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Impulse Response analysis, Agricultural Financing and Economic Growth in Nigeria

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ABSTRACT

The study examined the impulse response analysis of the effects of agricultural financing on economic growth in Nigeria from 1981 to 2020, using time series data on Economic growth rate, Deposit Money Banks loans to agriculture, Government capital and recurrent expenditure, Bank of Agriculture loans, and interest rate on agriculture loan obtained from the Central Bank of Nigeria statistical Bulletin and Annual Reports, National Bureau of Statistics, and Bank of Agriculture. The methodology adopted in the study is the ARDL Bounds Cointegration Approach based on the fact that the variables were not all stationary at same order of integration. The findings revealed that given the major challenges facing the agricultural sector in Nigeria such as inadequate funding, economic growth was positively affected by Deposit Money Banks Loans and advances to Agriculture, Bank of Agriculture Loans, and Federal Government Agricultural Finance but negatively affected by Interest Rate on Agricultural Loans during the period under investigation. The study recommended that since the Federal Government Agricultural Expenditure positively affects agriculture, the federal government should initiate policies towards revolutionizing agriculture to make it more productive by investing more on agriculture and concluded that considering the fact that agricultural funding variables were found to impact positively on economic growth in Nigeria during the period under investigation, adequate agricultural funding is essential for economic growth in the Nigerian economy.

Key word: Agricultural Financing, ARDL, Economic Growth, JEL Classification.

1.0 INTRODUCTION

The Federal Government embarked on numerous agricultural financial initiatives as part of its fiscal responsibility to provide finances and other agricultural inputs such as fertilizers and seedlings to farmers as well as price stability and support mechanisms through the implementation of protectionist tariffs, tax policies and long-term growth in the sector. As such, the Bank of Agriculture (BOA) (formerly known as Nigeria Agricultural Bank (NAB)) was set up in 1972 to focus on financing the sector. However, it has been plagued by inadequate capital and poor management. Other funding initiatives put in place to assist the agricultural sector have not been very successful as well due to the peculiar nature of agricultural production in Nigeria and hence, the preference for financing of commerce by financial institutions (CBN 2010)

Due to the poor performance of the agricultural sector and the increasing rural poverty, an agency of the government, the Central Bank of Nigeria has intervened to rescue the sector from further collapse thereby going out of the regulatory and supervisory function to direct agricultural financing. In order to increase farmers' access to credit and thus stimulate increased agricultural output, the Central Bank of Nigeria prescribed in its Monetary Policy (before its repeal in 1996) that no less than 15% of commercial and 10% of merchant bank credit be granted to agricultural activities. The banks were also to allow grace periods on agricultural loans: one year for small-scale peasant farming, four years for cash crop farming, five years for medium and large-scale mechanized farming and seven years for ranching (CBN 2020)

Similarly, the CBN promoted small-scale enterprises (of which most agricultural enterprises are classified) through its Policy Guidelines, directing that credit to indigenous borrowers be at least 35% of total commercial and merchant bank loans and advances beginning April 30, 1970. Until the deregulation of the financial industry in 1996, non-compliance attracted stiff penalties, while shortfalls (the undisbursed amount) were forwarded to the National Bank for Commerce and Industry (NBCI) for on-lending to small-scale businesses.

In the same vein, the CBN introduced the Rural Banking Scheme in June 1977 in three phases -1977-1980, 1980-1985 and 1985-1989 to encourage banking habit nationwide and channel funds into rural development (agricultural production activities take place mostly in the rural areas in Nigeria). As at end June, 1992, 765 of the 766 branches stipulated by the CBN had been opened. In addition, the CBN stipulated that not less than 50 per cent of the deposits mobilized from the rural areas be advanced as credit to rural borrowers to solve the problem of inadequacy of credit to rural-based small-scale industries in view of the fact that rural financing is a veritable tool for poverty alleviation (Omosebi & Saheed 2016)

It has also increased its agricultural capital and recurrent expenditure from N383 billion in 1999 to N771 billion in 2020.

However, these interventions have had little impact, as Nigeria's agricultural output remains low, and agricultural imports continue to rise from N851.62 billion in 2018 to N1.2 trillion in 2020, while agricultural exports only increase from N270 billion in 2018 to N321 billion in 2020. Based on these, has the federal government expenditure and other financing on agriculture had any effect on the increased productivity and economic growth in Nigeria? This is what this study is set to investigate.

The objective of the study therefore is to evaluate financial initiatives on agricultural productivity in Nigeria.

1.1 Statement of the Problem

Therefore, the main problem which actually instigated this study is that, given the high decline in agricultural productivity and high interest rates on agricultural loans to farmers in Nigeria, how has the federal government and CBN through the various financial initiatives on agriculture addressed the rural poor's living standards and increased agricultural productivity, seeing that agriculture is the primary occupation of the rural poor. It is evidently clear that despite the involvement of Nigeria in international trade, mass poverty, hunger, malnutrition, unemployment, income inequality, poor leadership capacity, overdependence on oil and importation of goods and services continues to worsen, thereby delaying the country's economic growth (Ijirshar 2015).

2.0 THEORETICAL AND EMPIRICAL REVIEW

This paper considered two basic economic theories that have link with the paper, the Harrod-Domar Growth Model, and the Endogenous Growth Theory.

The Harrod-Domar Growth Model theory is considered an extension of Keynes' short-term analysis of full employment and income theory. The Harrod-Domar growth model provides a long-term theory of output. Countries need to save part of its national revenue, either for unforeseen circumstances or to replace diminished capital goods such as buildings, equipment, and materials. Though, for growth, it is necessary to have in place, new investments on behalf of net additions to the capital stock. For example, assuming that the sizes of the overall capital stock A, is directly related to entire GNP, G and if ₦3 of capital is constantly necessary to produce a ₦1 Stream of GNP, it means that any net add-ons to the stock of capital as fresh asset will directly lead towards a conforming increase in the flow of national output, GNP.

According to Gareth (2007), Growth comes from the accretion of both physical and human capital and from inventions which bring about procedural progress. Hence, economic growth is the foundation of increased opulence. Accretion and invention increase the efficiency of inputs into production and increase the probable level of output. Endogenous growth theory provides numerous understandings of the causes of growth in an economy with the main aim being that, economic growth is a significance of coherent economic decisions. On the other hand, growth is increased by governments through provision of inputs, encouragement of foreign direct investment (FDI), and improvement of educational prospects. Whilst Firms spend resources on research and development to secure lucrative innovations, Consumers on the other hand, invest in education for human capital development and increase in lifetime earnings. Hence, the rate of growth turns into a variable of choice through the combination of these individual choices and can be affected by the governments tax policies. Public spending can improve productivity,

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such as the provision of infrastructure, public education, and health care. These expenditures can be financed through taxation and can indirectly cause an increase to growth. The model asserts also that internal factors and polices will have long term impact on economic growth. Taxation as a major fiscal policy tool and source of government revenue affects the economic growth by generating revenue for investment and developing Human capital.
A study carried out by Kenny and Nnamdi (2019) critically examined the role of agricultural sector performance on economic growth in Nigeria from 1986-2017. The study stated that there is a long run relationship between agricultural domestic production and its explanatory variables (Agricultural Credit Guarantee Scheme Fund, Federal Government current expenditure on agriculture, total employment, and effect of trade liberation). The VECM result found 35percent speed of adjustment of the endogenous growth model which includes Agricultural Credit Guarantee Scheme Fund, Federal Government current expenditure, total employment, and effect of liberalization (SAP) on agricultural domestic production implying interventions in agriculture will at least take 24 months for half of its effect to be significant on production in Nigeria. The study suggested that policy consistency and commitment of government is required before such intervention can yield the desired results. For an economy to be successful, it needs interaction or interconnection between its various sectors. In a developing economy like Nigeria, the agricultural sector is an important sector whose role remains crucial to development fortunes.
Iganiga & Unemhilin (2019), using a Cobb Douglas production function, studied outcome of financial expenditure by the federal government on agricultural output and the cost of agricultural production in Nigeria with variables comprising of credits to agriculture, CPI, annual average rainfall, population growth rate, food importation and growth rate of GDP. The paper did an all-inclusive enquiry of data whilst estimating the Vector Error Correction model. Their outcomes disclosed a positive relationship between agricultural output and capital expenditure of federal government. Similarly, Lawal (2019) used time series data to confirm the volume of finance expenditure of the federal government on Agriculture during 1979 – 2017. Substantial numerical suggestions gotten from the investigation indicated that government expenditure do not follow a stable pattern whilst Agricultural sector impact to GDP is directly related with funding of the sector by the government.
In a related development, Ogwuma (2018), using econometric analysis, examined public expenditure in the Agricultural sector. His report revealed that there exists direct correlation amongst interest rate and loanable capitals on the quantity of Agricultural production and Agricultural financing in Nigeria. The projections of subsector outside oil together with the general economy are thoroughly pinned to how the agricultural segment performs as being suggested by the strong correlation established between Nigerian's total GDP and the agriculture. This is evident in 1960, as agriculture contributed 64 per cent to GDP then progressively decreased to 48 per cent in 1970's.
In a paper done as a background for the World Bank's 2018 World Development report, Ligon & Sadoulet (2018) combine time series and cross-section data to estimate regression coefficients connecting consumer expenditures by decile to agriculture and non-agriculture GDP. Their findings are consistent with claims that "agricultural sector growth is substantially more important than non-agricultural sector growth for those households in the lower deciles of the expenditure distribution", *i.e.*, the poorer segments of the population. They find the opposite result for richer households, *i.e.* that the expenditure elasticity non-agricultural growth is much higher than for agricultural growth leading them to conclude that their findings are consistent with claims that agricultural sector growth is pro-poor.
Bolaji, Oluwaseyi, Emmanuel & Shakirat (2018), assessed this on the topic "Enhancing Agricultural Value Chain for Economic Diversification in Nigeria" This study examined how enhancing the agricultural value chain can contribute to rapid economic diversification in Nigeria within the period of 1981-2015. The autoregressive distributed lag (ARDL) model was employed as the econometric method of estimation. The inferences were drawn at 5% significant level. It was revealed that the agriculture expenditure had positive and significant impact on agriculture sector productivity in Nigeria. The findings also showed that agricultural raw material, agricultural machinery and agricultural land have direct impact on agricultural productivity in Nigeria. Agricultural machinery and agricultural land were found to be statistically significant at 5% significance level. The study concluded that agricultural value chain contributed significantly to the diversification of the Nigerian economy. It suggested that government should make deliberate efforts to create institutions that will make policy programmes on agricultural development not only to enhance its growth and the overall output growth but also make it inclusive.
Eze (2017), carried out an investigation titled, "Agricultural Sector Performance and Nigeria's Economic Growth". Specifically, the study examined the causality between agricultural sector and economic growth, as well as the impact of the sector on the growth of the Nigerian domestic economy. Cointegration test, Vector Error Correction Model

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(VECM) and Granger Causality test, were utilized in the analysis. The variables employed in the investigation include RGDP, VAO, FPI and FD became stationary after first differencing. On the other hand, result also revealed that value of agricultural output has positive and insignificant contribution to RGDP. The study, therefore, recommends that government should increase its budgetary allocation on agriculture to boost the growth performance of the sector.

3.0 METHODOLOGY

3.1 Model Specification

The study is anchored on the study conducted by Ogwuma, (2018) by using econometric analysis; he examined public expenditure in Agricultural sector in the model; EGR = f{GCAPEA, GCUREA, DMBLA, BOAL, INTAL} -. The study revealed that there exist direct correlation amongst interest rate and loanable capitals on the quantity of Agricultural production and Agricultural financing in Nigeria.

The projections of subsector outside oil together with the general economy are thoroughly pinned to how the agricultural segment performs as being suggested by the strong correlation established between Nigerian's total GDP and the agriculture. This is evident in 1960, as agriculture contributed 64 per cent to GDP then progressively decreased to 48 per cent in 1970's.

The study adapted the model used by Ogwuma (2018) in his study with slight inclusion of some variables which further identified the gap this study intends to fill. The model is therefore, specified as follows:

EGR = f{GCAPEA, GCUREA, DMBLA, BOAL, INTAL} -------------------------------------- (1)

Equation (1) is the functional specification of the model

Where:

EGR = Economic Growth Rate
GCAPEA = Government capital expenditure on Agriculture
GCUREA = Government current expenditure on Agriculture
DMBLA= Deposit money bank loan on Agriculture
BOAL = Bank of Agriculture loans
INTR = Interest Rate on Agric loans

Further specifying the model in the econometric form, it is stated thus:

$EGR_t = ß_o + ß_1GCAPEA_t + ß_2 GCUREA_t + ß_3DMBLA + ß_4BOAL_t + U_t$ -------- (3.2)

Where:

$ß_{i's,}$ = model parameters, t = time trend running from1981-2019, (U_t) = Stochastic Error Term.

Other variables remain as defined in equation (1) above.

The auto regressive distributed lag (ARDL) version of the model takes the following quasi log-linear form:

$$EGR_t = a_1 + \beta_{11}EGR_{t-1} + \beta_{12}GCAPEA_{t-1} + \beta_{13}GCUREA_{t-1} + \beta_{14}DMBLA_{t-1} + \beta_{15}BOAL_{t-1} + \beta_{16}INTAL_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{11}EGR_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{12}GCAPEA_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{13}GCUREA_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{14}DMBLA_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{14}BOAL_{t-1} + \sum_{i=1}^{n}\beta\sum_{i=1}^{n}\beta_{14}INTAL_{t-1} + \varepsilon_{1t} \quad (3.3)$$

Based on economic theory and intuition, the coefficients of $GCAPEA_{t-I,}$ $GCUREAt_{-i}$, $DMBLA_{t-I}$ and $BOAL_{t-i}$ are expected to be positive, while the coefficient of INTALt-i is expected to be negative.

3.2 Sources of Data Measurement

All the relevant financial variables used in this study were obtained from the Central bank of Nigeria 2021 statistical bulletin while the go data on government capital expenditure and government current expenditure were obtained from the federal ministry of agriculture. So, the study adopted secondary data as information on these variables are readily available.

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4.0 Data Analysis and Discussion of Findings.

4.1 Descriptive Statistics

This section shows the descriptive statistics of all subject variables from 1981 to 2020. It enables us to observe the behaviour of the variables over time.

Table 1: Descriptive Statistics

Statistic	EGR	GCAPEA	GCUREA	DMBLA	BOAL	INTAL
Mean	3.026	232.866	19.217	160.983	15.772	16.987
Median	3.700	185.237	7.300	44.795	13.525	16.767
Maximum	15.330	994.186	70.274	1049.678	46.870	21.503
Minimum	-13.130	0.656	0.012	0.590	0.940	14.990
Std Dev	5.453	244.830	22.784	248.032	9.160	1.273
Skewness	-0.800	1.089	0.913	1.891	1.554	2.044
Kurtosis	4.501	3.849	2.501	6.044	6.045	8.211
Jarque- Bera	8.034	9.109	5.976	39.315	31.567	73.125
Probability	0.018	0.010	0.050	0.000	0.000	0.000
Observation	40	40	40	40	40	40

Source: Extract from Regression Printout using Stata 15

Table 4.1 shows that the mean of economic growth rate (EGR), Government Capital expenditure on agriculture (GCAPEA), Government Recurrent expenditure on agriculture (GCUREA), Deposit money bank loan on agriculture (DMBLA), Bank of agriculture loan (BOAL), Interest rate on agriculture loan (INTAL) were 3.026, 232.866, 19.217, 160.983, 15.772 and 16.987, respectively. The minimum, maximum and standard deviation values of the variables are shown in the table.

4.2 Unit Root Test Results

The results Augumented Dickey-Fuller (ADF) unit root test and Zandrews unit root test with structural breaks are presented in Table 4.2.

Table 2 Unit Root Test Results

ADF Unit root Without Structural Break | **Zandrews Unit root With Structural Break**

Variable	Levels (Cons &Trend)	1st diff (Cons &Trend)	Order of Integration	Levels (Cons &Trend)	1st diff (Cons &Trend)	Order Integration
EGR	-3.021**	-	I(0)	-4.844** (2009)	-	I(0)
GCAPEA	-0.940	-4.123***	I(1)	-4.043 (2006)	-7.378*** (1988)	I(1)
GCUREA	-1.628	-6.344***	I(1)	-4.837** (2000)	-	I(0)
DMBLA	-0.999	-4.765***	I(1)	-3.893 (1995)	-7.093*** (2006)	I(1)
BOAL	-3.725***	-	I(0)	-5.874*** (2008)	-	I(0)
INTAL	-3.861***	-	I(0)	-3.868 (2014)	-6.869*** (2014)	I(1)

Source: Extract from Regression Printout using Stata 15

Note: The statistics reported are the t - Statistics with the associated break dates in brackets. EGR: Economic growth rate, GCAPEA: Gvernment capital expenditure on agriculture, GCUREA: Gvernment current expenditure on agriculture DMBLA: Deposit money bank loan on agriculture, BOAL: Bank of Agriculture loan on agriculture.

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*INTAL: Interest rate on agric loan. ***, **, * signify 1%, 5% and 10% significance levels respectively. Values in "( )" are the break dates revealed by the unit root tests with structural break. Zandrews Unit root Critical values: 1%: -4.93 5%: -4.42 10%: -4.11. ADF Critical values at levels: -3.668 -2.966 -2.616 @ 1% 5% 10% resp. ADF Critical values at 1st Diff: -3.675 -2.969 -2.617@ 1% 5% 10% respectively.*

The results indicate different orders of integration for the time-series variables. Specifically, EGR, BOAL and *INTAL were* stationary at levels with ADF while *GCAPEA, GCUREA and DMBLA* were stationary at first difference. EGR, CUREA and BOAL were stationary at levels with Zandrews test while GCAPEA, DMBLA and INTAL were stationary at first difference. This makes the time-series variables unsuitable for conventional cointegration methods which require the same order of integration for cointegration analysis, such as those proposed by Johansen (1995). However, the Autoregressive Distributed Lag (ARDL) bounds cointegration method suffices at this juncture because it allows for different orders of integration.

4.3 Bounds Cointegration Test Results

ARDL Bounds Cointegration Approach and its applicability to the study is justified to be econometrically efficient for small sample cases ($n < 30$), the bounds cointegration method developed by Pesaran and Shin (1999) is particularly useful for combining time-series that attain stationarity at levels and first-difference.

The bounds cointegration method makes use of upper bounds and lower bounds derived from 4 pairs of critical values corresponding to 4 different levels of statistical significance: the 1% level, the 2.5% level, the 5% level, and the 10% level. The null of "no cointegration" is to be rejected only if the computed bounds f-statistic surpasses any of the upper bounds obtained from a chosen pair of critical values, while the alternative hypothesis of cointegration is to be rejected only if the bounds f-statistic falls below any of the lower bounds obtained from a chosen pair of critical values. Therefore, in contrast to other cointegration tests, the bounds test can be inconclusive if the bounds f-statistic neither surpasses the chosen upper bound nor falls below the chosen lower bound.

To obtain the bounds f-test statistic, an f-test is performed jointly on all of the un-differenced explanatory variables of the "unrestricted" error correction model (ECM) derived from any corresponding autoregressive distributed lag (ARDL) model such as the previously specified empirical ARDL model in (3.2). This takes the general form:

$$\Delta i_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta i_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta j_{t-i} + \cdots + \sum_{i=0}^{n} \alpha_{ji}\Delta k_{t-i} + b_1 i_{t-1} + b_2 j_{t-1} + \cdots + b_j k_{t-1} + e_t \quad (3.6)$$

where Δi_t denotes the chosen endogenous variable in first difference; Δj_t and Δk_t denote the chosen exogenous variables in first differences; and e_t denotes the stochastic component. Choosing the best lag-length to be included is made possible by information criteria such as the Akaike and the Schwarz Information Criterion.

In the case where the bounds cointegration test disapproves the null, a "restricted" version of the error correction model can be estimated along-side a long-run model to capture the relevant short-run and long-run dynamics as seen in the following expressions:

$$i_t = \Lambda_0 + \Lambda_1 j_t + \cdots + \Lambda_j k_t + v_t \quad (3.7)$$

$$\Delta i_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i}\Delta i_{t-i} + \sum_{i=0}^{n} \alpha_{2i}\Delta j_{t-i} + \cdots + \sum_{i=0}^{n} \alpha_{ji}\Delta k_{t-i} + \varphi \Gamma_{t-1} + e_t \quad (3.8)$$

Here, the error correction term Γ_{t-1} is non-positive and bounded between 0 and 1 (or 0 and 100) in order to capture the short-run rate of adjustment to long run equilibrium, while the coefficients $\Lambda_{1,,j}$ in (3.7) capture the state of long-run equilibrium and are obtained from $\Lambda_1 = b_2/b_1, \ldots, \Lambda_j = b_j/b_1$ respectively.

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Table 3: ARDL Bound Co-Integration Test

Estimated Model	**F-Statistics**	
	K_3 7.011	
Critical Values	**Lower Bound I(0)**	**Upper Bound I(1)**
1%	3.41	4.68
5%	2.62	3.79
10%	2.26	3.35

Source: Authors' computation using Stata 15.

In Table 4.4, the bounds test statistic (7.011) was found to have exceeded the upper-bound value (3.79) at the 5% level of significance and therefore resulted to the rejection of the null hypothesis of "no cointegration". Based on this result, a "restricted" error correction model was estimated alongside the long-run and short-run model as seen in Tables 4.3.

As a starting point, the Akaike Information Criterion (AIC) and optimal lag of (1 1 1 1 0 1) was used as the optimal lag-specification for the ARDL model.

4.4 The Long and Short Run ARDL Model for EGR Model Specification

Table 4: Short and Long run Linear ARDL Results

Variables	**Linear ARDL Without Structural Break**	
	Short-run	**Long-run**
ECT	-0.529 (0.000***)	-
D.EGR	0.318 (0.047**)	0.056 (0.000***)
GCAPEA	-0.401 (0.716)	0.042 (0.015**)
GCUREA	-1.681 (0.041**)	0.007 (0.009**)
DMBLA BOAL	2.969 (0.031**)	0.713 (0.000***)
INTAL	-14.582 (0.099*)	-9.817 (0.553)

Source: Extract from Regression Printout using Stata 15

****, **, * signify 1%, 5% and 10% significance levels respectively. ECT is the error correction term that is expected to be negative and statistically significant. The statistics reported are the parameters with the associated probability values in brackets.*

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4.5 Post Estimation Diagnosis Results

Table 4.5: Post Estimation Diagnosis Results

Source	chi2	df	P
Heteroskedasticity	39.00	38	0.4246
Skewness	9.20	10	0.5135
Kurtosis	0.01	1	0.9415
Breusch-Godfrey LM test for autocorrelation	2.474	1	0.1157
Durbin - Watson statistics: 2.105			
R – square: 0.79			
Adjusted R – square: 0.68			
Jacque-Berra Normality Test (Chi(2): 0.8655			

Source: Extract from Regression Printout using Stata 15

Stability (CUSUM) Tests

The stability of the regression coefficients is tested using the cumulative sum (CUSUM) and CUSUM of Squares of the recursive residual test for structural stability. Plots of the CUSUM and CUSUM of Square in fig 4.1 show that the regression equations seems stable given that the CUSUM and CUSUM of Squares tests statistics did not exceed the 5% level of significance boundary.

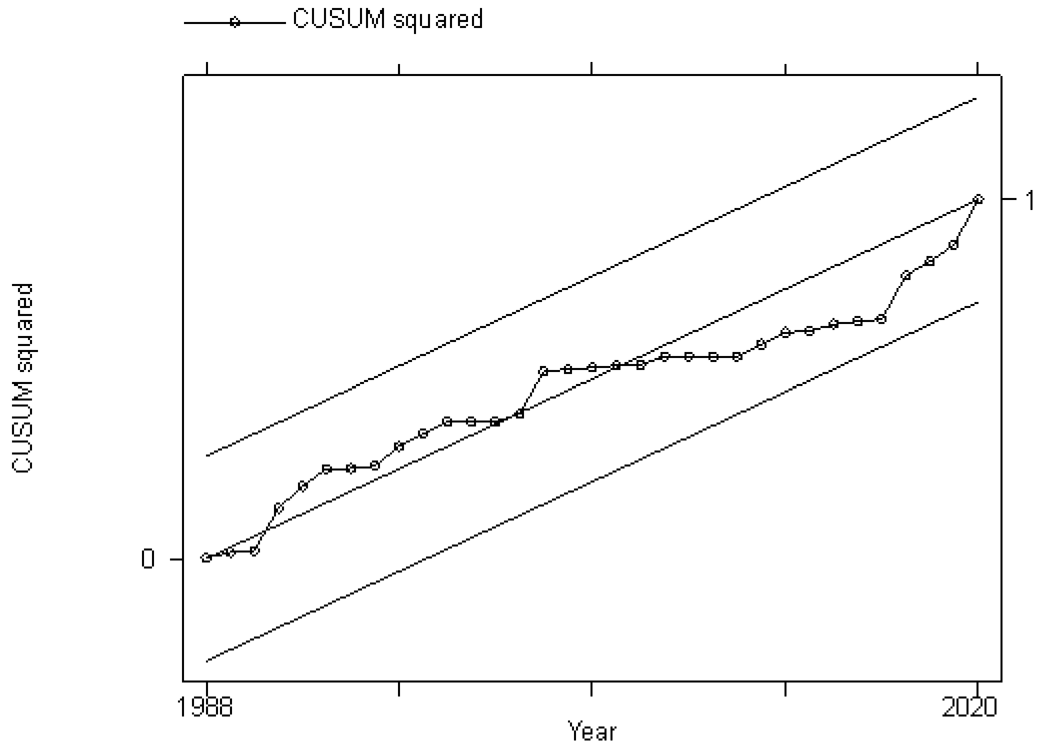

Fig 4.1: CUSUM Test Result

4.6 Discussion of Findings

In the error correction model, table 4, interest lies in the error correction term (ECT_{t-1}) which appears to be expectedly negative and statistically significant at the 1% level (based on its *p*-value (0.000)). Its magnitude (-0.529) indicates a moderate rate of adjustment to long-run equilibrium and specifically implies that approximately 52.9% of all discrepancies in long-run equilibrium will be corrected. More so, the coefficient of multiple determination of the model in table 5, that is, the R - square showed that the explanatory variables jointly explained 79% of the variations in the performance of the EGR, while the remaining 21% of the variation is explained by other variables not included in the model and the result of the coefficient of multiple determination showed that the model has a very good fit.

On the other hand, in the long-run model, all of the coefficients are expectedly positive; 0.318. 0.042, 0.007 and 0.713 for GCAPEA, GCUREA, DMBLA and BOAL, respectively; except INTAL with negative coefficient of -

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9.81. These results imply that a change in GCAPEA, GCUREA, DMBLA and BOAL will result to a positive change in economic growth rate (EGR) while a change in INTAL will be adverse to EGR. The *p*-values of GCAPEA, DMBLA, INTAL and BOAL are less than 0.05 indicating that they are statistically significant determinants of EGR at 5% level of significance. These findings conforms to a priori and in line with the findings of OgwumaAgbai Paul (2018)

In short run, the coefficients of GCAPEA and BOAL are positive; 0.318 and 2.969 respectively while that of GCUREA, DMBLA and INTAL are negative; -0.401, -1.681 and -14.582. These imply that an increase in GCAPEA and BOAL will lead to an increase in EGR while an increase in GCUREA, DMBLA and INTAL will lead to decline in EGR. The *p*-values of GCAPEA, DMBLA, BOAL and INTAL are less than 0.05 indicating that they are statistically significant determinants of EGR at 5% level of significance while that of GCUREA is statistically insignificant. Again these findings conforms to a priori and in line with the findings of Ogwuma (2018)

Also, the result of the Durbin - Watson statistics of 2.105 (Table 5) shows that the estimate of the model is free from the problem of serial auto-correlation and that the model estimate is appropriate and can be used for policy recommendation. The Prob > chi2-value of 0.4246 indicates the absence of heteroskedasticity. The Normality test result of Jacque-Berra (Chisquare 0.8655) shows that the model is normally distributed as the p-value is greater than 0.05.

These findings clearly imply that agricultural funding positively impacted on economic growth during the period under investigation and equally reinforce the fact that agricultural funding has a key role to play with regards to economic performance in developing countries such as Nigeria. Further, because these findings conform to the findings of several studies such as Iganiga and Unemhilin (2019), Lawal (2019), and Ogwuma (2018) that found similar positive effects from agricultural funding.

4.7 Conclusion

Considering the fact that agricultural funding variables were found to impact positively on economic growth in Nigeria during the period under investigation, this study concludes that adequate agricultural funding by government, Deposit money banks, Bank of Agriculture and a modest interest rate on agricultural loans are essential for economic growth in the Nigerian economy. Since the Deposit money bank loans to agriculture positively affect economic growth in Nigeria the monetary authorities should guarantee speedy disbursement of loans to farmers by DMB's at liberal conditions especially in the rural areas.

4.8 Recommendations

The Bank of agriculture should be repositioned to discharge their statutory functions towards specifically promoting agriculture in Nigeria. Since the Federal Government Agricultural Expenditure (both capital and current) positively affects agriculture, the federal government should initiate policies towards revolutionizing agriculture to make it more productive by investing more on agriculture. The federal government should guarantee single digit Interest Rate on Agricultural Loans as this will encourage more farmers accessing facilities for agricultural production.

Though implementing these policy recommendations to boost agricultural financing and economic growth in Nigeria faces several challenges:

1. Weak institutional framework: Inefficient regulatory bodies, corruption, and lack of transparency hinder effective policy implementation.
2. Financial sector constraints: Limited financial resources, risk aversion, and lack of agricultural expertise within financial institutions impede lending to the sector.
3. Farmer-level constraints: Low levels of financial literacy, inadequate infrastructure, and limited access to markets constrain farmers' ability to utilize credit effectively.
4. Political interference: Political instability, policy inconsistency, and corruption can undermine policy implementation efforts.

Addressing these challenges requires a multi-faceted approach:

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1. Strengthening institutions: Building capacity within regulatory bodies, promoting transparency, and reducing corruption are essential.
2. Financial sector development: Encouraging financial institutions to lend to agriculture through incentives, risk-sharing mechanisms, and capacity building.
3. Farmer empowerment: Improving financial literacy, providing access to extension services, and developing value chains can enhance farmers' capacity to utilize credit.
4. Policy consistency and implementation: Ensuring policy continuity and effective monitoring and evaluation are crucial for successful implementation.
5. Public-private partnerships: Collaborating with the private sector to develop innovative financial products and delivery channels.

By addressing these barriers and implementing effective strategies, Nigeria can unlock the potential of agricultural financing to drive economic growth and development.

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