RESEARCH ARTICLE

IMPACT OF COMMERCIAL BANK LENDING ON AGRICULTURAL PRODUCTION AND PRODUCTIVITY IN NIGERIA

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ABSTRACT

Provision of financial support for agriculture has been a prime intervention strategy for poverty reduction. The study analyzed the impact of commercial bank lending on agricultural production and productivity in Ondo and Ekiti State of Nigeria. Descriptive statistics, gross margin, elasticity of production, return to scale as well as regression analysis were used to analyze the data. The result showed that majority of the respondents (89.2%) were male, married (92.5%), educated (84.2%) and the amount of loan range from N10,000 to N100,000. The regression result revealed that labour cost is significant to all categories of farmers at 5% and the elasticity of production with respect to labour cost was decreasing positive function to labour, for all the farms were operating in the rational zone of production with respect to labour and it was efficiently utilized that is 0< Ep labour < 1, while return to scale were technically efficient, with only EKBN were technically inefficieny. The Ondo State Non-Beneficiaries made higher gross margin because majority of them enjoyed other credit sources outside the banking sector. The EKB made higher gross margin per hectare (₦26,246.35) than the EKNB who made an average of ₦9,896.99. It was therefore recommended that there should be active involvement of government and the private sector at boosting in flow of funds into agriculture and agribusiness.

INTRODUCTION

The financial system of a country is a conglomerate of various institutions, markets, instruments and operators that interact within an economy to provide financial services (CBN, 1998). Such services may include resource mobilization and allocation; financial intermediation; and facilitation of foreign exchange transactions to enhance international trade, among others. The financial system, thus, plays important roles in the process of economic growth and development of a country. In Nigeria, the financial system has undergone remarkable changes in terms of ownership structure, the depth and breadth of instruments employed, the number of institutions established, the economic environment, and the regulatory framework within which the system operates.

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Financial systems are of two types: market oriented and non market oriented. The market oriented financial system refers to a system in which market forces of supply and demand determine distribution of resources while the non-market oriented financial system describes a situation in which forces other than market forces of supply and demand perform these roles (CBN/NDIC, 1995). It is a widely held view that a market oriented financial system promotes real growth while a non-market oriented financial system constraints the growth process (Ijose and Abaelu, 1999). There is strong evidence in respect of positive relationship between financial and real development (Goldsmith, 1996), Gurley and Shaw (1997), Ojo and Adewumi (2002), Caprio et al (2003). In a broad cross-sectional study involving ninety countries, King and Levine (2002) found that positive relationship exists between the development of the financial sector and real growth. These ninety countries operate a free market economy. Hence, without active money and credit markets, appropriate monetary policy instruments will be lacking, and in any case, the

transmission mechanisms will be unreliable making policies less effective (Calvo andKumar, 1993). The Nigeria financial system comprises the regulatory/supervisory authorities, bank and non-bank financial institutions (CBN, 1998). The regulatory/supervisory authorities are the Federal Ministry of Finance (FMF), Central Bank of Nigeria (CBN), Nigeria Deposit Insurance Corporation (NDIC), Securities and Exchange Commission (SEC), National Insurance Commission (NAICOM), Federal Mortgage Bank of Nigeria (FMBN) and the National Board for Community Banks – NBCB (CBN, 1998). The CBN is the principal regulator and supervisor in the money market, with the NDIC playing a complementary role. The CBN exclusively regulates the activities of finance companies and specialized/development finance institutions such as the former Nigeria Industrial Development Bank (NIDB) and the Nigerian Agricultural and Cooperative Bank (NACB). In the third quarter of year 2000, The NIDB absorbed the NBCI and the NERFUND under a newly constituted Board of Directors.

The NACB was merged with the peoples Bank of Nigeria and Family Economic Advancement Programme (FEAP) to become the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB). The SEC (Security and Exchange Commission) is the apex regulatory/supervisory authority in the capital market. The Nigerian Stock Exchange (NSE) was a self regulatory institution. The registrars, Stock-broker, and issuing houses also interact in the market to complete the chain in the capital market (CBN, 1998). The Nigeria Stock Exchange (NSE) was slated for bifurcation in the year 2001 with Lagos and Abuja offices to be named Lagos Stock Exchange and Abuja Stock Exchange respectively. This move was, however, thwarted. In the 1997 amendment to CBN Decree No 24 of 1991, the CBN is to report to the presidency through the federal Ministry of Finance. Also with effect from 1st January 1997, the CBN has effectively assumed the leadership of all the banking institutions in the financial system. In this regard, the CBN now has responsibility for controlling and supervising all commercial, merchant and community banks, the former people's bank, finance companies, discount houses, primary nortgage institutions, bureau de change and all development banks (CBN, 1998).

Greater proportions of the Nigerian farmers are small and poor. Hence an assured supply of credit is required, since most of the new practices that have to be adopted have to be purchased, while only a few farmers have the financial resources to undertake such purchase. The rural capital market cannot supply the needed fund to finance such innovations. A result of the above, according to Famoriyo and Nwagbo (2001), is that agricultural development is stunted. Credit is therefore acknowledged to be an important and necessary factor in nearly all farm business (Ada-okungbowa and Aigoro, 1996). Concerted efforts continued to be made by successive governments to boost agricultural production and productivity via bank lending but with what effect? The broad objective of the study is to assess the impact of Commercial Bank lending on agricultural production and productivity in Ondo and Ekiti states. The study was specifically designed to (i) determine the socio-economic characteristics of the respondents; (ii) determine the influence of commercial bank lending on food

crop production; (iii) estimate and compare the nature of returns to scale of farmers under the beneficiaries/non beneficiaries categories; (iv) determine the gross margin of Beneficiary and Nom-Beneficiary in Ondo and Ekiti State.

Conceptual framework and literature review

Concept and meaning of Credit

The word credit was defined by Miller (1993) as a device for facilitating the temporary transfer of purchasing power from one individual or organization to another. He contended that credit provides the basis for production efficiency through specialization of function. Credit has been described as a continuation of potentially and actually obtaining goods and services (actually) by giving a promise to pay (potentiality). It is a present right to future payment Miller (1997). Credit is supposed to be based on mutual understanding between the two parties involved that is the lender and the borrower. This is because the word credit is coined from a Latin word CREDO which means literally I believe. The giving out of credit from individuals or organization to would-be lender is based on the confidence that such lender repay the money at the stipulated time. It is important to distinguish between credit capital and saving, which are much related word (Moosa, 2003). The agricultural Credit Guarantee Scheme Fund was established by Decree No 20 of 1977 and commenced full operations in April 1978. Hence, this study covered the period 1978 to 2007 in Ondo and Ekiti States. According to Olalokun *et al* (1999), the commercial banks have been identified as the main vehicle of monetary policy implementation in Nigeria. They are also the major financial intermediaries, because 80.3% of the assets and 85.3% of the total deposit liabilities of the financial institutions are managed by the commercial banks (CBN, 2003). Evidence also confirms that commercial banks show more practical interest in agricultural lending than the merchant banks and other specialized lending institutions (Osuntogun, 1993).

MATERIALS AND METHODS

The Study Area

The study area comprised Ekiti and Ondo States. Ekiti State was carved out of the old Ondo state on 1st October, 1996 while the latter was created out of the former western region in 1976. The present Ondo state is made up of 18 Local Government Area while Ekiti state comprises 16 local government areas. The study are has a population of 3,884,485 (NPC, 1996). It has an average annual total rainfall ranging between 1238mm and 2068.5mm (FOS, 2007) and an average annual temperature ranging between $17.5^{0}c$ to $37^{0}c$ (Ondo state Agro-climatological and Ecological monitoring unit, 2007).
The major occupation of the people in the area who are mainly Yorubas is farming. In the riverine area of Ilaje (Ondo State), the major occupation is fishing.

Sources of Data

The information used in this study was collected from both primary and secondary sources. The primary data were collected from farmers in the area with the aid of well-structured questionnaire. The secondary data were collected

from the commercial banks published bulletins and annual reports, CBN annual reports, CBN statistical bulletins and other publications.

Sampling Technique

A multi-stage sampling technique was used to select the farmers interviewed. At the first stage, three commercial banks (First bank of Nigeria Plc, Union bank of Nigeria Plc and United bank of Africa Plc) were purposively selected out of the six most active banks in Agricultural lending in Nigeria in recent years due to their large capital base and extensive branch network. At the second stage, stratified random sampling was used to select the credit beneficiaries and the non-beneficiaries from the lists obtained from the regional offices of the selected banks. A total of 120 farmers were randomly selected and interviewed. Ekiti and Ondo state have similar ecological conditions because they both lie in the Tropical rain forest zone of Nigeria. One hundred and twenty (120) respondents were used for the analysis. Seventy two (72) respondents or 60% came from Ondo State while 48 or 40% were interviewed from Ekiti State. This is a true reflection of the proportion of total population (of farmers) in the two States. Among the respondents drawn from Ondo State, 32 or 44% were commercial bank agricultural loan beneficiaries while the remaining 40 or 55.6% were non-beneficiaries. In Ekiti state 24 or 50% was drawn from loan beneficiaries while another 24 or 50% respondent was also drawn from non-beneficiaries.

Method of Analysis

The data collected were analyzed using both qualitative (descriptive) and quantitative methods. The descriptive techniques used include frequency tables, range and percentage to describe the socio-economic characteristics of the farmers. The quantitative techniques used were mainly the production function analysis and Gross margin analysis (GM).

Model Specification

In estimating production functions parameters, common algebraic functional forms such as linear, quadratic, polynomial, square root polynomial Cobb-Douglas, Semi-log, Exponential and Transcendental are fitted. The Cobb-Douglas function has been adopted in this study because it is easily adapted for most agricultural production functions and has been used in many empirical studies, particularly those relating to developing agriculture (Xu and Jeffrey, 1998) because it possesses some unique characteristics which make it easy to work with.

The Cobb Douglass production function is of the form:

$$Yi = B_0 \, X_{1i}^{B1} \, X_{2i}^{B2} \, X_{3i}^{B3} \, X_{4i}^{B4} \, X_{5i}^{B5} \, X_{6i}^{B6} \, E \ \ldots\ldots\ldots\ldots (1)$$

The above production function quantities when transformed into their logarithms become:

Cobb-Douglas functional form (Linearised in log):

$$\text{Log } Yi = \log\beta_0 + \beta_1 \log X_{1i} + \beta_2 \log X_{2i} + \beta_3 \log X_{3i} + \beta_4 \log X_{4i} + \beta_5 \log X_{5i} + \beta_6 \log X_{6i} + Ci \ \ldots\ldots (2)$$

The above functional form was fitted for each category of farmers. Where:

Y = Value of food crops (TVP) in Naira
X_1 = Farmers Age (years)
X_2 = Farming experience (years)
X_3 = Farm size (Ha)
X_4 = Labour cost (₦)
X_5 = other cost consisting of value of cuttings, seeds, fertilizers, plant production expenses, depreciation etc.
X_6 = Error term is assumed to be a random real variable with a zero mean and a constant variance.

Gross Margin Analysis (GM)

This is the difference between the Total Revenue (TR) and Total Variable Cost (TVC). It is expressed mathematically thus:

GM = TR − TVC

If GM is greater than zero, indicates that the enterprise is profitable. In this context, it shows the impact of lending on food crop production.

RESULTS AND DISCUSSION

Table 1 shows the distribution of respondents by gender. Majority of the respondent (89.2%) were male while only (10.8%) were female. Men are actively involved in farming, not withstanding, we still find women, though few that are involved in marketing and inputs procurement. The modal age group was discovered to lie in the age bracket of 50 – 59years accounting for 39.2% of total respondents. This was followed by the age bracket of 40 -49years representing 25%. A total number of 57 respondents (47.5%) belong to age bracket 20 – 49years. This can be interpreted that most farmer are in their middle age, mature, strong and productive. The highest percentage (84.2%) of the farmer had formal education while 15.8% of the respondents had no formal education. Only 36.7% had either secondary or tertiary education. These indicate that the education attainment of the respondents is low. Majority of the respondents (92.5%) were married while 3.3% were widowed. Only 2.5% were divorced and 1.7% was single. This shows that many of the respondents were married and they go into the production to help and support their family. The household size ranged between 1 and 20 persons. The modal household size lies between 6 – 10, accounting for (65%) of the total respondents. The household constitute the bulk of the labour force in a family. The study reveals that majority of the beneficiaries (53.6%) were granted loans between ₦1,000 – ₦20,000 while 25% enjoyed between ₦20,001 - ₦30,000 and 14.3% were granted above ₦40,000. The modal amount of loan granted in both state ranged between ₦10,001 and ₦20,000. This is low because of the lending policies and procedure of the selected commercial banks. These policies and procedure can be described under the eligibility criteria for borrowing.

Table 1. Socio-Economic Characteristics of the Respondents

Characteristics	Odb	Odnb	Ekb	Eknb	Total frequency	Percentage (%)
Gender						
Male	30	35	22	20	107	89.2
Female	2	5	2	4	13	10.8
Age						
≤ 29	-	1	-	1	2	1.7
30 – 39	6	10	2	7	25	20.8
40 – 49	9	6	8	7	30	25
50 – 59	16	14	13	4	47	39.2
≥ 60	1	9	1	5	16	13.3
Level of Education						
No formal Education	1	12	2	4	19	15.8
Primary Education	16	16	13	12	57	47.5
Secondary Education	6	5	4	2	17	14.2
Tertiary Education	9	7	5	6	27	22.5
Marital Status						
Single	-	1	-	1	2	1.7
Married	31	38	22	20	111	92.5
Widowed	-	1	1	2	4	3.3
Divorced	1	-	1	1	3	2.5
Household Size						
1 – 5	8	15	6	7	36	30
6 – 10	23	22	17	16	78	65
11 – 15	1	2	1	1	5	4.2
16 – 20	-	1	-	-	1	0.8
Amount of Loan Granted						
$\leq 10,000$	5	-	2	-	7	12.5
10,001 – 20,000	15	-	8	-	23	41.1
20,001 – 30,000	6	-	8	-	14	25
30,001 – 40,000	3	-	1	-	4	7.1
40,001 – 50,000	2	-	1	-	3	5.4
> 50,000	1	-	4	-	5	8.9

Source: Field Survey, 2015

Table 2. Ordinary least square estimate of the production function for farmers in Ondo and Ekiti states

Variables	Ondo Beneficiary	Ondo Non- Beneficiary	Ekiti Beneficiary	Ekiti Non-Beneficiary
Constant	6.8668*	8.6816*	4.5833	1.8493
	(3.064)	(3.183)	(1.407)	(1.101)
Age of farmers (X_1)	-0.5952	-0.8353	-1.3025*	0.2382*
	(-1.022)	(-1.742)	(-2.135)	(0,663)
Farming Experience (X_2)	0.2091	0.1582	0.3163	-0.0647
	(1.459)	(1.008)	(1.614)	(-0.569)
Farm size (X_3)	0.2082*	0.1953*	-0.1065	-0.0121
	(2.186)	(2.001)	(-0.303)	(-0.106)
Labour Cost (X_4)	0.1564	0.0696	0.8037*	0.1593
	(0.900)	(0.293)	(3.307)	(1.262)
Other Cost (X_5)	0.4464*	0.4617*	0.3793*	0.6794*
	(5.315)	(2.985)	(2,099)	(4,420)
Amount of Loan (X_6)	0.0066	NA	-0.0063	NA
	(0.062)		(-0.039)	
R^2	0.799	0.668	0.793	0.788
R^{-2}	0.630	0.512	0.629	0.620
F	13.633*	8.374*	9.024*	10.781*
S.E	0.427	0.571	0.465	0.337

Source: Computed from field data, 2015
Significant at 5% level
Figure in parenthesis are t-ratios

Eligibility Criteria for Borrowing

The eligibility criteria for obtaining Agricultural credit from the selected banks are discussed under the following headings:

- The applicant
- The application
- The project
- Acceptable security for loans

- **The Applicant**

The applicant must be resident in Nigeria and physically fit to carry out agricultural activities. He must be able either by training and / or experience to manage the agricultural project or must be in a position to provide adequate entrepreneurship. The agricultural credit facility beneficiaries of the selected banks include:

- Individual farmers

- Recognized farmers cooperative societies and farmers association
- State governments and parastatals
- Sole proprietors
- Partnership
- Limited liability companies
- Government owned agricultural organization

(b) The Application

An applicant's is expected to obtain and complete three copies of Agricultural Credit Guarantee Scheme Fund (ACGSF) application form. He then backs this up with written application addressed to the manager of the bank where he operates an account. The applicant is also require to submit 2 copies of detailed feasibility study of the project clearly stating the following:

- The purpose of the loan
- Method of production
- Expected yields
- Estimated cost and returns
- Financial analysis which include; cash flow, profit and loss as well as balance sheet statements
- Marketing of farm product
- Applicant's stake in the project
- Management structure
- Proposed repayment plan

but carried a negative sign for the Ekiti beneficiary. This variable (amount of loan) was not significant at 5% level for both states. Table 3 reveals that Ep Age of farmers: The elasticity of production with respect to Age of farmers was estimated to be negative among ODB, ODNB and EKB which implies that as farmers grow old their productivity decreases, but a decreasing positive returns to the factor among EKNB indicates that as the farmers grow old, their productivity increases at a decreasing rate because majority of them were still young and active.

Ep Farming experience: The elasticity of production with respect to farming experience was a decreasing positive function among ODB, ODNB and EKB. This implies that farming experience was being optimally utilized among those groups. It was negative for EKNB which means that the farmers farming experience was not being properly harnessed especially in the supervision of their farms.

Ep Farm size: The elasticity of production with respect to farm size was a decreasing positive function to the factor in Ondo State and negative in Ekiti State. This implies that while the farmers I Ondo State were making efficient use of land, the Ekiti farmers engaged in over utilization of the factor.

Ep Labour cost: The elasticity of production with respect to labour cost was decreasing positive function to labour for all farms indicating that all the farms were operating in the rational zone of production with respect to labour and it was efficiently utilized that is $0 < Ep\ labour < 1$

Table 3. Elasticity of Production (Ep) and Returns to Scale (RTS)

Farms	Age of Farmers (X_1)	Farming Experience (X_2)	Farm Size (X_3)	Labour Cost (X_4)	Other Cost (X_5)	Amount of Loan (X_6)	RTS
Ondo Beneficiary	-0.5938	0.2684	0.2574	0.1631	0.4657	0.0068	0.4332
Ondo Non-Beneficiary	-0.8511	0.1547	0.1875	0.0978	0.4625	-	0.0468
Ekiti Beneficiary	-1.2413	0.3189	-0.1172	0.8375	0.3688	-0.0065	0.087
Ekiti Non-Beneficiary	0.2267	-0.0672	-0.0143	0.1581	0.6871	-	1.0023

Source: Computed from field data, 2015

Gross Margin/ha of Beneficiaries and Non-Beneficiaries in Ondo and Ekiti States

Category of farmer	Farm Size (Ha)	Revenue (₦)	Total Variable Cost (₦)	Gross Margin (₦)	Gross Margin/Ha (₦)
ODB	2.71	79,131.44	28,501.15	50,630.29	18,682.76
ODNB	1.818	88,378.13	28,751.62	59,626.51	32,797.86
EKB	1.901	108,275.53	58,381.22	49,894.31	26,246.35
EKNB	1.661	45,655.72	29,216.82	16,438.9	9,896.99

Source: Computed from field data 2015

Table 2. reveals that the age of all categories of farmers had a negative sign except for the Ekiti non-beneficiary which carries a positive sign. This variable was significant at 5% level for Ekiti beneficiary only. Farming experience conformed to "a prior" expectation for all categories of farmers except for the Ekiti non-beneficiary which carried a negative sign. The coefficient was not significant at 5% level for all the categories. Labour cost was positive for all categories of farmer which conformed to "a prior" expectation but significant at 5% level for the Ekiti beneficiary and other cost also positive for all farmers which was in conformity with "a prior" expectation, it was significant for all categories of farmers. The coefficient of loan amount was positive for the Ondo beneficiary which was in line with a "prior" expectation

Ep Other costs: The elasticity of production with respect to other costs was a decreasing positive function for all the farmers. This was an indication that other costs were being efficiently controlled.

Ep Amount of loan: Among the ODB, the elasticity of production with respect to loan amount had a decreasing positive returns which implies that the loans were being rationally utilized while it was negative for the EKB farmers which indicates that the loans were not efficiently managed.

This could be due to fund diversion into other business activities in the State.

(b) Return to Scale

The study revealed that the returns to scale for the ODB was 0.4 which implies that the farmers were in the rational zone of production and were technically efficient. The return to scale for the EKB was estimated at about 0.1 which indicates that the farmers were technically efficient. It was also discovered from the study that the ODNB had a returns to scale of about 0.05. This implies that the farmers were almost at the boundary between stage II and III hence they should not adjust production any longer as they were already technically efficient. The return to scale for the EKNB was about 1.0 which implies constant returns to scale. This is the boundary between stages I and II of production. This is an irrational production Zone. Hence input use, once started, should be continued until stage II is attained where productivity of such input would reach its peak. The implication of the RTS for the ODB, ODNB and EKB is that input allocation and utilization and output production were technically efficient and were in stage II of the production function while the EKNB were technically inefficient. The average gross margin per hectare for ODB and ODNB were ₦18,682.76 and ₦32,797.86 respectively which show that food crop production was profitable among Ondo State farmers. The Ondo State Non-Beneficiaries made higher gross margin because majority of them enjoyed other credit sources outside the banking sector. The EKB made higher gross margin per hectare (₦26,246.35) than the EKNB who made an average of ₦9,896.99.

Conclusion / Recommendation

Agriculture and agribusiness hold the future for meaningful development in Africa.

- However the low level of in-flow of funds to the agricultural sector is insufficient. Efforts at boosting in-flow of funds into agriculture and agribusiness require active involvement of government and the private sector.
- Government agencies must address infrastructural challenges which constrain productivity of agribusinesses.
- Government agencies obviously do not have any business in retail credit to farmers while private lending institutions must adopt innovative approaches to address risks associated with agricultural lending.
- The lending policies and procedure of commercial bank should be flexible to accommodate more farmers.

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