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**Research Article**

# Does Commercial Banking Activities Exerts on Agricultural Growth in Nigeria? Evidence from ARDL Framework

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*Abstract*

*The current study examined the Impact of commercial bank loan activities on Nigeria's agricultural productivity with a focus on the impact of the agricultural sector credit guarantee scheme fund, commercial Bank credits to agricultural output, interest rate and the government recurrent expenditure on the agriculture sector. We employed the newly developed augmented regressive distributed lag to examine whether or not commercial lending activities enhances productivity. Our results shows that though a positive relationship exist between agricultural output and each of agricultural sector credit guarantee scheme fund and the government recurrent expenditure on the agriculture sector, the relationship is not significant. The result also shows that a positive but not significant relationship exists between commercial Bank credits to agricultural output, and that a negative but significant relationship exists between interest rate and agriculture output. The implication is that increase in commercial bank lending has not been able to induce positive growth in the agricultural output in Nigeria. Our results provoke insights thinking on the role of commercial banking activities in advancing agriculture in Nigeria.*

*Keywords: Agricultural Output, ARDL, Nigeria, Commercial banks*

## 1. Introduction

Agriculture in the 1960's was the pride of the Nigerian economy (Aminu & Anono 2012), contributing over 70% of the gross domestic product employs around 70% of the workforce and accounts for around 90% of foreign currency earnings and federal government revenues. (Gbaiye, Ogundipe, Osabuohein, Olugbire, Adeniran and Olatunji, 2011). At that time, Nigeria was the second biggest cocoa producer in the world, with world market of 15%, a 60% market share and the biggest exporter for palm oil and a 30% global market share for groundnut (Lawal & Atte 2006).

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Also, in the cotton, rubber, hides, and skin markets Nigeria dominated the market. The nation is bless with conducive natural environment like arable land, water resources, and large active populating that can tiled the land at the same time provides good market to stimulate the demand. This success story notwithstanding, farming practice was largely conducted using rudimentary farm implements and tools. The positive narrative began to change in the early 1980 as evidence in departure from self-sufficiency and leading exporter in 1960 to being a net importer (Enya and Alimba, (2008); Folawewo and Olakojo (2010); Udoka (2015). For example, 153,000 tons of palm oil were imported from the nation valued at about ninety two million US dollar ($92,000,000) in 1982; 55,000 metric tons of cocoa in 1983; Tons of wheat 7.07 million, 11.062 million tons of rice and431,000 tons of maize during those periods. Total expenditure to service importation of food items began to gallop, for instance $430million was spent in 1990, $1.25billion was spent in 2000 and $4.2billion was spent in the year 2010 (E1-Rufai (2011), Asaleye et al 2018a, 2018b, Dahunsi et al, 2019, Okere et al (2019),  Lawal et al 2018a, 2018b). Nigeria's imports of wheat were 7.07 million tons, rice 1,062 million tons, and maize 431.000. Nigeria spent US$ 430 million on food imports in 1990, a figure which increased to 1.25 billion US dollars in year 2000 and 4.2 billion in 2010 (EL-Rufai 2011). In 1976, Nigeria was once the world's largest exporter and palm oil producer and became a net importer of vegetable oil (Asaleye et al, 2018a; Asaleye et at, 2018b; Lawal et al, 2018a; Lawal et al, 2018b). This downward trend in Nigeria's initial success story has a number of factors, some of which neglect the agricultural sector because of the increase in oil revenues, poor access to modern inputs and technology, and the lack of sufficient credit supplies, amongst other factors (Lawal et al 2019a; 2019b).

The government has initiated several agricultural programs and programs that promote agricultural growth in the country because of the poor performance of its sector in terms of its contribution to Nigeria's overall annual revenues and economic growth. According to Ekpo & Umoh (2015), medium-term policy documents intended to help the country achieve its Millennium Development Goals for 2015, with a national economic empowerment and development (NEEDS) highlighting economic development in its own ' Vision 2020 ' driven by private sector, with agriculture playing a key role.

These reforms aim to make Nigeria one of the world's 20 largest economies by 2020, which means supporting existing domestic production for agriculture. Other policies by the government includes; the Agricultural Credit Guarantee Scheme Funds (ACGSF), National Accelerated Food Production Project (NAFPP), Green Revolution (GR), Operation Feed the Nation (OFN), Root Tuber Expansion Projects (RTEP) etc. (Abolagba, Onyekwere,  Agbonkpolor and Umar, 2010; Isola et al, 2015; Babajide et al, 2015).

Modern growth theory opined that the banking system's intermediation role is key to achieving sustainable growth and development for both developed and developing economies. The question then is, has bank credit facilities able to significantly impact on agricultural output in Nigeria? Answering this question is the core objective of the current study. The study also want know whether or not, a significant relationship exist between commercial bank rate and commercial bank lending to agricultural section in Nigeria. It is also the intent of the study to examine the relationship between government facilities to agriculture proxy by the Agriculture Credit Guarantee Scheme loan and agricultural productivity in Nigeria.

The remaining of this study is structured in the following way: Section two focused on the review of literature, section three on methodology and section four on results, while section five presents the conclusion of the study.

## 2. Literature Review

### 2.1 Theoretical Framework

The theory that governs this work is rooted in the financial liberalization framework that emphasizes the important of deregulation and free market model in attaining economic growth. This is premised on the fact that government intervention by a way of interest rate control, selective credit allocation among others induces a negative feedback on growth (Merlinda and Nash, (2004); Rajan and

Zingalas (1996); Stightz and Weiss (2010). Mckinnon and Shaw (1973) opined that to attain improved overall savings and investment efficiency as well as sustainable growth, the free market should determine credit allocation mechanism within the context of liberalized financial system Lawal et al 2016; Stiglitz and Weiss (2010). Extant literature exist on the relationship between bank lending and agricultural output both in the developed and developing economies. While some studies like Enang &Frances (2011); Afangideh, (2010) have established the positive impact of bank credit on agricultural output, some have noted that a negative relationship exist between the dual.

(2017) employed large, national farm household level data and two squared least estimation techniques to examine the impact of institutional credit lending on agricultural output for India. By calibrating the input on farm income and farm household consumption expenditure into the model, the study observed that formal credit induces upward surge in both net farm income and per capital monthly household expenditure in India.

The study concluded that bank credit facilities indeed drives increases in agricultural output for India (see also Gautam & Ahmed (2019) Mandel and Seydl (2016), Luan & Bauer (2016).

For some selected Sub-Saharan African economies, Adjognon, Liverpool–Tasie and Reardon (2019) employed recent nationally representative data to examine the impact of bank credit facilities on agricultural output. The study equally observed the sources of input financing. The result shows that bank credit has no impact on agricultural output, and that farm input are essentially product of farm holders savings derived from alternative sources and not bank credit (see also Julien, Bravo-Ureta and Rada (2019); Michalek, Ciaian and Pokrivcak 2018) (**)

## 3.  Materials & Methods

The study data comprises monthly data from publications of the Statistical Bulletin (various issues) of the Central Bank of Nigeria for data covering 1981-2017. We employed the Augmented Regressive Distributed Lag (ARDL) to analyse our data (see Ayopo, et al, 2015; Ayopo, et al, 2016a; 2016b; Lawal et al, 2017a; 2017b; Fashina et al, 2018 ).

### 3.1  Model Specification

The model is specified as below:
AGDP= f(CBCA, AGSCF, INT, , GREA )                    (1)
Where;
$AGDP_t$ = Gross Domestic Product of Agricultural Sector
AGSCF = Agricultural Credit Guarantee Scheme
CBCA = Commercial Banks' Credit
INT= interest rate on commercial bank credit to agriculture
GREA=government recurrent expenditure on the agricultural sector
We regressed Equ(1) as follows:
$AGDP_t = \alpha + \beta_t INT + \beta_1 ACG + \beta_2 CBC_t + GREA_t + \mu_t$                    (2)
Where α and $\beta_1$ are the coefficients of the parameter, other variables remains as earlier stated.

### 3.2  Method of Data Analysis

The study employed the ARDL (AUTO REGRESSIVE DISTRIBUTED LAG) co-integration bounds test for stationary testing, unit root test for stationarity that determined the long run relationship and to achieve the study's objectives. The ARDL co integration test was also employed to ascertain the hypothesis of this research work.

## 4. Results and Discussions

### 4.1 Introduction

This chapter contains the analysis and representation of data. It shows the empirical analysis of the study which examines the roles of commercial bank in agricultural growth in Nigeria from 1981-2017.

In other to achieve the objectives of this study, the following methods were employed, Unit root test, and Autoregressive distributed lag (ARDL) bounds test.

The variables that were examined on the course of the analysis include: Agricultural gross domestic product (AGDP), Commercial Bank credit to the agricultural (CBCA), Agricultural credit grant scheme fund (AGSCF), interest rate (INT), Government recurrent expenditure on the agricultural sector (GREA).

### 4.2 Presentation and Analysis of Result

#### 4.2.1 Unit Root with Break Point

| Variables | Critical Values at 1% | Critical Values at 5% | Critical Values at 10% | Adf Stat at Levels | Adf Stat at 1$^{st}$ Diff | Order of Integration |
|---|---|---|---|---|---|---|
| AGDP | -5.35 | -4.86 | -4.61 | -23.69 | - | I(0) |
| CBCA | -5.35 | -4.86 | -4.61 | -2.25 | -7.66 | I(1) |
| AGSCF | -5.35 | -4.86 | -4.61 | -4.14 | -7.15 | I(1) |
| INT | -5.35 | -4.86 | -4.61 | -7.12 | - | I(0) |
| GREA | -5.53 | -4.86 | -4.61 | -6.99 | - | I(0) |

$H_0$: series are not stationary
$H_1$: series are stationary

**Source:** Authors computation using Eviews 10

Decision rule: Reject H0 if the statistics for the test are greater than the critical value. The above table consists of a combination of stationary I(0) and non-stationary I(1) data. From the above table, the variables are combined with stationary I(0) and first difference I(1) data. Based on the above table, the most suitable technique is the ARDL co integration test

#### 4.2.2 ARDL Co-Integration Bounds Test

Since the variables are I(0) and I(1), the ARDL limit test is most suitable as shown in table 4.1.0. We use the autoregressive distributed lag (ARDL) model, amongst other techniques suitable for cointegration.

| Variables | Coefficient | Standard Error | T- Statistic | Prob |
|---|---|---|---|---|
| CBCA | 2.30E-06 | 0.000607 | -0.03796 | 0.9970 |
| AGSCF | 0.037529 | 0.022478 | 1.669573 | 0.1260 |
| INT | -0.010535 | 0.003671 | 2.869623 | 0.00167 |
| GREA | 0.005676 | 0.003841 | 1.477960 | 0.1702 |
| ECM | -0.791994 | 0.039640 | -19.97951 | 0.0000 |

**Source:** Author's Computation using Eviews 10

From the table above AGSCF, and GREA shows a positive and insignificant relationship that is an increase in any of these variables will increase the dependent variable AGDP but not a significant increase. INT show a negative and significant relationship that is an increase in this variable will increase the dependent variable significantly. Whereas CBCA shows a positive but not significant relationship that is an increase in this variable will decrease the dependent variable but not

significantly.

The ARDL ECM which is the co-integrating equation is given as -0.791994 and the probability value is less than 5% significance level. This shows the speed of adjustment from the short run to the long run. In other words, 79.1% disequilibrium is adjusted in the next period. The long run co-efficient needs to be negative and significant but from the above, its value is positive and as such is not significant. It can therefore be observed that there is a short run relationship between the variables.

### 4.2.3 F Bounds Test

| F-statistic value | Significance | I(0) | I(1) | Decision |
|---|---|---|---|---|
| 44.3 | 10% | 2.2 | 3.09 | Long run relationship |
| | 5% | 2.56 | 3.49 | Long run relationship |
| | 2.5% | 2.88 | 3.87 | Long run relationship |
| | 1% | 3.29 | 4.37 | Long run relationship |

**Source:** Author's computation Eviews 10

The table shows the result of the ARDL Bound Test which indicates the existence of a long run relationship between the variables in the model. A long run relationship is said to exist if the value of the F-statistics which in this case is given as 44.3 is greater than the value of the upper bound. From this we can deduce that a long run relationship exist in the model since the value of the F-statistics surpasses the value of the upper bound at all level of significance.

### 4.3 Residual Diagnostic Test

### 4.3.1 Stability Test
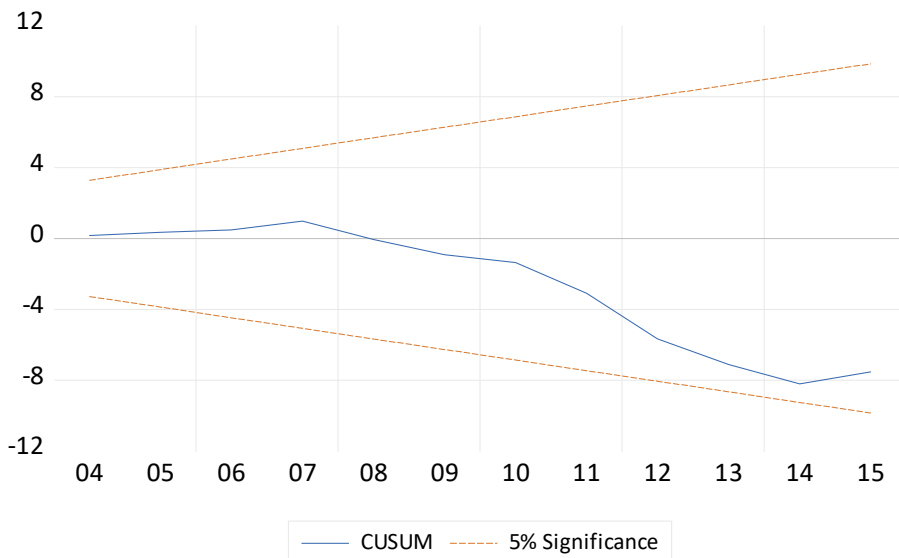


The graph above uses the combined residual residual cumulative sum (CUSUM) parameter stability test to evaluate the stability of parameters, and the estimates show the stability of the parameter, since the CUSUM plot falls within critical limits at the significance level of 5 %.

### 4.3.2 Heteroskedasticity Test (ARCH)

| Variables | Value |
|---|---|
| F-statistics | 0.006264 |
| Obs. R-squared | 0.006710 |
| Prob. F (1, 28) | 0.9375 |
| Prob. Chi-square | 0.9347 |

**Source:** Author's Computation using Eviews 10

The above table demonstrates that the prob.chi-square is 0.9347 which exceeds 0.05, so the null hypothesis of heteroscedasticity is accepted.

### 4.3.3 Serial Correlation Test

| Variables | Value |
|---|---|
| F-statistics | 1.824577 |
| Obs. R-squared | 9.710902 |
| Prob. F (2, 8) | 0.2224 |
| Prob. Chi-square | 0.0078 |

**Source:** Author's Computation using Eviews 10

The above table shows the result of the Breuch-Godfrey Serial Correlation Test. The above table shows the Prob. Chi-square value 0.0078 which is less than 0.05. Given the circumstance, we shall reject the null hypothesis which says that there is no serial correlation between the variables in the model.

## 5. Conclusion and Recommendation

### 5.1 Conclusion

This study examined the impact of commercial banking lending on agricultural productive and growth in Nigeria based on data sourced from 1981 to 2017. We employed the augmented regressive distributed lag (ARDL) to analysis the data within the concept of financial liberation framework. Our results shows that though a positive relationship exist between agricultural output and each of agricultural sector credit guarantee scheme fund and the government recurrent expenditure on the agriculture sector, the relationship is not significant. The result also shows that a positive but not significant relationship exists between commercial Bank credits to agricultural output, and that a negative but significant relationship exists between interest rate and agriculture output. The implication is that increase in commercial bank lending has not been able to induce positive growth in the agricultural output in Nigeria. This development could be resulting from negative impact of interest rate as the proceeds from commercial bank lending are eroded by increase in interest rate. The results provokes insightful thinking on the role of commercial bank lending in advancing agriculture output in Nigeria. The following recommendations are made.

### 5.2 Recommendations

From the results obtained in the study, the authors recommend that:
- ✓ Interest rate should be lowered;
- ✓ Bank credit to farmers should be broaden to accommodate more farm holders;
- ✓ Credit policy of the ACGS should be reviewed in order to impact positively on agriculture.

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