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Repayment Performance among Cassava Farmer-Beneficiaries of Microfinance Institutions (MFIs) In Abia State, Nigeria

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Abstract

This study investigated repayment performance among cassava farmer-beneficiaries of microfinance institutions (MFIs) in Abia state, Nigeria. The instrument for data collection used was a semi structured and pre-tested questionnaire. Multistage random sampling technique was used to select 120 cassava MFI- farmer beneficiaries. The period of data collection under review covered a duration of five years (2005 – 2010). Data collected was analyzed using descriptive statistics, discriminant function analysis and OLS multiple regression model. The empirical results revealed that the year 2006 under review has the highest average loan recovery rate of 86.0%, while the lowest average loan recovery rate was 78.0%.The result also revealed that 88 out of 90 MFI cassava farmer beneficiaries were grouped as worthy while 28 out of 30 were grouped as unworthy. The discriminant function analysis was significant at 1.0% with a canonical correlation of 0.795, wilk Lambda of 0.227 and a chi-square of 237.126 More so, cassava farmers with better education, larger farm sizes, good farming experience, extension supervision and low total operating expenditure to income ratio were credit worthy. However, cassava farmer MFI beneficiaries with lower loan to asset ratio were set to be non- credit worthy. Cassava farmers who repaid their loan according to the linear regression were those with better education, high loan volume and extension supervision all these variables had positive relationship to loan repayment. More so, the result revealed that farmers with more years of farming experience and late loan disbursement defaulted in their loan repayment. It is therefore, recommended that education and extension supervision should form a major trust in policy formulation in microfinance institution administration in Nigeria.

Keywords: Cassava farmers, loan repayment, Microfinance Institutions (MFIs), Beneficiaries

Introduction

Lending to agricultural activities has become a vital function in financial operations in the rural areas as it facilitates the economic growth, agricultural development and improves efficiency. For a farmer to derive benefit from any institutional credit, the size of the loan, the process of granting such loans, timelines in disbursement and repayment are very important (Nweze, 1991).

Godquin (2004) defines repayment performance as the total loans paid on time as stated in the loan agreement. The further added that repayment performance can be further defined in terms of binary variables; based on an arbitrary definition of what constitutes repaying "on time" (a given maximum "grace period" is allowed), while Gutman (2007) measures repayment performance on the degree of arrears.

However, the history of institutional credit administration in many parts of Nigeria has not been impressive when evaluated on the basis of beneficiaries' repayment performance. In the past, many credit agencies have been scrapped for gross mismanagement while others were heavily subsidized in order to keep afloat. In 2009 the Central Bank of Nigeria (CBN) withdrew the licenses of one hundred and twenty four (124) Microfinance Banks owing to sharp practices connected to repayment issues. No matter how financially endowed, no financial institution can successfully operate a revolving loan scheme without loan beneficiaries fulfilling their financial obligations (Okorie, 1989; Adegbeti, 2009).

Again amongst others, the discrimination against agriculture in granting credit and the high rate of interest coupled with stringent conditions like the issues of collateral and the short nature of credit granted by commercial banks are among the factors that led the government into adopting a policy measure that was expected to ensure easy flow of credit and financial services to the agricultural sector. This however, amongst others necessitated the establishment of microfinance banks in 2005. The positive socio economic impacts of microfinance Institutions (MFI) and its ability to provide financial services to a large number of poor and hard core poor households who need the services most and achieve financial sufficiency evidently depends on repayment performance. The borrowers of microcredit who are predominantly the poor and hardcore poor (lower income group) basically do not have any collateral asset, no financial record, no credit history and microfinance institutions (MFIs) lack the means to use legal system to enforce repayment. In such context as mentioned by Guttman (2007), economists identified three advantages of lending that allowed MFI to accomplish impressive repayment rate. These include;

(a) There are two types of borrowers, safe and risky. Borrowers who are likely to succeed in the project funded by the MFI and /or motivated to repay are safe borrowers. Borrowers who are not safe are risky borrowers. Potential borrowers from their own group commonly from the same village and they know about each other plus the knowledge they have about their joint liability. Risk

adverse borrowers tend to form a group among themselves. This process leads the risky borrowers to make a group among themselves and for MFI it becomes easier to identify the risky groups and therefore help them to reduce default rate by being more careful about all loan applications.

(b) Since MFIs lack the means to use legal systems to enforce repayment, clients knowing each other's information on economic and household activities would thus reduce the moral hazard of risky borrowers intentionally not paying the debts.

(c) The third advantage of group lending is the ability of the group to enforce loan commitment by using social sanctions, such as social isolation and even violent seizing of delinquent borrowers asset (Guttman, 2007).

However, the poor cassava household farmers who commonly have low investment opportunities, unable to take risk and low marketable skills commonly suffers most in economic and natural crisis. It is therefore unwise to expect that they have stable income, which they need to repay in weekly fixed repayment method. Clients encountering repayment problems may eventually drop out from the program or become inactive borrower. Therefore, it is important to explore whether clients are facing any repayment problems or not.

Institutions like Nigerian Agricultural Cooperative and Rural and Development Bank (NACRDB) and National Directorate of Employment (NDE) playing active role in extending credit to the agricultural sector is faced with the problems of ensuring credit effectiveness in sociological set up where government properties and financial assistance are erroneously considered as booties. The institutions have been threatened by high rate of default arising mainly from poor management procedures, poor loan utilization and reluctance to repay loans (Onyenucheya and Ukoha, 2007). Past approaches on appraising previous loan projects, focus on analyzing repayment from implementation records. Little is, however known about repayment from cassava farmers' point of view. Hence it has become necessary and essential to identify and incorporate the relevant product characteristics and determine repayment ability from cassava farmers who are beneficiaries of MFIs. This may enable the lending institutions to have an insight into the means of reducing the error of granting loans to those who might default, and also discover those variables that discriminate between cassava

farmers. Thus, perspective of reducing the error of judgments by lenders in selecting capable borrowers can be gained by incorporating relevant cassava farmers' socio-economic factors. It is however worthwhile to assess the relative importance of various delinquency among microfinance cassava farmer-beneficiaries. The need to identify the credit worthy and non-credit worthy farmer cooperator and determine factors influencing loan repayment among farmer cooperators necessitated this study. Various studies (Abraham, 2002; Ngwaziem, 2013; Nwachukwu *et al.*, 2010; Onyeagocha, *et al.*, 2012; Ugbomeh *et al.*, 2008) have been done on loan repayment. Other studies (Adebisi, 2007; Ajah *et al.*, 2014; Ezeh, 2003; Kohansal and Mansouri, Mbanasor and Nto, 2008) have also been done on credit worthiness but specifically, none of these studies were on credit worthiness and determinants of loan repayment among MFI- Cassava farmer beneficiaries in Nigeria. This kind of study will provide a platform for correcting the identified problems so as to make the microfinance institution (MFIs) effective and efficient in microcredit administration. In line with these: this study investigates the following

1. number of cassava clients benefitting from MFIs within the period under review i.e. 2005 – 2010.
2. establish the rate of loan recovery for these farmers within the period under review
3. determine the credit worthiness of cassava farmer-borrowers,
4. attempt to analyze variables that discriminate between credit worthy and non-credit worthy cassava farmers and then
5. discover factors influencing loan repayment.

Materials and Methods

Study Area

This study was carried out in Abia state, Nigeria. Abia is a state located in the south eastern zone of Nigeria. The state was chosen for the study because of its agrarian disposition and endowment in food crop production including various tropical crops especially cassava. It has been observed that major clients of microfinance institutions (MFIs) are mostly cassava farmers (ABSADP, 2005). The climate is essentially tropical humid with average annual rainfall of 229.20mm distributed evenly throughout the wet season, which covers a period of seven months (April to October).Diurnal temperature varies between 27^0C and 31.9^0C. Its annual rainfall is 1500 – 2600mm on a mean elevation of 122m above sea level (NRCRI, 2008). Abia state is located between longitudes 7^023^IE and 8^002^IE and latitudes 5^0 47^IN and 6^0 12^IN (NRCRI, 2003).It is bounded by Enugu state on the north, Rivers state on the south, Akwa-Ibom and Cross River states on the east and Imo state on the west. Abia state was created on the 22nd August 1991 out of the then Imo state and has its capital at

Umuahia. The state covers a total land area of 7677.20 square kilometers, with a total population of 2,833,999 persons made up of 1,434,193 or 55.0% males and 1,399,806 or 45.0% females (NPC, 2006). The state has 17 Local Government Areas (LGAs) clustered in three (3) agricultural zones namely Aba, Ohafia and Umuahia agricultural zones. The constituent LGAs of the zones are:

Ohafia Agricultural zone: Arochukwu, Bende, Isuikwuato, Ohafia and Umuneochi LGAs

Umuahia Agricultural zone:Ikwuano, Isiala Ngwa North , Isiala Ngwa South, Umuahia North, Umuahia South and Osisioma Ngwa LGAs

Aba Agricultural zone: Aba North, Aba South, Obingwa, Ugwunagbo, Ukwa East and Ukwa west LGAs.

Sampling Technique

The study adopted multi-stage random sampling technique to select respondents. Firstly, a list of registered MFIs in Abia State was collected from Central Bank of Nigeria (CBN) in Umuahia Abia State branch. The MFIs identified in the 3 agricultural zones were grouped into 3 clusters. Each cluster representing each agricultural zone in the state, more so, each cluster contains a list of 12 MFIs. Each list of the three clusters were subjected to a simple random sampling to select 6 MFIs from each cluster. This gave a sample of 18 MFIs cut across the three clusters involved in the study.

This gave a sample of 18 MFIs involved in this study. These MFIs are Ohafia MFIs, Arochukwu MFI, Abiriba MFI, Uzuakoli MFI, Umuneochi MFI and Abia State University MFI in the first cluster. Ohafia agricultural zone. From the second cluster which is Umuahia agricultural zone, the chosen MFIs include: Umuchukwu MFI, Chibueze MFI, Decency MFI, Ovuma MFI and LAPO MFI. While the third cluster which is Aba agricultural zone has the following MFIs: Ukwa MFI, Ecosal MFI, Easy gate MFI, Ugwu MFI, Swift MFI and Umuike MFI.

Secondly, the lists of cassava farmers who are contemporary beneficiaries of MFIs were obtained from the chosen MFIs. This formed a frame for a simple random selection of 40 cassava farmer beneficiaries from each cluster representing each agricultural zone. This eventually gave a sample size of 120 cassava farmer MFI beneficiaries.

Finally, in order to establish the number of cassava clients benefiting from MFIs within the period under review i.e. 2005 -2010 and to know the rate of loan recovery for these farmers. Another different randomize exercise was carried out where 2 MFIs were randomly selected from each cluster giving a total of six (6) selected MFIs. The following MFIs were chosen in this exercise: First cluster Ohafia zone (Ohafia and Uzuakoli MFIs), second cluster

Umuahia zone (Ovuma, LAPO and MFIs) and third cluster Aba zone (Ecosal and Easygate MFIs).

Data Collection

Data for this study were obtained using a pre-tested structured questionnaire. The researcher with the help of eight (8) extension staff of the Agricultural Development Programme (ADP) administered the questionnaire in the 3 agricultural zones of the state. The period under review in this study covered a duration of 2005 – 2010 within these period there seems to greater awareness of the impact of Microfinance to agricultural development. Both primary and secondary data were collected for this study.

Analytical Technique

The analytical tools adopted in this study are both descriptive and econometric tools of analysis. The descriptive tools consist of the use of percentages, frequencies and arithmetic mean. The econometric tools consist of the use of multiple regression model and discriminant analysis.

Objective 1 and 2 was achieved with the use of mean, frequency distributions tables and percentages, objective 3 and 4 was realized using discriminant model and objective 5 was achieved using ordinary least square (OLS) multiple regression model.

The discriminant analysis classified cassava farmers into two categories, using the loan repayment value as a basis. Group one consists of cassava farmers who had not completed payment of loan borrowed and group 2 are cassava farmers who had paid all loans following (Onyenucheya and Ukoha, 2007). Farmers in group 2 were assumed to be relatively credit worthy while those in group 1 were assumed to be relatively non credit worthy.

Model specification

The discriminant model is presented thus:

$Di = b_0 + b_1Z_{1i} + b_2Z_{2i}\ldots\ldots\ldots\ldots b_nZ_{ni-}\alpha\ldots\ldots\ldots$ (1)

Zi is derived by the formula $Z_i = X_{ij} - X\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (2)

Where:

Zi = the ith individual's discriminant score or the contribution of each independent variables to the total discriminant score (Di)

Di = total discriminant score

Xij = the ith individual value of the jth independent variable

bij = the discriminant coefficient for the jth variables

X = mean value of the independent variables

α= Standard deviation of the independent variables

Let each individual score Zi, be a function of the independent variables; that is $Z_i=b_o+b_iX_{ij}+b_2X_{2i}+……..b_nX_{ni}$ (Onyenucheya and Ukoha, 2007)…… (3)
Classification procedure is as follows if Zi =Zcrit classify individual i as belonging to group two
(Credit worthy farmers) and if Zi<Zcrit, classify individual i as belonging to group one (Non-credit worthy farmers).

The assessment of importance of the derived discriminant function for the study was done using Wilks' Lambda which measures goodness of fit; the group centroids which calculate the cut of score or cutoff point; and the standardized canonical discriminant function coefficient with the associated f-ratio
.

The classification boundary is the locus of points where
$b_o +b_ix_{1j}+ b_2x_{2i} +……..b_nX_{ni} = Z_{crit}$ …….(4)
The variables used in the discriminant analysis were;
Age (yrs) represented with a (-) negative sign
Sex (1 for female, 0 for male) represented with a (-) negative sign
Educational level (yrs) represented with a (+) positive sign
Farm size (Hectares) represented with a (+) positive sign
Distance to MFI (km) represented with a (-) negative sign
Extension Supervision (number of times) represented with a (+) positive sign
Loan Asset Ratio (Loan divided by farm asset of the farmer in Naira (₦), (-) negative sign
Total operating expenditure – income ratio (total operating expenditure divided by income i.e farm income in naira). Represented with a negative sign(-)

The multiple regression analysis was used to determine factors that influence loan repayment among cassava farmers benefitting from MFI. Using the ordinary least square estimators in analyzing the regression model. Four functional forms namely linear, semi log, double log and exponential were tried and the one that gave the best fit was chosen.

The model is presented implicitly thus:
$Y = f(X_1,X_2,X_3,X_4,X_5,X_6,X_7,X_8,X_9,X_{10},X_{11},e)$……..(5)
Where:
Y = Amount of loan repaid per cassava farmer in Naira
X_1 = Amount of loan borrowed per farmer in Naira
X_2 = Age of farmer (Yrs)
X_3 = Sex of the farmer (male = 0 and female = 1)
X_4 = Educational level (Yrs)

X_5 = Farming experience (Yrs)
X_6 = Household Size (Number of persons)
X_7 = Extension Supervision (Number of visits)
X_8 = Farm income (N)
X_9 = Distance to MFI (Km)
X_{10} = Farm size (hectare)
X_{11} = Disbursement lag in months
ei = Stochastic error term

Hypotheses

The following hypotheses are investigated:
Hypothesis1 (H_1): High schooling years of the farmers lead to increase in loan repayment.
Hypothesis 2 (H_2): Increase in extension supervision leads to increase in loan repayment.
Hypothesis 3 (H_3): Increase in the farm size leads to in loan repayment.
Hypothesis 4 (H_4): Increase in total operating expenditure to income ratio leads to decrease in loan repayment.
Hypothesis 5 (H_5): Increase in farming experience leads to decrease in loan repayment.
Hypothesis 6 (H_6): Increase in loan to asset ratio leads to decrease in loan repayment.
Hypothesis 7 (H_7): Increase in distance to MFI's from the farmers' residence leads to decrease in loan repayment.
Hypothesis 8 (H_8): Been a woman leads to decrease in loan repayment.
Hypothesis 9 (H_9): Increase in farm income leads to decrease in loan repayment
Hypothesis 10 (H_{10}): Increase in disbursement lag leads to decrease in loan repayment.
Hypothesis 11(H_{11}): Increase in household size leads to decrease in loan repayment.
If the calculated chi square is greater than the tabulated chi square we reject the null hypothesis.

Results and Discussion

Microfinance Institutions (MFIs) Cassava Clients in Abia State 2005 – 2010
The distribution of MFIs according to the number of cassava clients for the period of 2005 – 2010 is presented in the Table 1.0. It shows that MFIs in the area of study have been characterized by some level of significant growth rate in the number of cassava farmers per MFI over the period of review. This finding reveals that there were increases in the number of both total cassava farmer applicants and the total number of successful applicants. The growth per administrative unit of MFIs was highest in Ohafia agricultural zone with the year 2010 recording the highest (80.0%) number of cassava clients attended to i.e. 2609 and 3263 both for total successful applicants

and total number of cassava farmer applicants respectively. The reason for this high number as against other zones may be traced to the high level of awareness of the benefits of MFIs services to cassava productivity and the attendant benefit to the farm household. However, the lowest level of cassava farmers' participation was observed in Aba zone in the year 2005 recording the lowest (76.0%) number of cassava clients i.e. 1330 and 1749 both for total successful applicants and total cassava farmer applicants respectively. This may be on account of concentration of traders and their influence to the economic life in this area. The implication of this finding is that there is a reasonable level of cassava farmers' participation in Microfinance institutions (MFIs) in the state, more so there is still the need to meet up with the potential demand for MFIs services by cassava farmers in the study area. Therefore, the need to have more cassava farmers participate in MFIs programme is highly recommended as this agrees with the view of Ezeh (2004) that there is a huge potential demand for MFIs services in Abia state, Nigeria.

Table 1.0 Distribution of MFI according to the number of cassava clients for 2005-2010 in Abia Agricultural zone

	Ohafia Zone				Umuahia Zone				Aba Zone						
	OHA		UZU		OVM		LAP		ECO		EAS				
Year	TCFA	TSA	TCFA	TSA	TCFA	TSA	TCFA	TSA	TCFA	TSA	TCFA	TSA	Total TSA	Total TCFA	%
2005	415	345	421	262	392	313	262	218	127	110	132	82	1330	1749	76.04
2006	464	421	311	291	401	326	281	252	381	201	207	172	1663	2045	81.32
2007	612	427	389	342	608	386	310	233	321	245	304	193	1826	2544	71.78
2008	702	450	478	421	421	392	282	241	409	285	321	245	2034	2613	77.84
2009	800	500	621	421	572	421	297	261	394	311	384	310	2224	3078	72.26
2010	623	511	687	612	618	467	392	316	472	375	491	328	2609	3263	79.96

Source: ABSMFIs, 2012
TCFA = Total Cassava Farmer loan Applicants
TSA = Total Successful Applicants

MFIs Cassava Loan Recovery Rates

For MFIs to continue to supply their services sustainably, it is imperative that they maintain a high level of loan recovery rate. Table 2.0 shows that all the MFIs studied had a moderately high percentage of loan recovery rates at least above 60.0%. The year 2006 showed the best average loan recovery rate year of 86.0% by MFIs in the state, while the lowest average loan recovery rate was 78.0%. These moderately high recovery rates were closely linked to group loans and the use of group liability mechanism. These mechanisms are particularly adapted to small borrowers who generally lack the suitable traditional collateral asset required on individual basis.

Table 2.0 Distribution of MFI loan (In millions) recovery for cassava farmers in Abia State Agricultural zone

	Ohafia Zone						Umuahia Zone						Aba Zone					
	OHA			UZU			OVM			LAP			ECO			EAS		
Year	TLG	TLR	R%	TLG	TLR	R%	TLG	TLR	R%	TLG	TLR	R%	TLG	TLR	R %	TLG	TLR	R %
2005	2564	2135	83	750*	645*	86	-	-	-	1500	900*	60	1740	1310	75	1200	852*	71
2006	4687	4100	88	2380	2058	87	-	-	-	3200	2375	74	1340	1187	89	2500	2330	93
2007	2529	2160	85	3740	3200	86	2700	2295	85	3430	3187	93	1750	1246	71	2800	2100	75
2008	3394	2950	87	4490	3650	81	1800	1550	86	4120	3500	85	2100	1400	67	3100	1936	63
2009	3100	2600	84	3080	2400	80	2330	1950	84	2220	1650	74	2100	1800	86	3200	2768	87
2010	4011	3142	78	3700	3150	85	3200	2620	82	3000	2250	75	2870	2445	85	3500	3245	92

Source: ABMFIs Survey, 2012
TLG = Total Loan Given
TLR = Total Loan Repaid
R% = Repayment Percentage
** = Figures in thousand (000)*

Analysis of Credit Worthiness

Table 3.0 shows cassava farmer-microfinance beneficiaries credit worthiness based on their loan repayment performance. Credit worthy borrowers consists of cassava farmers who had completed payment of their loan on or before the date for repayment. The result in Table 3.0 shows that the discriminant analysis classified 75.0% of the cassava farmer MFIs beneficiaries had repaid their entire loan, while 25.0% of them had not completed payment of the loan after the date given for repayment.

Table 3.0 Credit Status of Cassava Farmer –MFI Beneficiaries

Credit Status	Frequency	Percentage
Credit Worthy	90	75
Non Credit Worthy	30	25
Total	120	100

Source: Field Survey, 2012

The strength of the discriminant function was derived from categorizing cassava farmers into credit worthy and non-credit worthy farmers. The categories as presented in Table 4.0 showed that the function was able to group 88 cassava farmers as credit worthy out of 90 cassava farmers representing 97.78% while 28 were grouped as non-credit worthy out of 30 cassava farmers representing 93.33%.This gave an average correct classification of 95.0% of actual grouped cases corrected classified (percentage correct prediction of worthy and non-worthy cassava farmer- borrower). The implication of this is that the information provided by the discriminant analysis will help to reduce losses.

Table 4.0 Discriminant Analysis Grouping for Credit Worthy and non-Worthy Cassava Farmers.

Actual Group	Predicted Group		
Group	Worthy	Non Worthy	Total
Worthy	88	2	90
Non Worthy	2	28	30
Ungroup Cases	0	0	0
Percentage Correct Prediction	97.78	93.33	95.0

Source: Field Survey, 2012

Factors that Discriminate between Credit Worthy and non-credit Worthy Cassava Farmers

Table 5.0 shows the result of the discriminant function analysis significant at 1.0% level with a canonical correlation of 0.795, Wilk Lambda of 0.227 and a chi-square of 237.126.The relative high canonical correlation of 0.795 and a low Wilk Lambda of 0.227 is an indication that the discriminant function used in this study gives significant amount for measuring credit worthiness of cassava farmer MFI beneficiaries. The low significant value of Wilk Lambda shows that there is difference between the two groups. The Eigen value shows a high discriminant score. The Canonical correlation value that is approximately one show that almost all the variance in the discriminant score are due to group means difference.

However, the estimated standardized Canonical discriminant function coefficient was subjected to chi-square test of significance. The calculated chi-square at 5.0% level of significance is 237.126, whereas the tabulated value is 16.12, indicating significance at 5.0%. Therefore, since, the calculated chi-square was greater than the tabulated value we rejected the null hypothesis at 5.0% levels that the discriminant coefficient are equal to zero. This implies 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 cassava farmers as initially defined.

Tables 5.0 Standardized Canonical Discriminant Function Coefficient of Variables

Variables	Discriminant Co-efficient
Age(yrs)	-0.049
Sex	0.124
Educational level	0.087
Farm Size	1.079
Farming Experience	0.082
Extension Supervision	0.089
Distance to MFI	0.138
Loan Asset Ratio	1.076
Expenditure Income Ratio	1.563
Eigen Value	3.786
% of Variance	100
Canonical Correlation	0.860
Wilk Lambda	0.207
Chi – Square	237.126
Degree of Freedom	12
Significance	0.000

Source: Field Survey, 2012

The standardized discriminant coefficient usually does not show the relative importance of the different variables. To arrive at this, we calculated discriminant function and the coefficients of the variables. This gave the pooled – within- group correlation between the discriminating variables and the Canonical discriminant function as shown in Table 6.0. The result got, arranged the variables according to their discriminating contributions. The result as presented in Table 6.0 shows that level of education was the

Table 6.0 Pooled – Within – Group Correlation between Discriminating Variables and Standardized Canonical Discriminant Function

Variables	Coefficient
Education	0.376
Extension Supervision	0.320
Farm Size	0.342
Expenditure Income Ratio	-0.139
Farming Experience	0.140
Loan Asset Ratio	0.123
Distance	0.030
Sex	-0.024
Age	0.003

Source: Field Survey, 2012

most important discriminating variable between credit worthy and non-credit worthy cassava farmer-beneficiaries of MFIs in the study area. This was followed by extension supervision, farm size, total operating expenditure to income ratio, farming experience, loan to asset ratio, distance to MFIs, sex and age. However, 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. The variables that made positive contributions to the credit worthiness of cassava farmers in MFI include; the level of education, extension supervision, farm size, farming experience, distance to MFIs, age and loan to asset ratio, while total operating expenditure to income ratio and sex of cassava farmers made negative contributions. The positive signs obtained for the variables suggests that a cassava farmers chances of belonging to the group of credit worthy farmers improves as the value of the positive variable increases; while the negative signs suggest that farmers borrowers chances of belonging to the group of non-credit worthy cassava farmers increases as the value of the negative variables increases.

However, the coefficients obtained in the discriminant analysis were further subjected to a statistical test of significance. The result presented in Table 7.0 shows that six (6) variables out of nine (9) were statistically significant.

Table 7.0 Discriminating Variables Significant Level

Variables	Coefficient Wilk Lambda	F- Value
Age	1.121	0.003
Extension Supervision	0.668***	45.876
Sex	0.976	0.300
Education	0.597***	89.572
Farming Experience	0.862***	11.232
Distance to MFI	0.966	0.522
Farm Size	0.768***	39.721
Loan Asset Ratio	0.852***	8.223
Expenditure Income ratio	0.862***	12.112

***, **,* = Significant at 1, 5 and 10 percent level
Source: Field Survey, 2012

These variables include: Extension supervision, education, farming experience, farm size, loan to asset ratio and total operating expenditure income ratio. This further confirms the earlier findings on the key variables distinguishing between credit worthy and non-credit worthy cassava farmers. More so, the result shows that education and extension supervision were the most important discriminators between credit and non-credit worthy farmers. This finding is in line Ajah *et al*., (2013) whose findings showed that education and extension supervision were the most important discriminators between credit worthy and non-credit worthy farmers.

Determinants of Loan Repayments

The estimators of the determinants of loan repayment for cassava farmer-beneficiaries of MFIs in Abia state is presented in Table 8.0.

Table 8.0 Determinants of Loan Repayment

Variables	**Linear**$^{+}$
Constant	-127530.6***
	(-3.673)
Amount of Loan Borrowed	1.230***
	(19.211)
Age	16.127
	(0.279)
Sex	-12234.243*
	(-1.672)
Education	8523.472***
	(7.832)
Farming Experience	-1732.124
	(-3.121)
Household Size	721.152
	(0.332)
Extension Supervision	16924.556***
	(3.745)
Farm Income	-0.0527***
	(-3.125)
Distance to MFI	-2181.4311
	(-0.823)
Farm Size	172.385
	(1.37)
Disbursement Lag	-7732.131***
	(-5.332)
R^2	0.972
Adjusted R^2	0.970
F- Ratio	397.056***

Figures in parenthesis are T- values + = lead equation ***, **, * = Significant at 1, 5, and 10 % levels. Source: Field Survey, 2012

The result showed that four functional forms of the ordinary least squares (OLS) regression model (Linear, exponential, semi-log and Double log) were tried. The Linear functional form was found to be the lead equation based on certain criteria i.e. it gave the best fit to the data, high R^2 value, F- values and the significance of the coefficients of variables plus conformity to *apriori* expectation.

The linear functional form was chosen as the lead equation because of the following: The regression results were significant at 1.0% level and the coefficient of determination

(R^2) was 0.972 which implies that the variables used in this study were able to explain about 97.0% of the total variations of the determinants of loan repayment. The result as presented in Table 8.0 showed that seven (7) variables out of eleven were significant. The amount of loan borrowed had a positive coefficient significant at 1.0% level. The implication of this is that increase in loan repayment is due to the increase in the size of volume of loan amount. This means that increase in the volume of loan given to cassava farmer-MFIs beneficiaries may enable farmers to adopt agricultural innovation which can translate to increase in the level of income and hence high level of loan repayment (Afolabi, 2010).

The coefficient for sex had a negative coefficient significant at 10.0% level. The negative sign implies that more males repaid their loans than their female counterparts. This is however in line with *apriori* expectation and agrees with work done by Ajah *et al*., (2013). The coefficient for education is positive and significant at 1.0% level. The implication of this is that the higher the schooling years of the farmer the higher the loan repayment. As expected high level of education would enhance adoption of improved technology, productivity, hence increased farm income and greater ability to repay loans (Njoku and Odii 1991; Ezeh *et al*., 2012). Meanwhile, the coefficient for farm income on the contrary is negative but significant at 1.0 % level, implying that the higher the farm income, the lower the lower the repayment of loan. This could be attributed to most of the cassava farmers having non-farm income and this is however on the increase (Okorji and Mejeha, 1993).

Furthermore, the coefficient for extension supervision is positive and significant at 1.0 % level. This implies that the more the loans given were supervised by the bank extension supervisors the probability that the cassava farmers can repay more of their loans than those not supervised is high. The coefficient for farm experience is negative and highly significant at 1.0 % level also, the coefficient for disbursement lag is negative but significant at 1.0 % level. This implies that the shorter the disbursement lag the higher the repayment of loans.

Conclusion and Recommendations

The study investigated the repayment performance among cassava farmer-beneficiaries of microfinance loans in Abia state, Nigeria. The major findings for this study reveal that the year 2006 was the year under review with the highest average loan recovery at the rate of 86.0 % and the lowest loan recovery rate is 78.0 %. More so 88 out of 90 MFIs cassava farmer beneficiaries were classified as worthy while 28 out of 30 were classified as unworthy. The study also reveals that credit worthiness has a direct relationship with education, farm size, total operating expenditure

– income ratio, farming experience, loan asset ratio and loan supervision. Furthermore, the determinant of loan repayment include loan amount, farm income, education, gender (sex), farm experience, loan supervision and disbursement lag.

The following are policy recommendation given to help reposition MFIs as a veritable tool for loan repayment.

MFI should consider cassava farmers with some level of education in the disbursement of loan if repayment is to be achieved; this is because education has a positive relationship with credit worthiness.
Extension supervision should be considered an essential aspect of loan management administered to cassava farmers if repayment is expected.
Disbursement lag should be greatly reduced, this is however to ensure that repayment is kept in focus.

References

Abia State Agricultural Development Project (ABSADP), (2005). A colossus in Agricultural Transformation Pp. 1-6.

Abraham G. (2002). Loan Repayment and its Determinants in Small Scale Enterprises Financing in Ethiopia: Case of Private Borrowers around Zeway Area. A Thesis Submitted to the School of Graduate Studies of Addis Ababa University.

Adebisi M. V. (2007). Appraisal of Credit Worthiness of small scale Farmers in Bosso Local Government Area of Niger State. A B.Tech Agric project Department of Agricultural Economics And Extension Technology, Federal University of Technology, Minna, Niger State.

Adegbite, D.A. (2009) Repayment Performance of beneficiaries of Ogun State Agricultural and Multipurpose Credit Agency (OSAMCA) in Ogun State, (2004 - 2007).*American – Eurasian Journal of Sustainable Agriculture* 3(1); 117 – 125.

Afolabi, J.A. 2010. Analysis of Loan Repayment among small scale farmers in Oyo State, *Nigeria Journal of Social Science*. 22(2) : 115 – 119.

Ajah, E.A., Eyo, E.O and Abang S.O (2013).Repayment Performance among Cassava and Yam Farmers under Nigerian Agricultural Bank small Holder Loan Scheme in Cross River State Nigeria. *British Journal of Economics, Management and Trade* 3(4): 437 – 467

Ezeh C.I, (2003) Credit worthiness and determinants of loan repayment of small holder farmers in Abia State, Nigeria, *Nigerian Journal of Sustainable Tropical Agriculture Research*, 5:10-13.

Ezeh C.I., Anyiro C.O and Chukwu J.A (2012).Technical Efficiency in Poultry Production Broiler Production in Umuahia Capital Territory of Abia State, Nigeria. *Greener Journal of Agricultural Science* 2(1); Pp 1-7

Godquin, M. (2004). Microfinance Repayment Performance in Bangladesh: How to Improve the Allocation of Loans by MFIs. World Development, Vol. 32 (11), Pp. 1909-1926

Guttman M.J. (2007). Repayment Performance in Microcredit Programs: Theory and Evidence. Working Paper-11, Networks Financial Institute, Indiana State University.

Kohansal M.R., Mansoori H. (2009). Factors affecting loan Repayment Performance of Farmers in Khorasan-Razavi Province of Iran. Paper presented at the Conference on International Research on Food Security, Natural Resource Management and Rural Development, University of Hamburg, October 6-8, 2009.

Mbanasor, J.A. and Nto, P.O.O (2008). Discriminant Analysis of Livestock Farmers Credit Worthiness Potentials under Rural Banking Scheme in Abia State, Nigeria. *The Nigerian Agricultural journal*, 39 (12): 1-7.

National Population Commission. (NPC) (2006). Preliminary 2006 census figures. Retrieved September, 2007 from http://www.population.gov.ng/pop-figure PDF.

National Root Crops Research Institute (NRCRI). (2003). NRCRI Annual Report. Umudike, Umuahia, Abia State Nigeria.

National Root Crops Research Institute (NRCRI). (2008) Annual Report. Umudike, Umuahia, Abia State Nigeria.

Njoku, J.E. and Odii, M.A.C.A (1991). Determinants of loan Repayment under the Special Emergency Loan Scheme (SEALS) in

Nigeria: A Case Study of Imo State. *African Review of Money, Finance and Banking* 1(1): 39 – 52

Njoku, J.E. and N.C. Nzewa, (1990).“Loan Repayment and its Determinants. Under the Smallholder Direct Agricultural loan Scheme in Imo State, Nigeria. *Nigeria Agricultural Journal,* 28(3): 247-254.

Nwachukwu, I.N. C.S. Alamba, and A. Oko-Isu (2010). Determinants of institutional credit repayment performance among farmers in Afikpo North LGA of Ebonyi State, Nigeria. *Advances in Agriculture and botanics-International journal of the bioflux society,* 2(3): 279-284.

Nweze, N.J. (1991). The Role of women Traditional Saving and Credit Cooperative in Small Farm Development in Africa. In: Oguta C.A. (Eds). Issues in Africa Rural Development, pp 234 – 236.

Ngwaziem, G.C. (2013). Rural Credit Supply and Loan Repayment Performance in Informal Financial Sectors in Abia State, Nigeria. A.B. Agricultural Project Report. Department of Agricultural Economics and Extension, Abia State University, Uturu.

Okorie, A. (1989). “Major Developments of Agricultural Small-Holder Loan Repayment in a Developing Economy: Emperical Evidence from Ondo State, Nigeria” *Journal of Agricultural Administration,* 2(1):223 – 234.

Onyeagocha, S. U. O., Chidebelu, S.A N. D. and Okorji, E. C. (2012). Determinants of Repayment of Loan Beneficiaries of Micro Finance Institutions in Southeast States of Nigeria. *International Journal of Agricultural Management and Development, 2 (3): 167-175.*

Onyenucheya F. and Ukoha O.O (2007). Loan repayment and credit worthiness of farmers under the Nigerian Agricultural Cooperative and Rural Development Bank NACRDB. *Agricultural Journal.*; 2(2):265–270.

Okorji E.C. and Mejeha R.O. (1993). 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 of Tropical Agriculture*.1 (1):1–13.

Ugbomeh, G.M.M, Achoja, F.O. Ideh, V. and Ofuoku, A.O (2008). Determinant of Loan Repayment Performance among women Self Help Groups in Bayelsa State, Nigeria. *Agriculture conspectus Scientifics.*73 (3): 189-195.