



British Journal of Economics, Management & Trade
3(4): 453-467, 2013

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Repayment Performance among Cassava and Yam Farmers under Nigerian Agricultural Bank Smallholder Loan Scheme in Cross River State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Research Article

Received 24th May 2013
Accepted 8th July 2013
Published 30th July 2013

ABSTRACT

This study analyzed credit worthiness and loan repayment performance of cassava and yam farmers in cross river state. Specifically, the study assessed credit worthiness of borrowers, identified factors that discriminate between credit worthy and non credit worthy farmers and analyzed factors that influence the farmers' ability to loan repayment. Purposive and multistage random techniques were used in selecting respondents from which primary data were collected using questionnaires. A total of 150 crop farmers were used in the study. Method of data analysis utilized were means, frequencies, percentages, discriminant analysis and the multiple regression analysis. The results revealed that only 56% of the respondents were creditworthy. Also, farmers with better educational level, larger farm sizes, longer years of farming, proper loan supervision, and low total operating expenditure to income ratio were credit worthy farmers. While farmers with lower loan to asset ratio were said to be non credit worthy. The results of the linear regression model showed that farmers with higher educational level, larger loan amount, and adequate supervision repaid their loans more. An increase in these variables increased their repayment ability. While farmers with longer years of farming, and those whose loans were disbursed late repaid less of their loans. An increase in these variables decreased their repayment ability. The study recommended that more supervision should be exercised on loan beneficiaries to encourage prompt repayment of loan. The bank should

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consider those with higher level of educational if complete repayment is to be achieved.

Keywords: Loan; repayment; credit worthiness; performance; bank.

1. INTRODUCTION

Agriculture has traditionally been acknowledged as the mainstay of the Nigerian economy. The primary place it occupies in providing food and fibre for the people has made it the most single factor in influencing the standard of living of many people in developing countries, particularly Nigeria, [1,2,3]. In terms of employment, agriculture is by far the most important sector in the Nigerian economy because it engages nearly 70 percent of the labour force [4,5,6]. Its performance in the development process in the 1960s was very commendable. According to [7], the sector accounted for well over 80 percent of the export earnings and about 50 percent of government revenue during this period. Unfortunately, over the years, the sector has witnessed tremendous decline in its contribution to the national output as explicated on Table 1 which presents the contribution of the Nigerian agricultural sector to the gross domestic product (GDP) of Nigeria between 1960 and 2009.

Table 1. Agricultural share of the GDP from 1960 – 2009

Year	Average % contribution. To total GDP
1960 – 1962	62.5
1963 – 1965	57.8
1966 – 1968	54.6
1969 – 1971	47.2
1972 – 1974	34.7
1975 - 1977	24.6
1978 -1980	21.8
1981 – 1983	32.1
1984 -1986	39.8
1987 – 1989	37.1
1990 -1992	30.0
1993 -1995	34.9
1996 -1998	34.4
1999-2001	31.7
2002 -2004	41.8
2005 -2007	32.5
2008 -2009	30.9

Source: Central Bank of Nigeria Statistical Bulletin, December, 2009

Specifically, from the table, it can be seen that the contribution of the agricultural sector to the GDP of Nigeria was 62.5 per cent on the average between 1960 - 1962. This contribution declined to 21.8 per cent between 1978 and 1980, and then fluctuated between 30.0 per cent and 31.7 per cent over the 1990-92 and 1999-2001 periods respectively. However, in the 2002-2004 period, the contribution to GDP increased to 41.8 per cent and then declined consistently to 30.9 per cent in the 2008-2009 period. It is widely believed that the civil war (which took place between 1967 and 1970) and the emergence of petroleum economy in the early 1970's, among other things had scuttled the production foundation of agriculture [4]. Several efforts have been made by successive governments to reverse the trend. Some of

which include; the introduction of the national accelerated food production project (NAFPP) in 1970, operation feed the nation (OFN) in 1976, the rural banking scheme in 2002, and Nigeria agricultural cooperative and rural development bank (NACRDB) in 2002, amongst others. Of all these efforts, government had attached more importance to provision of financial services to the agricultural sector. This is evident in the merging of risk assets of the family economic advancement programme (FEAP), people's bank of Nigeria (PBN) and the Nigeria agricultural cooperative bank in 2002 to become an integrated banking system called the Nigerian agricultural cooperative and rural development bank (NACRDB) [2].

The history of agricultural credit administration in many parts of Nigeria has not been impressive when evaluated on the basis of their repayment performance. The NACRDB, one of the formal government financial institutions, playing active role in extending credit to the agricultural sector, is faced with the nagging problem of ensuring credit effectiveness in sociological set up where government properties and financial assistance are erroneously considered as booties. The institution has been threatened by high rate of default arising mainly from poor management procedures, poor loan utilization and reluctance to repay loans, [8,9]. The problem of high incidence of default (poor repayment rate) seems to be one common feature of NACRDB loans. Studies on loan repayment performance of NACB/NACRDB borrowers by, [10] in Oyo and Ondo and [11] in Ibadan have shown high default rate of up to 48.75 per cent. In Cross River State, default rates of 18.9 and 46.2 percent have been alleged in 2004 and 2008 for crops subsector during these periods [12]. For loans to be repaid credit worthiness of the borrowers is important.

Past approaches on appraising previous loan projects, focus on analyzing repayment from implementation records. Little is, however, known about repayment from the producer's point of view. Hence it is essential to identify and incorporate the relevant producers' characteristics and determine repayment ability from producers' perspective. This will enable the lending institution to have an insight into the means of reducing the error of granting loans to those who may not be able to repay and also identify those variables that discriminate between farmers. Thus, a perspective on the means of reducing the error of judgment by lenders in selecting capable borrowers can be gained by incorporating relevant socioeconomic variables of the farmers.

Consequently, this study is an attempt to assess credit worthiness of the borrowers, analyse factors that discriminate between credit worthy and non credit worthy farmers and analyse the factors that influence loan repayment. The remainder of the paper is structured as follows. Section ii which is next presents and describes the theoretical issues, while section iii represents the methodology, describing the data and analytical technique. Section iv presents the results and discussion. Finally section v concludes the paper and provides some recommendations.

2. THEORETICAL ISSUES

This work is based on the theory of capital accumulation. The crucial role of capital in economic growth and development process has been recognized since the pre-Keynesian era when the classical ideology monopolized economic thinking and policy formulation. Without doubt, every nation in the world still lays tremendous emphasis on capital accumulation by stressing the need for raising the level of investment in relation to output. This emphasis is traceable to the short-term fiscal policies and national development plans of both the developed and the developing economies over the past four decades [13]. In fact the development of the industrialized countries can be said to be as a result of the heavy

capital investment, financed mostly from capital accumulation. Rapid and sustainable real economic growth is a necessary condition for economic development. This would also imply that for growth to occur in the developing nations there is the need for relatively stable macroeconomic environments which are indicators for low risks and conditions for attracting investment and boosting entrepreneurial activities.

From the standpoint of development economists, it is generally believed that capital accumulation is the springboard for the escape of low level equilibrium trap involving a vicious cycle of poverty, [14]. According to [15], the vicious cycles of poverty in under developed countries can be broken through capital accumulation. Due to low levels of income in these countries, demand, production and investment are deficient. This has resulted in the deficiency of capital goods which can only be removed by capital accumulation. It is capital formation that leads to utilization of available resources. Thus, capital accumulation leads to increase in the size of the national output, income and employment thereby solving the problems of inflation and balance of payments, and making the economy free from the burden of foreign debts.

3. METHODOLOGIES

3.1 Data

Purposive and multistage random sampling techniques were used in the study. In the first stage all the four branches of the NACRDB in the state were studied. These branches are located in Calabar Municipality, Akamkpa, Obubra and Ogoja Local Government Areas. In the second stage a list of all crop farmer borrowers in the years 2008 and 2009 were obtained from each branch of the bank. From the list, purposive sampling technique was used to select farmers whose loans were due. This list constitutes the sampling frame. There were three hundred crop farmer borrowers whose loans were due, (Calabar Municipality 170, Akamkpa 40, Obubra 40, and Ogoja 50). In the third stage Fifty percent of the crop farmer borrowers whose loans were due, were randomly selected using the lottery method from each of the four locations to obtain one hundred and fifty (150) crop farmers used in the study. The respondents were drawn in proportion to size. Structured questionnaire was used to elicit information from the respondents. Data analysis involved the use of mean, frequencies, percentages, discriminant analysis and the multiple regression analysis.

3.2 Analytical Technique

The discriminant analysis was used to classify the farmers into two mutually exclusive and exhaustive categories. Using the loan repayment value as a basis, loan beneficiaries were classified into two groups. Group one consisted of farmers who had not completed payment of the loan borrowed, whereas group two consisted of farmers who had repaid all on or before the due dates [9]. Farmers in group two were assumed to be relatively credit worthy while those in group one were assumed to be relatively non-credit worthy.

The model is presented implicitly as

$$D_1 = b_0 + b_1 Z_{1i} + b_2 Z_{2i} + \dots + b_n Z_{ni} - \infty \tag{1}$$

$$Z_i = X_{ij} - \bar{x} \tag{2}$$

Where Z_i = the i^{th} individual's discriminant score or the contribution of each independent variables to the total discriminant score (D_i).

- D_i =Total discriminant score
- X_{ij} =The i^{th} individual value of the J^{th} independent variable.
- b_{ij} =The discriminant coefficient for the j^{th} variable
- \bar{X} =Mean value of the independent variables.
- ∞ =Standard deviation of the independent variables.

Let each individual score Z_i , be a function of the independent variables; that is $Z_i = b_0 + b_1 X_{i1} + b_2 X_{i2} + \dots + b_n X_{ni}$ [9].

Classification procedure is as follows if $Z_i \geq Z_{\text{crit}}$ classify individual i as belonging to group two (credit worthy farmers) and if $Z_i < Z_{\text{crit}}$, classify individual i as belonging to group one (Non credit worthy farmers).

The classification boundary is the locus of points where

$$b_0 + b_1 X_{i1} + b_2 X_{i2} + \dots + b_n X_{ni} = Z_{\text{crit}} \tag{3}$$

The variables used in the discriminant analysis were;

- Age =age of the farmer in years
- FX = Farmer Supervision (number of times the farmers were supervised by the loan agents)
- Sex = 1 for female, 0 for male
- ED =Educational level (number of years of schooling)
- FE =Farming experience (number of years of farming)
- DS =Distance between home and source of loan (km)
- FS =Farm size (in hectares)
- LAR =Loan-Asset Ratio (loan divided by farm asset of the farmer in naira)
- OER =Total operating expenditure- income ratio. (Total operating expenditure divided by income i.e. farm income in naira)

The multiple regression analysis was used to determine factors that influence loan repayment among farmer borrowers. Using the ordinary least squares estimates in estimating the regression model, four functional forms namely the linear, semi-log, double-log and exponential were tried out and the one that gave the best fit was chosen.

This model was implicitly stated as;

$$Y_1 = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, U) \tag{4}$$

Where:

- Y_1 =Amount of loan repaid per farmer in Naira
- X_1 =Amount of loan borrowed per farmer in Naira
- X_2 =Age of the farmer in years
- X_3 =Sex of the farmer (sex=0 for male and 1 for female)
- X_4 =Educational level (number of years of schooling)
- X_5 =Farming experience (number of years of farming)

X ₆	=Household size (number of family members)
X ₇	=Loan supervision (number of times farmer was supervised by loan agents).
X ₈	=Farm income per farmer in Naira
X ₉	=Distance between home and source of loan in Kilometers
X ₁₀	=Farm size (hectares)
X ₁₁	=Disbursement lag in months
U	=Error term.

4. RESULTS AND DISCUSSION

4.1 Socio-Economic Characteristics of the Respondents

This study included 150 respondents, most of them were females. Table 2 shows the socio-economic characteristics of respondents. As shown in this table, 76% of the total respondents were females while 24% were males. From the result it can be seen that women were actively involved in agricultural production. The mean age of the respondents was 41.0 years.

Furthermore, the result reveals that 73.3% of them were married. The mean household size was 8 persons. In the study area as in other African settings, most households are made up of a man, wife/wives, children and extended family members. All these form the household size that pool and use resources of the household. The household size affects the credit demand and use. The mean annual income was 295,100 naira. The numbers of years of formal education obtained by the respondents were converted to the equivalent levels. All had formal education (100%). Years of formal education ranged from 6 years of completed primary education to 16 years of higher degrees. The mean duration for education was 13.7 years. These results showed that most of the respondents could read and write and so could fill the basic forms to request for loan. Similarly, the level of literacy attained by the borrowers suggests that they were capable of understanding the rules and procedures of acquiring and using loans. Also the level of education may indicate productivity potential both on and off farm [16]. This means that the more educated a farmer is, the more likely he/she is to work off the farm. Many studies contend that farmer's education influences farm productivity by affecting a farmer's input and output decisions [17].

The number of years of formal education is known to influence the behaviour, value, exposure and opportunities of an individual. The high level of literacy of the respondents implied that the farmers were likely to work off the farm. The survey result showed that 65.3% of the respondent had farming as their primary occupation. The survey also revealed that 34.6%, of the total respondent had farming as their secondary occupation 26.7% had no secondary occupation. From the result, it can be seen that some farmers work both on and off farm.

Table 2. Socioeconomic characteristics of the respondents

Sex	Frequency	%
Females	114	76
Males	36	24
Total	150	100
Age groups (yrs)		
21-30	16	10.7
31-40	60	40
41-50	52	34.7
51-60	20	13.3
Above 60	2	1.3
Total	150	100
Mean	41.0	
Household size	23	15.3
1-5	110	73.4
6-10		
Above 10	17	11.3
Mean	8.0	
Marital		
Single	10	6.7
Married	110	73.3
Divorced	18	12
Widowed	12	8
Total	150	100
Income In Naira 000'		
101-200	29	19.3
201-300	67	44.7
301-400	32	21.3
401-500	12	8
501-600	-	-
Above 600	10	6.7
Total	150	100
Mean	280.7	
Education		
Primary school completed (6yrs)	16	10.7
Secondary school completed (12yrs)	42	28
OND/NCE school completed (14/15)	21	14
HND/B.Sc (16yrs)	71	47.3
M.Sc (18yrs)	0	0
Total	150	100
Mean	13.7	
Primary occupation		
Civil servant	50	33.3
Farming	98	65.3
Trading	2	1.4
Total	150	100
Secondary occupation		
No of secondary occupation	40	26.7
Civil servant	7	4.6
Farming	52	34.7
Trading	51	34
Total	150	100

Source: Field survey, 2010

4.2 Agricultural Characteristics of the Respondents

Table 3 showed the agricultural characteristics of the respondents. According to the table the respondents were cassava and yam farmers. Majority of the farmers had farm sizes ranging from 1 – 3ha. This indicates that farmers in the study area are not into large scale farming (commercial or mechanized farming) but are predominantly small holders and subsistence farmers. The mean farm size was 3.8ha. The respondents farming experience measured the number of years the respondents have been consistently engaged in farming occupation (Table 3). The mean years of farming experience was 15 years.

Table 3. Distribution of respondents according to agricultural characteristics

Crop in Ha	Frequency	%
1 – 3	81	54
4 – 6	46	30.7
7 – and above	23	15.3
Total	150	100
Mean 3.8		
Experience yr	Frequency	%
1 – 10	45	30
11 – 20	76	50.7
21 – 30	26	17.3
Above 30	3	2
Total	150	100
Mean	15	

Source: Field survey, 2010

N/B: Interest rate on borrowed fund was 8% for all the beneficiaries. Loan amount received ranged from one hundred thousand naira to eight hundred thousand naira (100,000 - 800,000). The mean loan size was two hundred and ninety eight thousand five hundred naira (298,500) and loan duration was eighteen months.

4.3 Analysis of Credit Worthiness of the Respondents

Table 4 shows respondents' creditworthiness based on their loan repayment performance. Creditworthy borrowers consisted of borrowers who had completed payment of the loan on or before the due date while the non creditworthy farmers consisted of borrowers who had not completed payment after due date. Results from field survey revealed that 56% of the respondents had repaid their entire loan. However, 44% of the respondents had not completed payment of the entire loan after due date.

Table 4. Credit status of loan beneficiaries

Credit status	Crop
Creditworthy	84 (56)
Non creditworthy	66 (44)
Total	150 (100)

Source: Field survey, 2010

Note: Figures in parentheses are percentages

The validity of the discriminant function was derived from the classification of results of the respondents into credit worthy and non credit worthy. The classification results (Table 5) showed that the function was able to classify 83 as credit worthy out of 84 representing 98.8% while 64 were classified as non credit worthy out of 66 representing 97.0%. This gave an average correct classification of 98.0%. The implication is that, the information provided by the discriminant analysis will help the study to make recommendation to the banks which will reduce losses.

Table 5. Discriminant analysis classification for credit worthy and non credit worthy borrowers

Actual group	Predicted group		
	Worthy	Non worthy	Total
Worthy	83	1	84
Non worthy	2	64	66
ungroup cases	0	0	0
Percentage correct prediction	98.8	97.0	98.0

Source: Data analysis, 2011

4.3.2 Factors that discriminate between credit worthy and non- credit worthy farmers

The result of the discriminant function analysis as shown in Table 6 was significant at 1 per cent level with a canonical correlation of 0.890, Wilk Lambda of 0.208 and a chi square of 225.174. The relative high canonical correlation of 0.890 and a low Wilk Lambda of 0.208 indicated that the discriminant function developed in this study provides significant amount for measuring credit worthiness of farmer borrowers. The Wilk Lambda, which is the ratio of the within-group sum of square to the total sum of squares of the groups, was significantly low. Large Wilk Lambda ratio indicates no differences between the two groups while a small value indicates there are differences. The Eigen value also called the characteristics root for each discriminant function reflects the ratio of importance of the dimensions which classify cases of independent function. The higher the Eigen value, the higher the discriminant score. The canonical correlation, also known as the squared canonical correlation is the percent of variations in the dependent discriminated by the set of independent variables in the discriminant analysis. It is also the canonical correlation of each discriminant function with the discriminant scores. A canonical correlation close to one means that nearly all the variance in the discriminant scores can be attributed to group means differences.

The estimated standardized canonical discriminant function coefficient was subjected to chi-square test of significance. The calculated chi-square at 5% level of significance was found to be 225.174, whereas the tabulated value at same level of significance was 16.29. Since the calculated chi-squared was greater than the tabulated value we rejected the null hypothesis at 0.050 levels that all the discriminant coefficients are equal to zero. The implication is that the combined estimated function coefficients developed in the course of this study can be used to discriminate between relatively creditworthy and relatively non-credit worthy farmer borrowers as initially defined. The coefficients and statistics resulting from the discriminant analysis (Table 6) showed that the variables entered in the function were able to discriminate between credit worthy and non- credit worthy farmers.

Table 6. Standardized canonical discriminant function coefficients and related statistics

Variables	Co-efficient
Age	-.055
Loan supervision	.096
Sex	-.100
Education	.903
Farming experience	.070
Distance	.149
Farm size	1.083
Loan – asset ratio	1.590
Exp- income ratio	-.707
Eigen value	3.803
% of variance	100
Canonical correlation	0.890
Wilk lambda	0.208
Chi-square	225.174
Degree of freedom	9
Significance	0.000

Source: Data analysis, 2011. Reject the null hypothesis at 0.000 levels.

The standardized discriminant coefficient usually does not show the relative importance of the different variables. This was achieved by calculating the correlation between the values of the discriminant function and the coefficients of the variables. The results gave the pooled-within-group correlation between the discriminating variables and the canonical discriminant function represented in Table 7.

These values effectively rank the variables according to their discriminating contributions. The value in Table 7 indicates that educational status was the most important discriminating variable between credit worthy and non credit worthy farmers. This was followed by loan supervision, farm size, total operating expenditure to income ratio, farming experience, loan to asset ratio, distance, sex and age. Also, the variables with a negative sign indicate that the function value was negatively associated with the variable. The sign however did not reduce the relative importance of the variable as a discriminator; rather it enhanced the explanation of the relationship.

Table 7 showed that most of the variables made some contribution to the borrower's credit worthiness. The level of education, loan supervision, farm size, farming experience, distance between home and source of loan of the borrowers, age and loan to asset ratio made positive contributions while total operating expenditure to income ratio and sex of the farmer made negative contributions.

Table 7. Pooled-within-group correlations between discriminating variables and standardized canonical discriminant functions

Variables	Co-efficient
Education	.417
Loan supervision	.289
Farm size	.269
Top exp income ratio	-.146
Farming experience	.137
Loan asset ratio	.117
Distance	.029
Sex	-.023
Age	.002

Source: Data analysis, 2011

The positive sign obtained for level of education loan supervision, farm size, farming experience, distance between home and source of loan of the borrowers, age and loan to asset ratio suggests that a farmers borrower's chances of belonging to the group of credit worthy farmers improves as the values of the positive variables increases. The positive sign obtained for loan to asset ratio and distance between home and source of loan of the borrowers is against *a priori* expectation. The negative sign total operating expenditure to income ratio and sex of the farmer, suggests that farmers borrower's chances of belonging to the group of non credit worthy farmers increases as the value of the negative variables increase.

The coefficients obtained in the discriminant analysis were further subjected to a statistical test for significance. This was to find out the level of significance of the contributing variables. The test on Table 8 was achieved by obtaining f-values for each of the variables. The result shows that out of the nine variables six were statistically significant. These were loan supervision, educational level, farming experience, farm size, loan to asset ratio and total operating expenditure-income ratio. This further confirmed the earlier findings on the key variables distinguishing between credit worthy and non credit worthy farmers. The results showed that educational level and loan supervision were the most important discriminators between credit and non credit worthy farmers.

Table 8. Significant level of the discriminating variables

Variables	Coefficients Wilk lambda	f- value	Significance
Age	1.00	.002	.962
Loan supervision	.759***	46.979	.000
Sex	.998	.290	.591
Education	.603***	97.627	.000
Farming Experience	.933***	10.550	.0001
Distance	.997	.477	.491
Farm size	.784***	40.734	.000
Loan asset ratio	.951***	7.672	.006
Topex income ratio	.925***	11.994	.001

***, **, * = Significant at 1, 5 and 10 percent level

Source: Data analysis, 2011

4.4 Determinants of Loan Repayments

The Ordinary Least Squares (OLS) regression analysis was carried out to determine factors which influence loan repayment of borrowers. Four functional forms were tried: linear, semi logarithms, exponential and the double logarithms functions. The results of the estimations of loan repayments are presented in Table 9. The linear functional form was found to be the lead equation of the regression.

The regression results were significant at 1% level and the coefficient of determination (R^2) was 0.972 (Adjusted R^2 = 0.970). This implies that the included variables were able to explain about 97% of the total variations of the determinants of loan repayment. The F-ratio was 438.049 and significant at one percent level, implying that the joint effects of all the included variables were significant.

Table 9. Determinants of loan repayment

Variables	Linear+	Double log	Exponential	Semi log
Intercept	-138520.9*** (-4.306)	-1.675 (-.912)	10.246*** (30.980)	-3912075*** (-16.059)
Loan amount	1.062*** (18.811)	1.362*** (6.497)	3.99E 006*** (6.880)	317752.88*** (11.428)
Age	14.638 (.035)	-.039 (-.294)	.003 (.722)	-23398.817 (-1.333)
Sex	-11696.535* (-1.703)	-.190* (-1.764)	-.098 (-1.383)	-.42673.112*** (-2.990)
Education	9432.559*** (8.250)	1.027*** (7.630)	.105*** (8.964)	63769.918*** (3.573)
F. Experience	-1657.234*** (-2.724)	-.236** (-2.327)	-.019*** (-2.975)	-44051.872*** (-3.269)
Household size	562.251 (.341)	0.020 (.154)	.000 (.989)	14632.228 (.842)
Visit	17053.676*** (3.376)	.707*** (2.511)	.192*** (3.696)	94307.828*** (2.525)
Farm income	-.048** (-2.070)	-.399*** (-3.109)	-7.91E-007*** (-3.345)	3878.918 (.228)
Distance	-171.382 (-.137)	-.064 (-.791)	-.011 (-.887)	5416.790 (.505)
Farm size	1939.439 (.754)	.130 (1.046)	.003 (.122)	61184.089*** (3.699)
Disbursement lag	-6731.225*** (-5.441)	-.449*** (-4.891)	-.081*** (-6.353)	-18899.772 (-1.553)
R^2	0.972	0.795	0.816	0.942
Adj R^2	.970	.778	.802	.938
F ratio	438.049***	48.594***	55.806***	204.235***

Source: Data analysis, 2011.

Reject the null hypothesis at one percent level.

Figures in brackets are T-values. + = the lead equation.

***, **, * = Significant at 1, 5 and 10 percent.

From the result, out of eleven variables, seven variables were significant. The variables were loan amount, sex, education, farming experience, loan supervision, farm income and

disbursements lag. The amount of loan obtained had a positive coefficient and is significant at one percent level, suggesting increase in loan repayment as the loan amount or size of loan increases. This is possible due to the advantages associated with the economics of size, which comes about through expansion of productions and purchases of farm equipments;[18].

Education which implies the number of years of schooling had a positive coefficient and is significant at one percent level. This implies that the higher the schooling years of the respondents the higher the loan repayment. Literate farmers repay more of the loans obtained than illiterate ones, having understood the advantages of prompt loan repayment and not regarding such loans as their own share of the 'national cake'. Loan supervision had a positive coefficient and significant at one percent level. This implies that the more the loans were supervised the more the farmers are able to repay their loans. When the loan agents (bank officials) visit the loan beneficiaries there is a higher probability that they will repay more of their loans than when they are not visited. On the contrary, farming experience was significant at one percent level, but with a negative coefficient. This implies that as farming experience increases loan repayment decreases. The annual farm income had negative coefficient and was significant at one percent level, showing that the higher the farm income, the lower the repayment of loan. The possible reason for this could be that most farmers have non farm incomes and their nonfarm expenses are on the increase [18]. Disbursement lag was significant at one percent level but had a negative coefficient. This implies that the shorter the disbursement lag the higher the repayment of loans. Sex was significant at ten percent level but had negative coefficients. The negative sign implies that more males repaid their loans than their female counterparts [19]. Dummy variables were assigned to sex 1 for female and 0 for male.

In terms of *a priori* expectations farming experience and farm incomes were contrary to expectation. Others were in line with *a priori* expectations.

5. CONCLUSION/RECOMMENDATION

This study intended to assess credit worthiness of the borrowers, analyse factors that discriminate between credit worthy and non credit worthy farmers and analyse the factors that influence loan repayment. The major conclusion derived from this study was that credit worthiness is influenced by educational level, farm size, total operating expenditure-income ratio farming experience, loan supervision and loan to asset ratio. The classification of the discriminant analysis shows that only 1.2% of the respondents that had been classified as credit worthy were statistically not credit worthy and 3.0% of those that had been classified as not credit worthy were statistically credit worthy. This information provided by the discriminant analysis will help the banks reduce losses.

The study also revealed that determinants of loan repayment were education, loan amount, farm income, farming experience, genders (sex), disbursement lag and loan supervision. Credit is best used when it's likely to increase returns to the user. This may be for improved technology or increase farm size, therefore credit sustain the lives of the poorest of poor.

Based on the findings the following recommendations were made. Given that loan supervision contributed positively to creditworthiness, it is therefore recommended that more supervision (visit) should be exercised on loan beneficiaries so as to encourage repayments. The level of education was significant and had a positive coefficient for determinant of loan repayment. It is therefore recommended that banks should consider those with high

educational levels if higher percentage of repayment is to be achieved. This is so because educated farmers were found to be better able to understand the dynamics of agricultural production and resource management.

Disbursement lag was significant and had a negative coefficient for determinant of loan repayment. It is therefore recommended that time lag in loan disbursement should be greatly reduced so as to encourage prompt repayment of loan.

To facilitate effective credit use, the bank should put more emphasis on credit management training programmes to assist farmers manage their loans more efficiently.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Chigbu UE. The case of agriculture as the only Saviour to the Nigeria's dying economy. 2005; Accessed 25 July 2011. Available: <http://www.nigerianwillagesquare.com/articles/guest/2005/03/agric-as-only-saviour-to-html>.
2. Olagunju FI, Adeyemo R. Agricultural credit and production efficiency of small-scale farmers in south-eastern Nigeria. *Agricultural Journal*. 2007;2(3):426–433.
3. Akande OR, Soma JT, Nasmen AA. An investigation into the complementarities between post harvest and production credit under the NACRDB agricultural credit programme in Markurdi zone of Benue State. *FAMAN 22 annual conference*. 2008;102–166.
4. Okuneye PA. Rising cost of food prices and food insecurity in Nigeria and its implication for poverty reduction. *Journal of Central Bank of Nigeria Economic and Financial Review*. 2005;39(4):321-328.
5. Macon G. The Importance of Agriculture. 2008; Accessed on June 23; 2013. Available: <http://www.ilezine – article.com>.
6. Cervantes-Godoy D, Dewbre J. Economic Importance of Agriculture for Poverty Reduction. *OECD Food, Agriculture and Fisheries Working Papers*, No23. OECD Publishing; 2010.
7. Lawal AM, Ette OA. Analysis of agriculture production in Nigeria. *African Journal of General Agriculture*. 2006;2(1):20-36.
8. Nwachukwu IN, Alamba CS, Oko-Isu A. Determinants of institutional credit repayment performance among farmers in Afikpo North LGA of Ebonyi State, Nigeria. *AAB BIOFLUX*. 2010;2(3):211-226.
9. Onyenucheya F, Ukoha OO. Loan repayment and credit worthiness of farmers under the Nigerian Agricultural Cooperative and Rural Development Bank NACRDB. *Agricultural Journal*. 2007;2(2):265–270.
10. Olagunju FI, Adeyemo R. Determinants of repayment decision among small holder farmers in south western Nigeria. *Pakistan Journal of Social Science*. 2007;4(5):677–686.
11. Awoyemi TT, Olowa OW. Determinants of loan repayment potentials of group borrowers in Oyo State of Nigeria. *Medwell Journal of Agriculture*. 2010;5(1):12-18.
12. Nigeria Agricultural and Rural Development Bank. Annual report: Cross River State. Abuja Nigeria. 2010;87-124.

13. Ahoritor CRK, Adenutsi DE. Inflation, capital accumulation and economic growth in import-dependent developing economies. 14th Annual Conference on Econometric modeling, Abuja, October 20. 2009;22-40.
14. Schultz TW."The value of ability to deal with disequilibria," *Journal of Economic Literature*.1977;13(2):827-896.
15. Jhingan ML. *The economics of development and planning*. New Delhi: Vrinda Publication; 1999.
16. Abdulai A, Delgado CL. Determinants of nonfarm earnings of farm based husbands and wives in Northern Ghana. *American Journal of Agricultural Economics*.1999;81(1):117-130.
17. Khandler SR. Input management ability occupational patterns and farm productivity in Bangladesh agriculture. *Journal of Development Studies*. 1988;24(2):214-231.
18. Okorji EC, Mejeha RO. The formal agricultural loans in Nigeria: The demand for loans and delinquency problems of small holder's farmers in Owerri Agricultural zone of Imo State Nigeria. *International Journal Tropical Agriculture*. 1993;1:1–13.
19. Ugbomeh MM, Achoja FO, Ideh V, Ofuoku AU. Determinant of loan repayment performance Among Women self help groups in Bayelsa State, Nigeria. *Journal of Agricultural Conspectus Scientificus*. 2008;73(3):189–195.

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