food import bills. Farmers' access to farm credit is sometimes impaired by inadequate collaterals and administrative bottle necks of credit agencies and financial institutions which could result into production delays. Other challenges include a high cost of borrowing funds by farmers which constitute a major threat to agricultural production thereby creating dis-incentives to greater production. NBS (2019) reported that banks' loans (farm credit) to farmers hit N2.2 trillion naira in 2018. It is against this backdrop that the

study investigates the farm credit influence on the agricultural sector performance in Nigeria with specific objectives as follows:

- To investigate the dynamic relationship between the farm credit and agricultural real gross domestic product at value added (ARGDP).
- To examine the impact of farm credit on agricultural output sector performance.

Hypotheses

Null Hypotheses (H_o)

i. Farm credit does not influence growth in Agricultural Real Gross Domestic Product (ARGDP).

ii. Agricultural Real Gross Domestic Product (ARGDP) does not influence growth in Real Gross Domestic Product (RGDP)

Farm credit is important in meeting the production, harvest, conservation, distribution and value- added objectives and requirements in the agricultural sector. The study would help policy makers within the context of Nigerian economy to formulate appropriate macroeconomic policies to support sustainable growth and development in agricultural production.

LITERATURE REVIEW

Conceptually, farm credit could be referred to as agricultural credit. Downey (2021) put forward that farm credit is the process of "providing agricultural industry with resources including financial products both to rural communities and agribusiness industry" to purchase farm inputs and boost production. Eze (2010) emphasized the importance of credit or capital in agricultural production by saying that low funds were available for activities considered vital for promoting agricultural productivity thereby leading to pro-poor growth in basic and applied agricultural research, extension services, capacity building and agribusiness development in the sector.

Concepts of Agriculture, Economic Growth, Development, Output, and Performance

According to Ishola (2018) explained that agriculture involves productive activities relating to growing of crops, raising of animals/poultry (livestock), fishing and forestry for economic purposes. Hence agriculture is made up of four major productive activities which are: crop, livestock, fishing and forestry production. Economic Growth is an increase in the inflation-adjusted market value of goods and services produced by an economy over time and measured as the percentage rate of increase in real gross domestic product (Wikipedia,2020). Ishola (2018) referred to economic growth as sustained increase in

the output of goods and services per head or increase in the total volume of production of goods and services of a country while economic development is an increase in real output accompanied by changes in the economic structure and institutions as well as social, economic, and material lives of the people. Agricultural growth refers to market value or monetary value of a sustained increase in the expansion of agricultural gross domestic product or output over a period. Agricultural growth is recognized as an important instrument for poverty reduction and food security. Alain and Sadoulet (2010) observed that agricultural GDP growth induced income growth among the 40% poorest class of the people in the economy and promote growth leakage effects on the rest of the economy. Agricultural output on the other hand, refers to physical expansion in agricultural yields and productivity. It is the gross value production (GVP). Agricultural productivity refers to the physical relationship between quantity produced (output) and the quantity used during production (inputs). It is measured as the ratio of agricultural output to inputs (Farmer's Weekly, 2017). Agricultural performance relates to growth in the agricultural value added (AGVA) to Gross Domestic Product (GDP). Agricultural sector performance measures the percentage contribution of agricultural gross domestic product at value added to real GDP. Gardner (1996) reported that agricultural performance relates to growth rates of agricultural value added (AGVA) and that the rate of expansion and contraction of agricultural value added per capita is associated with Gross Domestic Product (GDP). This is supported by (Batrancea, 2021) that economic growth and performance is a nation's wealth increase over time.

Theory of Economic Growth and Development

Development economists such as Lewis (1954); Rostow (1960); and Johnson (1969) as cited in Salihu (2016) observed that investment is a fundamental factor in the growth process. According to them, economic growth could be brought about principally by labour, capital and total factor productivity which include human capital, social capital, governance, infrastructure capital, natural capital and knowledge capital. Classical growth theory of Smith (1776) and Ricardo (1817), both argued that sources of output growth in an economy are determined by capital accumulation, supply of land, growth of labor force, change in institutions and technological know-how while endogenous theory argued that the physical capital and knowledge capital are main determinants of economic growth With W.W Rostow model (1960) various agriculture polices of the

government past and present have met and satisfied the Rostow paradigm of development. That is condition for "pre-take off" stage which is the transitional. However, to Rostow, the take-off stage is the most essential stage in the life of the society when growth becomes normal condition. Equally Arthur Lewis model (1954) of economic development based on structural change theory with a prior statement that "industries cannot grow if agriculture remains stagnant" is premised on the fact that agricultural development is a necessary pre-condition for overall economic development of a nation. The neo-classical theory of Solow (1956) and Swan (1958) posited that growth in output is a function of growth in input factors such as capital, labour and technological progress. Leontief input-output theory (1953) where it explained that inputs of one major sector is regarded as output of another major sector of the economy (linkage effects).

Classical Theory of Loanable Funds and Financial Repression Theory

The supply of loanable funds comes from savings and the demand for loanable funds comes from investment (e.g. credit supply into agricultural sector). According to Palfreman and Ford (1984) the loanable funds theory states that the prevailing rate of interest at any one time represent an equilibrium price at which the demand for credit, from those who prefer to have the goods now, will equal the supply of loanable funds from those who prefer to have the interest. McKinnon (1973) and Shaw (1973) put forward that repression of interest rate, cash ratio, reserve ratio and credit administration and control are detrimental to financial sector development, economic growth and performance. Interest rate ceiling below market equilibrium rate reduces savings, suppresses loanable funds and investments consequently lowering of economic growth. Shaw (1973) linked a low interest rate ceilings and underdeveloped financial system results into poor allocative efficiency of credit but a higher interest rate and minimal government intervention in the financial system will raise allocative efficiency as well as savings.

Keynesian Perspective of Demand for Money

The theory of demand for money was pioneered by Keynesian monetary economists believed that income size, wealth of individual and rate of interest are important parameters that affect the demand for money. The monetary economists stressed that there is a direct relationship between wealth and demand for money (Jhingan, 2006). Keynesian theory of demand for money stated that demand for money falls within the realm of liquidity

preference. Keynes (1936) explored the basic fact that makes individual prefer liquidity to holding wealth in non-liquid assets. The demand for money according to Keynesian analysis rest on three (3) basic motives.

(i) Transactions motive (daily business of life)
(ii) Precautionary motive (unforeseen circumstanced) and
(iii) Speculative motive (investments).

Empirical Review

Izuchukwu et al (2022) examined causal relationship between guaranteed loans by ACGSF and agricultural output in Nigeria and findings showed that there was positive impact of guaranteeing agricultural credit (ACGSF) on agricultural output using ordinary least square regression. Sulaimon (2021) used a threshold regression analysis to evaluate the thresholds of ACGSF on agricultural performance and reported an insignificant result in terms of U- shaped relationship between agricultural real GDP and ACSGF. Uzowulu et al (2007) studied the influence of credit policies on institutional lending behavior of farmers in Cross River State, showed that there was a positive but inelastic relationship existed between credit financing and agricultural output and that farmers' demand for credit was influenced mainly by the availability of credit subsidies and availability of guarantees. (Ugwu, 2010) observed that statistical significance relationship existed between bank credit and the agriculture output.

Ozoali and Madueme (2018) conducted the impact of ACGSF on food crop production by small holders in south Nigeria and reported there was a significant impact of agricultural credit guarantee on food crop production in the region. Zakaree (2014) in his study of the impact of agricultural credit guarantee scheme fund (ACGSF) on domestic food supply in Nigeria reported that domestic food supply cannot be said to follow the same trend as credit facilities extended to agricultural sector by institutional lenders but concluded that there was a negative trend between domestic food supply (i.e. agricultural production) and agricultural credit facilities into agricultural sector. Olowofeso et al. (2017) also said there was no asymmetrical impact of credit elasticity to real agricultural output growth (ARGDP) overtime in Nigerian economy in short run. Adeyinka et al. (2015) used multiple regression OLS to examine the contribution of commercial banks in agricultural financing in Nigeria and concluded that agricultural output was negatively affected though credit distribution. Salihu (2016) observed that reduction in rate of investment affects steady growth in

agriculture and the overall performance of the economy.

METHODOLOGY

Quantitative data for the study were collected from secondary sources using Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and World Bank official and annual published time series data on macroeconomic variables from 1987 to 2016. The specific data of interest for the study include:(i) Statistics of yearly farm credit disbursements by institutional lenders. (ii) Statistics of yearly Gross Domestic Product (RGDP) at constant prices. Annual statistics of contributions of Agricultural Real Gross Domestic Product at value added (constant prices). (iii) CBN Statistics of yearly interest rate regime for agricultural credits in the economy. In carrying out the analysis of data, Ordinary Least Square (OLS) estimation technique was used. Linear and log linear (exponential) functional forms were found to provide goodness of fit to estimate agricultural sector performance (Enya and Bime, 2007) and (Uzowulu*et* al., 2007). Other diagnostic tests such as F- test, Breusch-Godfrey LM serial correlation test, Breusch-Pagan-Godfrey heteroscedasticity test, Normality test, Co-integration test and Augmented Dickey Fuller Unit Root test techniques were used. Analytical methods of descriptive and inferential statistics were adopted, involving the use of correlation [Pearson Moment Coefficient of Correlation (r)] to estimate the behaviour of the variables.

Theoretical Framework

The investigation of farm credit influence on agricultural sector performance is premised on the classical and neo-classical theory as discussed in the empirical literature on economic growth with respect to this study. The theoretical justification and rationale of importance of agricultural productivity, output and financial liberalization of agricultural credit financing were being examined through classical and neoclassical models of Fei and Ranis (1961) and McKinnon (1973) Shaw (1973) financial repression theories. Fei and Ranis (FR) model explained that increased agricultural productivity can complement the development of the industrial sector and the need for other sectors of the economy to grow mutually inclusive. The model further posited that agricultural -industrial interdependency and connectivity are strongly required to speed up economic growth. This model is relevant to this study because it emphasized that the growth of agriculture is importance as the growth of industry and that there should be a balanced growth between agricultural and industrial sectors cum other sectors of the economy. McKinnon and Shaw models stated that financial repression of interest rate, cash

ratio, reserve ratio and credit administration control is detrimental to financial sector development and economic growth. McKinnon (1973) posited that interest rate ceiling below market equilibrium rate reduces savings, suppresses loanable funds and subsequently hamper financial development and economic growth rate of the nation. Shaw (1973) also believed that low interest rate ceiling and underdeveloped financial system results in poor allocative efficiency of credit but higher interest rate ceiling and minimal government intervention in the financial system will raise allocative efficiency, savings, investment and economic growth.

Model Specification

(a) Linear Functional Model

The implicit equation is structurally specified below:

$AGVA = f(Fc)$ ---------- (1)

Where:

$AGVA =$ Agricultural Real Gross Domestic Product at Value Added (AGVA) measured in billion naira and in percentage (%) contribution to the RGDP.

$(Fc) =$ Farm Credit of commercial banks and other institutional lenders measured the loans and advances of commercial banks and other financial intermediaries into agricultural sector in billion naira.

The explicit equation of linear model is specified below:

$AGVA_t = \beta_o + \beta_1 Fc_t + \mu_t$---------- (2)

$\beta_o =$ is the autonomous intercept of the model.

β_1 is the Parameter of the regression.

$\mu_t =$Stochastic Error term

(b) Exponential Function (Non – Linear Model)

Uzowulu et al. (2007) and Olayemi (1998) pointed out that log linear functional form (exponential) is more realistic, and that elasticity of errors is reduced when used.

Implicit equation

$RGDP = f(ARGDP)$---------- (3)

Where:

$RGDP =$ Real Gross Domestic Product at constant prices. Real Gross Domestic Product (RGDP) is considered as proxy for the economic growth and measured in billion naira.

$ARGDP =$ Agricultural Real Gross Domestic Product at constant prices.

Explicit equation

By logarithmic transformation led to log linear relationship as stated below

$In(RGDP_{t)} = \beta_o + \beta_1 ARGDP_t + \mu_t$ ---------- (4)

Where:

$In(RGDP_t) =$ Natural logarithm of Real Gross Domestic Product at constant prices.

β_o = autonomous intercept of the model.

β_1 = Parameter of the regression model

$ARGDP_t$ = Agricultural Real Gross Domestic Product at constant prices

μ_t =Stochastic error term.

Equations 1 and 2 measured relationships between farm credit and agricultural real gross domestic product at value added while equations 3 and 4 examine the influence of agricultural real gross domestic product on real gross domestic product to determine the sector performance.

A- priori Economic Expectation

If $\beta_1 > 0$, it implies that there is a positive relationship and exponential growth process between the Agricultural Real Gross Domestic Product at value added (i.e. AGVA.) and farm credit (FC) investment in agriculture.

$\beta_1 > 0$, it also implies that Agricultural Real Gross Domestic Product (ARGDP) positively influenced Real Gross Domestic Product (RGDP).

RESULTS AND DISCUSSION

To Investigate the Dynamic Relationship between Farm Credit (FC) and Agricultural Real Gross Domestic Product (ARGDP)

Research objective 1 for this study is to investigate the relationship between farm credit and agricultural real gross domestic product (ARGDP)

Table 1

Pearson Correlation Farm Credit and Agricultural Real Gross Domestic Product

	Farm Credit (FC)	Agricultural Real Gross Domestic Product (ARGDP)
fc pearson correlation Sig. (2-tailed) N	1 30	- 0.46* .01 30
argdp pearson correlation Sig. (2 – tailed) N	- 0.46* .01 30	1 30

*Correlation is significant @ the 0.05 level (2- tailed)

Author's Computation, 2018

Based, on table 1 the result showed a negative [coefficient (r) -0.46] relationship between the farm credit and agricultural real gross domestic product. This is shown by negative correlation coefficient value (r= $-0.46, P = 0.01$ indicating a weak or poor linear relationship/association between Farm

Credit and Agricultural Real Gross Domestic Product at value added (ARGDP). The correlation coefficient value (r)=− 0.46 was within the coefficient range (-0.1 to -0.9) less than 0.5 significance level. This meant that the strength of relationship between farm credit and agricultural real gross domestic product was negatively significant and poorly or weakly or lowly correlated. This result is at a variance with many empirical studies such as Imoisi et al. (2012), Emecheta and Ibe (2014), Olowofeso et al. (2015), Nnamocha and Eke (2015), Udoka et al. (2016) and Chinweoke et al. (2015) as cited in Bada (2017), that loans and advances of banks to agricultural sector have a significant impact on economic growth.

To Examine the Impact of Farm Credit on Agricultural Output Sector Performance

Research objective 2 for this study is to examine the impact of farm credit on agricultural real gross domestic product on one hand and the impact of agricultural real gross domestic product on real gross domestic product on the other hand. Trend and regression analyses were applied.

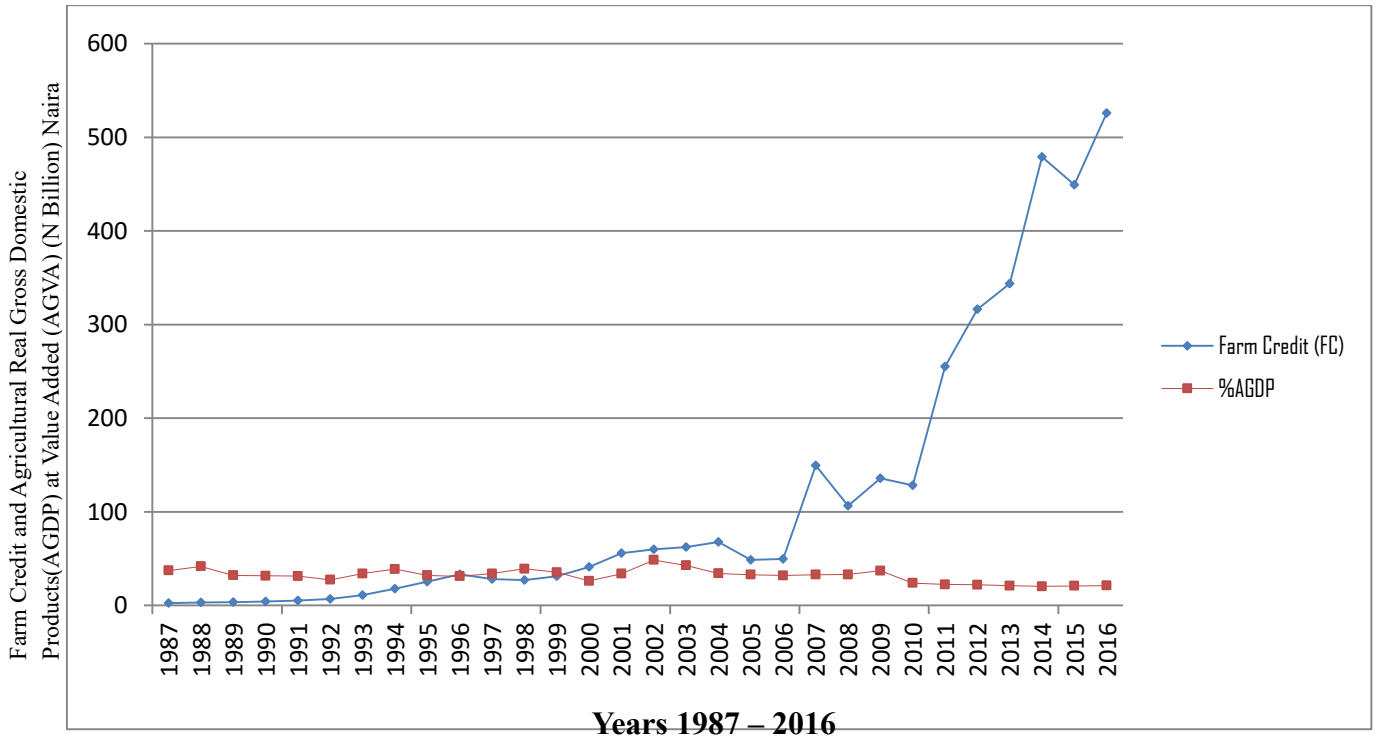


Figure 1. Trend Analysis Showed Relationship Between Farm Credit (FC) and Agricultural Real Gross Domestic Product at Value Added.

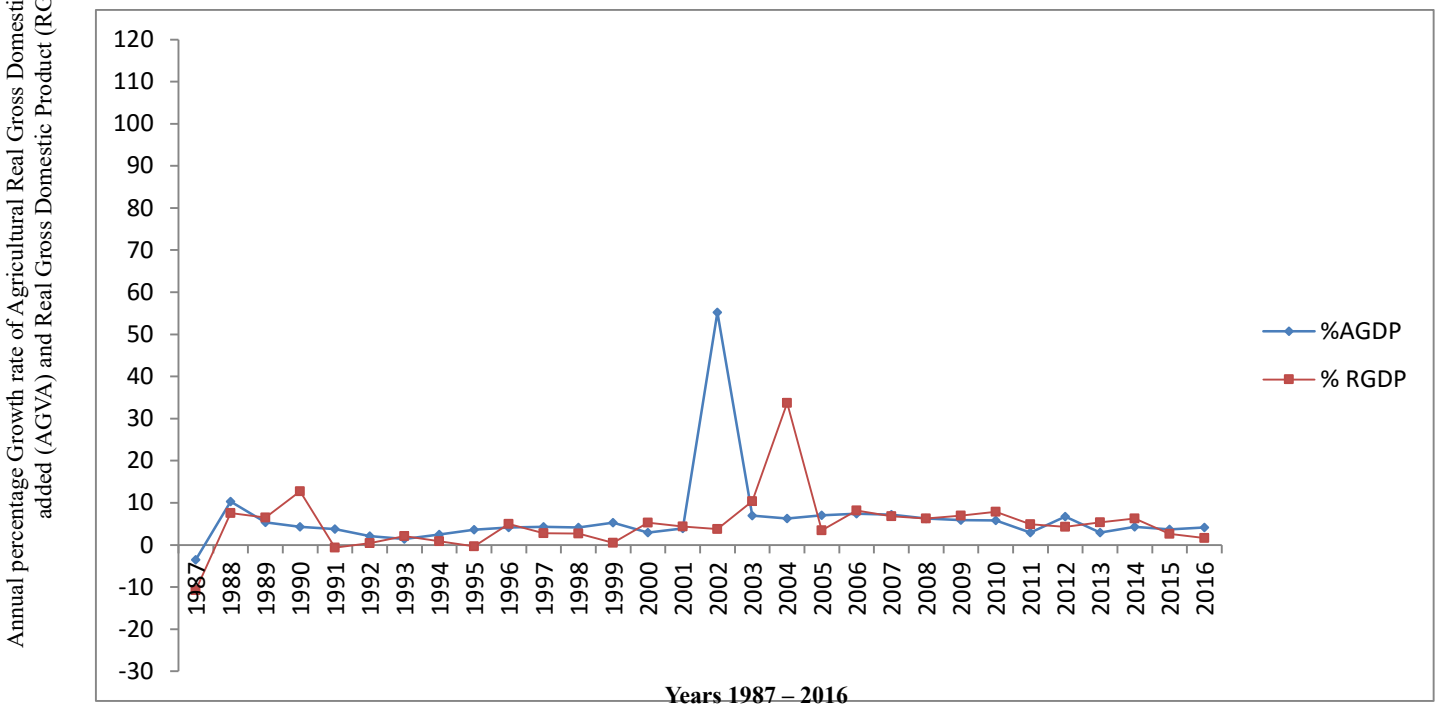


Figure 2. Trend Analysis of Percentage Growth Rate of Agricultural Real Gross Domestic Product and Real Gross Domestic Product.

Figure 1 showed interacting relationship between the farm credit and agricultural real gross

domestic product at value added while figure 2 showed percentage contribution of agricultural real gross domestic product influence on real gross domestic product. Figure 1 evidenced an increasing trend in the value of farm credit resulting from massive injection of intervention funds to stimulate growth in the sector, but agricultural real gross domestic product exhibited a decreasing trend. Farm credit investment increased from 2.5billion naira to 525.9 billion naira between 1987 and 2016 while agricultural real gross domestic product at value added increased at decreasing rate from 1987 to 2016 and recorded less than 100 billion naira in value over the period.

Figure 2 revealed both annual percentage growth rates in agricultural real gross domestic product in relation to real gross domestic product. The trend analysis reflected a steady close rank between agricultural real domestic product and real gross domestic product from 1987 to 2001. However, the percentage growth rate of the agricultural sector was at its peak in 2001 to 2003 by 55% due to effective credit delivery to the sector and policy of liberalization and deregulation of the government that saw private initiatives in agriculture especially in cassava and other root tubers production. The real gross domestic product also grew over the same period (i.e.2001-2004) by almost 40%. The

trend reflected a decline in both agricultural gross domestic product and real gross domestic product from 2005 to 2015 and a negative trend was recorded for real GDP in 2015 and 2016 at less than 0% growth rate. The descriptive statistics showed an average growth rate of 31.86% for agricultural real gross domestic product (AGDP) contribution to real gross domestic product within the period (1987-2016) while the farm credit supply to the sector grew by an average of 115.75%. This was an asymmetrical growth when compared with agricultural real gross domestic product. However, the series were normally distributed.

Table 2

Descriptive Statistics of the Variables.

	ARGDP % RGDP	(AGVA)	FC	RGDP
Mean	31.86	3.62	115.75	3.56
Median	33.14	3.53	49.00	2.52
Maximum	48.56	9.52	525.90	6.97
Minimum	20.23	1.02	2.40	1.52
Std. Dev.	6.82	2.39	106.60	1.85
Skewness	0.08	1.04	1.56	0.64
Kurtosis	2.63	3.35	4.12	1.87
Jarque-Bera	0.20	5.54	13.75	3.64
Probability	0.90	0.06	0.00	0.16
Sum	949.42	108.55	3472.40	106.75
Sum Sq. Dev.	1475.49	167.03	684229.3	99.68
Observations	30	30	30	30

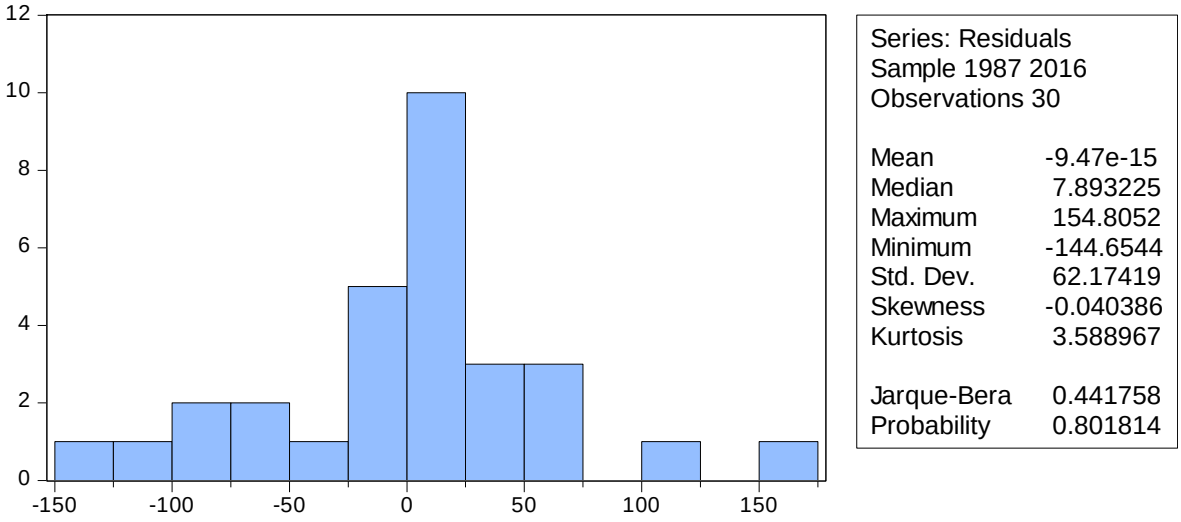


Figure 3. The result of Jarque-Bera reflected the normal distribution of all variables.

Source: Author's computation, 2018.

Table 3

Augmented Dickey Fuller (ADF) Unit Root Test on Variables

Variables	ADF At Level	ADF at 1st Difference	Status/Decision
AGVA (%GDP)	-1.97	-5.98**	I(1)
FC	4.46	-4.92**	I(1)
RGDP	2.78	-3.20**	I(1)
ARGDP (Absolute)	1.33	-4.14***	I(1)

/* denote stationary at 5% and 1% level of significance.

Source: Author's computation, 2018**.**

Table 4

Philip Perron (PP) Unit Root Test on Variables

Variables	PP At Level	PP at 1st Difference	Status/Decision
AGVA (%GDP)	-1.97	-5.91**	I(1)

FC	3.12	-4.94**	I(1)
RGDP	2.65	-3.13**	I(1)
ARGDP	-2.09	-4.63***	I(1)

/* denote stationary at 5% and 1% level of significance respectively

Source: Author's Computation, 2018

The series are tested using two different unit root models. The Augmented Dickey Fuller (ADF) and Philip Peron (PP) models. The reason for using these two test models was for confirmatory purpose. From the tables showed that the two test statistics indicated that all variables in the model are non-stationary at levels (0). They became stationary after taking the first difference transformation with similar results and the parameters were statistically significant at 5% levels. This implied that all variables are integrated of order one [i. e. I (1)] showing linear combination for co integrating relationship. This result necessitated the conduct of co-integration test.

Table 5

Engle –Granger –Dickey – Fuller (EGDF) Cointegration Test (short run)

Series: ARGDP AGVA FC RGDP

Sample: 1987- 2016

Included observations: 30

Null hypothesis: Series are not cointegrated

Variables	tau-statistic	Prob.*	z-statistic	Prob.*	
ARGDP	-5.44	0.01	-65.25	0.00	
AGVA	-4.27	0.08	-21.39	0.06	
FC	-1.98	0.87	-8.94	0.78	
RGDP	-4.16	0.10	-20.68	0.08	
		ARGDP	AGVA	FC	RGDP
Rho – 1		-1.54	-0.89	-0.37	-0.86
Rho S.E.		0.28	0.21	0.18	0.21

*MacKinnon (1996) p-values

Source: Author's computation,2018

Table 6

Long run Cointegration Regression (FMOLS)

Dependent Variable: ARGDP

Method: Fully Modified Least Squares (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.**
AGVA	5.46	8.33	6.56	0.00
FC	-0.01	0.01	-0.79	0.43
RGDP	-1.54	2.44	-6.30	0.00
C	43.29	2.26	19.11	0.00

** denotes significant @ 5% level

Source: Author's computation, 2018

It was established from the study that variables employed were integrated of order of 1(1), and then cointegration test was performed. The objective of this test is to establish if there was a long run relationship between agricultural real gross domestic product (ARGDP) at value added (AGVA)and farm credit (FC) on one hand and real gross domestic product (RGDP) and agricultural real gross domestic product (ARGDP) at value added on the other hand. There was a negative coefficient and insignificant value of (-1.54) long run relationship between the Agricultural Gross Domestic output or Product (AGDP) at value added (AGVA) and Real Gross Domestic Product. The results were consistent with the works of Enya and Bime (2007) and Onyebinama and Nnamerenwa (2013).

Tables 5 and 6 showed that the series were cointegrated because there existed at least one cointegration equation in the model. This was in line with the studies of (Ssekuma, 2011) and Bada, 2017) who reported that theory suggests that integrated variables of order one I (1) may have a cointegration relationship, then it is crucial to test for the existence of such relationship, if the group of variables are individually integrated of the same order and there is at least one linear combination of these variables that is stationary, then the variables used in the study are said to be cointegrated. Table 5 showed that (Rho- 1) as an indication and the role of error correction mechanism which pointed to distance and speed of adjustment of the variables to equilibrium. It implied that there was a short run fluctuations or imperfections (disequilibrium) in the agricultural sector and the economy in

general which would converge to its long run equilibrium path. The negative values of the size of the coefficients (-1.54, -0.89, -0.37 and -0.86) were indications of the speed of adjustment of the variables towards long run equilibrium within the period. The results were consistent with Akujobi and Chima (2012) and Sogules and Nkoro (2016) which revealed that a long run relationship exists between banks' credit to agricultural production sector and economic growth. The co integration regression coefficient (-0.01) with respect to farm credit (FC) in relation with Agricultural Real Gross Domestic Product (AGDP) at value added (AGVA) is negative and insignificant**.**

Regression Analysis of the results of the estimated coefficients.

Table 7

Estimated Regression Coefficients.

Dependent variable: Agricultural Real Gross Domestic Product (ARGDP) at value added.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.56	1.42	25.02**	0.00
FC	-0.04	0.01	-3.92**	0.00
R-squared	0.40	Durbin-Watson Statistic		1.37
Adjusted-R squared	0.37	Prob. (F-statistics)		0.00
F-statistics	15.35			

** denotes significant @ 5% level

Source: Author's computation, 2018.

Table 8

Estimated Regression Coefficients (exponential)

Dependent variable: Real Gross Domestic Product (RGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ARGDP	-0.03	0.01	-2.91***	0.01
C	32.19	0.39	83.53**	0.00
R-squared	0.27	Durbin-Watson statistic		0.26
Adjusted R-squared	0.24	Prob (F-statistic)		0.01
F-statistic	8.47			

** and *** denote (5% and 1%) level of significance.

Source: Author's computation, 2018

Tables 7 showed that explanatory variable [farm credit] (FC) exhibited a negative relationship (-0.04) which did not conform with the expected sign of the dependent variable (Agricultural Real Gross Domestic Product at Value Added). The long run influence of farm credit on agricultural real gross domestic product (ARGDP) at value added (AGVA) is (-0.04) which was negative but statistically significant at 5% level. This implies that an increase in farm credit decreased agricultural real gross domestic product growth by 4%. That a percentage point increase in the value of farm credit, decreases agricultural real gross domestic product by 4%. The constant variable being the autonomous intercept of the model revealed a positive intercept that agricultural output at value added changed over the period without farm credit by 35.56% (35.56). The implication is that (all things being equal), the variables not included in the model caused a 35.56% change in the agricultural real gross domestic product (ARGDP) at value added (AGVA). The p – value of 0.00 of the constant variable meant that the constant variable was statistically significant at 5%. Table 8 showed a percentage point increase in the growth rate in ARGDP (Agricultural Real Gross Domestic Product) causes growth rate in RGDP (Real Gross Domestic Product) to decrease by 3%.

Table 9

Error Correction Estimates

Sample (adjusted): 1987 2016

Included observations: 30 after adjustments

Cointegrating Eq:	CointEq1	
RGDP(-1)	1.00	
AGVA(-1)	0.27	
	(0.03)	
	[8.18]	
C	-12.08	
Error Correction:	D(RGDP)	D(AGVA)
CointEq1	0.14	-2.52
	(0.05)	(1.56)
	[2.54]	[-1.61]
D(RGDP(-1))	-0.31	6.36
	(0.29)	(8.71)
	[-1.02]	[0.73]
D(RGDP(-2))	-0.10	-0.26
	(0.24)	(6.96)
	[-0.43]	[-0.04]
D(AGVA(-1))	-0.03	0.33
	(0.01)	(0.33)
	[-2.27]	[1.03]
D(AGVA(-2))	-0.00	-0.22
	(0.01)	(0.30)
	[-0.31]	[-0.73]

C	0.25	-1.49
	(0.08)	(2.44)
	[2.96]	[-0.61]
R-squared	0.54	0.47
Adj. R-squared	0.43	0.35
Sum sq. resids	0.52	439.91
S.E. equation	0.16	4.58
F-statistic	4.88	3.86
Log likelihood	15.08	-75.98
Akaike AIC	-0.67	6.07
Schwarz SC	-0.39	6.36
Mean dependent	0.19	-0.41
S.D. dependent	0.21	5.69

Author's Computation 2018.

The value of the estimated coefficient for ECM was approximately -0.31, which implied that cointegration equations behaved well in the model because they carried negative signs. The result of the model as shown in table 9 was moderately low with R^2 of 54% which was below expectation of minimum of 60%. The ECM results (Table 9) indicated that RGDP converged to its long run equilibrium path within the period at a speed of about 31%. Hence, it took a bit longer period before the impact of ARGDP (Agricultural Real Gross Domestic Product) at value added (AGVA) was felt on RGDP (Real Gross Domestic Product) within each period due to shocks or changes in the economy. Conclusively the interaction effects were slow and sluggish with respect to growth in the sector.

Findings

Based on the findings, from the previous discussion, Pearson Product Moment correlation coefficient ($r = -0.46$) indicated a weak or poor but a negative relationship between farm credit and agricultural gross domestic product. This implied that there was a negative influence and relationship between farm credit and agricultural gross domestic product and the economy. It is likely that farm credit has been misapplied or late disbursements to farmers by institutional lenders. Since the farm credit had a weak and negative relationship with agricultural

real gross domestic product it meant that it did not conform or follow a- prior expectation of positive sign ($\beta_1 > 0$) for the study. This means that the average growth rate of the value of farm credit to the sector lead to negative growth rate on the agricultural real gross domestic product when comparing the value of the two variables. This is in line with the studies of Enya and Bime (2007), Uzowulu*et al.* (2008) Onyebinama and Nnamerenwa (2013).

Co-integration test was used to determine that long run relationship existed between the variables. This observation agreed with (Akujobi and Chima, 2014) that long run relationship existed between banks' credit to productive sector and economic growth. However, in this study farm credit had negative and insignificant long run relationship with Agricultural Real Gross Domestic Product at value added (AGVA). Moreover, a negative and insignificant long run relationship existed between real GDP and Agricultural Real Gross Domestic Product (ARGDP) at value added (AGVA) as evidenced in the negative and declining value of agricultural output to Real Gross Domestic Product (RGDP). This showed that the rate of adjustment to long run equilibrium was slow and sluggish at 31% (ECM = -0.31) and thereby accounted for low level of output in the sector.

CONCLUSION

The study concluded that long run equilibrium of farm credit with agricultural real gross domestic product and real GDP revealed a negative and insignificant long run relationship. Farm credit purveyance into the agricultural sector over the period under review did not influence a sustainable growth in the sector rather both output expansion path and growth rate in the sector had been on decline due to neglect. The sector could not provide effective linkage effects with the real GDP of other sectors of the economy thereby making agricultural sector performance incapable of providing much needed value change or value addition to other sectors of the economy to ensure sustainable growth.

Recommendations

i. Government spending should largely be focused on provision of farm credit but through specialized agencies and financial institutions/intermediation with less conditionalities.

ii. Farm credit must be delivered efficiently to end users and the same must be monitored effectively to guide against credit diversion or misappropriation.

iii. Agricultural value added must be strengthened and improve upon so

that agricultural RGDP can improve other sector of the economy through value addition.

iv. The cost of borrowing funds (farm credit) in agricultural sector must carry a low rate of interest.

v. Commercial banks and other institutional lenders of farm credit intervention funds must be supported and incentivized by government to ensuring effective credit delivery to the agricultural sector as well as promoting best global practices in the sector.

REFERENCES

Abdullah, N. M., Khalid, M. and Kouser, S. (2009). The Role of Agricultural Credit in the Growth of Livestock Sector: A case Study of Faisalabad, Pakistan. *Vet Journal. 29 (2):* 81-84.

Adeyinka, A. J., Daniel, A. A., Olukotun, G. A. (2015). An Assessment of the contribution of CommercialBanks to Agricultural Financing in the Nigerian Economy: *International Journal of Advanced Academic Research – Social Science and Education.*1 (2):1-16.

Afolabi, L. (1999). *Monetary Economics*, (Revised edition), Heinneman Educational Books and Publishers, Ibadan.

Akujobi, A. B. C., and Chimaijemr, C. C. (2012). The Production Sector Credit and Economic Development of Nigeria, A Cointegration Analysis: *International Journal of Event Management Research (IJEMR). 2* (11); 1-17

Alain, D.J. and Sadoulet, E. (2010) World Bank Research Observer, 25 (1). Retrieved June 24, 2019, https//elibrary.worldbank.org/doi/abs/10.1093/wbro/Ikpo1.

Bada, O. T. (2017). The Effects of Banks' Credits on the Development of Manufacturing and Agricultural Sectors of Nigeria's Economy. *International Journal of Advanced Studies in Economics and Public Sector Management.*5 (1):114-130

Batrancea, L. (2021). Empirical Evidence Regarding the Impact of Economic Growth and Inflation on Economic Sentiment and Household Consumption. *Journal of Risk and Financial Management.* 14 (7) 1-16

BUDGIT, (2016). Budget Office of Federation, Budgit Research Unit. http://yourbudgit. Com/wp-

content/uploads/2016/0112015 publication.

CBN, (2011a). Financing the Real Sector for Sustainable Economic Growth in Nigeria: Performance, Challenges and Prospects. *Economic and Financial Review*. 49 (4): 57-63

CBN (2011b). Agricultural Credit: ACGSF and Agricultural Credit Support Scheme, Claims and Settlement Activities. https://www.cbn.gov. ng dev fin/interest draw back claims.asp/ACGSF.

CBN, (2011c). *CBN Statistical Bulletin* and Annual Reports of Financial Statistics. www.cenbank.org/com,

CBN, (2014a).article.com/role-central-bank-nigeria-agricultural-finance-development.

CBN, (2014b). *Effects of Monetary Policy on the Real Economy of Nigeria: A Disaggregated Analysis, Real Section Division.* CBN Occasional Papers 54, Research Department, Central Bank of Nigeria, Abuja.

CBN, (2014c). *CBN Statistical Bulletin/ Annual Reports.*https://www.cbn.gov.ng /pdf 2014.

CBN (2016a). Central Bank of Nigeria Statistical Bulletin/ Annual Reports. 2016 Financial Statistics. http://www. Cbn.gov. ng./documents/statbulletin-asp.

CBN, (2016b). Agriculture Contribution to GDP. https://www.daily trust.com. ng/news/…/agriculture –now per-cent-gdp…/142355. html.

CBN, (2016c). *CBN Statistical Bulletin* /Annual Reports. https://www.cbn.gov..ng pdf CBN.

CBN, (2016d). *CBN Statistical Bulletin and Annual Reports.* Money Market Interest Rates. CBN, 2016, Garki, Abuja.

CBN, (2016e). Agriculture Accounts for 24% of GDP (Vanguard News). https:// www.vanguard ngr.com> News.

Downey, L. (2021). *Farm Credit System: What it means, How it works and History* .https://www.investopedia.com

Emecheta, B.C. and Ibe, R. O. (2014). The Impact of Banks' Credit on Economic Growth in Nigeria: Application of Reduced Vector Autoregression (VAR) Techniques. *European Journal of Accounting,*

Auditing *and Financial Research.* 2 (9): 11- 21

Emefiele, C. G. (2018). Nigeria has Achieved Food Imports Reduction and Saved $21Billion.Retrieved June 20, 2019, from: https://www.pmnews nigeria.com/2018/Nigeria-has-achieved-food.

Enya, V. E. and Bime, M. (2007). Analysis of the Influence of Agricultural and Non- agricultural sectors Performance 0n Nigerian Economy (1986-2004) *Global Journal of Agricultural Sciences.*7 (1): 7-9

Eze, C. C., Lemchi, J.J., Ugochukwu, A. I. Eze, V. C., Awulonu, C. A. O., and Okon, A.X. (2010). *Agricultural Financing, Policies and Rural Development in Nigeria.* The 84th Annual Conference of the Agricultural Economics Society, Edinburgh. ageconsearch.Umn.edu/bitstream/91677/2/7eze-lemich-ugochukwu etal.pdf.

Fakayode, S.B, Adewumi, M.O., Salau S.A. and Afolabi, O.A. (2009). Lending Credit scheme to Crop Farmers in Nigeria, An appraisal of Ekiti State Agricultural Credit Agency (ESACA) scheme. *Journal of Agriculture, Biotechnology and Ecology*: 2 (3) 286-294.

Farmer's Weekly, (2017). Agricultural Output Terms Explained. Retrieved June 24, 2019, from: https://www.farmer's weekly.co.za

Gardner, B. (1996). *Economic and Agricultural Performance with Changing Policy Environment, Policy Reforms in Agriculture*: An Assessment of Results in Eight Countries. www. Fao.org /3/w744le/w744le04.html

Imoisi, A. A., Sogules, I.W. and Ekpeyoung, B.I. (2012). An Appraisal of Credit Facilities on Agricultural Output and Productivity in Nigeria (1970-2010). *British Journal of Humanities and Social Sciences.* 7 (2): 24 -33

Ishola, K. A. (2018). Macroeconomics Analysis. Lagos: Crest Hill Publication Limited ISBN 13.9783436282.

Izuchukwu, O., Ogbodo, A.J. and Okechukwu, V. M. (2022). Does Agricultural Credit Guarantee Scheme Fund Guarantees Sustainable Agricultural Output in Nigeria? *Journal of Basic and*

Applied Research International, 28 (6) 22-34

Jhingan, M. L. (2006). *Macroeconomic Theory.* Delhi-India: Vrinda Publication Limited

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money.* New York: *Harcourt* and Brace Company.

Khan, N. (2018). *Critical Review of Past Literatures of Agricultural Credit in Developing World.* https://www. research gate.net/publication/323496866.

Laidler, D.E.W. (1985). *The Demand for Money. Theories, Evidence and Problems.* (3rd Eds.). New York: Harper and Row Publishers.

Leontief, W. (1953).” Domestic Production and Foreign Trade: The America Capital Position Re-Examined”. *Proceedings of the American Philosophical Society.* 97 (4) 332-349 JSTOR, 3149288.

MBP, (2016). Ministry of Budget and Planning (MBP). *2016 Budget Appropriations.* http: //www.naira/and.com/2844170/critical- analysis- 2016 budgets.

McKinnon, R. I. (1973). Financial Liberalization and Economic Development: A Reassessment of Interest-rate Policy in Asia and Latin America. *Oxford Review of Economic Policy.* 5 (4) 29-54.

NBS, (2013). National Bureau of Statistics. *Quarterly Reports 2013.* Abuja.

NBS, (2016). National Bureau of Statistics. *Nigerian Gross Domestic Product (GDP) Report*: Nigeria stat.gov.ng/download/398.

NBS, (2019). National Bureau of Statistics. *Banks' Loans to Farmers hit N2.2trn in 2018 Press Reader.* https://www.pressreader.com>Nigeria>business-day-nigeria.

Nnamocha, P.N. and Eke, C.N. (2015). Banks' Credit and Agricultural Output in Nigeria (1970 -2013): An Error Correction Model (ECM) Approach. *British Journal Economics, Management and Trade.*10 (2): 1-12.

Nwankwo, O. (2013). Agricultural Financing in Nigeria: An Empirical Study of Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB). *Journal of Management Research.* Macro think Institute. 5 (2): 28

Olayemi, J. K. (1996). *Food Security in Nigeria. A Research Report for Development Policy Centre,* Ibadan: DPC publishers Limited.

Olowofeso, O. E., Adeboye, A. A., Adejo, V. T., Bassey, K. J. and Abraham, O. (2017). Agricultural Sector Credit and Output Relationship in Nigeria: Evidence from Non-Linear ARDL, The Central Bank of Nigeria, *Journal of Applied Statistics.* 8 (1): 101 -122

Olowofeso, O. E., Adeleke, A.O. and Udoji, A. O. (2015). Impact of Private Sector Credit on Economic Growth in Nigeria. The CBN *Journal of Applied Statistics.*6 (2): 81-101.

Onyebinama, U.A.N and Nnamerenwana, G.C. (2013) Comparative Analysis of Credit Allocation to crop and Livestock Subsection under The Agricultural Credit Guaranteed Scheme Fund (ACUSF) in Nigeria. *The Nigeria Agricultural Journal.* 44 (2): 135-145.

Ozoali, C. & Madueme, I. S. (2018). Agricultural Credit Guarantee Scheme Funds and Food Crop Productivity in Southern Nigeria. *Asian Journal of Science and Technology*. 9 (2) 7534- 7547.

Palfreman, D. and Ford, P. (1984). *Element of Banking Levels I & II.* Plymouth, United Kingdom: Macdonald and Evans Publishers.

Ranis, G. & Fei, J. C. (1961). A Theory of Development. *American Economic Review*. 51 533-558.

Ricardo, D. (1817). *On the Principles of Political Economy and Taxation.* London: John Murray Publishers

Rostow, W. W. (1960). *The Stages of Economic Growth: A Non-Communist Manifesto.* London: Cambridge University Press.

Salihu, M. (2016). *Impact of Agriculture on the Growth of Nigerian Economy,* (Unpublished, Ph.D. Dissertation Non- Thesis). Department of Agricultural Economics, Modibbo Adama University of Technology, Yola.

Sanusi, L.O. (2010) *"Growth Prospects for Nigerian Economy."* http://www.centbank. org.(CBN. (CBN, Governor, Unpublished.) Lagos.

Semin, K. A. and Rassukhanov, U. (2018). Problems and main Mechanism to increase Investment Attractiveness of Agricultural Production. *Journal*

of European Research Studies. 21 (2) 378- 400

Shaw, E. S. (1973). *Financial Deepening in Economic Development.* New York: Oxford University Press.

Shitu, A.M. (2017) Economic Diversification in Recession. A case of Nigerian Agriculture as a Signpost for National Development and Sustainable Growth. *International Journal of Advanced Study in Economics and Public Sector Management.*5 (1):

Ssekuma, R. (2011). *"A Study of Conintegration Models with Application."* Uir.Unisa. ac.za/bitstream/handle/10500/4821/ thesis Ssekuma r.pdf? Sequence 1, University of South Africa.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nation.* London.

Sogules, I.W. and Nkoro, E. (2016). The Impact of Bank credits to Agricultural and Manufacturing Sectors on Economic Growth in Nigeria. *International Journal of Economics and Financial Research.* 2 (4):74 -78.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics.*70 (1).

Sulaimon, M. (2921). ACGSF Agricultural Performance in Nigeria: A threshold Regression Analysis. French Institute for Research in Africa (IFRA), University of Ibadan: Erudite Millennium Ltd. https//mpra.ub.uni-muenchen.de/105564.

Swan, T. W. (1958). *Economic Growth and Capital Accumulation, Economic Records.* 32.

Thibiebi, (2018). *An Evaluation of Nigeria's Food Import Bills.* https:// ships and ports.com.ng/evaluation-Nigeria's-food-import –bill.

Udoka, C.O., Mbat, D. O. and Duke, S. B. (2016). The Effect of Commercial Banks' Credit on Agricultural Production in Nigeria. *Journal of Finance and Accounting.*4 (1): 1-10.

Ugwu, C.M. (2010). *Commercial Bank and Agricultural output in Nigeria: 1982- 2007 (*Unpublished, B.Sc Project), Department of Economics, Caristas University, Amorji-Nike, Emene, Enugu.

Uzowulu, G.I., Ajayi, S., Opue, J.A., Adinya, I.B. and Kuye, O.O. (2007).

Monetary Policies and Credit Financing as Factors in Agricultural Productivity in Cross River State. *Global Journal of Agricultural Science*. 7 (1): 1-6.

WDA, (2017). World Data Atlas (WDA), Nigeria Real GDP Growth (1980-2018) Knoema.https:// knoema.com>world data atlas>Nigeria

Wikipedia, (2020). *Definition of Economic Growth.* Assessed from: https//en.m.wikipedia.org/wiki/economic growth.

World Bank, (2016a). http://databank.worldbank.org/data/download/WDI, CSV. Zip and wdi excel. Zip.

World Bank, (2016b). Gross Domestic Product (GDP) data world bank. data.world bank /org/indicator/NY.GDP.MKTP.CD. OR http://databank. Worldbank.org/data/download/WDI CSV. Zip.

Zakaree, S. S. (2014). Impact of Agriculture Credit Guarantee Scheme Fund (ACSGF) on domestic Food Supply in Nigeria. *British Journal of Economics, Management and Trade. 4 (8)*1273-1284