COCOA PRODUCTION – AGRICULTURAL CREDIT GUARANTEE SCHEME FUND NEXUS IN NIGERIA: A COINTEGRATION APPROACH

O. Oyakhilomen, U.O. Omadachi, R.G. Zibah, Researchers

Department of Agricultural Economics and Rural Sociology,
Ahmadu Bello University, Zaria, Nigeria
E-mail: saintoyas@yahoo.com

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ABSTRACT

This study was carried out to examine the relationship between cocoa production in Nigeria and agricultural credit guarantee scheme fund using time series data on cocoa production in Nigeria, value of loans guaranteed and number of loans guaranteed spanning over the period of 1981 to 2011. The Johansen cointegration test was employed in this study and the result indicated that there was no cointegrating relationship between cocoa production in Nigeria and Agricultural credit guarantee scheme fund over the period under study. This could be attributed to the guaranteeing of few number as well as limited value of credit to the farmers by agricultural credit guarantee scheme fund and the high incidence of loan diversion by the cocoa farmers who had access to the loans guaranteed by agricultural credit guarantee scheme fund. It is recommended that the number as well as the value of credit guaranteed to cocoa farmers should be significantly increased so as to enable the farmers expand their production and thereby, reposition the cocoa to assume a critical role as a major non-oil foreign exchange earner in the Agricultural transformation plan of Nigeria.

KEY WORDS

Cocoa; Agricultural credit; Guarantee; Nigeria; Cointegration.

Cocoa has been the main agricultural stake of Nigerian economy until early 1970's when crude oil was discovered in the country in commercial quantity. However cocoa has remained a valuable crop and a major foreign exchange earner among agricultural commodity exports of the country(Akinbola, 2001) and this was further emphasized by Nkang *et al.*, (2009) who opined that in terms of foreign exchange earnings, no single agricultural export commodity has earned more than cocoa in Nigeria. To restore Nigeria's lost glory in cocoa production, a transformation plan to rapidly grow Nigeria's production of cocoa through a combined strategy of increase productivity and planting new hectares by expanding existing 800,000 hectares of cocoa plantations by approximately thirty percent to over one million hectares have been set up (Bukar, 2011). The expansion of cocoa production as well as other export crops by farmers in Nigeria has been hindered by several factors note able amongst them is poor accessibility to credit to sustain production let alone expand production to harness the growing export market of major Agricultural commodities. This was further emphasized by Omojimite (2012), who stressed that Nigerian agriculture is largely subsistence and access to adequate funds have been a major bottleneck. According to Olaitan (2006) shortage of primary production credit was identified as one of the major causes for declining agricultural production in a study conducted by the central bank of Nigeria in 1976 and this shortage was attributed to reluctance by the banks to provide credit for real sector activities, especially agricultural production. The importance of credit to Agricultural production cannot be overemphasized and in view of this, the Agricultural Credit Guarantee Scheme Fund (ACGSF) was set up with the sole purpose of providing guarantee in respect of loans granted by any bank for agricultural purposes of which establishment or management of cocoa plantation is one of the purposes for which the scheme was set up to guarantee funds towards ensuring increased production of cocoa thereby making cocoa an integral compo-

nent of the non-oil export commodities of Nigeria. According to Wahab (2011) , the lack of interest by commercial bank and merchant banks in agricultural financing necessitated the need for the establishment of the scheme. The Scheme was established by Decree 20 of March, 1977 and as amended on 13th June, 1988 (Nwosu *et al.*, 2010). It provides for a fund of N100 million subscribed to by the Federal Government (60%) and Central Bank of Nigeria (40%). The fund was enhanced to 1 billion naira on the 8th December, 1999 and later to the present level of 4 billion naira as at early 2006 (CBN, 2007). The Scheme provides guarantee cover for loans advanced to the agricultural sector by banks and the cover pledges to pay to the banks 75% of any outstanding default balance by borrowers provided that collateral pledged has been realised and applied to the account. The Central Bank of Nigeria manages the Fund, and is responsible to a Board. The CBN issues a guarantee certificate to the lending bank to pay 75% of any outstanding balance in the event of default less the amount realised from the security pledged by the borrower. The lending bank can file a claim on the Fund if the above has been fulfilled. The scheme has achieved a considerable level of success in guaranteeing loans for agricultural production and processing activities but its success has being bedevilled by a number of factors. Olaitan (2006) noted that one of the major factors militating against the success of the ACGSF is scarcity of loanable funds due to lack of bank support for the Scheme. Other constraints are (i) inadequate capital base, (ii) unwillingness of farmers sometimes to repay loans; (iii) non-settlement of claims; (iv) poor project appraisal by banks; (v) lack of adequate collateral; (vi) high cost of administering small loans; (vii) reduction in the number of participating banks. From 1981 to 2007, it is recorded that the scheme guaranteed a total of 2845 loans valued at ₦114, 130600 to cocoa production. Therefore, it has become imperative to evaluate the performance of the scheme with respect to cocoa production. In view of this, this study was designed to assess the impact of the scheme on the production of cocoa over the years in Nigeria. The hypotheses tested in this study are:

H_O: There is no significant relationship between the Agricultural credit guarantee scheme fund and cocoa production in Nigeria.

H_a: There is significant relationship between the Agricultural credit guarantee scheme fund and cocoa production in Nigeria.

MATERIALS AND METHODS

Data source. This study employed secondary data on cocoa output in Nigeria, value of loans granted by purpose from Agricultural credit guarantee scheme fund and number of loans granted by purpose from Agricultural credit guarantee scheme fund spanning a period of 1981 to 2011 and this period was chosen because it is the period for which reliable data are available. The data were sourced from central Bank of Nigeria statistical bulletin and National Bureau of Statistics.

Analytical framework. The Johansen co-integration test was utilized to examine the relationship between Agricultural Credit Guarantee Scheme Fund and Cocoa Production in Nigeria. Prior to the co-integration analysis, the stationarity of the variables employed in the model were determined to avoid spurious regression which is a common problem in time series analysis. Granger and Newbold (1974) had concluded that regression results of non-stationary series may most of the times be spurious to the extent that a relationship would be accepted as existing between two variables as measured by their coefficient of determination, when in actual fact no such relationship exists. This study used the Augmented Dickey-Fuller (ADF) test to examine each of the variables for the presence of a unit root (an indication of non-stationary), since it can handle both first order and higher order autoregressive processes, by including the first difference in lags in the test in such a way that the error term is distributed as white noise. The equation of the Augmented Dickey Fuller test is given below:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} \sum_{i=1}^{m} a_i \Delta Y_{t-1} + e_t \qquad (1)$$

Where: ΔY_t = first difference of Y_t; Y_{t-1} = lagged values of Y_t; ΔY_{t-1} = first difference of Y_{t-1}; δ = test coefficient; e_t = white noise; β_1 = constant; β_2 = coefficient of time variable.

The null hypothesis of the Augmented Dickey Fuller unit root test is given below as:

$$\boldsymbol{H_0: \delta = 0}$$

This implies that the data is non – stationary i.e. integrated of order one I (1) and needs to be differenced once to make it stationary. The alternative hypothesis of the Augmented Dickey Fuller unit root test is:

$$\boldsymbol{H_a: \delta} < 0$$

This implies that the data is stationary i.e integrated of order zero I (0) and does not need to be differenced.

Two conditions must be met for variables to be cointegrated. First, the series must have the same order of integration. Second, there must be some linear combination (r) of variables, which must be at most of order one less than the number of individual variables (n), that is r = n-1 (Townsend and Thirtle, 1997). If r = n, then the series are stationary and co-integrated. Engle and Granger (1987) note that a linear combination of two or more I(1) series may be stationary, or I(0), in which case we say the series are cointegrated. If the null for no co-integration is rejected, the lagged residual from the co-integrating regression are imposed as the error correction term in a vector error correction model.

The null hypothesis for Johansen co-integration test is:

$$\boldsymbol{H_0: r = 0}$$

This implies that co-integration does not exist.

The alternative hypothesis for Johansen co-integration test is:

$$\boldsymbol{H_a: r} < 0$$

This implies that co-integration exists.

The underlying principle of the Johansen cointegration test is that if the coefficient matrix ($\prod$) has reduced rank ($r < n$), it can be decomposed into a matrix($n\ x\ r$) of loading coefficients (α) and a matrix($n\ x\ r$) of co-integrating vectors (β) such that $\prod$ = αβ'. r is the number of cointegrating relations (the cointegrating rank). The loading coefficients (α) indicate the co-integration relationships in the individual equations of the system and of the speed of adjustment to disequilibrium and therefore, determines the causality in the system and the direction of causality flows while the co-integrating vectors (β) represent the long run equilibrium relationship. Johansen (1988) opined two likelihood ratio tests, namely the Trace and the Maximum Eigen Value statistic tests, which are used to determine the number of co-integrating equations given by the co-integration rank (r). A co-integration equation is the long-run equation of co-integrated series. The Trace statistic tests the null hypothesis of r co-integrating relations against the alternative of k co-integrating relations, where k is the number of endogenous variables for r = 0, 1,..., k – 1. The Maximum Eigen Value statistic tests the null hypothesis of r co-integrating vectors against the alternative of r + 1 co-integrating vectors. The optimal lag lengths for the unit root and Johansen's cointegration tests are decided by the Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC).

Model specification. In order to examine the relationship between Agricultural credit guarantee scheme fund and cocoa production in Nigeria, the model express cocoa output in Nigeria as a function of lag of the value of loans guaranteed by ACGSF(₦) and the lag of the number of loans guaranteed by ACGSF.

$$\boldsymbol{lCOT_t = b_0 + \sum_{i=1}^{n} b_1 lVLG_{t-i} + \sum_{i=1}^{n} b_2\, lNLG_{t-i} + \varepsilon_t} \qquad (2)$$

Where: $COT =$ Cocoa output in Nigeria(tonnes); $VLG =$ Value of loans guaranteed by ACGSF(₦); $NLG =$ Number of loans guaranteed by ACGSF; $l =$ Natural logarithm; $b_0 =$ Constant term; $b_1 - b_2 =$ Coefficients; $\varepsilon_t =$ White noise.

RESULTS AND DISCUSSION

Jarque-Bera is a test statistic for testing whether the series is normally distributed. The test statistic measures the difference of the skewness and the kurtosis of the series with those from the normal distribution. The Jarque-bera test has the null hypothesis of normally distributed residuals. The probability values of 0.52, 0.92 and 0.52 for $lCOT$, $lVLG$ and $lNLG$ respectively indicates an acceptance of the null hypothesis of normal distribution for the variables employed in this study.

Unit root test. Augmented Dickey Fuller (ADF) unit root test was used to examine the presence of stationary in the variables of employed in this study. The ADF test was performed at level form as well as first difference form. The outcome of ADF test at level form indicates that all the variables are stationary which implies that they are integrated of order one and needed to be differenced once to make them stationary leading to the acceptance of the null hypothesis of the ADF test. The ADF test at first difference form indicates that all the variables become stationary after differencing them once leading to the acceptance of the alternative hypothesis of the ADF test.

Cointegration test. Johansen cointegration test was used to examine the presence of cointegrating relationship between cocoa production in Nigeria and Agricultural credit guarantee scheme fund. The result of the Trace test as well as the Max-Eigen test shows that there is no cointegrating (long run) relationship between output of cocoa production, value of loans guaranteed by ACGSF and number of loans guaranteed by ACGSF which implies the acceptance of null hypothesis for Johansen cointegration test and therefore, there is no need to carry out error correction test. The implication of this result is that Agricultural credit guarantee scheme fund had no significant influence on the output of cocoa production in Nigeria over the period of 1981 to 2011 and this could be attributed to the guaranteeing of few numbers as well as limited amount of credit to cocoa farmers by the ACGSF and also diversion of loans meant for cocoa production to other uses by the cocoa farmers. The major finding of this study is not in consonant with the findings of Efobi and Osabuohien (2011), who found out that there exists a long run relationship between non-oil export and ACGSF on cash crop, food crop, livestock production, other categories of agricultural production and political constraint in a study on assessment of the role of agricultural credit guarantee scheme fund in promoting non-oil export in Nigeria.

CONCLUSION

This study employed time series data on cocoa production in Nigeria, value of loans guaranteed by ACGSF and number of loans guaranteed by ACGSF spanning over the period 1981 to 2011 to examine the relationship between cocoa production in Nigeria and Agricultural credit guarantee scheme fund. The Johansen cointegration approach was employed to achieve the objective of this study and prior to the estimation of the cointegration test, the Augmented Dickey Fuller(ADF) unit root test was used to establish stationary of the variables. From the result of the cointegration analysis, the Trace test and the Max-Eigen test revealed that there is no cointegrating relationship between cocoa production in Nigeria and Agricultural credit guarantee scheme fund over the period under study which could be due to the loan diversion by farmers and limited amount of loans guaranteed by ACGSF. It is recommended that adequate measures should be put in place to avoid diversion of loans by the cocoa farmers and the volume of credit guaranteed to cocoa farmers should be significantly increased so as to enable the farmers expand cocoa production which is one of the objectives of the scheme and thereby, repositioning the crop to assume a critical role as a major non-oil foreign exchange earner in the Agricultural transformation agenda of Nigeria.

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