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Loan Size and Its Determinants as Critical Growth Factors for Rural Farmers in Imo State, Southeast Nigeria

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Research Article

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ABSTRACT

This study analyzed the loan demand requirements of rural staple and poultry farmers in Owerri Agricultural Zone of Imo State, Nigeria. Also, the factors affecting loan size were analyzed. In carrying out this cross-sectional study, data were collected with stratified sampling technique, using structured and pre-tested questionnaires from 100 loan beneficiaries and five financial institutions in the zone. The study lasted for a period of six months, effective April, 2010. Expect value method was used to determine their optimum loan requirement while OLS multiple regression analysis technique was employed in determining factors affecting loan size of beneficiaries. Results showed that the potent factors affecting loan size were farm size, level of education, enterprise type, farmers experience and dependency ratio. The result further indicated that the respondents were highly limited by capital as the financial institutions met only 60% of their capital needs. The optimum loan requirement determined for the farmers were 4292, 315, and 4435, 753 for Cassava and Yam farmers respectively, for farm size of 0.80 hectare. For poultry farmers of about 120 birds, the optimum loan requirement estimated was N492, 500. These figures would serve as reference points for financial institutions in loan administration of farmers of similar status and area. The financial institutions were admonished to consider providing start-up capital for the youths and fresh graduates, who apparently are yet to make in-road into farming as a business. On the other hand, government was urged to provide fiscal and monetary incentives to financial institutions supporting agriculture in view of the delicate nature of farm business.

Keyword: Loan size and its determinants; farmers; Imo state.

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1. INTRODUCTION

Agriculture is the main source of food, fiber/raw materials for industry and employment in Nigeria. The rural sector remains the only major base of agricultural production contributing over 80% of Nigeria's food crops and livestock under unfavourable conditions. It forms a greater part of the overall national population (60-70%) and has been described as a neglected and stagnant sector of the Nigerian economy (Olatunbosun, 1975; Anthonia, 1980). Notwithstanding the fact that Nigeria is a major global crude oil producer and exporter, agriculture contributes 41.25% of GDP in 2005 (CBN, 2005). Available statistics showed that between 2001 and 2005, it contributed to agriculture, at unit market prices (USD Billion) 63.1, 66.0, 78.3, 87.4 and 113.1, respectively of the GDP (Nwajuba, 2008).

These suggest that agriculture is the life wire of the nation's economy, especially in respect to food security. In spite of this, tonnes of food worth billions of dollars are imported into the country, year-in year-out. Part of the problem is that agricultural production is essentially subsistence. This, perhaps, may require radical changes that could introduce commercial thinking into agricultural production, especially the staple food crops. By staple crops are meant those food crops consumed by the populace as they contribute to the nutritional status, well-being and cultural life of millions of people, examples include; cassava, rice, yam, and maize to mention a few.

Apart from the subsistence nature of these rural farmers, they are also faced with multitudes of problems, which decelerate their ability to transform into improved and commercial farming. The problems include, the challenges of land use and procurement, high cost of quality inputs, lack of storage facilities, poor transportation and infrastructural facilities, low literacy level, information asymmetry and poor credit delivery system, to mention but a few. Among these problems, credit is a front burner and critical as it can be used to resolve to a large extent the other problems. Primarily, it assists in breaking the chains of the vicious circles of poverty, which is the main cause of low productivity and low income of the rural farmers. Unfortunately, the level of credit available to these farmers is grossly inadequate and therefore limits the realization of their full potentials. Access to formal financial services by the majority of the rural farmers is highly limited. The CBN (2005) noted that the formal financial system provides services to about 35% of the economically active population while the remaining 65% are excluded from access to financial services. These 65% are often served by the informal sector, through NGO-MFIs, friends, relatives, credit unions. This financial gap has been partly attributed to the inadequacy in the distribution of formal institutions. Peter (2001) in his study, elicit that Nigeria is under banked with one branch to 60,000 persons. This is unsatisfactory, when compared with the distribution of banks in other countries like United Kingdom where the ratio is 1:3,500 persons, USA 1:4,000 persons and India 1:30,000 persons (Reo, 1997).

Furthermore, there are indications of problems relating to timing, conditions and size where loans are made available to the farmers. Less than optimum size of the loans and some of the afore-mentioned problems are largely responsible for series of repayment problems characteristic of the rural farmers.

It is therefore in this regard, that this study examined and analyzed the optimum loan size, determinants of loan size and the socio-economic characteristics of selected rural staple crop and poultry farmers. This is in order to address both the financial gap of the farmers and the knowledge gap of the financial institutions.

2. RESEARCH METHODOLOGY

2.1 Study Area

The study was carried out in Imo State, located in Southeast states of Nigeria. The state is made up of three agricultural zones, namely; Okigwe, Orlu and Owerri. Owerri Agricultural Zone was purposively selected out of the three zones because of the huge agricultural potentials in terms of manpower, rich agricultural land and favourable climatic conditions among others. The zone is made up of 11 Local Government Areas out of 27LGAs. The population is about 1,480,853, which is about 38% of the total population of 3,934,899 of the state (NPC, 2006). The major crops grown in this area include yam, cassava, cocoyam, vegetable crops and the tree crops planted include; Iroko, cashew, orange, mango, pear, banana and plantain. The livestock kept include; sheep, goats, poultry and pigs. The rainfall of the zone ranges between 1900mm to 2200mm annually, while the annual mean temperature is 20°C, the relative humidity is about 75% annually, the high temperatures, rainfall and humidity favour luxuriant plant growth. The zone is located between Latitude 4 45' and 7°25' North of the equator and Longitude 6°5' and 7°25' east of the meridian

2.2 Sample and Sampling Procedures

The sampling technique used was the stratified random method. The 11 LGAs in the zone were stratified into four sub-zones, namely:

- Owerri sub-zone (Owerri North, Owerri West, Owerri Municipal and Ngor Okpala axis)
- Mbaise sub-zone (Aboh, Ahiazu and Ezinihitte axis)
- Ikeduru and Mbaitolu sub-zone and
- Egbema/Ohaji/Oguta sub zone.

The basis for the grouping was socio-cultural affinity.

From each sub-zone, five communities were purposively chosen based on intensity of agricultural activities. Furthermore, from each community five farmers, who are loan beneficiaries were randomly selected, thus, giving a total of 100 farmers. The list of the farmers from these communities was obtained from the extension agents in the LGAs and the Nigerian Agricultural, Co-operative and Rural Development Bank (NACRDB) Limited (now known as Bank of Agriculture). This constituted the sample frame. Similarly, data were collected from five financial institutions, namely; Nigerian Agricultural and Co-operative Bank Ltd, Supervised Agricultural Credit Scheme, two Commercial Banks and a Co-operative Society.

2.3 Data Collection

Primary and secondary data were collected for the study. The primary data were collected with structured and pre-tested questionnaires. The secondary data were collected from journals, textbooks and other published materials.

2.4 Data Analysis

The data collected were analyzed using simple statistical tools such as percentages, means and frequency distribution tables. Also, a multiple regression analysis was used to establish the relationship between the regressor/dependent variable (loan size) and the regressand/independent or diagnostic variables. The econometric model employed is implicitly specified as follows:

=	$F \; (X_{1,} X_{2,} X_{3}, X_{4,} X_{5,} X_{6,} X_{7,} X_{8,} X_{9,} e)$
=	Loan size (\)
=	Farm size (hectare or No. of birds)
=	Level of education (No. of years spent in school)
=	Enterprise Type/Riskiness due to pests and diseases (Likert Scale Method:
	Largely risky = 1, Intermediate risk = 2, Minor risk = 3)
=	Type of financial institution (Likert Scale Method: Informal = 1, Semi
	Formal = 2, and Formal = 3
=	Farmers experience (No. of years)
=	Dependency ratio (Proportion of children to total house hold size)
=	Type of technology employed (Dummy: traditional= 0, and
	Improved technology = 1)
=	Age of farmers (No. of years)
=	error term

In estimating the OLS (Ordinary Least Square) multiple regression model, four forms used were; linear, semi log, double log and exponential. Although the linear functional form is adjudged the most appropriate for financial functions, other functional forms were tried. The selection of the lead equation was based on the combination of the aforementioned and the highest R^2 (Coefficient of Multiple Determination) and F-values and apriori considerations.

In estimating optimum loan size various methods can be used. These include, discount measures, cost route approach in combination with break-even point and margin of safety. However, in this analysis, use was made of expect value method, involving proportions (Olufo-kumbi Banwo, 1981). This method is commonly used for experienced farmers who can easily estimate the credit requirement of their operations. The highlight of this method involves;

- Calculate expect value of credit of the loan beneficiaries (by multiplying percentage of respondents by mid-point of credit class and thereafter, a summation of the values)
- Then, multiply the expect value with the inverse of respondents reported percentage credit met.

2.5 A Prior Expectation

Loan size was hypothesized to be directly related to farm size, level of education, farmer's experience, type of technology used, type of financial institution and age but inversely related to enterprise type and dependency ratio.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics

The main occupation of the respondents was farming. Of the 100 respondents, 80% were predominantly yam and cassava based farmers while 20% were poultry farmers. The mean age of the farmers was 50 years. However, the mean age of poultry farmers was 41 years. This suggested that the farmers were of middle age bracket and were still energetic and enterprising. About 40% of the farmers spent six years in school, 22% spent between 7 and 12 years, and 10% spent 12 years and above in school. Twenty eight percent did not attend formal education at all. This suggested that education was still a problem and adoption of new technology and methods may not be satisfactory. Although, this scenario appeared brighter than similar studies in the southeast geo-political zones (Henri-Ukoha et al., 2011; Nwosu et al., 2010). The implication was that farmers can make reasonable estimate of their inputs and credit requirements. The reported experience was in tandem with similar study (Nwosu et al., 2010)

On gender, 65% of the respondents who were mainly loan beneficiaries were male while 35% were female. This suggested that males are still the main beneficiaries of credit programmes in Nigeria. This is consistent with the assertion that women have limited access to critical farm resources such as credit, farmland and improved inputs partly as a result of cultural and traditional considerations (Tanko, 1994). Unfortunately, rural women are responsible in producing 60-80% of food in most developing countries (FAO, 2004).

The mean farm size of crop farmers was 0.80 hectare while the mean stock of poultry farmers was 120 birds. The farm size of crop farmers in Imo State was lower than most other southeast state because of the small landmass of the state. This varied with the mean farm size of two hectares in the sister state of Abia (Ukoha et al., 2011).

The mean family size of the respondents was eight, which is above the recommended six (four children and their parents) by the National Population Commission (NPC, 2006).

3.2 Financial Requirements of the Survey Farmers

3.2.1 Distribution of borrowed funds

Loan size has been identified as one of the potent factors affecting farmer's income and repayment rate by many studies (Onyeagocha et al., 2007).

It has therefore become compelling to analyze loan size and its optimum level; for farmers/loan beneficiaries. Table 1 is the distribution of borrowed funds among the survey farmers/loan beneficiaries. It showed that 2% of the respondents borrowed funds from the lowest class $0 - \frac{1}{4}50$, 000 as well as from the upper loan class of $\frac{1}{4}01$, 000 - $\frac{1}{4}50$, 000. Majority (30%) of the survey farmers borrowed about $\frac{1}{4}226$, 000. The expect values for cassava, yam and poultry farmers were; $\frac{1}{2}18,188$, $\frac{1}{2}16,452$ and $\frac{1}{2}25,500$ respectively as shown in appropriate distributions of borrowed funds – Tables 2, 3 and 4.

3.2.2 Percentage of credit

About 75% of the survey farmers reported that about 60% of their credit needs were met. This suggested that capital was an important limiting factor in their operations and as such their profitability, efficiency and repayment capacity may have been adversely affected.

3.2.3 Estimated credit need of the farmers

Following Olufokumbi (1981) approach, the optimum credit need of the farmers can be calculated as follows:

Optimum Credit Need of the survey farmers (N)	=	= Total Expect Value (Table 1, summation of Column 5)		Inverse of reported credit need met
	=	₩226, 990 X 100 (Tota	al cre	dit required)
		60 (Total	cred	it met)
	=	N 378, 317		
Decomposing the figure for the v	variou	s enterprises, the result is	s as f	ollows:
Cassava Farmer:				
Optimum farmer's credit need =	(⁻ 0 =	₩175, 389 Table 2, summation f Column. 5) ₩292, 315	х	<u>100</u> 60
Yam Farmer:				
Optimum farmer's credit need =		N261, 452 (Table 3, summation of Column 5)	х	<u>100</u> 60
-	=	N 435, 753		
Poultry farmer:				
Optimum farmer's credit need =	:	N 295, 500 (Table 4: summation of col. 5) N4 92, 500	Х	1 <u>00</u> 60

These estimates can serve as guide or reference points to commercial banks and financial institutions interested in credit or loan administration to farmers of similar status and farm size of about 0.80 hectare or 120 birds as to the optimal amount they would consider. In other words, for a one hectare farm, a cassava farmer would require N449, 716 and a yam

farmer 4670, 390. In credit administration, the project owner is expected to contribute about 25% of the required fund requirements. This can be factored in across the board.

As to reasons why the loan beneficiaries' credits needs were not met, 70% opined that they were not able to meet the conditions for qualifying for bigger or investment loans, which require collateral securities in form of properties.

Amount Borrowed (Credit) (N) (1)	No. of Respondent	% of Respondent	Midpoint of credit (4)	Expect Value of Credit
(0.000) (0) (0)	(2)	(3)		(col. 3 x col. 4) (5)
0-50,000	2	2	25,000	500
51,000-100,000	4	4	75,500	3,020
101,000-150,000	11	11	125,500	13,805
151,000-200,000	18	18	175,500	31,590
201,000-250,000	30	30	225,500	67,650
251,500-300,000	15	15	275,500	41,325
301,000-350,000	14	14	325,500	45,570
351,000-400,000	4	4	375,500	45,570
401,000-450,000	2	2	425,500	8,510
451,000-500,000	-	-	475,500	-
	100	100		226,990

Table 1. Distribution of borrowed funds among survey farmers/loan beneficiaries

Source: Field data, 2010

Amount Borrowed (Credit) (N) (1)	No. of Respondent (2)	% of Cassava Respondent (3)	Midpoint of credit (4)	Expect Value of Credit (col. 3 x col 4) (5)
0-50,000	2	4.2	25,000	1,500
51,000-100,000	3	6.3	75,500	4,766
101,000-150,000	10	20.8	125,500	26,104
151,000-200,000	12	25.0	175,500	43,875
201,000-250,000	20	41.6	225,500	93,808
251,500-300,000	1	2.1	275,500	5,786
301,000-350,000	-	-	325,500	-
351,000-400,000	-	-	375,500	-
401,000-450,000	-	-	425,500	-
451,000-500,000	-	-	475,500	-
	48	100		175,389

Source: Field data, 2010

Amount Borrowed (N)	No. of Respondent (2)	% of Yam Respondent (3) (Credit) (N) (1)	Mid point of credit (4)	Expect Value of Credit (col. 3 x col. 4) (5)
0-50,000	-	-	25,000	-
51,000-100,000	1	3.1	75,500	2,341
101,000-150,000	1	3.1	125,500	125,500
151,000-200,000	4	12.5	175,500	21,938
201,000-250,000	6	18.8	225,500	42,394
251,500-300,000	10	31.3	275,500	86,232
301,000-350,000	8	25.0	325,500	81,375
351,000-400,000	2	6.2	375,500	23,281
401,000-450,000	-	-	425,500	-
451,000-500,000	-	-	475,500	-
	32	100		261,452
Source: Field data 2010				

Table 3. Distribution of borrowed funds among Yam farmers' loan beneficiaries

Source: Field data, 2010

Table 4. Distribution of borrowed funds among	Poultry farmers'	loan beneficiaries
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Amount Borrowed (N)	No. of Respondent (2)	% of Poultry Respondent (3) (Credit) (N) (1)	Mid point of credit (4)	Expect Value of Credit (col. 3 x col 4) (5)
0-50,000	-	-	25,000	-
51,000-100,000	-	-	75,500	-
101,000-150,000	-	-	125,500	-
151,000-200,000	2	10	175,500	17,550
201,000-250,000	4	20	225,500	45,100
251,500-300,000	4	20	275,500	55,100
301,000-350,000	6	30	325,500	97,650
351,000-400,000	2	10	375,500	37,550
401,000-450,000	2	10	425,500	42,550
451,000-500,000	-	-	475,500	-
	20	100		295,500

Source: Field data, 2010

3.3 Factors Affecting Loan Size

As outlined in the methodology the linear functional form was chosen among three other functional forms because it was adjudged most appropriate for a financial function. In any case, it also showed the highest number of significant variables (five out eight variables) and R^2 of 0.7543. The later suggested that about 75% of the difference in loan size was as a result of variation in the diagnostic variables. The remaining 25% was as a result of excluded variables and error considerations. The five significant variables at 5% LOS were; farm size, level of education, enterprise type, farmers' experience and dependency ratio (Table 5).

3.3.1 Farm size

Farm Size has been identified as a potent factor in several studies involving financial functions relating to farmer's income, repayment rate, etc, (Henri-Ukoha et al., 2011; Onyeagocha et al., 2007).

This is expected and is in consonance with the apriori expectation, which stipulated a direct relationship with loan size, since larger farms will also require larger resources.

3.3.2 Level of education

The level of education was among the significant factor at 5% LOS and positively signed as hypothesized. This suggested that as level of education improved the beneficiaries also improved ability to read and write and in the process, improved dexterity in farming, which concomitantly improve information procurement, profit and the capacity to increase the level of funding.

3.3.3 Enterprise type/Riskiness due to pests and deceases

Farming is replete with more risks and uncertainties than many other economic activities and in addition requires gestation period. This variable estimated the level of riskiness using Likert Scale Method. An inverse relationship was specified in the apriori between enterprise type and loan size and this was supported by the result as the parameters were negatively signed.

3.3.4 Farmers' experience

The coefficient of experience was positive and significant at 5% LOS. This suggested that the years of experience in farming was a potent factor in considering the amount of loan given to the beneficiaries. This was because experience provided the compass with which the farmer navigated the turmoil business environment and was a veritable tool. The result supported the hypothesis, and as stated earlier the mean experience of the respondents was 16 years. The finding was also supported by the study on credit by small-holders farmers (Onyenweaku and Ohajianya, 2003).

3.3.5 Dependency ratio

This is the proportion of children to total household size. The parameter was significant at 5% LOS and inversely related to loan size as was hypothesized. One of the 6C's of the principles of credit – capability, measures the extent of dependency of the would-be beneficiary among other considerations (Onyeagocha, 2001).

In the past, children contributed quite a lot in subsistence farming. However, with emphasis on education in the present dispensation, their contribution is minimal to family income, though in the short run. Since education is a long-term investment, the denial of family labour of children could be of immense benefit to the family in the long run.

Variables	Linear form	Semi-log form	Double-log form	Exponential form
X ₁ Farm size	16.0227	2.7712	0.2116	0.0086
	(3.8513)*	(0.9875)	(3.0014)	(2.7112)
X ₂ Level of Education	15.9122	1.5714	0.0844	0.0071
	(2.6372)*	(0.97110)	(2.7561)	(1.0580)
X ₃ Enterprise Type/Risky (Pests and diseases)	3.8213	2.5874	0.0824	0.0045
	(1.8217)*	(1.2012)	(1.0548)	(1.1548)
X ₄ Type of Financial Institution	-0.0612	-5.1002	-1.4730	-0.0060
	(-0.7997)	(-1.2120)	(-1.5960)	(-1.1689)
X ₅ Farmer's Experience	12.0318	2.5704	0.0528	0.0037
	(2.9272)*	(11.1227)	(1.0511)	(2.6429)
X ₆ Dependants ratio Proportion of children to Household size)	-10.4494 (-3.3368)*	-0.9287 (-3.0045)	-0.0497 (-1.3218)	-0.0801 (-1.0501)
X ₇ Type of Technology	9.1163	2.9217	0.0794	0.0017
	(1.3804)	(1.0528)	(1.0214)	(1.1339)
X ₈ Age	2.1394	6.4935	1.4427	0.0082
	(3.3928)	(2.6227)	(11.1400)	(1.4347)
Constant	34.9433	9.4884	8.2211	16.7011
R ²	0.7543	0.3947	0.5012	0.3100
F-value	10.0884	6.5034	5.7818	3.7001
N	100	100	100	100

Table 5. Multiple regression result on factors influencing loan size of the respondents

Source: Field data, 2010

The linear equation can generally be represented thus:

Y ₁	=	34.9433 + 16.0227 X ₁ + 15.9122X ₂
		(3.8513*) (2.6372*)
		$-0.0612X_3 + 3.8213X_4 + 12.0318X_5$
		(2.9272*)
		- 10.4494X ₆ + 9.1163X ₇ + 2.1394X ₈ + 4.0068
		(-3.3368*)

R² = 0.7543; F-Value = 10.0884; * 5% LOS

4. CONCLUSION AND RECOMMENDATIONS

The survey farmers in Owerri Agricultural Zone of Imo State were small-scale farmers and of middle age bracket. They were substantially experienced in farming but with fragile and weak educational background. The youths especially graduates, were yet to make in-road into farming as a business. This was partly attributed to lack of seed capital to kick-start the business. Generally, capital was found to be a limiting factor as only 60% of the working capital need was met. The financial institutions especially commercial banks were found to be hesitant in granting loans to farmers because of their perceived riskiness of farming. Even

when loans were granted the timing and magnitude of the loans were problematic and optimally unsatisfactory, for proper growth.

Five factors found to be critical in securing optimal loans size were farm size, level of education, enterprise type, farmer's experience and dependency ratio.

Based on the findings of this study, the following recommendations are proffered:

There is the need to inject fresh graduates and youths into farming as a business. This will infuse vitality, awareness, innovativeness, skills, and improve the level of funding of farming and above all reduce the rural-urban migration of the youths an associated socio-economic problems. The National Directorate for Employment (NDE) Youth and Graduate Employment (GE) Programme strategy- designed would have served the purpose but it is replete with various political and administrative problems. A modified design filled with incentives and start-up capital would be of immense help in this dispensation.

Further, to ensure increased level of farming activities, there is need for financial institutions to grant optimal funding to the farmers. In this regard, the optimum short term facilities recommended to financial institutions for farmers of similar status, especially in terms of size (0.80 hectare / 120 birds) are as follows:

i.	For Cassava farmers	-	N 449, 716 (1 hectare)
ii.	For yam farmers	-	N670, 390 (1 hectare)
iii.	For poultry farmer	-	N 492, 500 (120 birds)

These estimates can be indexed with rate of inflation, which as of July, 2011 was 12.5%, in order to make necessary adjustments for possible inflammatory pressures. Furthermore, it has became vitally important that financial institution involved in loan operations should provide start-up capital and device means of minimizing the bureaucratic process involved in loan administration, so as to ensure timely disbursement. This is to avoid late disbursement, which could lead to loan diversion after the critical farm operations have been completed. To minimize diversion, credit institutions are also advised to disburse at least one-third of the credit in kind in the form of improved inputs at a competitive price from reputable sources.

It is important for government to note that farming is a complex venture, per se. Unlike other businesses, given good management and capital, success is half-way assured. Farming unlike other businesses, is a high-risk venture subject to the vagaries of weather, incidence of pests, diseases as well as natural disasters (e.g. erosion, flooding). It therefore becomes important as a matter of social responsibility for the government to assist in softening the ground for these institutions through both monetary and fiscal measures, without necessarily using deregulation as a subterfuge, as always the case with Nigeria. It is of little benefit reiterating the financial repression (Deregulation) theory of Cameron et al. (1972), Mikinnon (1973) and Shawn (1973) supporting deregulation or those of opposing views of Stiglitz and Weiss (1981) and Neo-structuralist namely, Taylor (1983) and Van Wijnbergeer (1982). It is only discrete to note that food security should be accorded the same priority as defense as it is capable of triggering off internal and external disequilibria in terms of price fluctuation, balance of payment deficits resulting from huge importation bills, risk of hunger, malnutrition, social and political upheavals or conflicts. To restore normalcy and material losses encountered in such situation could require doubling the budgetary provisions on military defense.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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