A Vector Error Correction Model Of Agricultural Finance And Economic Growth In Nigeria (1992-2018)

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ABSTRACT

The study examines the relationship between agricultural finance and economic growth in Nigeria based on vector error correction model(VECM) and vector error correction (VEC) granger causality. The study employed annual time series data obtained from Central Bank of Nigeria, Statistical Bulletin and World Development Indicators which spanned from 1992-2018. Findings from the correlational analysis reveals a strong, positive and statistically significant correlation between agricultural finance and economic growth. Furthermore, cointegration tests attest to the long run co-movement among the variables. In the short-run, agricultural finance has a negative and statistically insignificant relationship with economic growth. However, the converse holds between agricultural finance and economic growth in the long run. There was no causality between agricultural finance and economic growth but a unidirectional causality running from interest rate to economic growth, as well as a bi-directional causality exists between inflation rate and economic growth. It can therefore be concluded that agricultural finance has negative and statistically insignificant impact on economic growth in the short run but the reverse is the case in the long run. The study recommends that agricultural finance should be used in conjunction with other agricultural incentives capable of stimulation agricultural outputs in Nigeria. Proper watch should be placed on macroeconomic environmental factors such as inflation in decision making process of agricultural organisations.

Keywords: Agricultural Finance, Economic Growth, Granger Causality, VECM

1.0 Introduction

Agricultural sector constitutes a cardinal sector of the Nigeria's economy. According to Ayeomoni and Aladejana (2016), although the sector has been instrumental in food provision, employment and foreign exchange generation, but it has been constrained by various problems like poor funding and unstable macroeconomic policies (Ayeomoni & Aladejana, 2016). Finance has been regarded as the life blood of any organisation. Its dearth in any sector or unit has the capacity to curtail the output and productivity of such unit, agriculture, not an exception. It has been observed (Obansa and Maduekwe (2013) that finance is needed by agricultural sector to acquire land, construct buildings, acquire machinery and equipment, hire labour, pay for irrigation, and carry other activities in agriculture. Ayeomoni and Aladejana (2016) also emphasized the vitality of financial capital in agricultural enterprises, as a stimulant of economic growth and development of the country.

Economic growth is attained by the positive contributions of the different sectors of the economy. One of such is agriculture. The agricultural sector, according to Okunlola, Osuma and Omankhanlen (2019) has the potential to stimulate economic growth. The sector, according to Osuma et al. (2019) as cited in Okunlola, at al. (2019), was the mainstay of the Nigerian economy before the discovery of crude oil at Oloibiri oilfield on January 15th, 1956.

Obansa and Maduekwe (2013) posit that agriculture financing is posed to inducing agriculture-led growth and development in an economy. However, empirically, the extent to which this assertion true to Nigeria economy is still a subject of debate among scholars. Therefore, this study contributes to the existing literature by examining agricultural finance and economic growth in Nigeria from 1992-2018. Specifically, the study aims to determine the impact of agricultural finance on economic growth in Nigeria; examine the relationship between agricultural finance and economic growth in Nigeria; and ascertain the direction of causality between agricultural finance and economic growth in Nigeria.

2.0 Literature Review

Agriculture finance could be described as all forms of financial resources sourced by, made available by private individuals, governmental organisations, financial institutions, and other financiers, for the purpose promoting agricultural production and outputs in all ramifications. Obansa and Maduekwe (2013) regard agricultural financing as basically long term funding provided to agricultural outfits, with the aim of creating agriculture-induced economic growth and development. Furthermore, the authors classified agricultural finance into two broad classes, namely domestic and external finance. Either of the two was sub-divided in to debt and non-debt finance. The authors exemplify debt domestic agricultural finance as including bank loans and advance, treasury bills, development stocks, treasury certificates, etc. Examples of non- debt domestic resources given by them are repatriated capital, agricultural share capital, savings, equity investments and others. In the same vein, multilateral debts, bilateral debts, foreign private, development bank loans are examples of debt external agricultural finance. On the other hands, foreign direct investment, foreign aid, foreign private investments are examples of non-debt external agricultural finance (Obansa & Maduekwe, 2013).

Economic growth refers to a quantitative and persistent increase in the productive capacity of an economy, thereby resulting in increase in goods and services. Economic growth has also been described as a sustained rise in national output, provision of wide range of economic goods, presence of improved technology and institutional, attitudinal and ideological adjustments (Ayeomoni & Aladejana, 2016; Obansa & Maduekwe, 2013). Economic growth is measured as gross domestic product (GDP), gross national product (GNP), either in nominal or real terms.

The nexus between agricultural finance and economic growth has been empirically investigated by different scholars. For instance, Ojo and Oluwaseun (2015) examined the Agricultural Credit Guarantee Scheme Fund(ACGSF) and its impacts on economic development in Nigeria. They concluded that the Fund has the potential to stimulate macroeconomic development when properly managed. In another study, Okunlola, et al. (2019) investigated the impact of guaranteed agricultural finance to oil palm, cocoa, groundnuts, fishery, poultry, cattle, roots, and tubers on the real gross domestic product (RGDP) of Nigeria (1981-2017) using Autoregressive Distributed Lag (ARDL). It was found that none of the guaranteed agricultural finance is statistically significant to RGDP.

Similarly, Ayeomoni and Aladejana (2016) examine the relationship between agricultural credit and economic growth in Nigeria.1986-2014 based on ARDL. The findings showed that short and long run relationship existed between agricultural credit and economic growth. Inflation rate revealed an inverse relationship with GDP. In a related study, Obansa and Maduekwe (2013) investigated the impact of agriculture financing on economic growth using Ordinary Least Square (OLS), and Granger causality test. The study found a bidirectional causality

between economic growth and agriculture financing. Similarly, Adetiloye (2012) examined agricultural financing through the lens of ACGSF (1978 to 2006) and its effectiveness in the process of lending for food production in Nigeria. The results of the t test and Granger causality reveal that though credit to the agricultural sector is significant it has not been growing relative to the economy.

3.0 Methodology

The study adopts ex-post fact design based annual time series data spanning 1992-2018. The data were sourced from the CBN Statistical Bulletin and World Development Indicators. Econometric techniques and models were applied to the data. Some of these tests include the unit root test, pairwise correlation test, Johansen co-integration test, VEC Granger causality test. The vector error correction model (VECM) was specified and estimated.

The VECM model estimated in this study is stated in equation 1.

Table 1: Descriptive Statistics

Measures	GDP	AGFIN	INTR	INFR
Mean	4.2392	4.2876	19.2725	19.1103
Maximum	5.1064	5.1549	31.6500	72.8355
Minimum	2.9589	2.9728	15.1358	5.3880
Std. Dev.	0.6543	0.6571	3.5510	17.6109
Skewness	-0.3671	-0.4087	1.8145	1.9126
Kurtosis	1.9010	1.9634	6.6168	5.4394
Jarque-Bera	1.9651	1.9607	29.5343	23.1572
Probability	0.3743	0.3751	0.0000	0.0000
Observations	27	27	27	27

Source: Authors' computation using Eviews 10, (2020).

Table 1 shows that the mean value of Gross Domestic Growth(GDP) is N4.2392billion with a standard deviation(S.D.) value of N0.6543billion. This implies that the series is widely dispersed given that the mean value is more than its S.D. The minimum and maximum value for the series was N2.9589b and N5.1064b respectively. The Jarque-Bera (JB) statistic value of N1.9651 with p-value of 0.374351 indicates that the series is normally distributed, since its p-value is more than 10% level of significance. The kurtosis of the series is N1.901048. The series' skewness (-0.3671) of approximately 0, also corroborates the normality of GDP in the period under investigation.

In the same vein, the Agricultural Finance (AGFIN) is well dispersed since its mean value (N4.2876billion) is less than its S.D. (N441.8908b). AGFIN values ranges between a minimum of N2.9728b and a maximum of N5.1549b. The series is normally distributed since the p-value of 0.375179 of its JB statistic(N1.960704b) is more than 5%. The series kurtosis of the series stands at N1.963468. The series' skewness of roughly 0 (that is -0.408794) shows that AGFIN is symmetric around it's mean and also attests to the normality of the distribution.

Table 2: Correlation Matrix

Correlation/Probability	GDP	AGFIN	INTR	INFR
GDP	1.0000			
	(-----)			
AGFIN	0.8098	1.0000		
	(0.0000)*	(-----)		
INTR	-0.7211	-0.7193	1.0000	
	(0.0000)	(0.0000)	(-----)	
INFR	-0.6458	-0.6546	0.5639	1.0000
	(0.0003)	(0.0002)	(0.0022)	(----)

*Values in parentheses are the probability values

Source: Authors' computation using Eviews 10, (2020).

Furthermore, table 1 reveals that Interest Rate(INTR) mean value is 19.2725% and its S.D. is 3.5510%. Thus, the series is not widely dispersed from its mean, since its S.D. is less than its average value. INTR's minimum and maximum value of 15.1358 and 31.6500% respectively. The series fails the test of normality due to the fact that it's the p-value of 0.0000 of its JB statistic (29.5343) is less than 5%. Since the series' skewness (1.8145) exceeds zero, INTR is considered positively skewed. The kurtosis of the series (6.6168) of exceeding 3, also attests to the non-normality of the series and indicates that it is leptokurtic in nature.

Finally, the Inflation Rate (INFR) has an average value and a S.D of 19.1103% and 17.6109% respectively. Thus, the series is not widely dispersed from its mean. INFR's minimum and maximum value of 5.3880% and 72.8355% respectively. The series fails the test of normality due to the fact that it's the p-value of 0.0000 of its JB statistic (23.1572) is less than 5%. Since the series' skewness (1.9126) exceed zero, INFR is considered positively skewed.

4.2 Correlational Analysis: Contained in table 2 is the result of pair wise correlation among the variables presented in the form of matrix.

Table 2 indicates that GDP and AGFIN are strongly and positively correlated and are statistically significant. However, the relationship GDP and INTR is strong, negative and statistically significant. Similarly, INFR has a strong, negative and statistically significant relationship with GDP. Generally, the variables correlated well considering the highest coefficient (0.8017987) is within the threshold of 0.8. This also suggests the absence of multicollinearity problem among the variables.

4.3 Unit root Test: In order to avoid spurious regression due to non- stationary time series, the Augmented Dickey-Fuller (ADF) unit root test was carried out on the times series and the results are shown in table 3.

Table 3: ADF Unit Root Test

Variables	T-statistics	Critical values @5% level	P-value	I(d)
GDP	-6.166492	-3.737853	0.0000	I(1)
AGFIN	-6.723749	-3.603202	0.00001	I(1)
INFR	-4.885269	-2.986225	0.0006	I(1)
INTR	-7.939485	-3.724070	0.0000	I(1)

Source: Author's computation using Eviews 10, (2020).

Table 3 indicates that all the variables (GDP, AGFIN, INFR and INTR) are found to be stationary at first difference, that is, they are integrated at order one I(1). For each variable, the null hypothesis(HO) of non-stationarity is rejected since the p-value of ADF t-statistic is less than the level of significance at 1%.

4.4 Co-integration Test: Since the series attained stationarity after first differencing, the study tested for any evidence of cointegration among the variables. Thus, the Johansen cointegration Trace and Maximum Eigen tests results are presented in table 4.

Table 4: Johansen Unrestricted Cointegration Rank Test (Trace, and Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None *	0.902941	118.9469	47.85613	55.97843	27.58434
At most 1	0.794190	62.96846	29.79707	37.93920	21.13162
At most 2	0.430612	25.02925	15.49471	13.51666	14.26460
At most 3	0.381026	11.51260	3.841466	11.51260	3.841466

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Authors' computation using Eviews 10, (2020).

From the Trace and Maximum-Eigenvalue statistics in table 4, the null hypothesis of no conintegration was rejected because their respective critical values at 5% was less the respective test statistic. Both tests indicate that indicates 3 cointegrating equations at the 5 per cent significance level. This implies that are evidence of long run co-movement among the variables. Ayeomoni and Aladejana, (2016) also found a similar evidence between agricultural finance and economic growth in Nigeria.

4.5 Models Estimation: In order to ascertain the relationship between agricultural finance and economic growth also observe the long run and short dynamics, the VECM was estimated. The short run and long run estimates of the model are presented in tables 5 and 6 respectively.

Table 5: VECM: Long Run Estimates

	Constant	GDPL	GFINL	INTR	INFR
Coefficient	-5.7228	1.0000	-0.9232	0.2831	0.0010
Std. Error			0.2874	0.0516	0.0095
T-statistic			-3.2122	5.4881	0.1128
Decision			Positive and not statistically significant	Negative and statistically significant	Negative and not statistically significant

Source: Authors' computation using Eviews 10, (2020).

The long run estimates of the VECM in table 5 indicate that AGFINL (with a coefficient of -0.923261) implies that a percentage change in AGFINL is associated with 92.3% increase in GDP, on average, ceteris paribus, in the long run. This result is in agreement with the a-priori expectation in the estimated model but is not consistent with Ayeomoni and Aladejana (2016)'s submission of an inverse relationship between credit to agriculture and economic growth, in the long run. However, INTR (with an estimated coefficient of 0.283182), reveals that a percentage change in the series will lead to 28.3% decrease in GDP, on average, ceteris paribus, in the long run. Furthermore, INFR (with a coefficient of 0.001077) indicates that a percentage change in INFR is associated with 0.1 decrease in GDP, on average, ceteris paribus, in the long run.

For estimated statistic to be considered statistically significant, the t-test value must be greater than 1.96 (Usman, 2019). Therefore, in the long-run, AGFINL has a positive and statistically insignificant relationship with GDPL. This implies that increasing AGFINL will result in a positive change in the level of economic growth in Nigeria but the changes in GDP may not be significant in the long run. INTR has a negative and statistically insignificant relationship with GDP. Thus, increasing INFR will significantly endanger economic growth in Nigeria in the long run. Furthermore, though the impact may not be significant, but increase in INFR will result in decrease in the level of economic growth in Nigeria, in the long run, ceteris paribus. This result is in agreement with the a-priori expectation in the estimated model and is in consonance with Ayeomoni and Aladejana (2016)'s.

Furthermore, the short run estimates of the VECM are presented in table 6.

Table 6: VECM: S hort Run Estimates

Variables	Coefficient	T-statistics	S.E.	Prob.	Significance
ECM	-0.0339	4.3673	0.0077	0.0000	Significant***
D(GDPL(-1))	0.1145	0.6460	0.1773	0.5202	Not Significant
D(AGFINL(-1)	-0.0898	-0.6614	0.1357	0.5103	Not Significant
D (INTR(-1)	-0.0089	-4.3558	0.0020	0.0000	Significant***
D(INFR(-1)	0.0013	2.8879	0.0004	0.0050	Significant***
C	0.0772	5.6391	0.0137	0.0000	N/A
R-squared	0.7383		**F-statistic**	10.7224	
Adj. R-squared	0.6694				

*** denotes the rejection of null hypothesis at 1%.
Source: Authors' computation using Eviews 10, (2020).

Table 6 indicates that the error-correction term (ECT) coefficient (-0.033999) with a p-value (0.0000) less than 1% reveals that the ECT is correctly signed (negative) and also statistically significant. This implies that the previous year deviation from long run equilibrium in the model is corrected in the current period at an adjustment speed of 3.3%. The model adjusts at a slow speed considering the ECT coefficient of 3.3%.

The AGFIN estimate (-0.0898) means that a percentage change in AGFIN is associated with 8.9 % decrease in GDP, on average, ceteris paribus, in the short run. The relationship is not statistically significant.

Furthermore, the INFR estimate (-0.0089), implies that a percentage change in the series will results in about 0.89% decrease in GDP, on average, ceteris paribus, in the short run. The relationship is statistically significant at 1%, since the p-value of INFR (0.0000) is less than 1%.

Similarly, going by the INFR coefficient (0.0013), a percentage change in INFR is associated with 0.13% increase in GDP, on average, ceteris paribus, in the short run. The relationship is also statistically significant, since the p-value of the series (0.0050) is less than 1%.

The coefficient of determination (R2) of the model (0.7383) shows that the explanatory variables (AGFINL, INTR and INFR) jointly account for about 74% of the total variation in gross domestic product (GDPL), while the unobserved features in the model constitute 26%. Thus, the model estimated is considered robust.

4.6 VEC Granger Causality: To ascertain the direction of causality among the variables, the VEC granger causality test was conducted. The results are presented in table 7.

Table 7: VEC Granger Causality Tes t

Dependent variable: D(GDPL)				
Excluded	Chi-sq	Df	Prob.	**Causality?**
D(AGFINL)	0.437508	1	0.5083	No
D(INFR)	8.340029	1	0.0039	INFR ⟹ GDPL
D(INTR)	18.97299	1	0.0000	INTR ⟹ GDPL
Dependent variable: D(AGFINL)				
D(GDPL)	0.739163	1	0.3899	No
D(INFR)	1.101952	1	0.2938	No
D(INTR)	8.070492	1	0.0045	INTR ⟹ AGFINL
Dependent variable: D(INFR)				
D(GDPL)	9.701830	1	0.0018	GDPL ⟹ INFR
D(AGFINL)	0.354091	1	0.5518	No
D(INTR)	8.764533	1	0.0031	INTR ⟹ INFR
Dependent variable: D(INTR)				
D(GDPL)	0.057219	1	0.8109	No
D(AGFINL)	0.588401	1	0.4430	No
D(INFR)	1.007797	1	0.3154	No

Source: Authors' computation using Eviews 10, (2020)

Table 7 indicates that there is a unidirectional causality running from INTR to GDPL. Similarly, a unidirectional causality was found running from INTR to AGFINL and from INTR to INFR. It was also established that there was a bi-directional causality between INFR and GDPL. There was causality found between AGFIN and GDP. However, Obansa and Maduekwe (2013) established a bidirectional causality between AGFIN and GDPL. Furthermore, a unidirectional causality running from INTR to GDP was established in this study.

4.7 Post-Estimation Diagnostic Tests: Presented in table 8 are results of the post-estimation diagnostic tests carried on the model.

Table 8: Post-Estimation Diagnostic Tests

Tests	**Type**	**Test statistics**	**Prob.**	**Remarks**
VEC Residual Heteroscedasticity Test	Joint test(Chi-sq)	128.4662	0.6293	Homoscedasticity
VEC Residual Serial Correlation LM Tests	LRE* stat at lag 2	47.0172	0.4230	Zero Serial Correlation
VEC Residual Serial Correlation LM Tests	Rao F-stat at lag 2	1.7230	0.6643	Zero Serial Correlation
VEC Residual Normality Tests	Joint test(JB)	8.3952	0.3958	Normality

Source: Author's computation using Eviews 10, (2020)

Based on the diagnostics results in table 8, the model estimated (VECM) is considered a good one. It neither suffers heteroscedasticity problem nor serial correlation. The model was found to be normally distributed.

4.5 Impulse Response Output: The impulse response output shown in table 9 indicates the accumulated response of GDPL to one standard deviation shock of each of the explanatory variables in the table. The accumulated response of GDPL to agricultural finance (AGFIN) is negative response in all the periods. Shock to AGFIN at period 9, imparts GDP by 2.08%. Conversely, the accumulated response of GDPL to both interest rate(INTR) and inflation rate (INFR) are positive response in all the periods. Shock to INTR at period 9, imparts GDP by 3.06%. In the same vein, shock to INFR at period 9 impacts GDP by 1.58%. This implies both variables (INTR and INFR) exhibited a relationship with gross domestic product (GDP), especially starting from the second period.

Table 9: Impulse Response of GDPL

Period	**GDPL**	**AGFINL**	**INTR**	**INFR**
1	0.0254	0.0000	0.0000	0.0000
2	0.0270	-0.0059	0.0006	0.0121
3	0.0222	-0.0072	0.0174	0.0147
4	0.0215	-0.0090	0.0286	0.0148
5	0.0214	-0.0098	0.0305	0.0157
6	0.0208	-0.0099	0.0307	0.0160
7	0.0207	-0.0098	0.0310	0.0158
8	0.0207	-0.0098	0.0309	0.0158
9	0.0208	-0.0098	0.0306	0.0158
10	0.0208	-0.0098	0.0306	0.0158

Source: Authors' computation using Eviews 10, (2020).

4.6 Variance Decomposition Output: Variance decomposition indicates how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables (Iheanacho, 2016). Thus, the variance decomposition output in table 10 shows the relative contribution of the variables of choice to change in GDP.

Table 10: Variance Decomposition of GDPL

Period	S.E.	GDPL	AGFINL	INTR	INFR
1	0.0254	100.0000	0.0000	0.0000	0.0000
2	0.0395	88.3063	2.2664	0.0290	9.3981
3	0.0513	71.2258	3.3624	11.5519	13.8598
4	0.0649	55.4412	4.0340	26.6165	13.9081
5	0.0771	46.9796	4.4827	34.4950	14.0426
6	0.0876	42.0389	4.7629	38.9663	14.2317
7	0.0971	38.8213	4.9191	41.9870	14.2724
8	0.1056	36.6604	5.0293	44.0185	14.2916
9	0.1135	35.1203	5.1117	45.4450	14.3227
10	0.1208	33.9505	5.1737	46.5284	14.3472

Source: Authors' computation using Eviews 10, (2020).

Table 10 shows that in the first year, economic growth accounts for 100% of it its changes. In the second year, AGFINL, INTR and INFR accounts for 2.26%, 0.02% and 9.39%, respectively, of the changes in economic growth. In third year, only marginal increase was 3.36% was noticed in the contribution of AGFINL to GDP but there was a substantial rise in the contributions of INTR (11.55%) and that INFR (13.85%) to the change in GDPL. From the fourth to the seventh year, AGFINL reveals a small increase in AGFINL, indicating an insignificant impact on the economic growth within the duration of forecast. Conversely, the substantial rise in the contribution of INTR to GDP, that began from period three was sustained through up to the ninth period, even till the tenth period. Just like AGFINL, the contribution of INFR from the fourth period till the ninth period, was not as substantial as INTR. Generally, over the period, though the contribution of both AGFINL and INFR to change in GDP increase but the increment was not as substantial as that INTR.

5.0 Conclusion and Policy Recommendations

The study investigates the nexus between agricultural finance and economic growth in Nigeria, using annual time series data spanning from 1992 to 2018, based on vector error correction model and VEC granger causality. Other techniques employed in the study include descriptive statistics, correlational analysis, ADF unit root test, Johansen co-integration test, variance decomposition, impulse response test.

Findings from the correlational analysis reveals a strong, positive and statistically significant correlation between agricultural finance and economic growth. However, the relationship between interest rate and economic growth is strong but negative as well as statistically significant. Similarly, inflation rate has a strong, negative and statistically significant correlation with economic growth. **Furthermore, cointegration tests attest to** the long run co-movement among the variables.

In the short-run, agricultural finance has a negative and statistically insignificant relationship with economic growth. However, the converse holds between agricultural finance and economic growth in the long run. Thus, increasing agricultural finance will result in a positive change in the level of economic growth in Nigeria but the changes in economic growth may not be significant in the long run and conversely, increasing agricultural finance will result in a negative change in the level of economic growth in Nigeria but the changes in economic growth may not be significant in the short run.

Furthermore, in the short run, a negative and statistically significant relationship exists between interest rate and economic growth unlike in the long run where interest rate has a negative and statistically insignificant relationship with economic growth.

The study indicates a positive statistically significant relationship between inflation rate and economic in the short run. Although the impact may not be significant, but increase in inflation rate will result in decrease in the level of economic growth in Nigeria, in the long run, *ceteris paribus*.

There was no causality between agricultural finance and economic growth but a unidirectional causality running from interest rate to economic growth was established in this study. A bi-directional causality exists between inflation rate and economic growth.

It can therefore be concluded that agricultural finance has negative and statistically insignificant impact on economic growth in the short run but the reverse is the case in the long run. Interest rates in both short run and long run have negative influence on economic growth in Nigeria. The impact is only significant in the short run and not in the short run. Inflation has positive significant effect on GDP in the short run but negative and statistical insignificant effect in the long run.

The study recommends that:

1. Agricultural finance should be used in conjunction with other agricultural incentives capable of stimulation agricultural outputs in Nigeria;

2. Proper attention should be given to interest rates on loans to agricultural sectors to ensure that they are business-friendly and sustainable to financial institutions providing the loans to the agricultural concerns;

3. Proper watch should be placed on macroeconomic environmental factors such as inflation. Proper discounting of these variables in the decision making of agricultural organisation will go a long way in ensuring optimum decisions that will boost agricultural production and contribution to economic growth in Nigeria;

4. Agricultural banks should be made mobile rather than being arm-chair banks. This will make them penetrate rural population where majority of the farmers are resident.

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