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Impact of Agricultural Financing Policy and Deposit Money Bank Loan on Agricultural Sector Productivity in Nigeria

Ajayi, Micheal Adebayo

University of Ilorin, Ilorin, Kwara State, Nigeria

Nageri, Kamaldeen Ibraheem

Al-Hikmah University, Ilorin, Kwara State, Nigeria

Akolo, Christy Seyi

University of Ilorin, Ilorin, Kwara State, Nigeria

Abstract

In transforming the economic situation of Nigeria, the impact of agriculture cannot be overemphasized. Agriculture was the primary foreign exchange earner for Nigeria, until the mid-seventies when it lost its prime position to the mineral sector. One important factor affecting agricultural sector productivity is inadequate capital. The objective of the study is to evaluate the impact of agricultural financing policy and deposit money bank loans to agricultural sector on agricultural productivity. The study used time series linear regression model employing data covering the period of 1981 and 2015. The result revealed that deposit money bank loans (CBF) and agricultural financing policy proxy by Agricultural Credit Guarantee Scheme Fund (ACGSF) have significant positive impact on agricultural productivity in Nigeria while lending rate (LR) shows a significant negative impact on agricultural productivity. It is recommended that commercial bank should complement the agricultural financing policy of the government by making agricultural finance accessible, easier and at low rate of interest for farmers. Farmers should also be sensitized on the benefit of accessing funds from the policy and banks to enhance productivity. The study further recommends that government should encourage financial inclusion for the farmers.

Keywords: Agricultural Financing, Deposit Money Bank, Lending Rate, Agricultural Productivity

JEL Classification: G21, G32, Q14

Paper classification: Research paper

Introduction

Agricultural sector lending in Nigeria started when banks played significant role in the activities of the marketing board and as agents for farmers by granting loans to farmers to embark on projects since agriculture was the strength of the economy in the pre and immediate post-independence era (Ojiegbe & Duruechi 2015). Apart from providing over 50% employment of the



labour force in Nigeria and contributing 70% of non-oil sector to the Growth Domestic Product (GDP) (Mang, 2009; NBS 2010), it also accounts for more than 3/4 of non-oil export earnings. Nigeria is blessed with massive fertile agricultural lands as well as other resources, if effectively harnessed, can transform the economy. In spite of these potentials, Ijaiya and Abdulraheem (2000) and Iwayemi (1994), reported that the sector is still characterised by low productivity. For example, agricultural sector's contribution to GDP averaged 12% in the 1970s increased to 29% in the 80s, 35% and 34% in the 90s and in the first decade of year 2000 respectively which caused increasing import bills causing huge deficit in the balance of payment (CBN, 2015)

The role of agriculture in transforming an economy cannot be overemphasized. The sector helps to generate employment opportunity, reduce poverty, improves income distribution, speeds up industrialization and subsequently eases the pressure of the balance of payments (Anyanwu 2003). Ojo (2003) opined that increased production and exportation of crude oil in the 1970s led to vast increase in foreign exchange earnings and changed the structure of the Nigerian economy. Migration of youths to the urban areas in search of white collar employment rendered the agricultural sector less competitive. During this period, currency overvaluation and importation of finished goods led to inappropriate pricing policies and scarcity of farm labour.

Deposit money bank advances credit (to various economic agents) to aid financial intermediation between deficit and surplus units for the purpose of increasing productivity (Ehikioya & Mohammed 2013). Were, Nzomoi and Rutto (2012) assert that deposit money bank is an important channel of financial intermediation in any economy. Loans advanced to farmers by deposit money bank have been in decline are at higher interest rates with other strict conditions such as availability of collateral (Hollinger, 2003).

Hunger and starvation is still rampant in Nigeria despite vast expanse of rich soil due to the neglect of agriculture while few agro-industries depend on imported raw materials and youth unemployment is on the rise (Iwayemi 1994). Various policies have been advanced to provide agricultural finance in which the banks have been earmarked to play a crucial role, however, the fact remains that the banks, especially the deposit money banks, have not been able to handle the problem (Anthony, Gabriel & Arikpo 2015). Thus, the concern of government is found in price stabilizing, food security, monetary and exchange rate policies through agricultural sector growth by channeling of credit, marketing services, extension and input supply through duty free import of farm machinery and tax exemption (Eze, Lemchi, Ugochukwu, Eze, Awulonu & Okon 2010).

Agricultural sector support in Nigeria is widely provided by the public sector through schemes, programmes and institutional support. The schemes include Agricultural Credit Guarantee Scheme Fund (ACGSF), Agricultural Credit Support Scheme (ACSS), Large Scale Agricultural Credit Scheme (LASACS), Supervised Agricultural Loans Board, Commercial Agriculture Credit Scheme (CACS) were established during the decade except the ACGSF which was established in 1977. Some agricultural support programmes include National Accelerated Food Production Programme (NAFPP)-1972; Agricultural Development Programme-1975; Operation Feed the Nation (OFN)-1976; Green Revolution programme-1980; Rural banking programme-1977 to 1991; Community banking programme-1991 to 2007; Root and Tuber Expansion programme-2000; National FADAMA Development programme among others. Agricultural development institutions are, Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) now Bank of Agric (BOA) and Nigerian Agricultural Insurance Corporation (NAIC).

As a result of leveraging linked with borrowing as a major form of agricultural financing and policies, average farm income made by ACGSF beneficiaries is larger than that made by non-



beneficiaries (CBN, 2007). Nigeria might have flourished in feeding its populations' and become key exporter of agricultural produces with a high rate of rural development if these schemes, programmes and institutions attained their aims and objectives. Unfortunately, Nigeria is still a major importer of industrial and consumer agricultural products (CBN 2015).

Consequently, the study examined the impact of Nigerian government agricultural finance policy with reference to the Agricultural Credit Guarantee Scheme Fund (ACGSF) and deposit money bank loan on the agricultural sector productivity in Nigeria.

Literatures within and outside Nigeria are abound on the impact of agricultural finance by commercial bank and agricultural output (Ijaiya & Abdulraheem, 2000; Bassey, Akpaeti & Udo, 2014; Obilor, 2013; Okorie, 1995; Fosu, 1992; Were, Nzomoi & Rutto 2012 and Avinash & Mitchell-Ryan, 2009) using different approaches and instruments of analysis. Succeeding governments in Nigeria always had a policy programme for agriculture, but oil exportation has continued to be Nigeria major foreign exchange earner.

The finding of this study is projected to benefit policy makers in this period of recession and diversification policy, and also deposit money banks by predicting the impact of interventionist programmes. It will aid the understanding of present trials and expose the essential factors that require attention in the agricultural sector. The scope of the study is the ACGSF, deposit money bank agricultural finance and agricultural sector contribution to the Gross Domestic Product (GDP) in Nigeria between the periods of 1981-2015.

Literature Review

Credit facility has the capacity to boost or motivate other factors of production by making the latent, potential or under-used capacities functional. Credit act as a spur that galvanizes the instrument of growth and advance in the planned or expected direction. It follows, therefore, that the more the influx of capital in the form of credit, the more the prosperity of the economy to move in its given path. (Ijere 1986; Fosu 1992; Amin 1996 and Umoh 2003). Agricultural credit are granted to farmers in support of planting and harvesting of crops which might be an overdraft, short-term, medium- term or long-term contingent on the resolution and growth period of the project (Ijaiya, 2003).

Ugwuanyi and Ugwuanyi (1999) identified the problem of agricultural financing in Nigeria in two (2) facets namely; the problem from the side of farmers and the problem associated with agricultural business. The problems of financing agriculture on the part of farmers have to do with the illiteracy of farmers, inability to use latest and sophisticated farm input and mechanization, poor finance management leading to high rate of loan default by farmers. The problems associated with agricultural business are unsystematic risks (risks that are beyond the control of the farmer such as natural hazard), time lag (period between cultivation and harvest), the nature of land and immobility of labour; long term rate of return (some agricultural events require a very long incubation period).

In solving the problem of agricultural financing in Nigeria, the government created the Nigerian Agricultural and Co-operative Bank (NACB) in 1972 as an agricultural financing institution. In 2001, the government merged Nigerian Agricultural and Co-operative Bank

(NACB), the Peoples' Bank of Nigeria (PBN) and the risk assets of Family Economic Advancement Programme (FEAP) and subsequently created the Nigerian Agricultural Co-operative and Rural Development Bank (NACRDB) Mustapha, (2006).



Agricultural financing provides access to fund for farmers to acquire other assets which farmers need. Suitable macroeconomic policies and supporting institutional finance for agricultural productivity will enhance the contribution of the sector to the economy in areas such as employment generation, income and foreign exchange earnings Olomola, (1997) & Shepherd, (2002). Agricultural financing reactivates, modernizes and expands agricultural productivity and also removes farmer's financial constraint in adopting new technologies that aid rapid productivity and growth Nzotta, (1999); Qureshi, Nabi & Faruquee (1996).

Theoretical Background

The Supply-leading and Demand-following hypothesis

The supply-leading hypothesis dons that financial development is the teamster of economic growth. This theory trusts that the actions of financial institution serve as a useful device for increasing the productive ability of the economy. Schumpeter (1911) emphasized the significance of financial services in stimulating economic growth. McKinnon (1973) and Shaw (1973) also submitted that the deposit money bank plays a serious role in financial intermediation for inspiring economic growth. The intermediation function of commercial bank towards agriculture through granting of credit for production purpose determines the productivity of the agricultural sector.

The demand-following hypothesis postulates that as real growth occurs in an economy, it will stimulate demand for financial services. Furthermore, Demetriades and Hussein (1996) hypothesise that support for demand-following theory can be found in the work on money demand by Friedman and Schwartz (1963). Friedman and Schwartz (1963) justify the view by comprehending that a consistent size of financial development (the ratio of the broad money stock to nominal GDP) is the transposed velocity in circulation of the broad money stock, and observing the services rendered by money balances as a luxury. Any progressive relationship between financial development and real GDP per capital may modestly replicate an income elasticity which is greater than unity. Therefore, the trend of causation would run from real GDP to financial development, through the demand for money.

Empirical Review

Ayoola and Oboh (2006) studied the effect of agricultural production on Nigeria's economic growth employing error correction model approach. Findings revealed that agricultural production sector requires adequate capital as the determinant of all other resources on which farmers depend. Agricultural financing boosts capital formation, increases productivity, operations, farming innovations, among others (Nwagbo, 2005). Bassey, Ibok, and Amba (2014) examined the effect of bank credit and macro-policy variables on agricultural output in Nigeria using co-integration approach. The result revealed presence of co-integration and shows that past value of gross domestic product exerted significant positive impact on agricultural output, while inflation rate, lending rate and exchange rate had significant inverse relationship with agricultural output.

Bassey, Akpaeti, and Udo (2014) investigated the impact of bank credit financing on agricultural output in Nigeria between the periods of 1970-2011. Employing Ordinary Least Square (OLS) regression method, the result shows that in order to boost agricultural GDP, emphasis should be directed towards proper funding of the sector by the government and other

financial stakeholders. Akintola (2004) identified banks' traditional roles to include financing of agriculture, manufacturing and syndicating of credit to productive sectors of the economy and opined that credit of banks to the Nigerian economy has been increasing over the years.

Ogbanje, Yahaya and Kolawole (2012) examined the relationship between commercial banking sector loans and agricultural development in Nigeria from 1981 to 2007 using descriptive and inferential statistics. The result revealed that during 1981-1991, there was substantial increase in commercial banks' loans to the agricultural sector, while the loans more than tripled during the subsequent periods. Thus, commercial banks showed great concern for the growth of the agricultural sector in Nigeria. Result also revealed that commercial banks' loan to the agricultural sector considerably and progressively affected agricultural sector contribution to GDP in Nigeria.

Agunuwa, Inaya and Proso (2015) studied the impact of commercial banks' credits on agricultural productivity in Nigeria employing the Ordinary Least Squares (OLS) technique for analysis. The result indicates positive connection between commercial banks' credit, government spending and agricultural productivity while there is adverse relationship between interest rate and agricultural productivity. Obilor (2013) assessed the impact of deposit money banks' credit to agricultural sector under the Agricultural Credit Guarantee Scheme Fund (ACGSF) in Nigeria using the Ordinary Least Square (OLS) method. The result shows that joint action of deposit money banks credit to the agricultural sector, agricultural credit guarantee loan, government financial provision to agricultural sector and agricultural produce prices are significant elements that can impact agricultural production in Nigeria.

Udensi, Orebiyi, Ohajanya and Eze (2012) examined the macroeconomic variables affecting agricultural sector in Nigeria using the Two-Stage Least Squares (TSLS) regression technique. The study discovered that nominal interest rate, government expenditure on agriculture and world prices of Nigeria major agricultural commodities are positively related to the index of agricultural sector, while the level of inflation is negatively related to the index of agricultural sector in Nigeria.

Mamman and Hashim (2014) studied the effect of bank lending on economic growth in Nigeria for the period 1987 to 2012 using multiple regression model and found that bank lending is significant in determination of growth. In a related study by Yakubu and Affoi (2014) covering the periods of 1992 – 2012 discovered that the commercial bank credit has significant progressive impact on the economic growth of Nigeria.

Methodology

Model specification

The model used for this study in the linear form is stated below as:

$$AGDP_t = f(DMF, LR, ACG) \dots \dots \dots (1)$$

The econometric form is:

$$AGDP_t = \alpha_0 + \alpha_1 DMF + \alpha_2 LR + \alpha_3 ACG + \mu_t \dots \dots \dots (2)$$

To test for the long-run relationship and the equilibrium of the variables, the co-integration model is stated as:

$$\log AGDP_t = \Delta_{\omega} + \log DMF_{t-1} + \log LR_{t-1} + \log ACG_{t-1} + \varepsilon_t \dots \dots \dots (4)$$



Where :

AGDP_t = Agricultural GDP in period *t*

DMF = Deposit money bank credit to agricultural sector

ACG = Agricultural Credit Guarantee Scheme Fund as proxy for agricultural financing policy

LR_t = Lending Rate in period *t*

u_t and ε = Stochastic error term

Apriori expectations.

Variables DMF LR ACG

Expected sign + - +

The apriori signs show that positive coefficient of deposit money bank loan (DMF) and agricultural financing (ACG) would encourage higher agricultural productivity. However, lending rate shows negative coefficient with agricultural productivity.

The study employed annual time series data covering the period 1981-2015 which was collected from Central Bank of Nigeria (CBN) statistical bulletin.

Data Analysis Methodology

By way of preliminary test, the study employed Augmented Dickey Fuller (ADF) unit root tests in ascertaining the stationary state of the time series variables. In addition, to test the presence of long-run relationships among the variables, the study employed the Johansen co-integration tests. Lastly, Fully Modified Least Squares Regression Techniques was used to test the hypotheses.

Multiple regression technique has been preferred because it assists in ascertaining the relationship and the statistical significance between variables. Overall the technique is appropriate for achieving the set objectives of the study. One of the merits of the model is that it produces best results in forecasting numeric output when correctly structured.

Presentation and Discussion of Results

In this section, the study presents and interprets the results of the analysis such as the descriptive statistics, the test for stationarity of the variables, the Johansen co-integration test (used to test for long run relationship among the variables) and the presentation and interpretation of estimated parameters with the use of fully modified least square regression analysis (co-integration regression).

Table 1: Descriptive Statistics

Variables	AGDP	DMF	ACG	LR
Mean	3909644.	40094.69	2874113.	13.24057
Median	1057584.	31045.70	241839.0	13.50000
Maximum	16870976	95895.90	12153356	26.00000
Minimum	13580.32	590.6000	26886.80	6.000000
Std. Dev.	5250104.	34922.44	4115343.	4.260874
Skewness	1.236878	0.206834	1.106129	0.498078
Kurtosis	3.185656	1.406769	2.560764	3.750110
Jarque-Bera	8.974487	3.951363	7.418564	2.267698
Probability	0.011252	0.138667	0.024495	0.321792
Sum	1.37E+08	1403314.	1.01E+08	463.4200
Sum Sq. Dev.	9.37E+14	4.15E+10	5.76E+14	617.2716
Observations	35	35	35	35

Source: Author's Computations, 2016

Table 1 presents the descriptive statistics of the variables that includes; Mean, Median Maximum, Minimum, standard deviation value of the data. Jarque-Bera shows the result of test of normality of the data (i.e. parametric and non-parametric test), the result shows that all the variables do not follow normal distribution (parametric in nature).

Table 2: Result of Unit Root Test Augmented Dickey-Fuller (ADF)

Variables	t-statistics	5% Significance level	Order of integration
Agricultural gross domestic product (AGDP)	-5.6260	0.0001	I(1)
Deposit money bank credit to agricultural sector (DMF)	-3.4277	0.0170	I(1)
Lending rate to agricultural sector (LR)	-5.7212	0.0000	I(1)
Agricultural financing policy (ACG)	-6.3643	0.0000	I(1)

Source: Author's Computations, 2016

The result of ADF test indicates that all the variables AGDP, DMF, LR and ACG of the series are integrated of order one i.e I(1). Based on this, the study is on the basis of the result of the ADF unit root test that all the variables series are stationary at first difference.

However, as suggested by Engle and Granger (1987), there could be a form of long run relationship amongst variables in the model, even though they are first difference-stationary. This possibility informs the need to conduct the co-integration test, which is presented below.

Table 3: Johansen Co-integration Test: Unrestricted Co-integration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace statistic	0.05 Critical value	Prob
None	0.5632	59.937	40.175	0.0002
At most 1	0.5108	32.602	24.276	0.0036
At most 2	0.1817	9.0100	12.321	0.1685
At most 3	0.0699	2.3911	4.1299	0.1441

Source: Author's Computations, 2016

Table 3 shows the result of Johansen co-integration test among the variables, and the result shows that there is presence of co-integration among the variable at most 1. This implies that long term relationship exists among the variable. At this point it is required using co-integration regression techniques in testing of the hypotheses.

Regression Results and Hypotheses Testing

Table 4: Deposit Money Bank Loan to Agricultural Sector and Agricultural Output

Dependent Variable: AGDP

Variable	Coefficient	Std. error	t-statistics	Prob.
Constant (C)	-0.0049	0.0062	-0.7933	0.4338
logACG	0.4031	0.0587	6.8678	0.0000
logDMF	0.9683	0.0759	12.7521	0.0000
LR	-0.4761	0.1726	-2.7581	0.0098
R2	0.7886			
Adj R2	0.6875			
S.E regression	0.1137			

Source: Author's Computations, 2016

Table 4 shows the linear relationship between deposit money bank loan to agricultural sector and agricultural productivity in Nigeria, with the use of fully modified least squares (FMOLS) regression analysis. The results obtained from the static model indicates that the overall coefficient of determination R-squared (R2) shows that the equation has a good fit with 78.9 percent of variations in agricultural output in Nigeria is explained by the variables in the model.

In terms of the sign of the coefficient that signify the impact of deposit money banks credit to agriculture (DMF) and agricultural financing policy (ACG) concur with a priori expectation with positive sign. This implies that there is positive relationship between deposit money banks credit to agriculture (DMF) with agricultural financing policy (ACG) and agricultural gross domestic product (AGDP). Also, the lending rate to agricultural sector (LR) concur with apriori expectation with negative sign, implying that there is inverse relationship between commercial bank lending rate (LR) and Agricultural Gross Domestic Product (AGDP).

The coefficient of deposit money banks credit to agriculture (DMF) has significant impact on agricultural gross domestic product (AGDP) as indicated by coefficient (0.9683) with p-value (0.0000). This implies that 1% change in deposit money banks credit to agriculture will induce 0.97% positive changes in agricultural gross domestic product in Nigeria. This is consistent with

the result of Ogbanje Yahaya and kolawole (2012), Obilor (2013) and Akintola (2004).

The coefficient of commercial bank lending rate (LR) has significant impact on agricultural gross domestic product (AGDP) as indicated by coefficient (-0.4761) with p-value (0.0098). This means that 1% change in lending rate to agricultural sector will induce 0.48% reduction in agricultural gross domestic product in Nigeria. This is in line with the findings of Udensi et. al (2012).

Finally, agricultural financing policy (ACG) has significant impact on agricultural gross domestic product (AGDP) as indicated by coefficient (0.4031) with prob (0.0000). This implies that 1% change in agricultural credit guarantee scheme fund as proxy for agricultural financing policy will induce 0.40% increase in agricultural gross domestic product in Nigeria. This is consistent with the result of Obilor (2013).

Conclusion and Recommendations

This study investigates the impact of agricultural financing policy and deposit money bank loans on Nigeria agricultural productivity for the period which spanned between 1981 and 2015. Using time series data, the test for stationarity of the variables was conducted with the use of augmented dickey-fuller (ADF), followed by Johansen co-integration test used to test for long term relationship among the variables. The study also reveals that agricultural financing policy proxy by Agricultural Credit Guarantee Scheme Fund and deposit money bank credit have positive significant impact on agricultural productivity in Nigeria, while lending rate has negative significant impact on agricultural productivity in Nigeria.

This implies that agricultural policy and deposit money banks credits inform of loan and advances contribution to agricultural productivity in Nigeria. On the other hand, interest charged on credit facilities on agricultural credit discourage farmers from obtaining the commercial bank loan and constitute a constraint on commercial bank finance to agricultural sector productivity in Nigeria.

The major conclusion of this study has been that there is significant relationship between agricultural financing policy and agricultural productivity in Nigeria. Increase in agricultural financing will boost agricultural productivity, which will ultimately lead to increase in Nigeria's total gross domestic product.

Based on the findings from the study, the study makes the following recommendation:

- i. The government should endeavor to ensure that there is sufficient and available credit allocation to the ACGSF. This will improve agricultural productivity and boost the Nigeria economy.
- ii. Agricultural Credit Guarantee Scheme Fund should extensively target the rural farmers in order to ease the financial stress of the farmers in Nigeria. This can be done by having liaison offices in the rural areas.
- iii. The government should subsidize agricultural input and conditions for credit guarantee should be less stringent in order to make agricultural financing attractive to commercial banks.
- iv. The government should complement the ACGSF policy by encouraging deposit money banks to provide low interest loans to farmers.

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Authors' Profile

Ajayi, Micheal Adebayo is working as Associate Professor in Department of Finance, University of Ilorin, Nigeria.

Nageri, Kamaldeen Ibraheem is working as Lecturer II in Department of Banking and Finance, Al-Hikmah University, Ilorin, Nigeria.

Akolo, Christy Seyi is a Master of Science Student in Department of Finance, University of Ilorin, Nigeria.
