

Commercial Banks' Credit and Agricultural Output in Nigeria: 1980 -2018

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Abstract:-This study empirically examined the impact of Commercial Banks' credit on Agricultural output in Nigeria, covering the period 1980 to 2018. Annual time series data was employed, which was sourced from Central Bank (CBN) publications such as Statistical Bulletins and Bullions, and National Bureau of Statistics (NBS) publications. Stationary test was conducted on variables to ascertain whether they have unit roots. It was discovered that they were all stationary at first difference. Co integration test however, revealed that long run relationship exists among the variables, also ECM model result showed that the model returns to short run equilibrium after an exogenous shock, with speed of adjustment of negative one (-1), this implies that 100% of all the deviations in the past will adjust to equilibrium. Ordinary least square Method was employed to estimate the relationships among the variables and the result showed positive and significant relationship exists between commercial banks' credit and Agricultural output in Nigeria, the same relationship also exists between Expenditure made on Agriculture by Government and Agricultural output in Nigeria. Interest rate was negatively related to Agricultural output in Nigeria, the results are all according to *a priori* expectations. However, commercial banks' credit performs better than Government Expenditure on Agricultural output in Nigeria. $R^2=0.98$, which means 98% of the variations in agricultural output is explained by the explanatory variables, while high F-statistic of 868 with probability value of 0.0000000 means the model is statistically significant at 5% level. The study based on the findings, recommends that; (i) Government should as a matter of policy through the Central Bank make credits from Commercial Banks available and affordable by lowering interest rate and (ii) Government should increase its expenditure on Agriculture, and ensure proper monitoring to enforce judicious utilization of fund.

Keywords: Agriculture output, bank credit

I. INTRODUCTION

Nigeria is a country endowed with arable land and different climatic zones. The climatic zones are suitable for raising animals, growing of diverse crops for food, other human needs and export. The Agricultural sector for more than three decades has not been performing well, its contribution to GDP has been low and the nation is depending on other countries for food. The Agriculture's share of GDP in Nigeria in 1950 was 69 percent, but declined continuously to 49% in 1970, 22 percent in 1982, 42.2% in 2007, 40% in 2010 (Ahungwa, Haruna and Abdusalam, 2012). Also, according to the National Bureau of Statistics

(NBS), the Agriculture's annual contributions to GDP in Nigeria were 23.91%, 23.33%, 22.90 and 23.11% in 2012, 2013, 2014 and 2015 respectively (NBS 2016).

The performance of the agricultural sector in Nigeria largely depends on the provision of affordable financial services to both the Rural and Urban population engaged in the Agricultural sector. Commercial Banks are the major sources of such financial services in form of loans and advances and that is why commercial banks in Nigeria have been directed to devote a major part of their funding to finance this sector, beside other government owned banks like the Nigerian Agricultural and Cooperative Bank (NACB) (Sunny, 2013). However, lack of fund is one of the challenges of agriculture in Nigeria, because beside efforts by farmers to produce, finance pose problem to prompt delivery of goods to the consumer for sale (Oni, 2013). The country has employed many policies to make credit available by financial institutions to the rural and micro entrepreneurs (Mohammed, 2005), for example, Agricultural schemes and banks were introduced in Nigeria to enhance credit flow to rural areas, such banks and schemes include, Nigerian Agricultural and Cooperative Bank (NACB) established in 1972, the Rural banking scheme (RBS) and the Agricultural Credit Guarantee Scheme (ACGS) established in 1977. While the NACB was established to deliver credit to the agricultural sector, the RBS was introduced to enhance banking habit among rural dwellers. ACGS was designed to encourage banks to increase lending to the agricultural sector by providing guarantee against the risk of default, similarly, Commercial Agricultural Credit Scheme (CACs) was also introduced in 2009 to provide similar services like that of ACGS, however, to a large-scale Commercial Agriculture in Nigeria. Apart from the schemes and banks established in favour of the sector, programmes such as Operation Feed the Nation (OFN), Green Revolution and Operation go back to Land among others were launched at different times to boost productivity of the Agricultural sector in Nigeria. Also one of the major policies of the Structural Adjustment Programme (SAP) which was introduced in Nigeria in 1986 was to resuscitate and develop the Agricultural sector in order to meet the needs of the Nigerian economy and export. Other strategies include the Agricultural Transformation Agenda (ATA) implemented in 2010, aimed at rebuilding the sector and the Agricultural Promotion Policy (APP), was to provide a disciplined

approach to building an agribusiness ecosystem (Agricultural promotion policy (APP) 2016-2020, P7). All these policies and efforts by government were put in place to develop Agriculture in order to reduce over dependence on oil and hence diversification of the economy (Daneji, 2011).

However, despite these attention and huge investment in the agricultural sector by various governments to boost the needs of farmers, the dwindling nature of the sector seems to persist, making people skeptical to the role of the financial system in providing credit to the agricultural sector in Nigeria (Udoka, Mbat and Duke, 2016). Despite these initiatives, studies have shown that Micro and Small scale farmers source large proportions of their capital requirements from informal sources, such as money lenders, relatives and friends as opposed to financial institutions such as banks (Mohammed, 2005 Cited Amali, 1996). Against this backdrop, the research work tried to find out the impact of commercial banks' credit on agricultural output in Nigeria. This is to shade more light on the effectiveness of commercial banks' credit to the agricultural sector of the Nigerian economy.

Statement of the Problem

Agriculture which used to be the only source of food to the teeming population and the major foreign exchange earner in Nigeria as well as provision of employment before the discovery of oil, has not been performing well in recent years, its contribution to GDP has been falling, the nation is depending on other countries for food while agro-allied industries available in the country depend greatly on imported raw materials. It has been envisaged that lack of finance could be one of the major problems facing the sector, despite priorities accorded to agriculture by establishing special financial institutions like Nigerian agricultural and cooperative bank (NACB) and schemes like agricultural credit guarantee scheme (ACGS) and the commercial agricultural credit scheme (CACS), the sector still performs below expectation. The study therefore is set to investigate the impact of commercial banks credits on agricultural output in Nigeria.

Research Questions

- What is the impact of commercial banks' credit on Agricultural output in Nigeria?
- Does expenditure on agriculture impact more positively on agricultural output in Nigeria than commercial banks' credit?
- What is the relationship between interest rate and agricultural output in Nigeria?

Objectives of the Study

The main objective of the study is to evaluate the impact of commercial banks' credit on agricultural output in Nigeria. The specific objectives of the study include:

- To evaluate the impact of Commercial Banks credit on agricultural output in Nigeria.
- To find out whether government expenditure on agriculture impact more positively on agricultural output than commercial banks' credit in Nigeria.
- To examine the causal relationship between agricultural output and interest rate in Nigeria.

Hypotheses

Hypothesis I

H₀: Commercial Banks' credit has no positive and significant impact on Agricultural Output in Nigeria.

H_a: Commercial Banks' credit has positive and significant impact on agricultural output in Nigeria.

Hypothesis II

H₀: Government expenditure on agriculture does not have more impact on agricultural output in Nigeria than commercial banks' credit.

H_a: Government expenditure on agriculture has more impact on agricultural output than commercial banks' credit.

Hypothesis III

H₀: Interest rate has no causal relationship with agricultural output in Nigeria.

H_a: Interest rate has causal relationship with agricultural output in Nigeria.

II. LITERATURE REVIEW

2.1.1 Concept of Agricultural output

Gross output of Agriculture refers to the total value of products and services of farming, forestry, animal husbandry and fishery. It reflects the total scale and results of agricultural production during a given period. The gross output of farming includes all the products of the field crops cultivation, cultivation of meadows, vegetables growing, orchard and vineyard cultivation. The gross output of livestock rising includes all the products of farming, beekeeping, sericulture, fish breeding, cattle, swine horse, reindeer and rabbit breeding (Lemeshev, 2010).

According to Reis (2016) gross output of a nation's agriculture is the summation of the yearly output of its components. Which according to him, output consist mainly of wheat, maize, rye, millet and barley, animal products, wine and olive oil. Gross farm output value has also been described by the department of agriculture, forestry and fisheries (DAFF) as the sum of all the values of farm enterprises, which include crops and livestock enterprises plus sundry farm income (DAFF, South Africa, 2015). This work intends to adopt the definitions of gross output of agriculture given by the authors above for the study.

2.1.2 Concept of Bank Credit

Credit is the extension of money from lender to the borrower. Sunny (2013, Cited Spenser 1977), noted that credit implies a promise by one party to pay another for money borrowed or goods and services received. This shows that bank credit can be in cash, kind or services. Banks depends on deposit from individuals or groups with surpluses which can be given out to those that need the money to carry out their businesses. These banks serve as debtors to the depositors but creditors to the borrowers. Banks therefore connects surpluses to the borrowers in form of credits. According to online definition of bank credit from Investopedia “is the amount of credit available to a company or individual from the banking system”. It is the aggregate of the amount of funds financial institutions are willing to provide to an individual or organization. Adebayo and Ademola, (2008) Cited Adegege and Ditto (1985), described agricultural credits as a process of obtaining control over the use of money, goods and services with a promise to pay at future date, while according to Obansa and Maduekwe (2013), Agricultural finance refers to financial services ranging from short, medium and long term loans, leasing, to crop and livestock insurance, covering the entire agricultural value chain – input supply, production and distribution, wholesaling, processing and marketing.

2.2 Theoretical Framework

In this section some theories are reviewed to form as basis for the study, such as the credit channel theory and the finance led growth hypothesis; The credit channel theory mechanism of monetary policy describes how a central bank’s policy changes the amount of credit that banks issue to firms and consumers for purchases which in turn affects the real sector. This theory has been sub-divided into two, the balance sheet and Bank lending channels (Lamont and Richard, 2007).

2.2.1 The Balance Sheet Credit Channel Theory

This Theory stressed that external finance premium facing a borrower depends on borrower’s net worth, the lower the external finance premium and overall term of credit. The theory further stated that the quality of borrower’s sheet similarly affects their investment and spending decisions. The balance that channel arose due to shift from central bank’s policy not only affect interest rate but also the financial position of borrowers.

2.2.2 The Bank Lending Channel Theory

The bank lending channel stated that monetary policy also affects the external finance premium by shifting the supply of the intermediated credit, especially loans from commercial banks. It indicated that if supply of bank loan is disrupted for some reasons, bank dependent borrowers may not be necessarily shut off but incur cost of finding lenders.

2.2.3 The finance-led growth hypothesis

The finance growth hypothesis postulated the supply leading relationship between financial and economic

development. It argued that the existence of financial sector, as well-functioning financial intermediations in channeling the limited resources from surplus spending units to deficit spending units would provide efficient allocation of resources thereby leading the other economic sectors in their growth process (Schumpeter, 1911 cited in Choong and Chan 2011). This research work will anchor on both the finance-led growth theory and the Balance Sheet Credit channel theory, since the study is looking at the impact of commercial banks’ credit on agricultural output in Nigeria.

2.3 Empirical Literature Review

There exist in the literature diverse studies with mixed findings on the subject under consideration in this paper. Aguwa, Inaya and Proscio (2013), investigated the impact of commercial banks’ credit on agricultural productivity in Nigeria from 1980 – 2013. Stationary test was conducted using augmented Dickey Fuller (ADF) unit root test to find out whether the time series data have a unit root. The result showed that all the variables were not stationary at level (originally), but became stationary at 1st difference, that showed that the variables were integrated at order one I(1). Ordinary least square (OLS) was used to estimate the relationship between the variables in the model, the result showed that alternative hypothesis which stated that “commercial banks’ credit has positive impact on agricultural productivity” between the period was validated and the null rejected. The second hypothesis (null) which states that government spending on agriculture has no severe effect on agricultural productivity in Nigeria was rejected and the alternative accepted. This is in accordance with a priori expectation.

Friday, Chris and Fredrick (2013) employed Vector Autoregressive (VAR) approach to examine the impact of credit supply, and various commercial bank loan schemes on agricultural sector production in Nigeria. The study covered the period 1981 to 2013; the result revealed that ACGSF performed poorly in explaining agriculture sector performance, while commercial bank loans to agriculture had significant impact on agricultural production in Nigeria. Similarly, using Ordinary Least Square method Kareem, Osisanya and Isiaq (2017), examined the effect of commercial banks financing on agricultural sector output in Nigeria, covering the period 1981 to 2014. The result showed that 99.6% of the variation in real agricultural gross domestic product is explained by commercial banks loan to agriculture. Similarly, Udoka, Mbat and Duke (2016), examined the effect of commercial banks’ credit on agricultural output in Nigeria covering the period 1970 to 2014. The study employed data sourced from Central Bank of Nigeria Statistical bulletin. Ordinary Least Square technique was employed to estimate the parameter which shows the relationships between the explanatory variables and the agricultural production in Nigeria. The result showed that there was positive and significant relationship between commercial banks’ credit to the agricultural sector and agricultural production in Nigeria.

Somehow contrary to the result above, Olusegun, Akintoye and Dada (2014) investigated the impact of commercial bank lending on Nigeria's aggregate economic growth for the period 1970 to 2011. Secondary data were employed for regression analysis, non-oil GDP was used as dependent variable, while commercial bank credit for the current year and one year lagged period as independent variables. The result revealed that the previous year's loan and advances to the service sector had more positive impact on economic growth compared with current year's loans and advances. The study also revealed that both previous and current year's credit to 'others' sectors had inverse relationship with economic growth. In terms of the subsectors, public utilities and transport/telecommunications subsector, the previous year credit showed positive contributions to economic growth, while the current year credit showed a negative impact. Nnamocha and Charles (2015), however, investigated the effect of bank credit on only agricultural output in Nigeria, using secondary data which covered the period 1970 to 2013.

Ordinary Least Square method was employed for the analysis, the result of the empirical findings revealed that in the long run bank credit and industrial output contributed positively to the agricultural output in Nigeria. However, only industrial output influences agricultural output in the short run in Nigeria. Similarly, Ebele and Iorember(2016), examined the impact of commercial bank credit on manufacturing in Nigeria, covering the period from 1980 to 2015. The study employed secondary data for the analysis, Cochrane-ocutt method was employed because of the presence of serial correlation as revealed by Durbin Watson test statistic result instead of OLS. The result showed that inflation and interest rate have negative effect on manufacturing sector output, while loans and advances and broad money supply have positive effect on the manufacturing sector output in Nigeria. Sunny (2013), however, empirically evaluated the impact of commercial banks' credit to agriculture on agricultural development in Nigeria from 1984 to 2007. Using secondary data and Ordinary Least Square method for estimating the relationships between the dependent and the independent variables, the result showed that commercial bank credit to the agricultural sector and prices of agricultural product for this period have no significant positive effect on agricultural productivity in Nigeria, but Agricultural credit scheme by purpose and government fund allocation to agriculture have.

Dori (2016), used descriptive statistics and content analysis to examine the impact of agricultural credit guarantee scheme fund on agricultural and Economic Development of Nigeria. Employing secondary data in the analysis, the result revealed that in Nigeria the scheme had increased the flow of credit to the farmers and has expanded the beneficiaries' acquisition and adoption of modern farming inputs, output, earning and finally standard of living. It has also enhanced food production, food security, import substitution on food locally produced, agricultural export commodities, GDP,

foreign exchange earnings and rural development in Nigeria. Ayeba and Ikani(2013), however, assessed the impact of agricultural credit on rural farmers in Nigeria using primary data. A simple percentage was used to interpret the result. The assessment found out that private money lenders constitute the major source of credit. The result showed that 53.3% of the respondent reiterated that high interest rate constitutes their major problem since private money lenders are unregulated and not monitored by government institutions. 43.33% of the respondents affirm that approval of loan constitutes the challenge in the entire race of accessing credit from the formal source. The result also showed that microfinance banks are not found in the rural areas. This last result does not depict the true nature of the Nigerian economy; it can only be expressed in percentage because some microfinance banks are found in the rural areas.

Identified Gap:

Based on the literature reviewed, a gap has been identified that need to be filled. The impact of government expenditure on agricultural output relative to that of commercial banks' credit in Nigeria has not been given attention, this what the study is set out to fill.

III. RESEARCH METHODOLOGY

3.1.1 Research Design and Method

The research is on the impact of commercial banks' credit on Agricultural output in Nigeria (1980-2016). The work is to find out how commercial bank's credit on Agricultural output in Nigeria, it will also examine how government expenditure and interest rate affect agricultural output. It employed Expo Facto research design, because this research design is more suitable since the situation for study already exists and data are available as corroborated by Asika, (1991).

Econometric procedures were adopted in the course of this research work, Ordinary least square method (OLS) was employed for estimation of the relationships between the dependent variable and the explanatory variables.

Unit root tests using Augmented Dickey Fuller and Philip-Perron unit root test were employed to test for stationarity of the time series to avoid spurious regression. To determine whether there exists long run equilibrium relationship among the variables, co integration test was performed and also ECM model was estimated to capture short run relationships.

3.1. 2 Types and Sources of Data

The data for this study was obtained mainly from secondary sources; which include:

- Central bank of Nigeria (CBN) publications
- National Bureau of Statistics (NBS) publications.

Annual time series data on agricultural output in Nigeria for the period of thirty-six (36) years was sourced which is dependent variable.

Annual time series data on commercial bank’s credit, interest rate (lending rate as a proxy) and government expenditure on agriculture was also sourced for the same periods which are explanatory variables.

3.1.3 Model specification

AGX = f (CBCR, GEXPA, INR) – functional relationship
..... 1

Employing Cobb Douglas production function, $X = \beta_0 L^{\beta_1} K^{\beta_2}$, the above functional relationship can be expressed as $AGX = \beta_0 CBCAG^{\beta_1} GEXPA^{\beta_2} INTR^{\beta_3}$2

Taking the natural log of both sides, $\ln(AGX) = \beta_0 + \beta_1 \ln(CBCAG) + \beta_2 \ln(INTR) + \beta_3 \ln(GEXPA)$

Therefore, The Econometric Model can be specified as $\ln(AGX)_t = \beta_0 + \beta_1 \ln(CBCAG)_t + \beta_2 \ln(INTR)_t + \beta_3 \ln(GEXPA)_t + U_t$ 3,

Where;

AGX = Agricultural output, CBCAG = Commercial banks credit to agriculture

GEXPA= Government expenditure on Agriculture and INTR is interest rate, using lending rate as a proxy, β_0 = Intercept

β_1, β_2 and β_3 are parameter estimates of the explanatory variables, U_t is the error term while \ln is natural log. While the ECM is expressed as $\ln(AGX) = \beta_0 + \beta_1 \Delta \ln(CBCAG)_t + \beta_2 \Delta \ln(INTR)_t + \beta_3 \Delta \ln(GEXPA)_t + U_{t-1} + e_t$,

The a priori expectation is that β_1 and $\beta_3 > 0, \beta_2 < 0$

IV. DATA ANALYSIS, RESULT AND DISCUSSION OF FINDINGS

4.1.1 Unit root test

In order to avoid spurious regression, stationarity test of the series was performed. The Augmented dickey fuller and Philips-Perron unit root test were employed for the test. The results and order of integrations are presented in table 1a and b below. In table 1a the ADF test result shows that all the variables are not integrated at level except interest rate at 5% critical value only. However, Philips-Perron test result in table 1b shows that all the variables have a unit root at level, but stationary at first difference at 1%, 5% and 10% critical values.

Table 1a: Stationarity test result using Augmented Dickey fuller test

AT level	Critical values				Order of integration
ADF Stat.	Variables	1%	5%	10%	
-1.614869	LOG(AGX)	-3.626784	-2.945842	-2.611531	1(0) @5%
-1.058185	LOG(CBCAG)	-3.626784	-2.945842	-2.611531	
-2.664058	LOG(INTR)	-3.646342	-2.954021	-2.615817	
-1.567852	LOG(GEXPA)	-3.632900	-2.948404	-2.612874	
At first difference					
-4.072280	LOG(AGX)	-3.632900	-2.948404	-2.612874	1(1)
-6.884569	LOG(CBCAG)	-3.632900	-2.948404	-2.612874	1(1)
-4.395308	LOG(INTR)	-3.639407	-2.951125	-2.614300	1(1)
-8.033219	LOG(GEXPA)	-3.632900	-2.948404	-2.612874	1(1)

Author’s computation, using Eviews

Table 1b: Stationarity test result using Philips- Perron test

AT level	Critical values				Order of integration
PP Stat.	Variables	1%	5%	10%	
-1.462737	LOG(AGX)	-3.626784	-2.945842	-2.611531	
-1.872705	LOG(CBCAG)	-3.626784	-2.945842	-2.611531	
-2.321797	LOG(INTR)	-3.626784	-2.945842	-2.611531	
-1.325265	LOG(GEXPA)	-3.626784	-2.945842	-2.611531	
At first difference					
-4.013709	LOG(AGX)	-3.632900	-2.948404	-2.612874	1(1)
-7.323420	LOG(CBCAG)	-3.632900	-2.948404	-2.612874	1(1)
-5.724454	LOG(INTR)	-3.632900	-2.948404	-2.612874	1(1)
-8.033219	LOG(GEXPA)	-3.632900	-2.948404	-2.612874	1(1)

Author’s computation, using Eviews

4.1.2 Co Integration test.

To find out whether long run equilibrium relationship exists among the variables, Co-Integration test using the Johansen Co Integration test was conducted. This is because the variables are individually I(1), which means they have stochastic trends, their linear combination is I(0) (Gujarati, 2004). Therefore, co integration test using Trace and Maximum eigenvalue test was carried out. The result indicates

that the null hypothesis of no co integration among the variables is rejected. Both the trace test and the Maximum eigenvalue test indicate at least two co integrating equations at 5% exist (Appendix B). The result conforms that long run equilibrium relationship exist among the variables at 5%.

In order ascertain whether the model returns to short run equilibrium, the ECM model specified as $\ln(\text{AGX}) = \beta_0 + \beta_1 \Delta \ln(\text{CBCAG})_t + \beta_2 \Delta \ln(\text{INTR})_t + \beta_3 \Delta \ln(\text{GEXPA})_t + U_{t-1} + e_t$.

Table 2: ECM model regression Result

Dependent Variable: DLOG(AGX)
 Method: Least Squares
 Date: 06/26/17 Time: 03:08
 Sample (adjusted): 1981 2016
 Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.191540	0.035090	5.458472	0.0000
DLOG(CBCAG)	0.069060	0.106387	0.649142	0.5210
DLOG(GEXPA)	0.022406	0.034359	0.652118	0.5191
DLOG(INTR)	0.153164	0.198305	0.772366	0.4457
RESID01(-1)	-1.00E-07	6.45E-07	-0.155751	0.8772

R-squared	0.058687	Mean dependent var	0.213145
Adjusted R-squared	-0.062773	S.D. dependent var	0.157155
S.E. of regression	0.162013	Akaike info criterion	-0.674035
Sum squared resid	0.813694	Schwarz criterion	-0.454102
Log likelihood	17.13263	Hannan-Quinn criter.	-0.597272
F-statistic	0.483178	Durbin-Watson stat	1.311804
Prob(F-statistic)	0.747881		

The result revealed that the model returns to short run equilibrium after an exogenous shock because the coefficient of U_{t-1} is negative one (-1) as shown in the table above.

4.1.3 Estimation and Discussion of Result

Table 3: Impact of Commercial Banks' Credit on Agricultural output

Dependent Variable: LOG(AGX)
 Method: Least Squares
 Sample: 1980 2016
 Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.524296	0.629765	7.184102	0.0000
LOG(CBCAG)	0.885277	0.071544	7.184102	0.0000
LOG(INTR)	-0.655544	0.192767	-3.400701	0.0018
LOG(GEXPA)	0.267012	0.054680	4.883170	0.0000
R-squared	0.987490	Mean dependent var	13.45643	
Adjusted R-squared	0.986353	S.D. dependent var	2.520816	
S.E. of regression	0.294483	Akaike info criterion	0.494617	
Sum squared resid	2.86177	Schwarz criterion	0.668771	
Log likelihood	-5.150422	Hannan-Quinn criter	0.556015	
F-statistic	868.3100	Durbin-Watson sta	1.305117	
Prob(F-statistic)	0.000000			

Author's computation, using Eviews

In this study, Ordinary least square Method was employed to estimate the model, since the variables are all stationary at first difference. This is to identify the nature of relationships that exist between Agricultural output (AGX) and other variables, with special interest on Commercial banks' credit to agriculture (CBCAG) in Nigeria, using annual data from 1980 to 2016. The estimated equation from the table is given as:

$$\ln(\text{AGX}) = 4.52 + 0.88\ln(\text{CBCAG}) - 0.65\ln(\text{INTR}) + 0.26\ln(\text{GEXPA})$$

$$\begin{matrix} 7.184102 & 7.184102 & -3.400701 \\ 4.883174 & & \end{matrix}$$

$$(0.629765) \quad (0.071544) \quad (0.192767) \quad (0.054680)$$

$$R^2 = 0.987490, \quad R^2 \text{ Adjusted} = 0.986353, \quad F\text{-statistic} = 868.3, \quad \text{Prob.}(F\text{-stat.}) = 0.000000, \quad DW \text{ statistic} = 1.305117.$$

The result is according to the a priori expectation, there exist positive relationship between commercial banks' credit to agriculture and Agricultural output in Nigeria, this means that the null hypothesis of commercial banks' not having significant impact on agricultural output in Nigeria is rejected and the alternative accepted. Government expenditure on Agriculture and Agricultural output are also positively related. The negative relationship between Agricultural output and the rate of interest (lending rate as a proxy) in Nigeria revealed by this result is also expected. $R^2 = 0.98$, means 98% of the total variation in agricultural output in Nigeria is explained by explanatory variables. Only about 2% of the variation in agricultural output in Nigeria is explained by other variables outside the model- statistic of 868 is high with probability value of 0.000000 which means the model is statistically significant. The DW statistic value of 1.305 indicates a problem of positive serial correlation, this could be as a result of an important explanatory variable that have not been included in the model. The result also revealed using standard error test, that the variables included in this analysis with exception of interest rate are statistically significant in explaining the variations in Agricultural output in Nigeria, therefore null hypothesis of not statistically significant is rejected and the alternative accepted, while for interest rate, the null hypothesis which state that interest rate has no causal relationship with agricultural output in Nigeria is rejected and the alternative accepted.

The estimated equation shows that if commercial bank credit to Agricultural sector increased by one Naira, it will increase agricultural output value by approximately nine Naira, similarly a one Naira increase in Government expenditure to Agricultural sector will increase Agricultural output value by approximately three Naira. This shows that commercial bank credit performs better in boosting Agricultural output than Expenditure made on Agriculture by government in Nigeria. Therefore, the null hypothesis which stated that government expenditure does not impact Agriculture more positively than commercial banks credit is accepted and the alternative rejected.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1.1 Summary of Findings

Based on the result of the findings, commercial Banks' credit to the agriculture has positive and significant impact on agricultural output in Nigeria, which is in line with the findings of Agunuwa, Inaya and Proso (2013), Friday, Chris and Fredrick (2013), Udoka, Mbat and Duke (2016) and Kareem, Osisanya and Isiaq (2017), but contrary to the finding of Sunny (2013). Government spending also has positive and significant impact on agricultural output in Nigeria, however, commercial banks' credit performs better than government spending in boosting agriculture in Nigeria, while Interest rate is negatively related to agricultural output in Nigeria.

5.1.2 Conclusion

Commercial Bank credit is one of the major sources of fund required by the sector, therefore availability and affordability of such fund will make it easier for the farmers to obtain required inputs at the right time, which will encourage them to produce at a large scale, instead of subsistence which is a common feature of agriculture in Nigeria.

The result of this study revealed that both Commercial banks credits to agriculture and expenditure made on agriculture by government are positively related to agricultural output in Nigeria. This means that funding agriculture will make the nation self-reliant in terms of food and the nation will be among major exporters of agricultural product, provide raw materials for our industries and reduce unemployment in the country.

5.1.3 Recommendations

Based on the findings of this study, the following recommendations are made:

- (i) The Federal Government through the Central Bank of Nigeria (CBN) as a matter of policy should lower interest rate charged on credit to some sectors of the economy, especially the Agricultural sector with a view of making credit available and accessible to the farmers, since positive and significant relationship exist between agricultural output and commercial banks' credit.
- (ii) Government should increase its expenditure on agriculture and ensure proper utilization through monitoring, because the result has indicated positive and significant relationship between the expenditure made by government on agriculture and the agricultural output in Nigeria, however, the result showed commercial banks credit performs better than expenditure made on Agriculture despite huge allocations made to the sector annually.

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