

**COMMERCIAL BANK AGRICULTURAL CREDIT AND OUTPUT IN NIGERIA: (1981 - 2011)**

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**ABSTRACT**

*This study examines Commercial bank agricultural credit and the performance of the agricultural sector in Nigeria ranging from 1981-2011. A cointegration approach to econometric analysis was employed in investigating the commercial bank agricultural credit output relationships. The results of the cointegration estimation suggest that there exists a significant long-run steady state relationship between agricultural credit and output in Nigeria within the period under review. Furthermore the result of the granger non-causality indicates non-existence of any causality between the depended and explanatory variables employed in the study. In the same view the OLS estimating intended to examine the impact of agricultural credits on agricultural output in Nigeria, revealed that while credit to agricultural sector by the commercial bank is positively and significantly correlated with a general out, the reverse is the case for expenditures on agricultural sector via the government agricultural credit guarantee scheme. To this extent it is recommended that all the findings provided by government for improvement in agricultural sectors should be better channeled through the commercial bank rather than do otherwise.*

**KEYWORDS:** Credit supply, agricultural credit, agricultural credit policy.

**1.1 Background to the Study**

Nigeria is endowed with huge expanse of fertile land, rivers, streams, lakes, forests and grasslands, as well as a large active population that can sustain a highly productive and profitable agricultural sector. This enormous resource base could support a vibrant agricultural sector capable of ensuring self-sufficiency in food and raw material for the industrial sector as well as, providing gainful employment for the teeming population and generating foreign exchange through export (CBN 2000).

As confirmed by Ugochukwu (1999), agriculture is the first and most thriven occupation of mankind. From its early form of wild fruits, leaf, root, snail and insect gathering, fishing and hunting, to its present mechanized and almost automated form, it has undergone a lot of development.

The role of agriculture in transforming both the social and economic frame work of an economy cannot be over emphasized. Anyanwu (1997) posits that “agriculture has been the main source of gainful employment from which Nigeria nation can feed its feeding population, providing the nations industries with local raw materials and as a reliable source of government revenue. Corroborating the above is Reynolds (1975) who asserts that agricultural development can promote the economic development by increasing the supply of food available for domestic consumption and releasing the labour needed for industrial employment.

The major agricultural export commodities in Nigeria include cocoa, coffee, cotton, groundnut, groundnut oil, palm kernel, soya beans, ginger rubber, benign –seed and chili pepper (CBN,2003).there are other commodities that are being demanded in the world market such as cassava and cassava products, banana, plantain and so on. The Nigerian economy until today is still dependent on primary products both as foreign exchange earner and contribute to gross domestic product.(GDP). Olurosunsola (1996) attributes this to the fact that the main interest of the colonial masters was and still is the exportation of products needed for their home industries.

## **1.2 Statement of the Problem**

Nigeria is characterized by a vicious circle of poverty (low income, low savings and consequently low productivity). Countries that have suffered natural disasters in form of low or dearth of rainfall, storm and severe flooding have experienced food shortages, which have made those countries to appeal for food aid from donor countries. A myriad of problems have impaired the performance of the agricultural sector over the years in Nigeria. These problems have resulted in limited agricultural produce of staples that can be ready for the table in less than one year (Okunneye2002), and the continuous increase in the food imports leading to outflow of foreign exchange. For instance, \$1.23 billion was spent on food imports in Third Quarter of the fiscal year 2010 with \$1 billion alone spent on rice. This could either have been ploughed into assisting the farmers to increase local production or used to rehabilitate decaying infrastructure. At present 9 percent of Nigeria's population is undernourished (UNDP 2008) and depends largely on food imports to satisfy the requirements of the population. However, government has made some efforts using the banking system which has been providing credit to the Nigerian economy. In order to examine the role of bank credit to the economy, the aggregate bank credit to the economy is used to estimate its impact growth, which is proxy by gross domestic product. This credit is classified into credit to the public sector (government) and credit to the private sector. This section presents and examines credit to these sectors from 1992 to 2008 with a view to assessing its impact on the growth of the Nigerian economy. Data on aggregate domestic credit of deposit money banks reveal that between 1993 and 1994, credit to the economy grew from 64.5 per cent to 67.3 per cent. Between 1995 and 2008, credit to economy fluctuated as follows with 24.1% in 1995, 34.7% in 1996, 25.9% in 1997, 14.8% in 1998, 55.7% in 1999, 42.1% in 2000, 32.7% in 2001, 37.9% in 2002, 15.3% in 2003, 38.4% in 2004, 20.5% in 2005, 40.2% in 2006, 86.1% in 2007 and 45.7% in 2008. The highest growth rate was recorded in 2007, which could be attributed to the gains on post-consolidation of Nigerian Banks, CBN (2010). This situation should improve as countries become more self-sufficient in food production rather than depend on importation. For some countries, food output cannot be regarded as adequate for today's mental needs in the face of continuous increases in the prices of good nourishing food. This has lasting effect throughout the lifetime of the individual. Studies on the Commercial Bank agricultural credit and the performance of Agricultural sector in Nigeria will assist farmers increase food production for national food security and will also help improve the flow of credit to the agricultural sector and improve the operations of guarantee schemes. This is in addition to the need to overhaul the entire credit guarantee scheme for maximum efficiency for food production.

## **1.3 Research Questions**

1. What is the level of commercial bank agriculture credit impact on agricultural output in Nigeria?
2. To what extent does causal relationship exist between commercial bank agriculture credit and Agricultural output in Nigeria?
3. To what extent does long-run relationship existing between commercial bank agriculture credit and agricultural product performance in Nigeria?

## **1.4 Objective of the Study**

The general objective of the study is to examine the impact of Commercial Bank Agriculture Credit on Agricultural sector output in Nigeria. The specific objectives of the study are:

1. estimate the commercial bank agriculture credit impact on agricultural product performance in Nigeria.
2. investigate the extent of causal relationship between commercial bank agriculture credit and agricultural output in Nigeria.
3. determine the extent of long-run relationship existing between commercial bank agriculture credit and agricultural product performance in Nigeria.

## **2:1 Theoretical Literature**

One of the most dominant theory by which we can conceptualize the development process is termed a two-sector or dualistic model. Its analytical framework is always based on distinguishing the traditional sector (Agricultural) from the modern sector (Manufacturing). The early model of Lewis (1954) began with the assumption of the existence of an Unlimited (or totally elastic) supply of labour originating from the traditional sector. It was assumed that the traditional sector was not rational in the sense of profit maximizing and that the emigration of reduction of its output because of zero marginal product of its labour.

The modern sector, says Lewis, which consists of manufacturing and some agricultural production, uses modern technology. The sector is capital intensive and is rational in the sense of seeking to maximize profit by hiring labour up to the point where the marginal product of the last unit of labour transferred to the modern sector is equal to the wage. Savings were assumed to be made only out of profit. As these profits were reinvested, the demand for labour would increase. This would continue until labour in the traditional sector is no longer unlimited. At the point when labour becomes scarce traditional sector, it began to be commercialized and subsequently, labor would be hired up to the point where the marginal product is equal to the wage.

An alternative on Lewis's unlimited labor supply theory was made by Rains and Fei (1961), where the marginal product of labor was drawn out of the sector, terms of trade would turn against the modern sector and the wage rate must be raised, as the traditional sector produces, foods were assumed to be consumed by the modern sector. Consequently, profits in the modern sector tended to go down, and investment would also slow down. It is also likely, therefore, that growth will stop prior to the commercialization of the traditional sector.

### **Financing Agriculture in Nigeria.**

Finance is one input required for agricultural development as it represents the power to purchase all other inputs and thus, it is not the single determinant of the level of development in agriculture. Several studies have been carried out on commercial banks and the finance of agriculture in the country. According to Elegham (1983), the availability of credits to local farmers poses a serious problem. This is because of the rate in the increase of defaulting cases among small farmers. Tims (1974) also revealed that commercial banks in Nigeria were willing to grant to large-scale farmers because it has noticed that small farmers default. Mostly in the act of loan repayment, they also have no provision for collateral security required by banks. It is in light of this that the government has always maintained that commercial banks should not neglect agricultural and allied activities since they are the Chief agent of mobilization of savings.

Notwithstanding the unsuitability of commercial banks for financing agriculture in general and small-scale farmers in particular, studies carried out by Akinwale (1985), Osuntogu (1973) and Ijere (1975) pointed out the need for raising the volume of loan resources available to the credit constitutions? so as to permit increase in lending to the individual borrowers. However, Ogunfowora et al (1972) attributed most of the shortcomings and institutional credits in Nigeria to facts such as; ineffective supervision or monitoring, insufficient funds, political interference, cumbersome and time consuming loan processing and gearing absence of financial projections.

The importance of project supervision or monitoring of facilities is to ensure that all conditions attached to the approval of credits facilities are complied with. Credit Supervision is also aimed at identifying emergent problems before they got out of control. Problems detected earlier through warning signals could be easily solved to avoid total loss of the project.

Agricultural facilities granted are closely monitored. This is occasioned by the nature of the industry, especially the production aspect that is highly risky because of its precarious nature.

Agricultural facilities are also known to be specific-purpose oriented i.e planting, fertilizing, harvesting and transporting etc.). As a result of follow-up facilities, the indications of possibility of default (usually) referred to as "danger sign" of default are easily detected, a current finding in the view on bank credit management.

### **Commercial Bank Credit and Agricultural Output.**

Essang and Olajide (1974) define a commercial bank as a monetary institution owned by either government or private businessmen for the purpose of profit. In pursuit of the profit, the bank undertakes a number of functions. One of these functions is the acceptance of deposits from the public, these deposit are in turn given as credit to trade industry, agriculture etc. which lead to more production and employment (see Stephen and Osagie, 1985; Ekezie, 1997; Ijaiya and Abudulraheem, 2000).

To Aryeety (1996) credit is the amount extended out with a future date of payment. The NDIC prudential guide lines of 1990 however, provides a wider definition of credit, and this includes aggregate of all loans, advances, overdrafts, commercial papers, Bankers acceptance, bills discounted. Leases and guarantee (NDIC, 1990).

Muftau (2003), on the other hand, defines agricultural credit as credit granted to farm and ranch operators to assist in planting and harvesting crops to support the feeding and care of livestock. Credit to agricultural sector could take the form of an over draft, short-term, medium-term or long-term depending on the

purpose and gestation period of the project. Such credits granted to framers to purchase inputs are paid directly to the suppliers who must furnish the bank with evidence of delivery. This is done to avert diversion of fund, which is common with Nigeria Farmers ( See Adekanye, 1986: Nzotta, 1999).

Discussing the importance of credit to agricultural sector, Nzotta (1999) posited that it reactivates, expands or modernizes all types of agricultural enterprise which are considered economically feasible and desirable to the achievement of stated economic goals of self-sufficiency in agricultural production. While Qureshi, et al (1996) reported that such credit removes financial constraints faced by farmer, as it provides incentives to adopt new technologies that would otherwise be more slowly accepted. Thus, the availability of credit enables farmers to switch quickly to new technologies which enable the achievement of a rapid productivity and growth. According to Ijere(1996) “ Credit can be considered from its ability to energize or motivate other factors of production. For example, it can make the latent, potential or under-used capacities functional. He further said that credit act as a catalyst that activates the engine of growth enabling it to mobilize its inherent potentials and to advance in the planned or expected direction. It follows, therefore, that the greater the influx of capital, the more the propensity of the economy to move in its given path. As summarized by Fosu (1992) Amin (1996), Umoh (2003) “Credit thus constitutes the power or key to unlock latent talents, abilities, vision and opportunities, which in turn act as the mover of economic development.

Contributing to the argument about Commercial bank Credit and agricultural output, wells (1970) confirms that commercial bank credit contributions to economic development by enhancing production and productivity and thus higher income and better quality life for people.

Agricultural credit in Nigeria dates back to the 1930s but organized credit to farmers did not start until 1972 when the Nigeria Agricultural and Cooperative Bank (NACB) were established (Ajakaiye. 1984). He further said that agriculture is the largest sector of Nigerian economy, though its contribution to the Gross Domestic Product (GDP) has declined from 67% in 1950 to 18% in 1980.

According to the Federal Ministry of agriculture publication(1980), 58% of farming- related borrowings was obtained from family and friends; 24% from professional private money lenders, 15% from merchant and only 3% from commercial banks and other institutional sources. As Garba (2000) noted, they are grossly, inadequate and unsatisfactory for the credit needs of the farmers. Thus, there is the need for lager credit sources.

## **2.1 Empirical Literature**

Anthony et al (2009) analyzed the trends and pattern of institutional credit supply to agriculture during pre-and post-financial reforms along with their determinants. It then compared the effects of reform policies on access to institutional credits in Nigerian agricultural sector before and after the reforms (1978 - 1985; and 1986 -2009). Relying mainly on time series data from CBN and NBS, it used ordinary least squares method (linear, semi-log and double log) to model the determinants of banking sector lending to the agricultural sector during the review period. The models were subjected to several econometric tests before accepting one. Chow test was used to verify the presence of structural change in the selected equation before and after the reforms. Results indicated an exponentially incre asing trend of agricultural credit supply in the economy after the reform began. Econometric analysis shows that stock market capitalization, interest rate and immediate past volume of credit guaranteed by ACGSF significantly influenced the quantity of institutional credit supplied to the agricultural sector over the period in review. There was a significant difference between the credit supply function during the pre-reform and post reform periods. It was recommended that government must consider interest rate regulation as a veritable tool for making credit accessible to farmers at affordable levels;increase fund allocation to ACGSF; boost monitoring capacity of CBN on banks generally and strengthen the microfinance banks to be more responsive to agricultural credit needs.

Zuberi (1989) estimated production function for institutional credit and agricultural development in Pakistan and concludes that the impact of institutional credit comes through financing of seed and fertilizer and that the role of financing fixed investments was found insignificant.

Khandaker and Binswager (1989) estimated the effect of institutional credit on agricultural output, investment, fertilizer demand, farm-nonfarm employment and real wage using district-level panel data from India. In India special credit programs were launched after the nationalization of commercial banks in 1969 to support the country's green revolution in agriculture. An important policy question thus emerges: to what extent low-interest institutional credit has helped increase private investment and output in Indian agriculture and consequently rural employment and wage.

Qureshi and Shah (1992) did a critical review of rural credit policy in Pakistan. The study observed that institutional credit affects agricultural output through financing of capital investment. The study also found that the responsiveness of agricultural output is larger to institutional credit than that of output to fertilizer. Iqbal, Ahmed and Abass (2003) studied the impact of institutional credit on agricultural production in Pakistan, the study found that institutional credit The share of production loans in total loan advanced has been increasing during 1980-81 to 1986-87 and after mid 1990's. It shows multiple shifts in credit policy from loans for fixed capital to advances for operational capital during the study period. The OLS estimates of the production function revealed that institutional credit affects agricultural production positively. Water availability at the farm gate, labor, and cropping intensity are the other important variables that affect agricultural output positively. However, the shocks like floods, cotton leaf curl virus (CLCV), and drought have caused significant decline in agricultural output during certain years

Akram, Hussein, Sabir and Hussain (2008) estimated the impact of Agricultural credit on growth and poverty in Pakistan. The short run elasticity of agricultural credit with respect to GDP was 0.031 and long elasticity was 0.162. However, the short run elasticity of agriculture credit with respect to agricultural GDP was 0.13. The results further explained that elasticity of agricultural credit with respect to poverty -0.35 percent and -0.27 percent in the short run and long run respectively. The short run elasticity of agricultural respect to rural poverty was - 0.30 per cent. The use of fertilizer has strong effect in reducing poverty in the short run because the balanced use of fertilizer increase productivity and it also serves as a land augmenting factor of production. The result of the study showed that agriculture credit has positive impact on agriculture gross domestic product and reducing poverty over time. Nevertheless, the large majority of farmers were several constraints in obtaining agricultural credit through institutional sources.

Saleh, Varmazyari and Moslemzadeh (2008) investigated the potential of investments in Agricultural sector in Iran. The study describes the placement of agricultural sector in Iranian economy, considers the trend of investment in agricultural sector over the period of 1963 – 2004, emphasizing on development programs in country. It also evaluates the capability of investment procuring in this sector comparing with other economic sectors in the country. In addition, obstacles of investment in agricultural sector such as inflation and other factors are examined. Results showed that capital productivity in agricultural sector is high and this sector has potentials for extension of investments. However, capital per capita in agricultural sector is lower than other economic sectors. In addition, findings of this study confirmed a significant negative relationship between capital per capita in agricultural sector and capital productivity in the sector which indicates inappropriate capital allocation in the sector. It is recommended that the investments especially infrastructural investments are extended. Moreover, reformation of the structure of the agricultural production market and more emphasis on appropriate feasibility studies of projects in the agricultural sector were also recommended.

Mahmood, Khalid and Kousser (2009) employed stratified random sampling approach to collect the input-output and socioeconomic data set to see the impact of credit on the growth of livestock sector in the rural areas. The income elasticities of meat and livestock products were highest compared to all other food items except fruits, defining the future role of livestock sector in our food basket. It was observed that credit availability expanded the livestock sector more than double (economies of size), which increased per family per month income from livestock sector by 181%. The elasticity values of family size, literacy rate (schooling years) and credit were 0.18, 0.05 and 0.06, respectively. The elasticity of family size was highest, followed by credit and literacy rate, indicating that adequate potential exists that can be explored to utilize unemployed and untrained rural labor in the agriculture sector. It would help to mitigate the increasing population pressure on mega cities of Pakistan by providing employment opportunities at the door steps of rural community.

The significant contribution of available, accessible and affordable credit to the alleviation of capital constraints and poverty reduction among resource – poor agricultural households is not in doubt. This formed the basis of the study of Oboh and Kushwaha (2009), whose objective is to identify significant farmer – related socio-demographic factors that affect the flow of adequate credit facilities to rural farmers. Using cross-sectional data collected from 300 randomly selected loan beneficiaries of the Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB), the t-test showed a statistically significant gap (P0.01) between credit demand and credit supply. According to the multiple regression analysis, the coefficients of annual income, distance, farm size and previous loan status showed positive signs and were significant, indicating that all the variables encouraged larger loan size to farmers. The

paper recommends increased flow of capital to NACRDB for onward disbursement to farmers. By so doing, farmers will increase their farm sizes and income thereby attracting larger loan size.

Sharif, Salehi and Alipour (2009) aims to examine the relationship between financial market development and agricultural sector in Iran. The study attempts to answer these questions empirically and try to shed some light on the roles of financial development as well as other conditional variables in agricultural sector. The results of this study showed that this financial market plays a very important role in developing agricultural sector in Iran. However, the results also indicated that there is still some weakness in the role of the financial market. The authors come to conclusion that for improving this vital sector in Iran the weakness should be removed or at least reduced as early as possible.

(Nwosu et al, 2010). Other incentive put forward by the scheme to achieve its objectives includes the increase in the limit of the guarantee granted to individuals and corporate bodies. For example, the limit granted to individuals was increased from N5, 000 to N20, 000 for individuals without collateral required. With collateral, the limit of the guarantee was increased from N100,000 to N500,000. For corporate bodies and corporative societies, the guarantee limit was increased from N1 million to N5 million. The above measures were geared towards the development of the agricultural sector. Furthermore, the ACGSF enforces the attainment of its objective by mandating commercial banks to set aside a fraction (10%) of their profit before tax to farmers as loans and more so have a certain percentage of their branches set up in rural areas. This will enable effective reach to the target audience/beneficiaries. The Central Bank in Nigeria is supposed to ensure and enforce the compliance of the banks to these stipulations. Success story was accounted from these stipulations. These include that as at 2004, 11 out of 25 universal banks in the country are already participating in this scheme, while 669 eligible micro credit institutions have joined the scheme. Despite all these, the loan to the agricultural sector by commercial banks still remains minute. The question that comes to mind is whether the declining share of agricultural loan from commercial banks can be traceable to the challenges that encumbered ACGSF. For example, Nwosu et al (2010) identified three major problems associated with the ACGSF scheme, which includes increasing incidence of loan defaulters, bank related problems and the inclusion of the term “personal guarantee”. Nwosu et al illustrates that the term is subjective in interpretation especially as the decree forming ACGSF was not able to explain this. Therefore, banks utilize By 2008, about 34 years after Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) formerly Nigerian Agricultural and Cooperative Bank (NACB) established in 1973 and 31 years after the Agricultural Credit Guarantee Fund Scheme (ACGFS) put in place in 1977, one would have thought that the problem of agricultural credit inadequacies would have been solved. The problem is still very much around and be-devilled with many bottlenecks. Viewed against this background, it is felt that there is the need to examine the operation of commercial banks in terms of agricultural credit approval and rejection. The aim is to identify key determinants in their decision making process.

This indicated that the shadow price of capital was far in excess of its social opportunity cost and implies a weak financial intermediation (Saleh and Moslemzadeh, 2008). Carter and Boucher (1994) noted that in an economic environment that is characterized by a weak financial market, the provision of interest rate subsidies on formal credit does not seem to be a rational economic policy. This is because it may reduce access to agricultural credit. In Nigeria, it is feared that the attempt at credit price discrimination led to policy distortion and the divergence of its benefits from the intended to the unintended beneficiaries. Even then, many banks perceive agricultural credit as risky and seek to channel credit to less risky sectors. This behaviour calls for empirical quantification in the Nigerian context. It is, therefore, pertinent to ask how formal lenders respond to the borrowing demands of farm households in Nigeria.

More so, farm households are quite heterogeneous in terms of resource endowments, production and consumption opportunities. Hence, lenders are supposedly able to obtain and use information about the potential credit-worthiness of the borrowers. Credit rationing models have been developed and applied (World Bank 2008), UNDP (2008) enumerated the occurrence of loan rationing through household survey.

Sohail et al (1991) on the relationship between bank credits and agricultural out puts in Pakistan, they found out that a statistical significant relationship existed between bank credit in Pakistan and the agricultural outputs.

Moreover, Yaron et al (1997) also argued that directed credit programmes were associated with the adoption of modern technologies such as green-houses in Morocco and tube wells in North West

Bangladesh and these innovations were associated with increase in production gains in the agricultural sector (see also Ijaiya and Abdurraheem 2000).

May (1970) report that countries that emphasized the agricultural sector ended up with faster industrial growth than those that focused on industries alone. Hence, agriculture may therefore be the fastest road to industrialization.

Emmanuel (2008) carried out a study on the impact of macroeconomics environment on agricultural sector growth in Nigeria. The macroeconomic policies included in the model are:- credits to the agricultural sector, nominal interest rates on the loan, exchange rate, world prices of agricultural produce, foreign private invest-government expenditure and inflation rate. Using multiple regression analytical technique (ordinary least square), he discovered that nominal interest rate is positively related to the index of agricultural production. This implies that at higher nominal interest rate, more credit facilities are made available to the operators of the Nigerian agricultural sector, but at lower nominal interest rate, credit facilities are no more widely available. The index of agricultural output is also positively related to world prices of Nigeria major agricultural commodities.

This implies that better world prices enhance agricultural output growth in Nigeria. Similarly, the index of agricultural production was positively related to government expenditure on agriculture. Moreover, it was discovered that the index of agricultural production is negatively related to the level of inflation, implying that as inflation becomes high, and the index of agricultural production declines. He thus recommends that macroeconomic policies that enhance favorable exchange rates make agricultural credit widely available at low interest rate, reduce the rate of inflation, increase foreign private investment in agriculture would not fortify government investment in the sector but would be invaluable in supporting agricultural output growth in Nigeria.

### **3.1 Research Design**

The design adopted for this study is the ex-post factor method also called causal comparative research. This becomes necessary especially as the independent variables cannot be manipulated directly (Orji, 1996). The variables to be included in the study model includes Agricultural Gross Domestic Product (AGDP) as the dependent variable, Commercial Bank Credit to Agriculture (CBCA), Agricultural Credit Guarantee Scheme (ACGS) and Government Expenditure on Agriculture (GEA) as explanatory variables, with a view to determining the nature and extent of the relationship that exist between the dependent variable and the set of explanatory variables. The preference for this technique is predicted on the optimal properties which it possesses such as randomness, zero mean value of the error terms, minimum variance, unbiasedness, etc (Wonnacott and Wonnacott, 1969; Koutsoyiannis, 2003; Gujarati, 2003).

### **3.2 Model Specification**

In this study, hypothesis has been stated with the view of estimating the commercial bank agriculture credit effects on agricultural product performance in Nigeria. Investigate the extent of causal relationship between commercial bank agriculture credit and agricultural output in Nigeria. Also, to estimate the extent of long-run relationship existing between commercial bank agriculture credit and agricultural product performance in Nigeria.

In capturing the study, these variables were used as proxy. Thus, the model is represented in a functional form. It is shown as below:

$$AGDP = F(CBCA, ACGS, GEA,) \quad 1$$

In its stochastic form, the model is specified as follows:

$$AGDP = b_0 + b_1CBCA_t + b_2ACGS_t + b_3GEA_t + U_t \quad 2$$

While the log-linear function of the model is specified in the manner:

$$\text{Log}AGDP_t = \text{log}a_0 + a_1\text{log}CBCA_t + a_2\text{log}ACGS_t + a_3\text{log}GEA_t + u_t \quad 3$$

Where

AGDP = agricultural Gross Domestic Product  
CBCA = Commercial Bank Credit to Agriculture  
ACGS = Agricultural Credit Guarantee Scheme  
GEA = Government Expenditure on Agriculture

$U_t$  = Stochastic error term

$b_0$  = constant term

$b_1, b_2,$  and  $b_3$  = Coefficients to be estimated

A priori expectation: ( $b_1, b_3, > 0; b_2 < 0$ )

This means that AGDP is the function of Commercial Bank Credit to Agriculture, Agricultural Credit

Guarantee Scheme, and Government Expenditure on Agriculture.

#### **4.1 Ordinary least squared (OLS) results**

Dependent variable: AGDP, current sample 1981 to 2011, 30 observations.

The above table in section four (table 3 & 4) regressed Agricultural sector contribution to Gross Domestic Product on Commercial bank credit to agriculture (CBCA), and agriculture credit grantee sachem (ACGS), government expenditure to agriculture (GEA). The coefficient of the constant term shows positive sign; this implies that at zero performance of the independent variables, Nigerian Agricultural sector contribution to Gross Domestic Product (GDP) stood at 2.411688 percent.

The Total Government Expenditure on agriculture (GEA) coefficient has a negative linear relationship with AGDP. It means that if the Total Government Expenditure to agriculture (GEA) in Nigeria increase, then Agricultural sector contribution to Gross Domestic Product (GDP) in Nigeria will decrease at or by - 0.118892 percent. The result is not in line with initial expectation because theoretically, a country that experiences increase in her Government Expenditure on agriculture (GEA) her real sector like the one of agriculture will always and equally experienced increase to her Agricultural sector contribution to gross domestic product in return, since the GEA could be seen as investment to the sector. But in the Nigerian case, the result shows that the total money stated as Government Expenditure on agriculture in Nigeria is not statistically significant and not theoretical in line, it could be said that due to some linkages, that resulted to this. Thus, the variable (GEA) was not statistically significant to the study base on 5 percent significance level.

The Commercial bank credit to agriculture (CBCA) and agriculture credit grantee sachem (ACGS) coefficients has a positive linear relationship with that of Agricultural sector contribution to gross domestic product (AGDP), the dependent variable. The implication is that one percent change (increase) in any of the variables in the economy, will lead to expansion and increase of Agricultural sector contribution to gross domestic product (AGDP), at the same proportion which will then result to an increase on the economic growth. Thus during the period of the study. These variables were in line with the stated expectation which could result from appropriate chinless of NDIC policies and right supervision against fraud, corrupt bank manager's and good policy follow-up and implementation of 2005 increased of minimum capital base credit to agricultural sector from banks by CBN in Nigeria banking that led to this positive expectation. However, these variables were all statistically significant to the study at 5% level of significance.

Meanwhile, the  $R^2$  square is very low as it shows = 0.618391 percent. This implies that the total variation in AGDP could be explained up to 61% percent at current value by the explanatory variables (i.e. Commercial bank credit to agriculture (CBCA), and agriculture credit grantee sachem (ACGS), government expenditure to agriculture (GEA) While variables not in the model accounts about 39% of the remaining variation in the agricultural sector contribution to gross domestic product in Nigeria during the period under review. Base on the  $R^2$  result, we conclude that our model has a no good fit. The f- ratio, which is a joint test of significance of all parameter estimated in the model, is statistically significance at 5 percent level. The calculated value of f- ratio is at 14.04422 greater than the Tabulated or f- critical value of 3.034.

The test for incidence of serial correlation or autocorrelation (Durbin-Watson) stood at 1.467935. This shows that the presence of negative first order autocorrelation in the model was inconclusive since the DW calculated is greater than the  $d_L$  1.43, but less than  $d_U$  1.63 at 5% significant level.

#### **4.2 The Granger Causality Test Results**

In attempt to investigate the effect of Commercial bank credit to agriculture (CBCA), on Agricultural sector contribution to Gross Domestic Product in Nigeria led the researcher to test for the causality relationship among the variables. From Table 5 above in section four, we used the Granger test to find out the Nature of causality between Commercial bank credit to agriculture (CBCA) and Agricultural sector contribution to Gross Domestic Product, from periods of 1981 – 2011, using two lags value. The arrow in the table, denote the direction of the null hypothesis, suggesting that the variable in the left side does not Granger causes the variable in the right side.

However, from the results we compare the computed  $F^*$  – value with reference to the critical f -ratio at 5 percent level of significance for final Decision. These results revile that Commercial bank credit to agriculture (CBCA) do granger causes Agricultural sector contribution to Gross Domestic Product since



the Commercial bank credit to agriculture (CBCA) estimated F-coefficient shows (51.1429) greater than the f-critical value (3.034) at 5% level.

Thus, the estimated F-coefficient of Agricultural sector contribution to Gross Domestic Product computed, stood at (4662.90). This reveals that there is an existence of positive causality from AGDP to GEA in Nigeria. In other words, the past value of the AGDP does both theoretical and statistically, in many ways granger cause the present value of the Commercial bank credit to agriculture in the Nigerian economy within the period of study. We then concluded that the nature of causality in this case is bar directional causality. We therefore reject the null hypothesis and accept the alternative hypothesis.

#### **4.3 Co-integration Results**

The result above in table 6 of section four shows that there exist two co-integrated vectors. In Johansen's Method, the eigenvalue statistic is used to determine whether co-integrated variables exist. As can be seen from the Likelihood ratio statistics, here all the absolute values of these variables are greater than 5% critical values. Also, their Eigenvalues are significantly greater than zero. In other words, the null hypothesis of no co-integration among the variables was rejected since at least two equations at 5% were statistically significant. The test result shows the existence of a long-run equilibrium relationship among the two co-integrating variables.

#### **4.4 Evaluation of the working Hypothesis using t-statistic value from the model**

Restatement of the hypotheses:

1. Commercial bank credit to agriculture does not have significant positive impact on agricultural sector contribution to Gross Domestic Product in Nigeria.

We used the t-statistic in testing the hypothesis one of this study. Thus, given the outcome of t-value calculated with reference to the critical t-value (2.096), our null hypothesis stated in chapter one is expected to be rejected. Thus, rejecting the null hypothesis implies acceptance of the alternative hypothesis since the calculated t-value of the explanatory variables did pass the individual significant test of hypotheses. Thus, we conclude that commercial bank credit to agriculture does have significant positive impact on agricultural sector contribution to Gross Domestic Product in Nigeria during this period of observation.

2. There is no causal relationship between Commercial bank credit to agriculture and Agricultural output to Gross Domestic Product in Nigeria.

From the causality test carried out above, we therefore examine this hypothesis. Thus, the result reveals that there exist causal relationship between AGDP and CBCA in Nigeria during the period of study. In other words, the past value of the CBCA does not statistically granger cause the present value of the AGDP in the Nigerian economy within the period of study. We therefore reject the null hypothesis and accept the alternative hypothesis.

3. The null hypothesis of no co-integration among the variables was rejected since at least two equations at 5% were statistically significant. The test result shows the existence of a long-run equilibrium relationship among the two co-integrating variables.

#### **5.1 Summary of Findings**

This research work tries to study the commercial bank agricultural credit and agricultural output in Nigeria from 1981 to 2011. In the specified model, Agricultural Gross Domestic Product (AGDP), Commercial Bank Credit to Agriculture (CBCA), Agricultural Credit Guarantee Scheme (ACGS) and Government Expenditure on Agriculture (GEA) were captured.

On the application of advanced econometric techniques (Augmented Dickey Fuller and Phillips Perron Unit Roots, Johansen Cointegration Test, and Error Correction Mechanism), the following information surfaced;

- (i) None of the variables was stationary at zero level. This means they all have unit roots;
- (ii) The four variables became stationary at first difference by ADF and PP application.
- (iii) There exists a long-run equilibrium relationship between Agricultural Gross Domestic Product and Commercial Bank Credit to Agriculture in Nigeria within the period under study.
- (iv) In the Error Correction Model (ECM), Agricultural Credit Guarantee Scheme (ACGS) and Government Expenditure on Agriculture were positively correlated with AGDP while Commercial Bank Credit to Agriculture (CBCA) was negatively related with AGDP.
- (v) The joint influence of the explanatory variables is statistically significant. This was very well echoed by the F-statistics which tested the entire regression plane.

(vi) The past value of the CBCA does not statistically granger causes the present value of the AGDP in the Nigerian economy within the period of study.

Between 2001 and 2005, actual federal spending averaged 681 billion naira per year, of which 11.4 billion naira went to agriculture, or slightly less than 1.7 percent. Again the share of actual expenditure that went to the agriculture sector compared unfavourably with the shares that went to other sectors, CBN (2007).

Federal government spending represents only a portion of the public resources going to the agricultural sector in Nigeria. Additional spending is effected by state and local government authorities, but that spending is hard to quantify because it is not tracked centrally.

## **5.2 Policy Recommendation**

Based on the findings from the empirical estimation of these models and the reviewed of related literatures, the following policy recommendations are designed.

1. Since credit does not exist in a vacuum, it is imperative that government should support its credit policy with the provision of infrastructure, good marketing facilities, storage, processing and manpower training.
2. An intensive cooperative and credit education should be imparted to those using credit before being entrusted with it. This is important in other to adequately support, and provide the necessary training to farmers, school leavers and credit managers in the administration of credit and better farming practices.
3. There is need to revive and strengthen such laws as the Guaranteed Minimum Price and Agricultural Credit Guarantee Scheme to make them workable, so that farmers and banks can have enough incentives to invest in agriculture.
4. The same applies to the issue of the Certificate of Occupancy and the general question of the Land Use Decree. These deserve to be up-dated and made more functional.
5. An upsurge in the activities of the Fund will force a credit demand from farmers who already have the assistance in groups on ground than in the unviable single unit borrower; the benefits have always been to the major farmers.
6. An area for future research would concern the optimum amount of credit that should be available for productive agriculture and for food security, which should take into the consideration the variables of total credit and population growth in the economy.
7. A clear-cut credit policy which ensures a long-term financing of agriculture should be encouraged. Short-term, discriminations policies cause confusion and prevent farmers from investing in agriculture.
8. Efforts should be made to regulate the legal aspects of credit, particularly the laws relating to loan agreements and enforcement, moneylenders and transfers. The Land Use Decree should be amended to make it easy for farmers to acquire, cultivate land and feel secure on the land.

## **5.3 Conclusion**

The study re-affirms the fact that one of the most important functions of the Banking sector and other monetary authorities is to make credit available to the investors at affordable rate most especially the agricultural sector. This is because low credit or high lending rate will amount to low level of investment which transmits to low agricultural output.

However, this study focuses on finding the long run relationship between Agricultural Gross Domestic Product and Commercial Bank Credit to Agriculture in Nigeria. Granger Causality and Cointegration test were employed in the empirical analysis. Prior to the Cointegration test, it was tested for stationarity of the variables using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP). The variable proved to be integrated of the order one  $I(1)$  at first difference. Johansen and Juselius Cointegration test was used to determine the presence or otherwise of a cointegrating vector in the variables. Both Trace and Maximum Eigenvalue indicated existence of cointegration at 5% level of significance pointing to the fact that the variables have a long-run relationship.

Furthermore, the Pairwise Granger Causality was carried out to determine the direction of Causality among the variables, at least in the short run. Neither Agricultural Gross Domestic Product nor Commercial Bank Credit to Agriculture Granger Cause each other.

Commercial Bank Credit to Agricultural development is not only desirable, but also absolutely necessary in Nigeria in order to widen a narrow export base. Foreign exchange earnings from a very limited number of Agricultural products often cannot generate enough additional foreign exchange, especially when there has been exchange rate instability. Thus, exchange rate stability should be considered as an important factor than can boost Agricultural output.

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Adeleke Salami and Damilola Felix Arawomo. Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) is a typical example of a specialized bank established for the purpose of advancing agricultural credit. Land Bank is also a statutory body with a mandate South Africa Government to support the development of the agricultural sector in the country. Oyatoye (1981) averred that credit is a major factor necessary for technological transfer in traditional agriculture. According to her, given the availability of inputs needed to improve technology, how rapidly farmers would adopt improved technology depend on additional factors. Nigeria agriculture is divided into two types, the subsistence agriculture and commercial agriculture-: the subsistence agriculture is the type of farming which involves only the farmer and his family i.e the farmer produces for himself and his family with little or none to sell in the market it is practiced in small scale system. It involves only a little amount of money to practice unlike commercial farming that involves huge amount of money to practice. It does not involve the machine to carry out, since the land is very small and fragmented (Amechi 2004). The broad objectives of the study is to investigate the extent to which commercial bank credit had supported agricultural output in Nigeria. However, the specific objectives of the study are as follows.