MONETARY POLICIES AND CREDIT FINANCING AS FACTORS IN AGRICULTURAL PRODUCTIVITY IN CROSS RIVER STATE

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ABSTRACT

The study evaluates the influence of credit policies on institutional lending behaviour of farmers in Cross River State. It also ascertains the relationship between credit and agricultural development. Using econometric methods, results reveal that credit quota and portfolio lending devices and pursuit of cheap interest rate polices has negative effect on credit supply while policies associated with plough back of rural savings mobilization and availability of guarantee were marginally effective. Results also show that farmers demand for credit was influenced mainly by the availability of credit subsidies and availability of guarantees. Also, the study showed that a positive but inelastic relationship exist between credit and agricultural output. Finally, it was revealed that some factors which militate against the effectiveness of agricultural credit polices include lack of viable technologies, defective production environments and wrong perception of the roles of credit in development. 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.

KEY WORDS: Agricultural Productivity, Credit policies, Agricultural development, Monetary policies and Cross River State

INTRODUCTION

The International Encyclopedia of Social Science (1968) states that monetary policy in its broadest sense include well laid down actions of government, central banks and other public authorities that influence the quantity of money and bank credit. It therefore embraces policies relating to such things as choice of the nations monetary standard, determination of the value of the monetary unit in terms of a metal or foreign currencies, determination of the types and amounts of the governments own monetary issues, establishment of a central banking system and determination of its powers and rules for its operation and policies concerning the establishment and regulation of commercial banks and other related financial institutions. A few even extend the meaning of monetary policy to include official actions affecting not only the quantity of money but also its rate of expenditure thus embracing government tax, expenditure, lending and debt management policies. However, in its broadest sense and that of which we adopt for this study, monetary policy as a major economic stabilization weapon involves measures designed to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve some specified macro-economic policy objectives (Olaloku, 1979, Wrightsman 1976; Mankino 1992). For Bruno (1995) and many other macro-economists monetary policy is a way in which a well-advanced industrial economy controls the supply of money. This assumes the existence of separate and at least minimally independent fiscal and monetary authorities, the existence of a well developed market for short term debt instruments and a clear definition of the monetary objectives.

However, governments in most tropical African countries have been compelled to intervene in the economy with a view to foster agricultural growth and development. Such interventions are often and most frequently in extension, input supply, marketing services and of course credit supply. Provision of cheap credit appears to be the most pronounced intervention route. As such, most governments have promoted the growth of institutional financial markets mainly to provide credit facilities to farmers on concessionary terms. Monetary policy measures such as these are used extensively by governments without any clear understanding of what should be the proper channel. This often results in failure to redress the problems of macro-economic instability they were set to solve (Ojo 1992), Sanusi 2001, Nnanna 2002). Now some questions: since the government as in the past, have always resolved to finance agriculture sector to boost food production, how well have we achieved this objective? If this objective has been achieved, are the farmers still demanding credit? These and other questions have resulted in our quest in this study, hence, the need to evaluate existing policies on agricultural credit in state, assess the impact of credit on agricultural performance as well as identifying the major constraints associated therewith.

THEORETICAL FRAMEWORK FOR EVALUATING THE EFFECTS OF CREDIT FACILITIES

Relevant studies designed to evaluate the influence of credit policies on agricultural performance are rather scanty. However, Sayad (1979) used descriptive statistics to show the relationship between credit and performance of farmers within a framework of "with" or "without" credit situation. In assessing this approach, it is found out that the result is inconclusive since it suffers from 'attribution' problem, which results from the fact that several other factors exist which may explain the differences in "with" and "without" credit situation. These include differences in yield, uncertainty of prices and management ability, differences in product and input prices and differences in household financial constraints on savings. Other studies have used econometric methods to assess the impact of borrowing. David and Meyer (1980) used three different methods viz: a production function, an input demand function and an efficiency gap function. In all of these approaches, the assumption is that all production parameters are affected by credit. It uses time series data to assess the effects of credit on agricultural performance and input use. The results of majority of these studies confirm the complex and indirect relationships that exist between credit and agricultural production and the constraints involved in stimulating agriculture through credit policies. It is however agreed by these studies that both institutional lending and borrowing behaviiour of farmers could be influenced through certain price and quantity variables. Some key instruments that have been widely employed to achieve this include subsidy on interest rates, credit control as well as provision of incentives such as

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guarantees. However, the success of this policy instruments in achieving desired results depend on the general perception of the role of credit in development.

METHODOLOGY

Two sets of hypotheses are tested in this study. First, credit policies influence the behaviour of both institutional lenders and borrowers i. e. policy can influence supply of and demand for agricultural credit. Secondly, that there is a positive relationship between agricultural credit and a number of variables i. e. output and use of modern inputs. This of course is on the assumption that lending behaviour of financial institutions is influenced by credit allocation, interest rate policies, rural savings mobilization and available incentives such as guarantees and refinance abilities. Borrowing behaviour of farmers is influenced by availability of subsidies, accessibility, cost of transactions and relative profitability of farming, available technology and collateral incentives. The relationships are as shown below.

$X_1 = F(DC, Ia/IP, RS, CG, Rr)$……………..   (1)
$X_2 = F(CS, Pa/P_1, RB, CG, F, T)$…………..   (2)
$X_1 = X_2$…………………………………….   (3)
Where
X_1 = Credit supply
X_2 = 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 for agriculture
P_L = Relative factor income for industry
RB = No. of rural bank branches
F = A proxy for agricultural technologies available
T = A trend variable factor

A production function model in line with Colombian Brazilian and Ghananian models (Coyler and Jimencz, 1971, Becker 1970, Gyeke et al 1977) hypothesize that credit influences the farm production relationship. The model details 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 as follows

$X_3 = F(ACR, W, F, ia, R_1 T_1)$………………..   (4)
Where
X_3 = Agricultural output as captured by the real agricultural GDP
ACR = Agricultural credit supply
W = Average annual farm wage rate
F = Annual fertilizer input use/or supply in tonnes
ia = lending rate for agriculture
R = Average annual rainfall in Nigeria
T = Trend factor

These equations are specified in linear and log-linear forms. The log linear forms are preferred since we can read off the elasticities of dependent variables in relation to each variable(Amadi and Osao,2000;Ekpo,1997;Friend and packet,1964;Boyd and Schonfeld, 1977) all agreed that the use of the log linear equations aim at reducing, if not completely removing the heterosce elasticity errors, which may result from unscaled magnitudes in both sides of the equations. If the dependent variable responds to the set of credit policy instruments included in the model, it can be inferred that policies can influence both lending and borrowing behaviour and performance of agriculture. But if the parameter estimates obtained are inelastic and insignificant we can infer that credit policies do not influence lending and borrowing behaviour and thus are ineffective in encouraging agriculture.

Underneath each of the coefficient is the t-statistics in parenthesis and a coefficient marked (a) is significant at 5% confidence level, while a coefficient marked (b) is significant at the 10% 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 the significance of the coefficient of multiple regression. The coefficients of the log linear equations are the elasticities of the dependent variables with respect to the explanatory variables under consideration.

SOURCES AND METHOD OF DATA COLLECTION

The required secondary data for this study are extracted through intensive research and consultations. Relevant publication such as the Central Bank of Nigeria Statistical Bulletins published by Central Bank of Nigeria, and Annual Abstracts of Statistics and the National Account of Nigeria, published by the Federal Office of Statistics (FOS) were also consulted.

RESULTS

Regression results of the effects of credit policies on institutional lending and borrowing behaviour and agricultural production are shown in the tables 1,2, and 3 respectively. In all of the cases, linear and log linear equations were estimated for three dependent variables viz: agricultural credit supply, agricultural credit demand and agricultural output.

(A) INFLUENCE OF CREDIT POLICIES ON AGRICULTURAL CREDIT SUPPLY

Table 1 show the linear and log-linear regression results of the influence of credit policies on institutional agricultural credit supply. Equation J is thee most preferred equation as all the parameter estimates were significant at 5% level of significance. Also both the adjusted R2 and F-statistics indicated that it is the equation of best fit. The D-W test also shows that there is no first order serial correlation in the data used. The equation is

$InX_1 = -1.88 - 0.21 \ln DC - 1.28 \ln(1A/1P)$
       (3.41)   (2.21)   (2.50)21
   $+ 3.58 \ln RS + 0.28 \ln CG + 0.85 \ln RR$………….. (5)
       (4.22)   (2.74)   (6.05)
R^2 Adjusted = 0.9777, R^2 = 0.9833
F = 176.3,   DW = 1.49

Table 1: Regression Analysis Result of the Effect of Credit Policies on Agricultural Credit Supply (X_1)

		C	DC	IA/IP	RS	CG	RR	R^2adj	R^2	D:W	F
A	X_1	-3.43 (0.43)	0.52 (a) (26.72)					0.9727	0.9741	1.45	713.8
B	X_1	-810.2 (-2.53)	-0.51(a) (2.58)	971.06(a) (2.58)				0.979	0.9811	2.01	466.5
C	X_1	-245.8 (0.70)	0.42 (a) (10.48)	3.71 (0.93)	0.13(a) (2.60)			0.9841	0.9865	2.18	412.8
D	X_1	49.64 (0.18)	0.24 (a) (4.15)	-47.02 (-0.15)	0.15(a) (3.54)	12.65(a) (3.92)		0.9914	0.9931	1.74	574.6
E	X_1	113.19 (0.41)	0.21(a) (3.40)	-150.12 (10.46)	0.18(a) (3.58)	10.08(a) (2.48)	0.049(a) (1.04)	0.9914	0.9936	1.92	462.2
		LC	LDC	L IA/IP	LRS	LCG	LRr				
F	LX_1	0.67–(b)	0.83 (a) (15.72)					0.9249	0.9286	1.27	247.2
G	LX_1	0.77(b) (2.20)	0.84 (a) (16.24)	0.88 (b) (1.45)				0.929	0.9361	1.45	131.9
H	LX_1	0.43 (0.97)	0.73 (a) (7.13)	0.44 (0.63)	0.17 (1.25)			0.9312	0.9415	1.29	91.18
I	LX_1	0.65 (1.03)	0.65 (a) (3.53)	0.27 (0.34)	0.18 (11.25)	0.087 (0.5)		0.928	0.9424	1.16	65.44
J	LX_1	-1.88 (a) (-3.41)	0.21 (b) (-1.21)	-1.28 (a) (-2.50)	3.58 (a) (4.22)	0.28 (a) (2.74)	0.85 (a) (6.05)	0.9777	0.9833	1.49	176.3

Inferences drawn her include:

Credit quota and portfolio ceiling devices had a negative effect on credit supply, though credit supply was elastic with regard to changes in credit quota (as captured by DC). Secondly, pursuit of cheap credit policies had a negative effect on credit supply. This is shown by the fact the parameter estimate is elastic and negative with regard to cheap interest rates policy. Also, 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. Supply of credit is inelastic with regard to availability of credit guarantees. Finally, cash reserve requirements of institutional lenders have a positive inelastic relationship to total credit supply to agriculture.

INFLUENCE OF CREDIT POLICIES ON AGRICULTURAL CREDIT DEMAND

Table 2 shows the stepwise regression result of the influence of credit policies on borrowers. Equations R and T are most preferred here since they gave higher R^2 values and three parameter estimates of the explanatory variables were significant. The equations are

$$Ln\ X_2 = -1.20 + 0.20\ In\ CS + 1.31\ In\ L_n\ PA/P1\ldots\ldots..(6)$$
$$(-0.58)\quad (1.54)\quad (1.95)$$

R^2 adjusted = 0.9565, R^2 = 0.9656, F = 102.5

$$Ln\ X_2 = 1.49 + 0.25\ Ln\ CS + 0.23\ Ln\ PA/PI$$
$$(0.89)\quad (2.69)\quad (0.43)$$
$$0.074\ In\ RB + 0.3\ In\ CG + 1.04\ In\ T\ldots\ldots\ldots\ldots \quad (7)$$
$$(-0.51)\quad (2.80)\quad (3.82)$$

R^2 adjusted = 0.9796, R^2 = 0.9869, F = 135.5

Equation 6 is the most preferred because all the parameter estimates are significant at 10% confidence level. Inferences from the 2 equations include:

(a) CS representing credit subsides has a significant and positive effect on credit demand by farmers. Total credit demand however is inelastic with regards to subsides.

(b) Relative profitability of farming vis-à-vis manufacturing plays a keg role in agricultural credit demand. From equation (6) agricultural credit demand is elastic and positive with regards to this variable. This is expected because investors are rational.

(c)   From equation (7), the responsiveness of credit demand to credit guarantees available is significant, inelastic and positive suggesting that the availability of guarantee did not attract a commensurate change in credit demand. This could be as a result of inaccessibility of guarantees as well as high transaction cots associated with application for guarantees.

A trend variable shows that demand for credit showed a rising trend over the period. We can therefore conclude that rising demand for rural credit over time shows new or additional investments in agriculture.

Table 2 Regression Results of the Influence of Credit Policies on Agricultural Credit demand (X_2)

		C	CS	PA/P1	RB	CG	T	R^2adj	R^2	DW	F
K	X_2	1294.4 (a)	-0.31					-0.05	0.0008	0.059	0.014
		(3.41)	(-0.12)								
L	X2	-170.6 (a)	-0.72	44.45 (a)							
		(-3.43)	(-1.18)	(6.70)				0.6825	0.8909	0.6	46.27
M	X2	151.6	-0.29	-9.49	6.95 (a)			0.8716	0.8909	0.43	46.27
		(0.32)	(0.73)	(0.85)	(5.25)						
N	X2	0.78	-0.15	-3.64	1.49	29.75 (a)		0.9605	0.0684	0.84	122.9
		(0.00)	(-0.66)	(-0.56)	(1.30)	(6.27)					
O	X2	1.292	-0.19	3.58	2.44(a)	29.81(a)	-80.13		0.9617		110.4
		(0.55)	(-0.92)	(0.49)	(2.00)	(6.64)	(-1.71)				
		LC	LCS	L(PA/PL)	LRB	LCG	LT-R^{-2}	R^2	DW	F	
P	LX2	3.33(a)	0.75(a)				0.8369	0.8486		72.86	
Q	LX2	-5.61(a)	0.18	2.67(a)							
		(-1.92)	(0.94)	(3.08)			0.9013	0.9154		64.91	
R	LX2	-1.2	0.2(b)	1.31(a)							
		(-0.58)	(1.54)	(1.95)			0.9565	0.96555		102.5	
S	LX2	-1.26	-0.21(b)	1.31(a)	-0.26(b)						
		(-0.54)	(1.49)	(1.86)	(0.24)		0.9519	0.9656		70.27	
T	LX2	1.49	0.25(a)	0.23	-0.74	0.3(a)	1.04(a)	0.9869		135.5	
		(0.89)	(2.69)	(0.43)	(-0.51)	(2.80)	(3.82)				

AGRICULTURAL OUTPUT AND CREDIT

Table 3 below shows regression results of the effects of credit policies and other variables on agricultural output. From the table, the linear results are better than the log-linear ones. Equations V and Y are the most preferred. These equations are

$X_3 = 28.41 + 0.0075$ ACR $- 1.86$w...............   (8)
          (34.58)   (5.99)   (-4.76)
$E_c = 2.95$, EACR = 0.081, EW = 0.11
R^2 adjusted = 0.7793, R^2 = 0.8013, FW= 1.65

F = 36.30.
$X_3 = 31.73 + 0.01$ ACR $- 2.60$W $- 0.00015$ F
          (12.48)   (7.80)   (-7.48)   (-1.11)
$E_o = 2.40$ EACRR = 0.044, EW = 0.17, Ef = 0.062
5.0196TA $- 0.007$R $- 0.0039$CS...............   (9)
          (-1.25)   (0.15)   (4.20)
$E_{ai} = 0.36$ ER = 0.0014, $EC_S = 0.05$
R^2 adjusted = 0.8790, R^2 = 0.9153, D.w = 2.35
F = 25.22

Where the E values represent elasticity estimates.

From the 2 equations above, the following inference could be drawn

(a). A positive and significant relationship exists between agriculture credit and output. But elasticity estimates showed that output is inelastic with respect to change in credit availability confirming that many other factors exist which influences agricultural output other than credit alone.

Elasticity estimates also show that the responsiveness of output to wage increases is inelastic. Other explanatory variables tried in the model such as use of fertilizer, interest rate on agriculture, available rainfall and credit subsidy.

Both fertilizer use and rainfall had a negative relationship with output. Also, availability of credit subsidy had a negative influence on output. From equation (9), credit subsidy was a major source of poor agricultural output.

Table 3. Regression Result of the Influence of Credit and other Variables on Agricultural Output (X_3).

	C	ARC	W	F	IA	R	CS	T	R^2ady	R^2	DW	F
AX_3	25.23(a)	0.016(a)							0.5273	0.5509	0.53	23.1
	(35.89)	(4.83)										
VX_3	28.41(a)	0.0075(a)	-1.86(a)						0.7793	0.0813	1.65	36.3
	(34.58)	(5.99)	(-4.76)									
WX_3	28.46(a)	0.0075(a)	-1.87(a)	0.0008					0.7698	0.8044	1.62	23.3
	(33.65)	(5.87)	(-4.66)	(-0.51)								
XX_3	29.28(a)	0.008(a)	-1.93(a)	-0.0002	0.095				0.7585	0.807	1.62	16.73
	(15.03)	(4.71)	(-4.44)	(-0.65)	(-0.47)							
YX_3	31.733(a)	0.01(a)	-2.6(a)	0.00015	5.0196(a)	0.00027	-0.0039(a)		0.879	0.9153	2.35	25.22
	(12.48)	(7.80)	(-7.48)	(-1.11)	(1.25)	(0.15)	(-4.20)					
ZX_3	30.85	0.01(a)	3.12(a)	0.00021	–0.19	0.00081	0.0048(a)	0.18	0.8719	0.9167	2.38	20.48
	(9.54)	(4.33)	(-2.68)	(-1.08)	(-1.18)	(0.09)	(-2.21)	(0.47)				

	LC	LACR	LW	LF	LIA	LR	LCS	LTS	R^2ady	R^2	DW	F
ZAX_3	3.21(a)	0.016							0.0033	0.0531	0.35	1.065
	(33.64)	(1.03)										
ZBX_3	2.95(a)	0.81	-0.11						0.0351	0.0684	0.37	0.66
	(6.26)	(0.67)	(-0.54)									
ZXC_3	3.02(a)	0.14	-0.15	-0.064(b)					0.0282	0.1739	0.74	1.192
	(6.57)	(1.14)	(-0.75)	(-1.47)								
ZDX_3	2.29(a)	0.103	-0.21	-0.0038	0.296(a)				0.4	0.52	1.38	4.33
	(5.45)	(1.05)	(-1.33)	(-0.10)	(3.40)							
ZEX_3	2.4(a)	-0.44	-0.17	0.062	0.36(a)	-0.00004	0.05		0.3054	0.6031		2.026
	(4.35)	(-0.26)	(-0.84)	(1.10)	(2.74)	(-0.01)	(1.11)					
ZFX_3	2.48(a)	0.000012	0.13	0.054	0.32(a)	-0.000016	0.042	-0.01	0.2502		2.6253	1.669
	4.23	(0.00)	(-0.61)	(0.90)	(2.19)	(-0.08)	(0.86)	(0.64)				

DISCUSSION

Results of the analysis show that credit financing has been ineffective in influencing lending and borrowing behaviour of farmers and thus affects growth of agriculture. Several reasons are responsible for this development and this include lack of a viable technology for investment to induce real demand for credit and subsistence level of production characterized by low output. Also there is a high degree of variability of farm incomes due to crop failures or theft, fire and other hazards for which there is no insurance cover. All these further increases the risk of borrowing since the repayment capacity is terribly low. Other factors include the behaviour of farmers to divert credit to other uses other than those for which it was intended. From the point of view of the lenders, factors that militate against the effectiveness of credit financing are weak base for agricultural credit supply, because of low profitability of agricultural credit portfolios, political interference in the operations of lending institutions, failure of most institutional lenders to adopt their lending practices to rural behaviour and needs, for instance, banking hours, minimum cash balances on accounts before granting loans as well as the insistence on provision of collateral which ultimately render some credit policies ineffective. Finally, distortionary effect on other macro-economic policies may also hamper the effectiveness of agricultural credit policies.

CONCLUSION

We can therefore conclude that credit policies play very little role in influencing lenders as well as borrowers behaviour. Also, that credit has little or no effect on agricultural output while credit subsidies are major sources of production disincentives. In order to make credit policies on agriculture workable, it may be necessary to re-orient the evaluating criteria for measuring the effectiveness of credit policies. Policy reforms may thus be necessary and these reforms include:

- There is a need to reform credit policies away from quotas and rationing
- Ensuring that savings mobilization and all other financial services must be made a complementary part of rural financial markets, and finally, as part of the farm level policies, farmers credit demand should be based on the need to make incremental investments so as to guarantee repayment ability and thee need for farmers to change their behaviour towards loan repayments.

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