

Financing Grain Crop Production and the Economic Growth in Nigeria

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Abstract - This research study examined the impact of financing grain crop production on economic growth in Nigeria with the use of secondary time series data for a period of twenty-three years (2000-2023). Ex-post facto research design was adopted employing Unit root test and ARDL approach. Specific references were made to one of the most relevant macroeconomic variables such as loans and advances. Empirical results reveal that loans and advances considered for the analysis had insignificant effect on economic growth in Nigeria during the period under review, implying that financing is an important determinant of crop grain productivity in Nigeria. The real Gross Domestic Product is the dependent variable proxied economic growth. The result revealed that; 1 percent increase in financing grains production leads to about 0.011% increase in real gross domestic product (RGDP). It was found that coefficient of FGP is positive, indicating positive relationship between FGP and RGDP, and this is in line with a-priori. Also revealed; 1 percent increase in interest rate leads to about 0.002% decrease in real gross domestic product (RGDP). It was found that coefficient of FGP is negative, indicating negative relationship between INTR and RGDP, and this is in line with a-priori. The study therefore recommended that, government should provide financing policies in place in terms of financing crop grain production and interest rate that will boost the agricultural sector output to cushion effects of high cost of living in the country.

Key Words: RGDP; Grain crop production financing (FGP); Interest Rate (INTR); Economic growth; Nigeria

1. INTRODUCTION

According to Mbutor, O.M. et al (2013); For many countries in the middle stages of nutrition transition, continued high rates of food insecurity and under nutrition, combined with increased prevalence of overweight and associated non-communicable diseases, are all resulting in a “double burden” of malnutrition. Furthermore, there is real urgency among governments and multilateral agencies to boost food production and this is being pursued with different agricultural models, including the need to migrate to commercial farming in many developing countries. Commercial agriculture had emerged as a principal factor that distinguished transition economies from the predominantly agrarian ones. Finance is pivotal in the commercialization of innovations. Therefore, since the size of agricultural production theoretically appears as a positive function of finance, the coefficient of association between finance and food security must also be positive. Agricultural production also depends on the vagaries of weather. Rainfall in the right volumes would boost output through aiding the decomposition of nutrients and providing fluidity. Sunshine is important for many reasons, including photosynthesis. These dependencies on weather do not diminish the importance of finance for modern farming (Mbutor, O.M. et al 2013). The rain would need to be harvested and

supplied across the season and channeled appropriately in irrigation facilities and ditto sunshine. However, in economies dominated by traditional agriculture, output is essentially seasonal depending wholly on the clemency of weather and crude farm equipment. However, available agricultural statistics do not separate the volume of output that is supported by finance from that accruing as a consequence of the effect of other factors. But such a separation would be important in many fronts. Visibly, such a calculation will make it easier for policy makers to understand, in clear terms, the need to advocate for increased funding of agriculture for greater productivity of the sector. In addition, it would be possible to establish the exact numerical association between extent of financing and expected periodic output. For farmers seeking financial assistance from formal financial intermediaries, the result of this separation would make credit evaluation more transparent and therefore ease access to finance, among others (Mbutor, O.M. et al 2013). Therefore, this research is aimed at determining the impact of financing Grain crop production and its interest rate on the economic growth in Nigeria.

2. Literature Review

Agricultural finance can be defined as the acquisition and the use of capital in agriculture. It basically deals with the supply and demand for funds in agriculture. USAID (2010) defined rural agricultural finance to include all types of finance available to farmers. It is a field of work in which people aim to improve access to efficient sustainable financial services for the agricultural industry, including farming and all related enterprises. It involves all financial services, including savings, transfers, insurance and loans, input supply, processing, wholesaling and marketing (Meyer, 2011). IFAD (2010) further adds that agricultural finance refers to all those financial services that focus on on-farm activities and agricultural businesses without necessarily targeting poor people. The crucial role of financing in agriculture cannot be overemphasized. The escalating world population is associated with greater pressure on food demand and the demand for agro-products that are input for further production, thus the need for use of more sophisticated methods capable of yielding greater output is essential. Finance in agriculture is as important for improved productivity as technical input can only be purchased and used by farmers if they have required fund at their disposal.

In Africa, a significant proportion of the population live in the rural areas with agriculture as their major pre-occupation and financial constraints in agriculture remain prevalent. Finance to the agricultural sector remains costly and inequitably distributed and this limits the ability of small-scale farmers to grow their productivity. According to Nyoro (2002), lack of working capital and low liquidity limit the farmer's ability to purchase productivity enhancing input like seeds, fertilisers and pesticide. This was supported by Awudu and Huffman (2000) and Kimbaara (2005) stating that the average production efficiency levels are higher among producers who have access to formal credit. Agricultural credit therefore enhances productivity and

promotes standard of living by breaking the vicious cycle of poverty among farmers. Literature abounds on the relationship between agricultural finance and agricultural productivity.

Iqbal et al., (2003) in their study identified three main factors that contributed to agricultural growth as the increased use of agricultural input, technological change and technical efficiency. Technological change was the result of research and development efforts, while technical efficiency referred to the rate at which new technology was adopted and used more rationally and was affected by the flow of information, better infrastructure, and availability of funds and farmers' managerial capabilities. Higher use and better mix of input also required funds. These funds could come either from farmers' own savings or through borrowings. In less developed countries where savings were negligible, agricultural credit appeared to be an essential input along with modern technology for higher productivity. Jan et al., (2012) pointed out that other associated reasons for low productivity in agriculture included land fragmentation; lack of managerial skills in farmers, which limited their ability to adopt improved farming practices; and insufficient use of modern technology and input. The latter was a function of the inadequate finance available to the farmers, particularly the smallholders. The matter of enhancing agricultural productivity, therefore, largely depended on inter alia, the availability of finance to farmers. Saboor et al., (2009) added that the use of modern technology increased demand for credit and resulted in increase in agricultural productivity of small farmers. Access to credit promoted the adoption of yield-enhancing technologies. Adams and Vogel (1990) also supported the argument that most third-world countries studied used credit programmes to promote agricultural output. Mahmud (2008) and GOB (2009) posited that of all agricultural reform policy interventions aimed at achieving success, the agricultural/rural credit had been considered one of the crucial factors toward sustainable development of the agricultural sector. Abedullah et al., (2009) and Saboor et al., (2009) stated that timely and easy access to credit enables farmers to purchase the required input and machinery for carrying out farm operations and increasing production.

Johnson and Cownie (1969) in their study noted that developing countries improved their agricultural output by introducing modern agricultural technology such as chemical fertilisers, recommended seeds, tractors and modern irrigation facilities, among others. But the adoption of such modern agricultural techniques is capital intensive and requires increased financing. Siddiqi et al., (2004) reported that the flow of credit to farmers had increased demand for input to increase crop production. The elasticity of amount of credit, number of tractors, irrigation, use of chemical fertiliser and pesticides, with respect to agricultural income, indicated that credit (production credit) and tube wells impacted positively on agricultural output. Audu et al., (2007) stressed the need for agricultural finance, arguing that capital in the form of finance is needed to modernise agriculture because new technologies have to be purchased before they can be used on the farms. They emphasised that farmers' need for finance in consumption and payment for labour during the gestation period of their enterprises. They further argued that inadequate agricultural capital stems from the small size of operations of most farmers, which limited the extent to which savings accrued from surplus output, and consequently stagnated income. Therefore, any system of financial intermediation that would leave a pool of money for investment among farmers would catalyse agricultural production and development. Richard (1990),

Khandker and Faruquee (2003) and Khan et al., (2008) provided empirical evidence that institutional agricultural credit

played a key role in enhancing farm production. They argued that without doubt, agriculture could be the main medium for improving the socio-economic conditions of the rural people. Nosiru (2010) showed that micro credit enabled farmers to acquire needed input to increase their agricultural productivity. However, the credit obtained by the farmers in the study area did not contribute positively to the level of output. This was as a result of non-judicious utilisation, or diversion of credits obtained to other uses apart from the intended farm enterprises. Other studies have sought to link improvement in agricultural production to poverty reduction. Maxwell, (2001), noted that poverty remained a predominantly rural problem and agriculture is generally central to rural livelihoods. Some 70.0 per cent of the workforce in sub-Saharan Africa and 67.0 per cent in South Asia are at least partly engaged in agriculture. Therefore, any improvement in rural incomes should – if only by sheer weight of numbers – have a major impact on poverty.

The most useful assessments of the impact on poverty of changes in agriculture are those that followed farming communities' experiences over a long-term period (Lanjouw and Stern, 1998; Hazell and Ramasamy, 1991). These studies showed that agricultural productivity gains have raised rural incomes in two ways: by directly increasing farmers' incomes and, of particular importance to the poorest, by increasing employment opportunities and wages. DFID (2004) explained that increased agricultural productivity reduced poverty through four transmission mechanisms including: direct and relatively immediate impact of improved agricultural performance on rural incomes; impact of cheaper food for both urban and rural poor; agriculture's contribution to growth and the generation of economic opportunity in the non-farm sector; and agriculture's fundamental role in stimulating and sustaining economic transition, as countries (and poor people's livelihoods) shift away from being primarily agricultural towards a broader base of manufacturing and services.

In a similar research work, Bresciani and Valdes (2007) framed their analysis in terms of three key channels that linked agricultural growth to poverty, namely: labour market, farm income and food prices. They provided a theoretical framework for investigating the quantitative importance of those various channels and then reported findings from six country case studies. They concluded that when both the direct and indirect effects of agricultural growth were taken into account, such growth was more poverty-reducing than growth in nonagricultural sectors.

2.1 Theoretical Framework

This study is theoretically centered on the Theory of Financial Intermediation. Financial institutions, as presented by Shaw (1973) and Mickinnon (1973), are a channel through which huge amounts of credit are available for spontaneous economic expansion. Robison (2001) stated that this theory specifically postulates rural economic growth with an emphasis on agricultural financing. Robison (1952) argued that finance is a handmaid to economic expansion, that increase in productivity promotes the demand for the financial instrument.

The study employed secondary annual time series data obtained from the Central Bank of Nigeria and the National Bureau of statistics annual statistical bulletins from 2000 -2023 respectively. Also employed was quasi-experimental research design and econometric methodology to evaluate the long-term relationship between Real Gross Domestic product (RGDP), Loans and Advances from agricultural credit guarantee scheme fund and its interest rates obtained from commercial bank credit, advances and Community- Microfinance credits. The study employed Unit root test and ARDL approach.

3. Research Methodology

The choice of information coincides with the choice of secondary data. Furthermore, secondary data was chosen over other possible alternatives, reason due to its accessibility and reliability.

The research design adopted is the ex-post facto research design. This design method was chosen because; it implies a systematic process where the researcher cannot just manipulate data due to its occurrence.

The time series Secondary data running from 2000 - 2023 extracted from the Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics annual bulletins were the sources of data used for this study.

Econometric software (E-Views version 9.0) was used to analyze the data collected. The descriptive statistics for all study variables were extracted from the E-views 9.0 outputs and were presented in Tables. Also, the employed was the Augmented Dickey-Fuller Test to test for stationarity and the Ordinary Least Square for regression.

The model proxies RGDP as the dependent variable (endogenous variable) that measures economic growth while Loans/advances and interest rates represents the independent variables (exogenous variables)

The econometric form of the model is hereby specified as;

$$RGDP = f(LA, INTR)$$

The econometric equation becomes;

$$\text{Regression of } RGDP = \alpha + \beta_1 LA + \beta_2 INTR + U_t$$

Where;

α = Intercept of relationship in the model

β_1 = Coefficient of the independent variable LA

β_2 = Coefficient of the independent variable INTR

The a-priori expectation defines the theoretical expectations of the signs of the parameters of the model. These are mathematically expressed as follow;

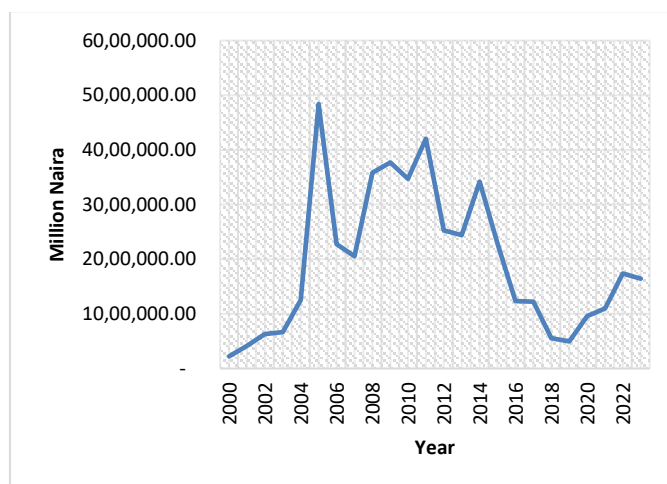
$\beta_1 > 0$ = Positive relationship between LA and RGDP

$\beta_2 < 0$ = Negative relationship between INTR and RGDP

4. Data Presentation, Discussion and Findings

The trends in the variables are captured in separate figures below. This is to give an insight into the existence of any unique characterization of the variables over the study.

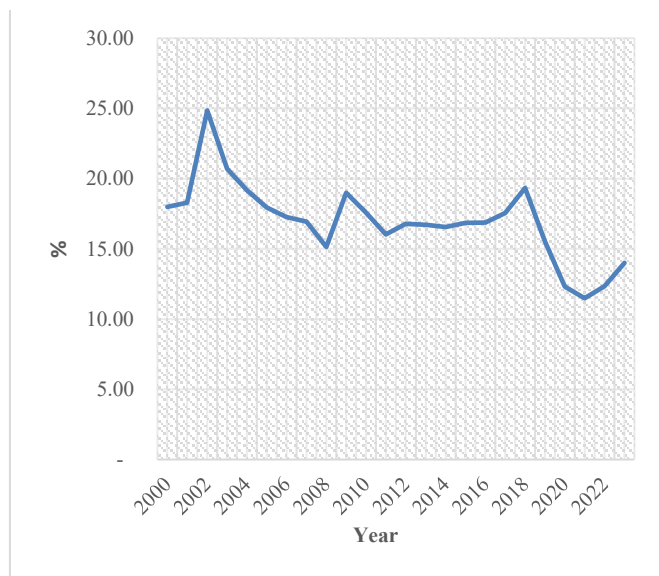
Figure 4.1.1: A line chart showing the distribution of trends of Nigeria's real Gross Domestic Product Growth rate (%) from 2000 -2023



Source: Author's computation, 2025 using E-views 9.0

Fig. 4.1.2 above showed that the grains Production from 2000 to 2023. The Financing to grains was flattering from 2000 to 2004 then zig from 2005 to 2020 and sharply rise in 2021 to 2023. The figure shows that Financing to grains production in Nigeria was not stable between 2007 and 2016 while stable from 2017 to 2023. The initial instability in Loans and Advances experienced in Nigeria could be due to government policies inconsistencies

Figure 4.1.2: A line chart showing the distribution of trends of Nigeria's Interest rate (%) from 2000-2023



Source: Author's computation, 2025 using E-views 9.0

Fig. 4.1.3 above showed that the interest rate from 2000 to 2023. The interest rate was flattering from 2000 to 2004 then zig from 2005 to 2020 and sharply rise in 2021 to 2023. The figure shows that interest rate in Nigeria was not stable between 2007 and 2016 while stable from 2017 to 2023. The initial instability in interest rate experienced in Nigeria could be due to government policies inconsistencies.

Table -1: Summary of Descriptive Statistics

Variab le	Mea n	Std	Max	Min	Skewne ss	Jarqu e- Bera	Probabili ty
RGDP	7.72	7.77	7.89	7.41	0.15	-0.68	2.60

FGP	6.17	6.23	6.68	5.35	0.36	-0.51	1.43
INTR	16.97	16.91	24.85	11.48	2.83	0.35	2.19

Source: Author's computation, 2025 using E-views 9.0

The table 4.1.3 reveals that real Gross domestic product growth (RGDP) has a mean of 7.72 and varies from a minimum of 7.41 to a maximum of 7.89 and a standard deviation of 7.77 with a probability value of 2.60. However, grains Production (FGP) has a mean of 6.17 and varies from a minimum of 5.35 to a maximum of 6.68 and a standard deviation of 6.23 with a probability value of 1.43. Lastly, Interest rate (INTR) has a mean of 16.97 and varies from a minimum of 11.48 to a maximum of 24.85 and a standard deviation of 6.23 with a probability value of 16.91. Therefore, RGDP, FGP and INTR are were positively skewed.

Table -2: Summary of the description of variables and their corresponding unit and sources

Variable	Description	Unit	Source
RGDP	Real Gross Domestic Growth	Million Naira	NBS
FGP	Financing to Grains Production	Million Naira	CBN
INTR	Interest rate	Percentage	CBN

Source: Researcher's own computation

Dickey-Fuller (1979) stated that there is likelihood of obtaining spurious results if the series that generated the results are non-stationary. This is why this study investigated the time series properties of the data by conducting unit root test for stationarity using Augmented Dickey-Fuller (ADF) method.

Table -3: Augmented Dickey-Fuller (ADF) Unit Root Test

Variable	ADF Test Statistics at Level	ADF Test Statistics at First Difference	5% Critical Value at Level	5% Critical Value at First Difference	Probability Value at Level	Probability Value at First Difference	Order of Cointegration
INRGDP	-4.854	-2.580	-2.998	-3.005	0.008*	0.1120	1(0)
INFGP	-2.637	-4.378	-2.998	-3.005	0.1004	0.026*	1(1)
INTR	-1.919	-5.137	-2.998	-3.768	0.3184	0.995*	1(1)

Source: Output of E-Views 9.0, 2025

The results of unit root test shown on table 4.2.3 above revealed that all the absolute values of ADF test statistics for RGDP, FGP and INTR are greater than their critical values at 5% implying that RGDP, FGP and INTR are stationary at 5%, It is integrated of order 1, and 0 that is, I(0) and 1(1) indicating mixed result. The results also showed that all the variables are stationary at both 5% since their absolute value of ADF statistics are respectively greater than their critical values at 5%.

Table -4: Regression of $RGDP = \alpha + \beta_1 FGP + \beta_2 INTR + U_t$

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP(-1)	0.822466	0.541698	1.518309	0.1797
RGDP(-2)	0.485860	0.440768	1.102306	0.3126
RGDP(-3)	0.209943	0.559452	0.375265	0.7204
RGDP(-4)	-0.721899	0.591039	-1.221408	0.2677
FGP	0.011086	0.036720	0.301912	0.7729
FGP(-1)	-0.026777	0.019638	-1.363542	0.2217
FGP(-2)	-0.020568	0.025383	-0.810318	0.4487
FGP(-3)	-0.012254	0.017320	-0.707496	0.5058
FGP(-4)	0.037720	0.015599	2.418127	0.0520
INTR	0.002490	0.002083	1.195377	0.2770
INTR(-1)	0.001328	0.002318	0.573038	0.5874
INTR(-2)	-0.005333	0.002616	-2.038732	0.0876
INTR(-3)	-0.004314	0.003117	-1.384145	0.2156
C	0.963840	0.691718	2.839076	0.0296
R-squared	0.997800	Mean dependent var	7.770500	
Adjusted R-squared	0.993033	S.D. dependent var	0.105704	
S.E. of regression	0.008823	Akaike info criterion	-6.426858	
Sum squared resid	0.000467	Schwarz criterion	-5.729845	
Log likelihood	78.26858	Hannan-Quinn criter.	-6.290794	
F-statistic	209.3132	Durbin-Watson stat	1.834157	
Prob(F-statistic)	0.000001			

*Note: p-values and any subsequent tests do not account for model selection.

Model:

$$RGDP = 0.963 + 0.011FGP + 0.002INTR + U_t$$

(2.839) (1.195) (0.302)

Where;

RGDP = Real Gross Domestic Product = Dependent Variable

FGP = Financing to Grain crop Production = Independent Variable

INTR = Interest rate = Independent Variable

4.1 Discussion of Results

The result on table 4 above revealed the following:

The equation shows that $\alpha = 0.963$ which is the intercept. This is the base level of prediction for the dependent variable when all the independent variables are equal to zero. The coefficients of the independent variables measure how a percentage change in independent variables affect the dependent variable.

(i.) 1 percent increase in financing grains production leads to about 0.011% increase in real gross domestic product (RGDP). It was found that coefficient of FGP is positive, indicating positive relationship between FGP and RGDP in the periods 2000-2023, and this is in line with a priori. This result is statistically insignificant at 5 percent as the p-value of 0.7729. The standard error measures the statistical reliability of the coefficient estimates- the larger the error, the more statistical noise in the estimates. The standard error is 0.036720 percent which is small or significant and thus shows that FGPP is statistically reliable to predict RGDP in Nigeria.

(ii.) 1 percent increase in interest rate leads to about 0.002% decrease in real gross domestic product (RGDP). It was found that coefficient of FGP is negative, indicating negative relationship between INTR and RGDP in the periods 2000-2023, and this is in line with a priori. This result is statistically insignificant at 5 percent as the p-value of 0.5874. The standard error measures the statistical reliability of the coefficient estimates- the larger the error, the more statistical noise in the estimates. The standard error is 0.691718 percent which is small or significant and thus shows that FGP and INTR are statistically reliable to predict RGDP in Nigeria.

4.1 Discussion of Results

Based on the quest to examine the impact of financing of agricultural sector on real gross domestic product in Nigeria, the ARDL result revealed that components of financing such as; loans and advances and interest rate had an symmetric impact on RGDP growth rate in Nigeria. This is because the positive changes in financing to grains production had effect on RGDP growth rate while negative in interest rate had negative effects on RGDP in Nigeria. This implied that the increase in financing to grains production and interest rate will have more impact on RGDP in the Nigerian economy within the study period.

5. CONCLUSIONS AND RECOMMENDATIONS

This research study has so far examined the effects of financing grain crop production on economic growth in Nigeria employing Unit root test and ARDL approach. Specific references were made to the relevant macroeconomic variables complementary to financing grains and interest rate. Empirical results reveal that financing to grains production and interest rate considered for the analysis had insignificant effect on economic growth in Nigeria during the period under review, implying that financing is an important determinant of groundnut and ginger production productivity in Nigeria. The real Gross Domestic Product is the dependent variable proxied economic growth. The result shows that there is positive and significant impact of financing grains production and interest rate. The study therefore recommended that, government should provide financing policies in place in terms of financing grains production and interest rate that will boost the agricultural sector output to cushion effects of high cost of living in the country.

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