

## **Demand For Financial Capital By Smallholder Food Crop Farmers And Disbursement Decisions of Financial Institutions In South-East Nigeria**

**Okon Xavier-Itam .A<sup>1</sup>, Orebiyi J.S<sup>2</sup>, Ohajianya D.O<sup>3</sup>, Ibekwe U.C<sup>4</sup>, Ugwu J.N<sup>5</sup>, Tim-Ashama .A<sup>6</sup>**

1: Development finance Department, Central Bank of Nigeria Headquarters,  
Abuja

2,3,4: Department of Agricultural Economics, Federal University of Technology  
Owerri, Nigeria

5: Department of Agricultural Economics and Extension, Enugu State University of  
Science and Technology, Enugu State, Nigeria

6: Department of Agricultural Science, Alvan Ikoku Federal College of Education  
Owerri, Nigeria

### **Abstract**

*This study analyzed demand for financial capital by smallholder food crop farmers and disbursement decisions of financial institutions in Southeast Nigeria. The specific objectives of the study were to; determine the demand for financial capital by smallholder food crop farmers, determine the factors affecting the smallholder food crop farmers' demand for financial capital, and determine factors influencing the financial capital disbursement decisions of the financial institutions with respect to smallholder food crop farmers. Data were collected with validated questionnaire from 360 randomly selected smallholder food crop farmers and 36 purposively selected financial institutions from the three sampled states of South-East Nigeria. Data were analyzed using descriptive statistics, multiple regression techniques, multinomial logit model, and Analysis of variance model. Results showed that mean amount of credit demanded by smallholder food crop farmers was ₦508,426.39. There were no significant differences in the small holder food crop farmers' demand for financial capital in the states of South-East Nigeria. Factors affecting small holder food crop farmers' demand for financial capital were age, education level, farming experience, farm size, annual farm income, annual estimated farm expenditure, level of awareness of financial capital sources, grace period and farmers' loan transaction cost. The study equally found that farmers' sex, education level, farming experience, farm size, possession of collateral, dependency ratio, and farm household's networth were important in the financial capital disbursement decisions of financial institutions to smallholder food crop farmers. Demand for financial capital by smallholder food crop farmers was relatively high. Policies that will strengthen farmers' capacity to exhibit effective demand for financial capital such as targeted capacity building programmes, credit and farm output price guarantees should be pursued by government.*

**Keywords: Demand, Financial Capital, Smallholder farmer, Disbursement, Financial Institutions**

## INTRODUCTION

Agriculture is the single largest contributor to the well-being of the rural poor, sustaining 90% and 70% of the rural and total labour force respectively (International Fund for Agricultural Development (IFAD,) 2009).

Access to production inputs and improved technologies by small holder food crop farmers is considerably conditioned by financial capital (Nwaru, 2004; Sharma, 2012). The demand for financial capital by small holder food crop farmers could be viewed as their willingness and ability to obtain farming capital (Odoemenem and Asogwa, 2010; Rahji & Adenti, 2010).

For the small holder food crop farmers, the temporal and spatial dynamics of financial capital is mostly captured by interactions of demand for and supply of financial capital in the financial market and the risk orientation reflected in disbursement decisions and volume of financing from financial institutions over time (Okorie, 2005). However, the amount of financial capital demanded by smallholder food crop farmers and their determinants as well as the determinants of disbursement decisions of the financial institutions have not been determined in South East Nigeria, thereby leaving a gap in literature which is a cause for concern to researchers. The focus of this study was to determine the demand for financial capital to food crop farmers and its determinants, and determine factors influencing the financial capital disbursement decisions of the financial institutions to small holder food crop farmers in South-East Nigeria.

It was hypothesized that there are no significant differences in the small holder food crop framers demand for financial capital in the states of South-East Nigeria, and the financial capital disbursement decision of the financial institutions with respect to small holder food crop farmers in South-East Nigeria is positively and significantly related to sex, farmer's marital status, education level, farming experience, farm size, farm insurance, possession of collateral, borrowing frequency, farm household's net worth, and agricultural commercialization level; and negatively and significantly related to farmer's age, dependency ratio and weather effects.

## **MATERIALS AND METHODS**

The study was conducted in South-East Nigeria. The South-East Nigeria lies between latitudes 4° and 7° N and longitudes 6° and 9° East. It has a total land mass of 10,952, 400 ha and spread over a total of 78, 612 Km<sup>2</sup> representing 8.5% of the country's total land area (Okoye et al, 2010). It comprises five states; Abia, Anambra, Enugu, Ebonyi and Imo States. The inhabitants of south-East Nigeria are Ibos with farming as the major occupation of the rural population.

The South-East Nigeria is dominated by plains less than 200m above sea level. The three major land forms are plains and lowlands, cuesta landscapes and the eastern highlands. The climate is typically equatorial with distinct dry and rainy seasons. The mean annual rainfall varies from 1500mm in the northern fringes of Enugu and Ebonyi States to over 200mm in the Southern areas of Anambra, Imo and Abia States. Three distinct vegetation types found in the area are; the humid forest, derived Savana and semimontane. The major soil types in the area are fluvisol, regosol, arenosol, ferrisols and acrisols. Farm holdings are smaller due to high population density. Yam, cassava and rice are the dominant food crops. It also produces 80% of the national cocoyam and contributes about 27% of Nigeria total fish production. Livestock production is dominated by small ruminants (Imo State ADP, 2012). There are various sources of financial capital in the area that fund small holder food crops production and other farming enterprises.

### **Sample Selection**

A multi-stage sampling technique was used to select a representative sample. In the first stage, three out of the five states of the South-East Nigeria were purposively selected based on having relatively higher amounts of financial capital inflow into agriculture as provided in the CBN annual reports and NBS records over the last five years. At the second stage, two agricultural zones per state were randomly selected giving a total of six agricultural zones. In the third stage, two Local Government Areas (LGAs) were randomly selected from each agricultural zone giving a total of 12 LGAs. In the fourth stage, three communities were randomly selected giving a total of 36 communities. In the fifth and last stages, 10 food crops farmers were randomly selected from each community giving a sample size of 360 food crops farmers for the study. The sampling frame was the list of 890 food crops farmers that demanded for capital from the financial capital sources in their states

compiled with the assistance of credit officers of the financial institutions and extension agents in the selected communities.

The financial institutions where the food crops farmers demanded for capital were also sampled. Three financial institutions were purposively selected from each LGA giving a total of 36 financial institutions for the study. The purposive selection of the financial institution was based on the institutions that more food crops farmers demanded farm capital from in the selected LGAs.

### Data Collection

Data were collected from primary sources. Primary data were collected with structured and validated questionnaire alongside personal observations. Data were collected on variables such as, amount of capital demanded, determinants of amount of financial capital demanded and factors influencing the decision of financial institutions to disburse capital to food crops farmers.

### Data Analysis

Qualitative as well as quantitative analytical techniques were used for the analyses of the data. Simple descriptive statistics such as mean, percentages were used as well as other statistical and econometric tools such as Analysis of variance, ordinary least squares multiple regression techniques, and multinomial logit model.

The multiple regression model to determine the factors affecting amount of capital demanded by small holder food crop farmers is implicitly specified as follows;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, e) \dots \dots \dots (1)$$

Where,

Y = Amount of capital demanded by food crops farmers (₦)

X<sub>1</sub> = Age of the farmer (years)

X<sub>2</sub> = Level of education (No. of years spent in school).

X<sub>3</sub> = Farming Experience (years)

X<sub>4</sub> = Farm size (Hectares)

X<sub>5</sub> = Annual farm income (₦)

$X_6$  = Annual estimated farm expenditure (₹)

$X_7$  = Extension contact (Number of visits)

$X_8$  = Membership of Co-operative society (dummy variable,  
1 for membership, zero for non-membership)

$X_9$  = Level of awareness of financial capital sourcing (Dummy variable, not  
aware = 0, aware = 1)

$X_{10}$  = Grace period for loan repayment (number of months)

$X_{11}$  = Farmer's loan transaction cost (₹)

$X_{12}$  = Amount of loanable funds per borrower (₹)

$e$  = error term

It is expected *a priori* that the coefficients of  $X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{12} > 0$ ;  $X_1, X_{11} < 0$ . Four functional forms of the model; linear, semi-log, double-log and exponential were fitted so as to determine the lead equation based on the functional form that produced the highest value of the coefficient of multiple determination, highest number of significant variables and conformed to *a priori* expectations.

The multinomial logit model was used to express the probability of small holder farmer being in a particular category. The model is predicted on the utility derivable by the financial institution. The financial institutions are assumed to be seeking to maximize their utility in the disbursement of the financial capital to the potential small holder farmers.

A utility function is therefore assumed to exist for the financial institutions. Arising from this, is an implicit preference function in respect of the total financial capital available. The financial institutions are assumed to be rational in their capital disbursements and the utilities accruing to them are additive. The financial institutions' decision to capital disbursement is characterized as a polychotomous choice between three mutually exclusive alternatives.

Let  $U_{ij}$  denote the utility that the financial institutions derive by choosing one of the three outcomes and  $U_{ij} = \beta_j X_{ij} + e_{ij}$

Where  $y_j$  varies and  $X_{ij}$  remains constant across alternatives, and  $e_{ij}$  is a random error term reflecting intrinsically random choice behaviour, measurement or specification error and unobserved attributes of the alternative outcomes.

Let also  $P_{ij}$  ( $j = 0, 1, 2$ ) denote the probability associated with the three choices, with  $j = 0$  if the borrower is fully rejected,  $j = 1$  if the borrower is partially satisfied, and  $j = 2$  if the borrower is fully accommodated by the financial institution.

The multinomial logit model (Babcock et al, 1995) is given by;

$$P_{ij} = \frac{\exp(y_j X_{ij})}{3} \dots\dots (2)$$

$$1 + \sum_{j=1}^3 \exp(y_j X_{ij}) \text{ for } j = 1, 2, 3$$

$P_{ij}$  is the probability of being in each of the groups 1 and 2.

$$P_{i0} = \frac{1}{3} \frac{1}{1 + \sum_{j=1}^3 \exp(y_j X_{ij})} \dots\dots(3)$$

$P_{i0}$  is the probability of being in the reference group or group O. In practice, when estimating the coefficients of the reference group are normalized to zero (Maddala, 1990; Ohajianya, 2004; Maddala, 2003, Greene, 1993, Kimhi, 1994). This is because the probabilities for all the choices must sum up to unity (Greene, 1993). Hence, for 3 choices only  $(3 - 1)$  distinct sets of parameters can be identified and estimated.

The natural logarithms of the odd ratio of equations (2) and (3) give the estimating equation (Greene, 1993) as,

$$\ln \left( \frac{P_{ij}}{P_{i0}} \right) = y_j X_{ij} \dots(4)$$

$I = 1, 2, \dots 10$

This denotes the relative probability of each group 1 and 2 to the probability of the reference group. The estimated coefficients for each choice therefore reflect the effects of  $X_i$ 's on the likelihood of the financial institution, choosing that alternative to the reference group.

The explanatory variables,  $X_i$  are;

$X_1$  = Age of the farmer (years)

$X_2$  = Sex (Dummy variable, male = 1, female = 0)

$X_3$  = Marital status (Dummy variable, married = 1 otherwise = 0)

$X_4$  = Level of education (No. of years spent in school)

$X_5$  = Farming experience (years)

$X_6$  = Farm size (Hectares)

$X_7$  = Farm insurance (Dummy variable, yes = 1, No = 0)

$X_8$  = Possession of collateral (Dummy variable, Yes = 1, No = 0)

$X_9$  = Borrowing frequency (Number of times)

$X_{10}$  = Dependency ratio (number of dependents to those working in the household).

$X_{11}$  = Farm household net worth (the sum of gross income, remittances and domestic assets) (₦)

$X_{12}$  = level of agricultural commercialization (percentage of production value sold)

$X_{13}$  = Adverse weather effects (Dummy variables, Yes = 1, No = 0)

$e$  = error term

The *a priori* estimates of the coefficients  $b_3, b_4, b_5, b_6, b_7, b_8, b_9, b_{11}$  and  $b_{12} > 0$ , while  $b_1, b_{10}$ , and  $b_{13} < 0$ . The coefficient estimate  $b_2 < 0$  or  $b_2 > 0$ , i.e., indeterminate because, from the view point of the financial institution, the small holder farmers' gender status could determine disbursement decision in either direction. On the one hand, as a male, possibility of being in control of economic resources, having higher mobility, participating in different meetings and exposure to information (Yehuala, 2008) could imply higher ability to repay, hence commanding a more favourable disbursement decision. On the other hand, female farmers are known to be better credit risks compared to males, as they tend to be more reliable, have better loan management and higher repayment rates, hence could attract a better disbursement decision (Adegbite, 2009; Ojiako & Ogbukwa, 2012; Idoga, 2013).

The first hypothesis stated that, there are no significant differences in the small holder food crops farmers demand for financial capital in the five states of Southeastern Nigeria.

To test this hypothesis, the Analysis of Variance (ANOVA) model was employed. The ANOVA model is mathematically specified as follows (Pedhazur, 1999).

$$F = \frac{MSSB}{MSSW} = \frac{SSB / (n - k)}{SSW / (k - 1)}$$

$$SSB = \sum_{j=1}^k n_j (\bar{X}_j - \bar{X})^2$$

$$SSW = \sum_{j=1}^k \sum_{i=1}^{n_j} (X_{ij} - \bar{X}_j)^2$$

Where,

F = Value by which the statistical significance of the mean differences was judged.

SSB = Sum of squared deviations between the small holder food crops farmers demand for financial capital in the five states of South-East Nigeria.

SSW = Sum of squared deviations within the small holder food crops farmers demand for financial capital in the five states of South-East Nigeria.

$\bar{X}_j$  = Mean demand of financial capital by the small holder food crops farmers from state j.

$\bar{X}$  = Grand mean demand of financial capital by the small holder food crops farmers from the five states of Southeastern Nigeria.

$\bar{X}_{ij}$  = ith demand of financial capital by the small holder food crops farmers from state j.

$n_j$  = Sample size of small holder food crops farmers from state j.

n = Number of small holder food crops farmers in the



five states of South-East Nigeria.

$K$  = Number of States of South-East Nigeria.

$n - k$  = Degree of freedom for the denominator

$k - I$  = Degree of freedom for the numerator

#### **Decision Rule:**

If  $F_{cal} > F_{tab}$ , reject  $H_0$ ; and if otherwise, accept  $H_0$ .

To test the second hypothesis, the results of multinomial logit regression analysis were used. The multinomial logit regression analysis produced t-ratios which were compared with the tabulated t-ratios at specified alpha level and degree of freedom to test the hypothesis.

## **RESULTS AND DISCUSSION**

### **Demand for Financial Capital by Smallholder Food crop farmers**

Table 1 shows that smallholder food crop farmers in Southeast Nigeria demanded for loan amount of N481000 – N640000 from the financial institutions, while 22.5%, 18.9% and 11.9% of them demanded for loan amounts of N321000 – N480000, N641000 – N800000, and N801000 – N960000 respectively from the financial institutions. Only 6.1% of the farmers in southeast Nigeria demanded for N961000 and above, while only 3.6% of them demanded for not more than N160000 from the financial institutions. The mean amount of credit demanded by the small holder food crop farmers in Southeast Nigeria from financial institutions was N508,426.39 which implies that the demand for credit from financial institutions by smallholder food crop famers in southeast Nigeria was high considering the fact that they are smallholder farmers cultivating less than 4 hectares.

Results also show that when the data were disaggregated, 35% and 30.9% of the smallholder food crop farmers in Abia state and Ebonyi state demanded loan amounts of N481000 – N640000 respectively, while 25% of smallholder food crop farmers in Imo state demanded loan amounts of N32100 – N480000.

Table 1 Distribution of smallholder food crop farmers by amount of credit demanded in the selected three states of Southeast Nigeria

Amount of credit demanded (₦'000)	Abia state		Ebonyi state		Imo state		Pooled Sample	
	Freq	%	Freq	%	Freq	%	Freq	%
≤ 160	4	3.3	7	5.8	2	1.7	13	3.6
161 – 320	9	7.5	10	8.3	9	7.5	28	7.8
321 – 480	20	16.7	31	25.8	30	25.0	81	22.5
481 – 640	42	35.0	37	30.9	26	21.7	105	29.2
641 – 800	25	20.8	15	15.5	28	23.2	68	18.9
801 – 960	14	11.7	12	10.0	17	14.2	43	11.9
961 and above	6	5.0	8	6.7	8	6.7	22	6.1
Total	120	100	120	100	120	100	360	100
Mean	₦587,008.33		₦543,170.83		₦597,858.33		₦508,426.39	

Source: Field survey Data, 2014



The mean amount of credit demanded by smallholder food crop farmers from financial institutions were ₦587,008.33, ₦543,170.83, and ₦597, 858.33 in Abia, Ebonyi and Imo states respectively.

This result implies that the demand for credit from financial institutions by smallholder food crop farmers was relatively high, but was higher in Imo State followed by Abia state. This could be because the farmers need more capital to hire labour which is very costly in Imo state due to out migration of the youth for search of white kola jobs or for businesses, and to pay land rent which is also high due to population pressure on land leading to land fragmentation into small uneconomic units.

To test for the hypothesis which stated that there are no significant differences in the smallholder food crop farmer's demand for financial capital in the states of South east Nigeria, analysis of variance test was conducted and the results of ANOVA test are presented in Table 2. The table shows that the ANOVA test produced an F-value of 1.39 which was not significant at the 5% level of probability when compared with the critical F-value of 2.99 at 0.05 level at  $v_1 = 2$ ,  $v_2 = 357$  degrees of freedom.

Therefore, the hypothesis was accepted since there were no significant differences in the small holder food crop farmers' demand for financial capital in the sates of southeast Nigeria.

Table 2 Results of Analysis of Variance for test of significant differences in the smallholder food crop farmer's demand for financial capital in the states of southeast Nigeria

Sources of Variance	Sum of Squares (SS)	Degrees of freedom (dt)	Mean square (MS)	F-value
Between Amount of credit demanded	730942	2	365471	1.39 <sup>ns</sup>
Within amount of Credit demanded	94083769	357	263539.9	
Total	94814711	359		

F.05,  $v_1 = 2$ ,  $v_2 = 357 = 2.99$

ns = F –calculated value not significant at 5% level

Source: Field survey Data, 2014

## **Factors Affecting Smallholder Food Crop Farmers' Demand for Financial Capital**

The factors affecting smallholder food crop farmers' demand for financial capital were determined using the ordinary least squares multiple regression techniques fitted in four functional forms of linear, semi-log, double-log, and exponential. The results of the four functional forms are presented in Table 3. The results show that the exponential function emerged as the lead equation having produced the highest value of coefficient of multiple determination ( $R^2$ ), highest number of significant variables, and conformed to a priori expectations. The value of  $R^2$  was 0.7928, which implies that about 79% of the variation in smallholder food crop farmers' demand for financial capital was accounted for by the joint action of the independent variables included in the multiple regression model.

The test of significance of  $R^2$  produced F-value of 121.0493 which was significant at 1% level, indicating that the exponential function had a good fit to the data generated.

Table 3 Results of four Functional forms of Multiple Regression analysis on factors affecting smallholder food crop farmers' demand for financial capital

Explanatory Variable And Important Statistics	Functional Forms			
	Linear	Semi-log	Double-log	Exponential
Constant	397.036	341.607	210.092	193.253
Age ( $x_1$ )	-14.374 (-1.638)	-3.916 (-1.703)	-0.063 (-2.415)*	-0.009 (-3.102)**
Education level ( $x_2$ )	12.893 (3.699)**	4.902 (2.523)*	0.092 (3.116)**	0.007 (2.912)**
Farming Experience ( $x_3$ )	16.948 (3.213)**	3.064 (1.892)	0.087 (2.713)**	0.004 (3.015)**
Farm size ( $x_4$ )	11.087 (48.17)**	2.338 (3.166)**	0.059 (2.881)**	0.008 (2.716)**
Annual Farm Income ( $x_5$ )	13.136 (1.394)	4.511 (1.287)	0.088 (2.551)*	0.005 (2.522)*
Annual Estimated farm expenditure ( $x_6$ )	10.44 (1.871)	3.609 (1.384)	0.074 (1.664)	0.008 (2.493)*
Extension contact ( $x_7$ )	12.083 (1.492)	1.587 (1.304)	0.049 (1.513)	0.007 (1.613)
Membership of cooperative ( $x_8$ )	10.338 (1.771)	2.009 (1.492)	0.068 (1.813)	0.005 (1.704)



Level of awareness of financial

Capital sources ( $x_9$ )	13.813 (1.913)	3.284 (1.528)	0.057 (2.514)*	0.009 (2.536)*
Grace period ( $x_{10}$ )	14.887 (1.882)	4.366 (1.347)	0.069 (1.841)	0.006 (2.544)
Farmers' loan transaction costs( $x_{11}$ )	-12.679 (-2.538)*	-2.502 (-2.413)*	-0.078 (-3.116)**	-0.009 (-3.048)**
$R^2$	0.5126	0.4723	0.6434	0.7928
F-value	33.2857**	28.6242**	57.3440**	121.0493**

Figures in parentheses are t-ratios, \* and \*\* mean significance at 5% and 1% levels respectively



The results of the exponential function were therefore used for discussion. Results show that the coefficients of age ( $x_1$ ), education level ( $x_2$ ), farming experience ( $x_3$ ), farm size ( $x_4$ ), and farmers' loan transaction cost ( $x_{11}$ ) were significant at 0.01 level, while the coefficients of annual farm income ( $x_5$ ), annual estimated farm expenditure ( $x_6$ ), level of awareness of financial capital sources ( $x_9$ ), and grace period ( $x_{10}$ ) were significant at 0.05 level, which implies that these significant variables are the factors affecting the smallholder food crop farmers' demand for financial capital in Southeast Nigeria.

The coefficients of extension contact ( $x_7$ ), and membership of cooperative ( $x_8$ ) were not significant at 0.05 level, which implies that these non-significant variables are not factors affecting the smallholder food crop farmers' demand for financial capital in southeast Nigeria.

The coefficient of age ( $x_1$ ) was negative and significant, implying that as a farmer gets older, his demand for financial capital decreases. This could be because the farmer would no longer be very active to embark on the cultivation of large acreage that requires more financial capital.

The coefficient of education level ( $x_2$ ) was positive and significant, which implies that farmers' demand for credit increases with increase in level of education. This could be because the more educated a farmer is, the more his awareness of credit sources and the more he explores avenues for farm investment. The awareness of credit sources and the knowledge of profitable investment outlets necessitates demand for more financial capital.

The coefficient for farming experience ( $x_3$ ) was positive and significant, which implies that the more experienced a farmer becomes, the more he discovers other profitable agricultural ventures to invest in, and since he cannot adequately fund the farm business, the need for more financial capital arises.

The coefficient of farm size ( $x_4$ ) was positive and significant, which implies that increase in the farm size cultivated necessitate demand for more financial capital to meet the requirements for labour, production inputs and maintenance inputs in the production of food crops.

The coefficient of annual farm income ( $x_5$ ) was positive and significant, implying that increase in annual farm income leads to increase in demand for financial capital. This finding implies that smallholder food crop farmers who have higher annual farm incomes explore other avenues for farm investment which at the long run requires additional capital which they cannot adequately provide, thereby necessitating demand for financial capital.

The coefficient of annual estimated farm expenditure ( $x_6$ ) was positive and significant, which implies that as the annual estimated farm expenditure increases, the demand for financial capital by the smallholder food crop farmers increases so as to meet the requirements of purchased inputs, and hired labour.

The coefficient of level of awareness of financial capital sources ( $x_9$ ) was positive and significant, which implies that as the farmers' level of awareness of financial capital sources increase, the demand for financial capital increases so as to utilize the various sources of financial capital. The coefficient of grace period ( $x_{10}$ ) was positive and significant, which implies that as the grace period for loan repayment increases the demand for financial capital also increases. This is so because longer grace period allows enough time for farm investments to mature, thus allowing for sufficient inflow of farm income. This could be an incentive to request for and secure more financial capital for farm investment. The coefficient of farmers' loan transaction costs ( $x_{11}$ ) was negative and significant. This finding suggests that high loan transaction cost decreases farmers' demand for financial capital.

### **Factors Influencing the Financial Capital disbursement decisions of the financial institutions to smallholder food crop farmers**

The factors that influence the choice of financial institutions in southeast Nigeria to disburse financial capital to smallholder food crop farmers as demanded by the farmers, less than demanded by the farmers or not to disburse loan at all to the farmer in multinomial logit model estimate are shown in Table 4. The table indicates that the chi-square value of 76.319 and log-likelihood ratio of  $-169.037$  which are significantly different from zero at a  $P < 0.001$  critical level confirms that the estimated multinomial logit model displayed a good fit to the data generated and that the inclusion of the 13 explanatory variables jointly and significantly explained the financial institutions choice in the model.



Table 4 Results of Multinomial logit regression analysis of factors influencing the financial capital disbursement decisions of financial institutions to smallholder food crop farmers

Explanatory variable	Disbursements were as demanded by Farmers		Disbursements were less than farmers' demands		No Loan was disbursed to the farmers	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant	11.039	3.506	13.826	2.916**	14.668	3.557**
Age (x <sub>1</sub> )	-0.208	-1.637	-0.317	-1.805	-0.215	-1.503
sex(x <sub>2</sub> )	0.319	1.825	0.0408	2.513*	0.337	1.679
Marital status (x <sub>3</sub> )	0.403	1.664	0.337	1.667	0.506	1.812
Education level (x <sub>4</sub> )	1.168	3.561**	1.873	3.184**	0.817	3.511**
Farming experience (x <sub>5</sub> )	1.229	2.803**	1.513	3.795**	1.304	1.016
Farm size (x <sub>6</sub> )	1.487	1.897	1.896	2.802**	0.902	1.759
Farm insurance (x <sub>7</sub> )	0.613	1.349	0.415	1.713	0.664	1.802
Possession of collateral (x <sub>8</sub> )	0.382	3.152**	0.152	2.649**	0.529	3.003**
Borrowing frequency (x <sub>9</sub> )	0.165	1.887	0.303	1.841	0.672	1.596
Dependency ratio (x <sub>10</sub> )	-0.334	-2.492*	-1.619	-2.538*	-0.813	-1.783
Farm household's net worth (x <sub>11</sub> )	0.493	1.684	0.802	2.407*	0.712	1.946
Agricultural commercialization level (x <sub>12</sub> )	0.385	1.902	0.416	1.816	0.586	1.847

weather effects on loan						
disbursement ( $x_{13}$ )	-0.186	1.785	-0.367	-1.772	-0.412	-1.992
Chi – square	76.319					
Log-likelihood Ratio	-169.037					
Pseudo $R^2$	0.392					
Observation	360					

\*Significant at 0.05 level

\*\*Significant at 0.01 level

Source: Summarized from computer output, 2014



Table 4 shows that the multinomial logit model results for financial institutions decisions to disburse less than the farmer demanded was better than the other two results on disbursements were as demanded by farmers and no loan was disbursed at all. The coefficient for sex ( $x_2$ ) was positive and significant at 5% for only the financial institutions decision to disburse less than the farmer demanded. This finding implies that financial institutions in their decision to disburse part of the amount demanded by the farmers favour the male farmers more than their female counterparts. The coefficient of education level ( $x_4$ ) was significant at 0.01 level and positive across the different choices of financial institutions. This implies that smallholder food crop farmers that have higher levels of education are considered for financial capital disbursement more than farmers with poor level of education.

The coefficients for farming experience ( $x_5$ ) were positive and significant at 0.01 level for financial institutions decisions on disbursements were as demanded by farmers, and disbursements were less than farmers loan demands, which implies that financial institutions disburse more financial capital to farmers that acquired more farming experience.

The coefficient of farm size ( $x_6$ ) was positive and significant at 0.01 level for only the financial institutions decision to disburse less than the farmers demanded. This implies that financial institutions disburse more financial capital to farmers that cultivate larger acreage of farmland.

The coefficients of possession of collateral ( $x_8$ ) were positive and significant at 0.01 level across the different choices by financial institutions, which implies that food crop farmers that possess collateral are considered for financial capital than farmers that do not possess collateral for financial capital acquisition. The coefficients of dependency ratio ( $x_{10}$ ) were negative and significant at 0.05 level for the financial institutions choices or decisions to disburse as demanded by farmers or to disburse less than demanded by farmers. This finding implies that the higher the dependency ratio of farmer, the lower the amount of financial capital disbursed to him by the financial institution.

The coefficient of farm household's network (XII) was positive and significant as 0.05 level for only financial institutions choice to disburse less than the farmer demanded. This finding implies that small holder food crop farmers that have higher network are favoured more by financial institutions in disbursements of financial capital.

To test the hypothesis which stated that, the financial capital disbursement decision of the financial institutions with respect to the smallholder food crop farmers in southeast Nigeria is positively and significantly related to farmer's marital status, education level, farming experience, farm insurance, possession of collateral, borrowing frequency, farm household's network and agricultural commercialization level; and negatively and significantly related to farmer's age and dependency ratio, the results of multinomial logit regression analysis (Table 4) were used. The table shows that out of the three decision choices of financial institutions on financial capital disbursement to smallholder food crop farmers, the second decision choice which was that disbursements were less than farmer's demand emerged with the highest number of significant variables and therefore was used for discussion.

The coefficients of education level ( $x_4$ ), farming experience ( $x_5$ ), farm size ( $x_6$ ), and possession of collateral ( $x_8$ ), were positive and significant at 0.01 level, while the coefficient of sex ( $x_2$ ), and farm household's network ( $x_{11}$ ), were positive and significant at 0.05 level. Also, the coefficient of dependency ratio ( $x_{10}$ ), was negative and significant at 0.05 level. the hypothesis was therefore accepted with respect to these variables. The coefficients of marital status ( $x_3$ ), farm insurance ( $x_7$ ), borrowing frequency ( $x_9$ ), and agricultural commercialization level ( $x_{12}$ ), were positive and not significant at 0.05 level, while the coefficients of age ( $x_1$ ), and weather effects on loan disbursement ( $x_{13}$ ), were negative and not significant at 0.05 level. The hypothesis was therefore rejected with respect to these variables.

## 5.2 Conclusion and Recommendations

This study analyzed demand for financial capital by small holder food crop farmers and disbursement decisions of financial institutions in South-East Nigeria. The mean amount of financial capital demanded by small holder food crop farmers from financial institutions in South-East Nigeria was ₦508,426.39 and this was considered

relatively high regarding that they are smallholder farmers cultivating less than 4 hectares.

Smallholder food crop farmers' demand for financial capital were determined by age, education level, farming experience, farm size, annual farm income, annual estimated farm expenditure, level of awareness of financial capital sources, grace period and farmers' loan transaction costs.

Various factors were found to influence credit demand. These factors should be adequately considered in making policies aimed at improving credit demand by farmers.

Policies that will strengthen the capacity of small holder famers to exhibit effective demand for financial capital such as targeted capacity building programmes, credit and farm output price guarantees should be pursued by government at all levels to reduce constraints to this demand.

There is need for the disbursement decisions of financial institutions to learn towards cash-flow based lending and other methodologies that will strengthen the capacity of farmers to absorb available loanable funds. Banks can assist farmers have access to markets through vertical linkages to the bank's agro-processing or wholesale customers and lend through these off takers to assure the farmers of certain income, thereby increasing their borrowing capacity.

## REFERENCES

- Adegbite, D.A (2009). Repayment performance of beneficiaries of Ogun State Agricultural and Multipurpose credit Agency (OSAMCA) in Ogun State, Nigeria (2004-2007). *American Eurasian Journal of Sustainable Agriculture*, 3(1):117-125.
- Greene, W.H (1993). *Econometric Analysis* (2<sup>nd</sup> ed) New York. Macmilan publishing Company. Vol. 72 (5) 1151 – 1157.
- Idoge, D.E (2013). Regionalizing loan repayment capacity of small holder cooperative farmers in Nigeria: exploring South-South Nigeria. *Journal of Biology, Agriculture and Healthcare*, 3(7): 176 – 183.

- Imo State Agricultural Development Project (2012). Information Bulletin, No. 89, Pp. 9-13.
- International Fund for Agricultural Development (IFAD) (2009). Small holder agriculture and food security in the 21<sup>st</sup> century. Proceedings of the Governing council round tables in conjunction with the thirty-second session of IFAD's Governing Council, February Rome.
- Kimhi, A (1994). "Participation of Farm Owners and Off-farm work including the Option of full-time off-farm work". *Journal of Agricultural Economics*, 45(2). Pp. 232 – 239.
- Maddala, G.S. (2003). "Limited Dependent and Qualitative Variables in Economics". Cambridge University Press.
- Maddala, G.S. (1990). "Limited Department and Qualitative Variables in Econometrics. Cambridge University Press, Cambridge.
- Odoemenam, I.U. and Asogwa, B.C. (2010). Capital Resource use and Allocation in Cereal Crop Enterprise: Empirical Evidence from the Cereal crop Farmers of Benue State, Nigeria. *Journal of Social Sciences*, 23(20): 91 – 97.
- Ohajianya, D.O. (2004). Socioeconomic Determinants of Multiple Uses of Water for Irrigation in Kaduna State, Nigeria. *Journal of Modeling and Simulation techniques in Enterprises. AMSE France*. Vol. 25, No. 1 Pp. 67-77.
- Ojiako I.A and Ogbukwa B.C (2012). Economic analysis of loan repayment capacity of small holder cooperative farmers in Yewa North Local Government Area of Ogun State. *African Journal of Agricultural Research*, 7(13): 2051 – 2062.
- Okorie, N.U. (2005). "Farmers Participation in Micro-Credit Facilities in Akwa Ibom and Abia State". An Unpublished M.Sc Thesis, Department of Agric. Ext. and Rural Sociology, MOUA Umudike, Abia State, Nigeria. Pp. 15 – 16.
- Okoye, B.C., Onyenweaku, C.E. and Asumugha, G.N. (2010). Allocative Efficiency of Small-Holder Cocoyam Farmers in Anambra State, Nigeria. *The Nigerian Agricultural Journal*. Vol. 38, Pp. 70 – 81.

Pedhazur, E.J (1999). Multiple regression in behavioural research (3<sup>rd</sup> ed) Orlando, Florida:  
Holt, Reinhart and Winston, Inc.

Rhaji M.A.Y and Adenti A.I (2001). Determinants of agricultural credit rationing by  
commercial banks in South-Western, Nigeria *International Research Journal of  
Finance and Economics* 37, Pp. 7-14

Yehuala, S (2008). Determinants of smallholder farmers access to formal credit: the case of  
Metema Woreda, North Gondar, Ethiopia M.Sc Thesis, Haramaya University  
Ethiopia.

