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E.D. Balogun

M.F. Otu

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CREDIT POLICIES AND AGRICULTURAL DEVELOPMENT IN NIGERIA

By

E. D. BALOGUN* AND M. F. OTU**

Credit policies have been used widely in Nigeria to stimulate agricultural development. This article evaluates through econometric methods the influence of credit policies on both institutional lending and borrowing behaviour of farmers, and ascertains the relationship between credit and agricultural development. The results show that credit quota and portfolio ceiling devices and the pursuit of cheap interest rate policies had negative effect on agricultural credit supply, while policies associated with plough back of rural savings mobilization and availability of guarantee were marginally effective. Farmers demand for credit was influenced mainly by the availability of credit subsidies, relative profitability of the farming enterprise vis-a-vis manufacturing investment portfolios; and availability of guarantees. However, availability of rural bank branches did not confer accessibility to institutional farm credit, and rising trend in farm credit outstanding did not imply rising access to institutional credit. Finally the study shows that a positive but inelastic relationship exist between credit and agricultural output. Among the key factors which militate against the effectiveness of agricultural credit policies include: lack of viable technologies and defective production environment, weak and defective administrative set-ups for credit policy implementation and the wrong perception of the roles of credit in development which informed the pursuit of defective financial intermediation policies that tended to undermine rather than promote growth. An agenda for credit policy reforms stressed the need to evolve and adopt policies which foster desirable financial technologies which serve both the interest of institutional borrowers and lenders.

For many years, the urge to foster agricultural growth and development, among other things, has often compelled government to intervene in the economy. Among the key areas of intervention include extension, input supply, credit and marketing services. In particular, it is the general belief that the provision of cheap credit is a pre-condition for technological change. As such, governments of most developing countries have often fostered the growth of institutional financial markets mainly to provide credit facilities to farmers on concessionary terms. Despite this effort, there is evidence that the performance of agriculture is poor in most of these countries while agricultural loan portfolios are weak.

This paper reviews existing policies and institutional network for agricultural credit in Nigeria; assesses the impact of credit on agricultural performance and identifies the major constraints.

The study covers the period 1970 to 1990. This time frame is chosen because the Central Bank of Nigeria introduced the Annual Monetary and Credit Policy Guidelines in 1969 to date as a tool of monetary and macroeconomic management. Since then, specific credit policy prescriptions are often stipulated annually for agriculture and the economy as a whole.

For ease of presentation, the paper is divided into five parts. Part I reviews existing

* MR. E. D. BALOGUN is a Principal Economist in Agricultural Studies Office, Real Sector Division of Research Department.

** MR. M. F. OTU is an Economist in Financial Statistics Office, Statistical Services Division.

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credit policies and institutions in Nigeria. Part II presents a conceptual framework for the analysis of impact of credit on agriculture. Part III presents the empirical results. Part IV identifies institutional credit constraints while the final part contains the summary and concluding observations.

I. A REVIEW OF AGRICULTURAL CREDIT POLICIES AND INSTITUTIONS IN NIGERIA, 1970 — 1990

The concern for agricultural credit manifests itself in the set of policies and institutions put in place to promote it. The policies ranged from regulations and controls of formal financial institutions to the provision of incentives and establishment of specialized lending agencies.

Agricultural Credit Policies and Incentives, 1970 — 1990

The agricultural credit policies and incentives pursued in Nigeria since 1970 can be classified into three: viz. credit allocation and control policies; institutional credit incentives; and policies establishing specialized lending institutions.

(i) *Credit Allocation and Control Policies*

Beginning from 1969 when the CBN Annual Monetary and Credit Guidelines were introduced, credit allocation and control became a vital instrument of macroeconomic management. Credit allocation and control policies involve compelling banks and other financial intermediaries to support a particular development activity. Five policy instruments are available for compelling banks to allocate credit to the agricultural sector.

First, there are credit quota and portfolio ceiling devices which require that commercial and merchant banks must lend a certain percentage of their loan portfolio to agriculture. This quota rose from 4 per cent in 1970 to 6, 10, 12 and 15 per cent in 1976, 1980, 1985 and 1990, respectively. Failure to comply attracts a penalty of forfeiture of the amount in default, which is passed over to Nigerian Agricultural Co-operative Bank to support their lending operations.

The second policy instrument is interest rate regulation. Prior to interest rate deregulation in 1989, lending to agriculture was at concessionary interest rates. Agricultural lending rate was fixed at $\frac{1}{2}$ percentage points above the minimum re-discount rate, and about 2 — 3 percentage points below the prime lending rate. Since 1989, interest rates were liberalised completely.

The third instrument of control is usually the requirement that certain percentage of rural saving mobilized by commercial banks must be ploughed back as credit. Currently 45 per cent of such savings is required to be ploughed back as credit to the rural sector.

The fourth is made up of policies tied to the discount and guaranteed mechanism, by which the Central Bank may offer preferential rates in rediscounting papers originating in high priority sectors to provide an added incentive for the commercial and merchant banks to increase lending to those favoured activities. An example of this in Nigeria is the Export Credit Guarantee and Refinance Scheme.

The fifth instrument is the reserve requirement. This links differential reserve

requirements to the composition of commercial and merchant banks portfolio. Banks whose portfolios conform to the requirement of certain minimum percentages of loans to the high priority areas are allowed to maintain lower cash or liquidity ratios than the normal ratio.

(ii) *Credit Incentives and/or Supportive Financing Facilities*

The supportive financing facilities and/or incentives are meant principally to induce commercial and merchant banks to provide credit to desired economic activities. In Nigeria, these include Rural Banking Schemes, Agricultural Credit Guarantee Scheme, Export Credit Guarantee and Refinance Schemes, Crops Insurance Schemes, National Economic Reconstruction Fund and World Bank Facility for Small-and-Medium-Scale Enterprises Loan.

Due to dearth of banking services in rural areas, the *Rural Banking Scheme* was introduced in 1977 and banks were required under it to open rural branches. A total of 776 rural branches were opened by commercial banks in three phases, which expired in 1989.

In order to reduce the risk associated with commercial and merchant banks intermediation in rural financial markets, the *Agricultural Credit Guarantee Scheme (ACGS)* was introduced in 1978 under which the Central Bank provides 75 per cent collateral to the banks for credit granted to farmers. A recent amendment to the ACGS Decree provides for 100 per cent guarantee for any small-scale farmer whose credit requirement is below ₦10,000.00. *The Nigerian Agricultural Insurance Company (NAIC)* was established in 1989 to provide formal insurance cover for the financial risks associated with farming enterprises. *The Export Refinancing and Rediscout Facility (ERRF)* was introduced in April, 1987 to enhance the provision of Export Credit by commercial and merchant banks. Considering that most non-oil exports are essentially primary commodities (mainly agricultural products), provision of credit for packing of commodities is very vital in stimulating production.

The National Economic Reconstruction Fund (NERFUND) is an on-lending credit fund established in 1989, and aimed principally at providing soft, medium- and long-term loans through participating banks to wholly Nigerian-owned small- and medium-scale enterprises (SME). It is more like a refinancing facility to participating banks who borrow cheaply from the fund to support on-lending operations to SMEs. It is also designed to access foreign exchange to needy enterprises.

(iii) *Specialized Institutional Lending Policy:*

This is a policy associated with the establishment of specialized agricultural credit institution. In Nigeria, the Nigerian Agricultural and Co-operative Bank, established in 1973, is charged with the responsibility of providing credit solely to support agricultural activities. Other specialized finance and development agencies such as National Directorate of Employment and State government-sponsored Graduate Farming Schemes also fall into this category. In contrast to other financial institutions, their financial portfolio consists almost entirely of credit; they do not, to any significant degree, accept savings deposits or provide money transfer services. In most cases, they depend entirely on government subvention or multilateral agencies for financial support.

Institutions and Credit Supply to Agriculture

The network of financial institutions which provide credit to agriculture include commercial and merchant banks and the specialized development bank — Nigerian Agricultural and Co-operative Bank (NACB). The commercial and merchant banks provide credit to agriculture in line with credit policy prescriptions, while the NACB's sole lending is to agriculture.

Preliminary estimate show that total commercial and merchant bank credit outstanding to the economy as a whole rose from ₦6,849.0 million in 1980 to ₦27,472.5 million in 1989. The share of agriculture in this credit was ₦690.3 and ₦4,678.3 million or 10.1 and 17.1 per cent in 1980 and 1989, respectively. In terms of institutional credit to agriculture, commercial banks granted the bulk while the NACB and merchant banks accounted for the rest.

Available data showed that both the commercial and merchant banks consistently lent short of prescribed limits under the credit allocation policy. Average shortfall in commercial and merchant bank lending to agriculture ranged from 29.5 per cent in 1980 to as high as 44.2 per cent in 1990.

With regard to the specialized lending institutions, the trend in annual loan disbursement is generally very discouraging. Apart from the existence of a wide divergence between approvals and actual allocations, the NACB seemed to rely mostly on the fortunes of government subvention for meeting their operational requirements.

A close look at the available data would reveal that growth in commercial and merchant bank credit to agriculture was most substantial in periods when refinancing, guarantee and on-lending schemes were in operation.

II. CONCEPTUAL FRAMEWORK FOR EVALUATING THE EFFECT OF CREDIT POLICIES

It is the consensus in the literature (Von Pischke et-al, 1980; Wallis, 1980) that due to fungibility and the complex and indirect relationships which exist between finance and production activities, attempts to gauge and quantify the effect of credit policies on agriculture has been difficult. In this section, a review of the literature on rural credit is attempted hopefully to provide guides in the specification of the model relating credit to output in agriculture.

Literature Review

The studies on an aggregate level designed to evaluate the overall influence of credit policies on sectoral performance are few and far between. However, several studies at the former level, which assessed the impact of credit have been done. Sayad, (1979) used descriptive statistics to relate credit to the performance of farmers, within a general framework of "with" and "without" credit situation. In evaluating this approach Sacay et.al (1980) and Schaefer-Kehaet (1982), concluded that the results would be inconclusive as it suffers from "attribution" problem, which stems mainly from the fact that several other factors exist which may explain the differences in "with" and "without" credit situation. These usually include difference in yield, price uncertainty and management ability; differences in product and input prices and finally differences

in household financial constraint on savings. This view was corroborated by the findings of Graham and Bourne (1980) in their study, "Agricultural Credit and Rural Progress in Jamaica". In that study agriculture registered an impressive growth rate of 3 per cent in 1973—78 (periods of depression) when all other sectors such as manufacturing, construction and commerce suffered economic declines of about 7, 10 and 8 per cent, respectively due to contractions in savings and credit.

A few other studies have used econometric techniques to analyse the impact of borrowing. David (1980) uses three different models: a production function, an input demand function, and an efficiency gap function. The production function approach by Gyeke, Acquah and Whyte (1977) for "An Evaluation of Institutional Credit in Ghana" hypothesizes that loans influence farm production relationship. It assumes that all production parameters are affected by credit. It uses time series aggregate data to assess the influence of credit on key indicators of agricultural performance and input use.

The results of most of these studies confirm overwhelmingly the complex and indirect relationships which exist between credit and agricultural production, and the difficulties involved in stimulating agriculture through credit policies. However, there is the consensus in the literature that both institutional lending and borrowing behaviour of farmers could be influenced through certain price and quantity variables. Among the key instruments which have been employed widely include interest rate subsidy, credit controls and rationing, and provision of incentives such as guarantees and refinance.

The effectiveness of these policy instruments in yielding desired results depends, to a great extent, on the general perception of the role of credit in development. Traditional views especially major proponents of "supply-leading finance" (Patrick 1966) perceive the main thrust of control and allocative policy pursuit as "the creation of financial institutions/instruments and the supply of their financial assets, liabilities and related financial services in advance of demand for them, especially the demand of entrepreneurs in the modern, growth-inducing sector". Patrick (1980) further asserts that unlike "demand-following finance", supply-leading finance "presents an opportunity to induce real growth by financial means (although) as the process of real growth occurs, the supply-leading impetus gradually becomes less important, and the demand-following financial response becomes dominant". Emerging views and perceptions suggest that the resort to supply-leading finance strategies, has not been encouraging (Von Pischke 1981). Because of the fungibility, divisibility and substitutability of money, it is difficult to attribute specific increases in production and income to credit activities (David and Meyer, 1980). Also, in some cases, credit expansion has coincided with output decreases and more agricultural imports (Graham and Bourne, 1980). Rural inequality appears to have increased as a consequence of agricultural credit policy. Furthermore, many rural credit institutions are not financially viable. The portfolios of some have tended to decline or stagnate rather than grow in real or nominal terms (Adams, 1980). This body of literature concludes that evolving an efficient evaluating criteria for credit policy impact would be meaningful and feasible only when credit is viewed as a process of intermediation rather than as a productive input.

Methodology

Two sets of hypotheses have been tested in this study. First, that credit policies influence, to a large extent, the behaviour of both institutional lenders and borrowers. That is, policy can influence favourably, the supply of and demand for agricultural credit. Second, that a positive relationship exists between agricultural credit and a host of other variables such as output and use of modern inputs.

We assume that lending behaviour of financial institutions is influenced by credit allocation and interest rates policies, rural savings mobilization and available incentives such as guarantees and refinance facilities. Borrowing behaviour of farmers is influenced mainly by availability of subsidies, accessibility, transactions costs, and relative profitability of farming, availability of technology and collateral incentives. The relationships are specified as follows:

$$\begin{aligned} \text{ACRS} &= \text{F}[\text{DC}, \text{ia}/\text{ip}, \text{RS}, \text{CG}, \text{Rr}] \dots\dots\dots(1) \\ \text{ACRD} &= \text{F}[\text{Cs}, \text{pa}/\text{pi}, \text{RB}, \text{CG}, \text{F}, \text{T}] \dots\dots\dots(2) \\ \text{ACRS} &= \text{ACRD} \dots\dots\dots(3) \end{aligned}$$

where

- ACRS = credit supply
- ACRD = credit demand
- DC = Desired level of credit prescribed for agriculture
- ia = Lending rate for agriculture
- ip = prime lending rate
- RS = Rural savings mobilized
- CG = Level of total credit guaranteed
- Rr = Reserve requirement
- Cs = Level of credit subsidies
- pa = Relative factor income (producer income) for agriculture
- pi = Relative factor income for industry
- RB = No. of rural bank branches
- F = A proxy for Agricultural Technologies available.
- T = A trend variable or factor.

A production function model specified in line with Colombian, Brazilian and Ghanaian models (Coyler, et.al, 1971; Becker, 1970; Gyeke, et.al, 1977) hypothesizes that credit influences the farm production relationship. This model specifies the use of credit as a factor of production, in addition to other farm inputs such as farm wage rate, fertilizer input use, rainfall, interest rate subsidy and trend variable, a follows:

$$\begin{aligned} \text{QA} &= \text{F}[\text{ACR}, \text{W}, \text{F}, \text{ia}, \text{R}, \text{T}] \dots\dots\dots (4) \\ \text{QA} &= \text{Agricultural output as captured by the Real Agricultural GDP} \\ \text{ACR} &= \text{Agricultural credit supply} \\ \text{W} &= \text{Average Annual farm wage rate} \\ \text{F} &= \text{Annual Fertilizer Input use/or supply in '000 tonnes} \\ \text{ia} &= \text{Lending rate for agriculture} \\ \text{R} &= \text{Average annual rainfall in Nigeria} \\ \text{T} &= \text{Trend factor} \end{aligned}$$

Several limitations of this model must be recognized. We agree with David and Meyer (1980), that "specifying credit as a separate production input presents a conceptual problem, because loans are claims on resources and do not directly generate output; double counting of inputs occur when credit is treated as a separate variable." Thus the model does not imply a direct causality between output and credit use, but serves only to indicate the relative strength of credit use (vis-a-vis other farm inputs) in explaining the behaviour of agricultural output.

These equations are specified in linear and log-linear forms. The log-linear forms are preferred as one can read off the elasticities of dependent variables in relation to each explanatory variables.

The inferences that can be drawn from the method of analysis is that if the dependent variables respond to the set of credit policy instruments included in the model, we can conclude that policies can influence both lending and borrowing behaviour and the performance of agriculture. However, if the parameter estimates obtained are inelastic and insignificant, we can conclude that credit policies do not significantly influence lending and borrowing behaviour, and are ineffective in stimulating agriculture.

Data: Sources, Measurement and Limitations

The data for this study were obtained and/or derived from the publications by Central Bank of Nigeria and the Federal Office of Statistics. The period covered is 1970 to 1990.

The basic regression equation specified in the above model require the operational measurement of some variables. Some of these variables can be measured in more ways than one. In selecting a particular measure for a given variable, it is important to bear in mind that "attempts to estimate the parameters of a theoretical model require operational correspondence between variables specified in the model and the data used for statistical estimation" (Racette, 1973). It is in consideration of this that we defined and estimated the variables as follows:

- (a) $ACRS = ACRD =$ Total institutional agricultural credit measured by the addition of agricultural credit outstanding by all the commercial, and merchant banks and NACB.
- (b) Desired level of credit, DC, is calculated as the absolute value of the recommended share of Agric credit in total commercial, merchant and NACB's outstanding credit to the economy.
- (c) ia , ip , RS , CG , R_r , and RB are as defined in the Central Bank of Nigeria's publications.
- (d) Level of credit subsidies, $C_s = ACR_n (P_n - ia_n)$, where $ACR_n =$ Total Agricultural credit supply in year n . $P_n =$ Inflation rate as captured by the annual changes (in per cent) in the all-items consumer price indices in year n , i.e. $P_n = 100 \left[\frac{P_t}{P_{t-1}} - 1 \right]$ where

$p_t =$ Consumer Price Index in year t .

$ia_n =$ Agricultural lending rate in year n .

Cs is negative when $P_n > i_{an}$ as real interest rate is negative, suggesting a positive level of interest rate subsidies.

Cs is positive when $P_n < i_{an}$ as real interest rate is positive, suggesting an implicit support for rural savers and a proportionate implicit taxation of borrowers.

This measure of credit subsidy was used in the studies by Sayad (1979) and Graham and Bourne (1980).

- (e) Relative factor income for agriculture and industry, p_a and p_i is derived as the agricultural and manufacturing GDP deflators.* This measure has been used widely on a macro-economic and/or aggregate level as a measure of the relative earning opportunities of investment in agriculture and industry. It has also been used to measure the extent of bias in protection of agriculture vis-a-vis industry arising mainly from policy pursuits.
- (f) Availability of Technology F, measured by total annual fertilizer supply to farmers in Nigeria. As the most extensively utilized modern input, which use has been promoted through huge government subsidies on procurement and distribution, our assumption is that this variable may more approximate the demand for technology than any other one. In view of these adjustments, and variable measurements, it is advisable that parameter estimates obtained from the analysis of the data and the implication drawn from them should be regarded as indicative rather than firm or definite policy prescriptions.

III. EMPIRICAL EVIDENCE OF THE EFFECTS OF CREDIT POLICIES ON AGRICULTURE

The regression results of the effects of credit policies on institutional lending and borrowing behaviour, and agricultural production are presented in Tables 1, 2, and 3, respectively.

In all the cases, step-wise linear and log-linear equations were estimated for the three dependent variables viz: Agricultural Credit Supply, Agricultural Credit Demand and Agricultural Output.

EFFECT OF CREDIT POLICIES ON AGRICULTURAL CREDIT SUPPLY

Table 1 presents both the linear and log-linear regression results of the influence of credit policies on institutional agricultural credit supply. Of all the equations estimated, equation 1.10 is most preferred as all the parameter estimates were significant at the 5 per cent level of significance (except that of DC which is significant at 10 per cent level). Moreover, both the Adjusted R^2 and F-statistic indicated that it is the equation of best fit. The D-W test also indicated that there is no first order serial correlation in the data used. The elected equation is:

* GDP deflators is derived as follows:

$$P_a, \text{ or } P_i = \frac{\text{Nominal GDP}}{\text{Constant GDF}} = \frac{Q_n P_n}{Q_n P_o} \text{ where } Q_n \text{ is output}$$

$$\text{For the base year, } P_n = P_o, \text{ and let us assume that } P_o = 1 \text{ then } P_i = \frac{Q_n}{Q_n} \cdot \frac{P_n}{1} = P_n$$

Table 1:

**REGRESSION RESULTS OF THE INFLUENCE OF CREDIT POLICIES
ON AGRICULTURAL CREDIT SUPPLY**

	C	DC	IA/IP	RS	CG	RR	R sqrd Adj	R sqrd	D.W	F
1.1 ACRS	-3.43 (-0.43)	-0.52* (26.72)					0.9727	0.9741	1.45	713.8
1.2 ACRS	-810.2* (-2.53)	-0.51* (29.62)	971.06* (2.58)				0.979	0.9811	2.01	466.5
1.3 ACRS	-245.8 (-0.70)	0.42* (10.48)	3.71 (0.93)	0.15* (2.60)			0.9841	0.9865	2.18	412.8
1.4 ACRS	49.64 (0.18)	0.24* (4.55)	-47.02 (-0.15)	0.15* (3.54)	12.65* (3.92)		0.9914	0.9931	1.74	574.6
1.5 ACRS	113.19 (0.41)	0.21* (3.40)	-150.12 (-0.46)	0.18* (3.58)	10.08* (2.48)	0.049 (1.04)	0.9914	0.9936	1.92	462.2
	LC	LDC	LIA/IP	LRS	LCG	LRR				
1.6 LACRS	0.67** (1.89)	0.83* (15.72)					0.9249	0.9286	1.27	247.2
1.7 LACRS	0.77** (2.20)	0.84* (16.24)	0.88** (1.45)				0.929	0.9361	1.45	131.9
1.8 LACRS	0.43 (0.97)	0.73* (7.13)	0.44 (0.63)	0.17 (1.25)			0.9312	0.9415	1.29	91.18
1.9 LACRS	0.65 (1.03)	0.65* (3.53)	0.27 (0.34)	0.18 (1.25)	0.087 (0.5)		0.928	0.9424	1.16	65.44
1.10 LACRS	-1.88* (-3.41)	-0.21** (-1.21)	-1.28* (-2.50)	3.58* (4.22)	0.28* (2.74)	0.85* (6.05)	0.9777	0.9833	1.49	176.3

$$\begin{aligned} \text{Ln ACRS} = & - 1.88 - 0.21 \text{ Ln DC} - 1.28 \text{ Ln } i_a/i_p \\ & (3.41) \quad (2.21) \quad (2.50) \text{1/} \\ & + 3.58 \text{ Ln RS} + 0.28 \text{ Ln CG} + 0.85 \text{ Ln RR} \dots (5) \\ & (4.22) \quad (2.74) \quad (6.05) \\ \text{Adjusted R}^2 = & 0.9777, \text{ R}^2 = 0.9833, \\ \text{F} = & 176.3, \text{ D.W} = 1.49. \end{aligned}$$

Several interpretations and inferences could be drawn from the signs and magnitudes of the parameter estimates of the above equation.

Firstly, contrary to expectation, credit quota and portfolio ceiling devices had a negative effect on credit supply. Although credit supply was inelastic with regard to changes in credit quota (as captured by DC), several reasons could be adduced for the negative relationship. Compliance with prescribed requirements could have been thwarted due to fungibility of finance and the high cost of auditing both borrowers and lenders in order to ensure compliance. In addition, high degree of waste is often associated with scarce human resources in the allocative credit programming, while there is also the tendency of powerful producer groups to falsify claims in order to benefit from the allocative policy.

Secondly, true to *a priori* expectation, the pursuit of cheap credit policies (as captured by the policy specification of a wide spread between maximum nominal interest rates for agriculture vis-a-vis other prime portfolios) had a negative effect on credit supply. Indeed, cheap interest rate policies often distort the way lenders allocate loans. This is attested to by the fact that the parameter estimate is elastic and negative with regard to cheap interest rate policy.

Thirdly, the requirement that a certain percentage of rural savings mobilized must be ploughed back as rural credit was very effective. Credit supply was elastic and positively related to this policy instrument. This result has to be interpreted with caution as it suffers from attribution problem. Indeed, majority of the rural savers may not actually be the beneficiary of the credit policies. Majority of beneficiaries could be urban dwellers who collude with lenders to borrow through rural bank branches.

Fourthly, supply of credit is inelastic with regard to availability of credit guarantees. This is likely to be true as the level of credit actually guaranteed is low (compared to outstanding) in addition to the difficulties often encountered by lenders when such guarantees are to be redeemed.

Finally, cash reserve requirements of institutional lenders bore a positive (although inelastic) relationship to total credit supply to agriculture.

EFFECT OF CREDIT POLICIES ON AGRICULTURAL CREDIT DEMAND

In Table 2, the stepwise regression results of the influence of credit policies on borrowers is presented. Equations 2.8 and 2.10 are preferred in this order, because

1/ Under each coefficient is the t-statistics in parenthesis and an asterisked coefficient is significant at 5 per cent confidence level, while a double asterisked coefficient is significant at the 10 per cent level. The symbol D-W stands for Durbin-Whatson Statistic which is a test of first-order serial correlation. The overall goodness-of-fit of the equations to the data is measured by the coefficient of determination R^2 and corrected for the degrees of freedom Adjusted R^2 . The F-Statistic is presented to test for the significance of the coefficient of multiple relation. It should be noted that the coefficients of the log-linear equations are the elasticities of the dependent variables with respect to the explanatory variables under consideration.

they gave higher values for R² and three parameter estimates of the explanatory variables were significant. The equations are:

$$\begin{aligned} \text{Ln ACRD} = & - 1.30 + 0.20 \text{ Ln CS} + 1.31 \text{ Ln Ln pa/pi} \\ & (- 0.58) \quad (1.54) \quad (1.95) \\ & + 0.30 \text{ Ln RB} - \dots \dots \dots (6) \\ & (3.99) \end{aligned}$$

Adjusted R² = 0.9565, R² = 0.9655, F = 102.5

$$\begin{aligned} \text{Ln ACRD} = & 1.49 + 0.25 \text{ LN CS} + 0.23 \text{ LN pa/pi} \\ & (0.89) \quad (2.69) \quad (0.43) \\ - & 0.074 \text{ Ln RB} + 0.30 \text{ Ln CG} + 1.04 \text{ Ln T} \\ & (- 0.51) \quad (2.80) \quad (3.80) \dots \dots \dots (7) \end{aligned}$$

Adjusted R² = 0.9796, R² = 0.9869, F = 135.5

Equation 6 above is most preferred, as all parameter estimates (estimated coefficients) are significant at 10 per cent confidence level.

From equations 6 and 7 the following inference could be drawn.

Firstly, credit subsidies CS exact a significant and positive influence on credit demand by farmers. However, total demand for credit is inelastic with regard to subsidies. One would have expected that the responsiveness of demand for credit would have been more with subsidies, it seems that many more factors existed which did not allow farmers to take full advantage of the subsidies. Among these factors include accessibility of subsidized credit, high transaction costs, and lack of compatibility of the operational behaviour of institutional lenders with those of farmers. In particular the banking hours of institutional lenders and the need to complete cumbersome application forms before subsidized credit could be accessed all contribute to forestall patronage by farmers.

Secondly, the relative profitability of farming enterprise vis-a-vis the industry (manufacturing), also play a key role in agricultural credit demand. As could be inferred from equation 6, agricultural credit demand is elastic and positive with regard to this variable. This is to be expected, since investors are rational. Even within agriculture, enterprises like poultry which hitherto yield higher returns than crops attracted more credit.

Thirdly, the number of rural bank branches established had a positive but inelastic effect on rural credit demand. Again, no categorical statement can be made to suggest that beneficiaries of this policy are rural-based farmers.

Fourthly, from equation 7, the responsiveness of credit demand to credit guarantees available is significant, inelastic and positive. This suggests that availability of guarantee did not elicit a commensurate change in credit demand. This may be so, due to the relative inaccessibility of guarantees and high transaction costs associated with application for guarantees.

Finally, a trend variable, confirmed that demand for credit exhibited a rising trend over the years. One is tempted to conclude that rising demand for rural credit over time is indicative of new and/or additional investments. However, *a priori* information show that most agricultural credit outstanding are deadwoods, that is, they are in permanent default. This reason combined with the rising trend in nominal interest rate

Table 2:

**REGRESSION RESULTS OF THE INFLUENCE OF CREDIT POLICIES
ON AGRICULTURAL CREDIT DEMAND (ACRD)**

	C	CS	PA/PI	RB	CG	T	R sqrd Adj	R sqrd	D.W.	F
2.1 ACRD	1294.4* (3.41)*	-0.13 (-0.12)					-0.05	0.0008	0.059	-0.014
2.2 ACRD	-1701.6* (-3.45)	-0.72 (-1.18)	44.45* (6.70)				0.6825	0.7143	0.6	22.5
2.3 ACRD	151.6 (0.32)	-0.29 (-0.73)	-9.49 (-0.85)	6.95* (5.25)			0.8716	0.8909	0.43	46.27
2.4 ACRD	0.78 (0.00)	-0.15 (-0.66)	-3.64 (-0.58)	1.49 (1.30)	29.75* (6.27)		0.9605	0.0684	0.83	122.9
2.5 ACRD	1.292 (0.55)	-0.19 (-0.92)	3.58 (0.49)	2.44* (2.00)	29.81* (6.64)	-80.13** (-1.71)	0.9617	0.9736		110.4
	LC	LCS	LPD	LRB	LAG	LT				
2.6 LACRD	3.33* (9.60)	0.75* (8.54)					0.8369	0.8486		72.86
2.7 LACRD	-5.61* (-1.92)	0.18 (0.94)	2.67* (3.08)				0.9013	0.9154		64.91
2.8 LACRD	-1.2 (-0.58)	0.2** (1.54)	1.31* (1.95)	0.3* (3.99)			0.9565	0.96555		102.5
2.9 LACRD	-1.26 (-0.54)	-0.21** (1.49)	1.31* (1.86)	-0.26** (1.49)	0.047 (0.24)		0.9519	0.9656		70.27
2.10 LACRD	1.49 (0.89)	0.25* (2.69)	0.23 (0.43)	-0.074 (-0.51)	0.3* (2.80)	1.04* (3.82)	0.9796	0.9869		135.5

charges which were often compounded with the principal to show that credit outstanding to agriculture by institutional lenders are on the increase, could explain the rising trend in credit demand.

Agricultural Output and Credit

The regression results of the influence of credit policies and other variables on agricultural output is shown in Table 3. From the Table, the linear results are better than the log-linear ones. Equations 3.2 and 3.6 in the Table are the most preferred. These equations are 8 and 9 as follows:

$$QA = 28.41 + 0.0075 ACR - 1.86 W \dots \dots \dots (8)$$

$$(34.58) \quad (5.99) \quad (-4.76)$$

$$E_c = 2.95, \quad E_{ACR} = 0.081 \quad E_W = -0.11$$

$$\text{Adjusted } R^2 = 0.7793, \quad R^2 = 0.8013 \quad E.W = 1.65$$

$$F = 36.30$$

$$QA = 31.73 + 0.01 ACR - 2.60 W - 0.00015 F$$

$$(12.48) \quad (7.80) \quad (-7.48) \quad (-1.11)$$

$$E_o = 2.40 \quad E_{ACR} = -0.044 \quad E_W = -0.17 \quad E_f = 0.062$$

$$-0.196 ia - 0.0002 R - 0.0039CS \dots \dots \dots (9)$$

$$(-1.25) \quad (-0.15) \quad (-4.20)$$

$$E_{ai} = 0.36 \quad E_R = 0.00014 \quad E_{CS} = 0.05$$

$$\text{Adjusted } R^2 = 0.8790 \quad R^2 = 0.9153, \quad D.W = 2.35,$$

$$F = 25.22$$

Where the E's are elasticity estimates.

From equations 8 and 9 it could be inferred that:

A positive and significant relationship exist between agricultural credit and agricultural output. However, elasticity estimates showed that output is very inelastic with respect to changes in credit availability. This tends to confirm the assertions that many more factors exist which influence agricultural output other than credit alone.

The introduction of farm labour wages into the model confirm that agricultural output exhibits an inverse relationship with wage increases. This conforms to expectation, since agriculture in Nigeria is essentially labour intensive. Elasticity estimates also show that the responsiveness of output to wage increases is inelastic.

Some other explanatory variables which were tried in the model include fertilizer use, nominal interest rate on agriculture, available rainfall, and credit subsidy. Ironically, both fertilizer consumption and rainfall bore a negative relationship with agricultural output. Also, contrary to expectation, availability of credit subsidies had a negative effect on output. As can be deduced from the parameter estimate in equation 9, credit subsidy was a major source of poor agricultural performance.

Availability of subsidies often do not elicit the adoption of good management practices by credit subsidies' beneficiaries, a factor which accounts for the poor

Table 3:

**REGRESION RESULTS OF THE INFLUENCE OF CREDIT AND OTHER VARIABLES
ON AGRICULTURAL OUTPUT (QA)**

	C	ACR	W	F	IA	R	CS	T	R sqrd Adj	R sqrd	D.W.	F
3.1 QA	25.23* (35.89)	0.0016* (4.83)							0.5273	0.5509	0.53	23.1
3.2 QA	28.41* (34.58)	0.0075* (5.99)	-1.86* (-4.76)						0.7793	0.8013	1.65	36.3
3.3 QA	28.46* (33.65)	0.0075* (5.87)	-1.87* (-4.66)	-0.00008 (-0.51)					0.7698	0.8044	1.62	23.3
3.4 QA	29.28* (15.03)	0.008* (4.71)	-1.93* (-4.44)	-0.0002 (-0.65)	-0.095 (-0.47)				0.7588	0.807	1.62	16.73
3.5 QA												
3.6 QA	31.733* (12.48)	0.01* (7.80)	-2.6* (-7.48)	-0.00015 (-1.11)	-0.196** (-1.25)	-0.00027 (-0.15)	-0.0039* (-4.20)		0.879	0.9153	2.35	25.22
3.7 QA	30.85* (9.54)	0.01* (4.33)	-3.12* (-2.68)	-0.00021 (-1.08)	-0.19 (-1.18)	0.00018 (0.09)	-0.0048* (-2.21)	0.18 (0.47)	0.8719	0.9167	2.38	20.45
	LC	LACR	LW	LF	LIA	LR	LCS	LT				
3.8 LQA	3.21* (33.66)	0.016 (1.03)							0.0033	0.0531	0.35	1.065
3.9 LQA	2.95* (6.26)	0.81 (0.67)	-0.11 (-0.54)						-0.0351	0.0684	0.37	0.66
3.10 LQA	3.02* (6.57)	0.14 (1.14)	-0.15 (-0.75)	-0.064** (-1.47)					0.0282	0.1739	0.74	1.193
3.11 LQA	2.29* (5.45)	0.103 (1.05)	-0.21 (-1.33)	-0.0038 (-0.10)	0.296* (3.40)				0.4	0.52	1.38	4.33
3.12 LQA												
3.13 LQA	2.4* (4.35)	-0.044 (-0.26)	-0.17 (-0.84)	0.062 (1.10)	0.36* (2.74)	-0.000014 (-0.07)	0.05 (1.11)		0.3054	0.6031		2.026
3.14 LQA	2.48* (4.23)	0.00012 (0.00)	-0.13 (-0.61)	0.054 (0.90)	0.32* (2.19)	-0.000016 (-0.08)	0.042 (0.86)	-0.01 (-0.64)	0.2505	0.6253	1.669	

performance.

IV. CRITICAL ISSUES WHICH MILITATE AGAINST THE EFFECTIVENESS OF AGRICULTURAL CREDIT POLICIES

The results so far suggest that credit policies have been relatively ineffective in influencing institutional lending and borrowing behaviour of farmers and in stimulating the growth of agriculture. This calls for a re-examination of the credit policies and the factors which have mitigated their effectiveness.

From the borrower — farmer perspective, credit policies have had little impact on borrowing behaviour for several reasons. Among them are lack of viable technology for investment, and sufficient enough to induce real demand for credit; and subsistence level of production characterised by low output. Related to this is a high degree of variability of farm incomes, owing to incessant crop failures or destruction by theft, fire and other hazards for which no insurance cover is available. All these heightens the risk of borrowing as repayment capacity is low. Other factors include the inherent tendency of farmers to divert credit to uses other than those for which it was intended.

From the institutional lenders perspective, key factors which militate against effectiveness of credit policies include weak base for agricultural credit supply, largely because of the relative low profitability of agricultural credit portfolios; political interference in the operations of lending institutions which in most cases undermines repayment performance; failure of most institutional lenders to adapt their lending practices to rural behaviour and needs. In particular, their banking hours, and other demands, such as minimum cash balances on accounts before loans can be granted, and the insistence on the provision of adequate collateral render ineffective some credit policies.

At the national policy level, credit quota and allocation policies have failed to inspire both borrowers and lenders commitment to investment specified in loans contracts. In fact, credit quota and allocation policies fostered the development of unwholesome practices. These include the ease with which credit for agriculture had often been diverted to other uses due to fungibility, and the high cost associated with monitoring the use of funds.

Another major factor responsible for the ineffectiveness of credit policies is the failure to integrate savings mobilization schemes into credit programmes. This has often created a serious bottleneck for financial institutions in the management of agricultural loans portfolios. It denies them access to the financial transactions of the borrower, and have often depended on extension service agents to determine the level of credit worthiness of farmers. It also makes the task of loan recovery difficult, a factor which may be instrumental to the high rate of loan delinquency among beneficiaries of specialized lending schemes which do not operate savings mobilization schemes.

Finally, distortionary effect on other macroeconomic policies may hamper the effectiveness of agricultural credit policies. For instance, it is known, that prior to the adoption of SAP, several farm investment disincentives emanated from trade, pricing and exchange rate policies. In particular, the relative non-profitability of agriculture vis-a-vis manufacturing was due to its neglect, and also to the undue protection of domestic industries through trade, pricing and exchange rates policies. Price stabilisation policies of the abolished commodity boards were major sources of implicit taxation of

agriculture while trade and exchange rate policies encouraged large import of cheap food to the detriment of local production. Consequently, there was much greater demand for trade credit than agricultural credit.

V. CONCLUDING REMARK AND POLICY IMPLICATIONS

The effects of credit policies on institutional lending, borrowing behaviour and agricultural output have been quite revealing. The major conclusion is that credit policies play very little role in influencing both lenders and borrowers behaviour. Also, credit has limited effect on agricultural output while credit subsidies are major sources of production disincentives.

Thus, there is the need to re-examine the overall objectives of agricultural credit policies, largely because it will be erroneous to infer that finance plays little role in agricultural development. In order to make agricultural credit policies work it may be necessary to re-orient the evaluating criteria for measuring the effectiveness of credit policies.

Of importance is the viability of institutional lenders and credit beneficiaries. This calls for concerted efforts to tackle the problems faced by lenders, borrowers and those arising from defective policy framework.

The areas of policy reforms would include:

- The need to reform credit policies away from quotas and credit rationing. This calls for a widespread adoption and stimulation of derived demand for credit projects based on the direct demand for attested technological packages which could enhance the supply of credit.
- The need to discontinue the policies of partial financial intermediation. Savings mobilization and all other financial services must be made a complementary part of rural financial markets.

There is also the need to reduce the financial risks in agricultural production ventures. This should stress the pursuit of policies of informal insurance which includes investment on viable technologies such as yield improvements and output expansion and the provision of rural infrastructure such as roads, storage and processing facilities. This policy should be complemented by formal insurance against financial losses for all agricultural enterprises.

As part of their corporate policies, suitable financial technologies should be adopted. Dynamic and innovative strategies such as provision of mobile banking services at times and hours convenient to the farmers may be more effective in reaching the target group. The banks may also need to strengthen their administrative capacity for agricultural credit purvey.

Finally, as part of the farm level policies, farmers' credit demand should be based on the need to make incremental investment, so as to guarantee repayment ability. There is also the need for farmers to improve their poor attitudinal behaviour towards loan repayments.

REFERENCE

- (1) Adams, D. W.; and Graham, D. H.; (1981) "A Critique of Traditional Agricultural Credit Projects and Policies". *Journal of Development Economics* 8(1981) pp. 347—366.
- (2) Balogun, E. D.; Alimi, A. (1988): "Loan Delinquency Among Small Farmers in Developing Countries: A case study of the Small Farmers Credit Programme in Lagos State of Nigeria". *CBN Economic and Financial Review*, September, 1988.
- (3) Balogun, E. D. (1990); Banking and Credit Facilities for Integrated Rural Development. An Invited Paper presented at the National Seminar on Integrated Rural Development Policy for Nigeria, Sheraton Hotel, Abuja 30th July — 3rd August, 1990.
- (4) Becker, W. S. (1970); "Agricultural Credit and Colombia's Economic Development". Ph.D. Thesis, Louisiana State University 1970.
- (5) Colyer, D., and Jimencz, G. (1971); "Supervised Credit as a Tool in Agricultural Development". *American Journal of Agricultural Economics* Vol. 53, No. 4, pp. 639—642.
- (6) David, C. C. and Meyer, R. L. (1980); "Measuring the Farm Level Impact of Agricultural Loans". In *Borrowers and Lenders: Rural Financial Markets and Institutions in Developing Countries*. Ed. John Howel, London: Overseas Development Institute, 1980.
- (7) Graham, D. H.; and Bourne, C.; (1980) "Agricultural Credit and Rural Progress in Jamaica, In *Borrowers and Lenders: Rural Financial Markets and Institutions in Developing Countries*" . Ed. John Howel, London: Overseas Development Institute, 1980.
- (8) Gyeke, A. B., Acquah, E. T., Whyte, C. D., (1977). "An Evaluation of Institutional Credit in Ghana" (Petersburg, Va.; Virginia State College, Bureau of Economic Research, (1977).
- (9) Ojo, M. O. (1985); "Agricultural Credit Policies in Nigeria: A Review of Achievement, Problems, and Prospects", *CBN Economic and Financial Review*.
- (10) Patrick, H. T. (1966), "Financial Development and Economic Growth in Underdeveloped Countries". *Economic Development and Cultural Change* 14 (1966): 174—189.
- (11) Racette, G. A. (1973), "Earnings Retention, New Capital and the Growth of the Firm: A Comment". *The Review of Economic and Statistics*, 55 (1) 127—128.

- (12) Sacay, O. J.; Agabin, M. H.; Tanchoco, C. J. E. (1985): *Small Farmer Credit Dilemma* (C) 1985 Technical Board for Agricultural Credit, Manila, Philippines.
- (13) Sayad, J. (1984); "Rural Credit and Positive Real Rates of Interest: Brazil's Experience with Rapid Inflation". In *Undermining Rural Development with Cheap Credit*. Ed. Dale Adams and Others pp. 146—160 Westview Special Studies in Social, Political and Economic Development.
- (14) Schaefer - Kehnet (1982). "What Is Needed To Make Rural Credit Work?" EDI Training Materials Course Note 030/034, (c) 1981 International Bank for Reconstruction and Development (IBRD).
- (15) Von Pischke, J. D. (1980). Rural Credit Project Design, Implementation and Loan Collection Performance" *Savings and Development Quarterly* No. 2, 1980, pp. 81—91.
- (16) Wallis, J. A. N. (1985); *Rural Finance. An Introduction to Agricultural Credit Policies and Issues* EDI Training Material Course Note 030/060, January 1985 (c) 1985 IBRD/World Bank Publication.