

RISK ATTITUDE AND LOAN REPAYMENT PERFORMANCE AMONG SMALLHOLDER FARMERS IN MBAITOLU AND OWERRI NORTH LOCAL GOVERNMENT AREA OF IMO STATE.

¹Kadurumba, C., ²Enekwachi, M.E and ³Njoku, I.A.

¹ Department of Agricultural extension and rural management, Federal College of Agriculture Ishiagu, P.M.B 7008 Ebonyi State Nigeria

²Department of Public Administration, Federal College of Agriculture Ishiagu, P.M.B 7008, Ebonyi State, Nigeria.

³Department of Marketing, Federal College of Agriculture Ishiagu, P.M.B 7008, Ebonyi State, Nigeria.

Corresponding author: Email:kadurumbachukwuemeka@gmail.com

ABSTRACT

This research focused on risk performance and loan repayment among smallholder farmers in the Mbitolu and Owerri North (LGA) areas of Imo State. In the study area, governmental and non-governmental organizations have extended credit facilities to farm households to reduce the gap between the owned and required capital to use improved agricultural technologies that could increase production and productivity. However, there are serious loan repayment problems in the study area, which discourages rural finance from promoting and extending credit. A well structured questionnaire was used to collect information from sixty small farmers in two LGAs, using the multistage sampling technique. The result shows that the respondents are mainly women (86.6%) and that majority of them are married (75%) and are of working age (38 years old). The multinomial logistics model, with included explanatory variables, correctly predicts 41.17% of risk-neutral respondents, 34% of risk-seeking respondents and 51.55% of risk-averse respondents. The overall forecast was 54.63%. The study shows that, gender, primary education status, number of years of experience in agriculture, marital status, household size, credit, co-op membership, acquisition of land by inheritance and total investment capital are the factors that determined the risk attitude at different levels of significance but with different signs compared to the basic result. A two-limit tobit regression model was applied to identify the factors that influenced loan repayment. The results indicate that the agro-ecological zone, non-agricultural activities and technical assistance of extension agents had a positive influence on the repayment performance of small farmers' loans, while the loss of production, informal credit, social celebrations and the loan-to-income ratio have negatively affected the repayment of loans ($p < 0.05$). Based on the results of the study, policy implications have been drawn for improving loan repayment performance and the sustainability of credit services and institutions in the study areas.

Key words: Loan, farmers, multinomial, two - limit tobit model

INTRODUCTION

Loans play a vital role in economic transformation and rural development (Ayinde and Adano, 2010). Agricultural or agricultural loans are a critical input needed by smallholder farmers to establish and expand their farms to increase agricultural production, increase food sufficiency, promote household and country incomes, and increase the capacity of the individual borrower to repay borrowed funds (Afolabi 2010). It enables poor farmers to exploit financial resources and take advantage of potentially profitable investment opportunities in their immediate environment (Zeller and Sharma, 2008). The need for lending facilities is necessitated by the limitations of self-financing, uncertainty about production levels and the mismatch between inputs and outputs (Kohansal and Mansoori, 2009). However, its accessibility is imperative to improve the quality and quantity of agricultural products, so as to increase farmers' incomes and reduce rural-urban drift (Kohansal and Mansoori, 2009). Agricultural lending is thought to be an indispensable tool for achieving the socio-economic transformation of rural communities (Eze and Ibekwe, 2007). Well implemented, it would stimulate capital formation and diversified agriculture, increase resource productivity and farm size, promote agricultural innovation, sales efficiency and value-added while increasing net farm incomes (Nwagbo *et al.*, 2009). In Nigeria, the recognized importance of loans in the promotion and development of the agri-food sector, despite their acquisition, management and repayment, faces many challenges (Obob and Ekpebu 2011, Afolabi, 2010), particularly smallholder farmers (Awoke, 2004). In the case of acquisition and management of loans, Rhaji (2000) found that the lack of adequate, accessible and affordable loans is one of the main factors responsible for the systemic decline in agriculture's contribution to the Nigerian economy. With regard to repayment, the high level of defaults among borrowers remains a major obstacle (Oladeebo and Oladeebo, 2008, Oni *et al.*, 2005). Awoke (2004) reported that the high default rate due to poor management procedures, credit diversion and reluctance to repay loans threatened the sustainability of most public agricultural lending programs in Nigeria. In the same vein, Olagunju and Adeyemo (2007) succinctly set out that the problem of the lack

of repayment of agricultural loans is one of the factors which has hindered the development of the agricultural sector in Nigeria, will of the economy. Institutions to increase lending to the sector. Whatever the cause, one of the direct consequences of a loan default is that it has resulted in a significant reduction in loanable funds for a larger majority of loan applicants and a significant cost in terms of time and administrative resources to recover. the amount in default (Udoh, 2008). Partly because of the high default rate, most credit institutions are increasingly reluctant to provide loans to small farmers (Afolabi 2010, Olagunju and Adeyemo 2007) who are in dire need of them. To reduce loan repayment defaults and improve loan repayment performance among Nigerian farmers, it has been advocated to form and join farmer groups. A group is a set of individuals from which a set of interrelated relationships exists (Ofuoku and Urang, 2009). Groups are characterized by shared interactions, values and beliefs, common purpose, structure, and ideology (Ofuoku and Urang, 2009). Cooperatives are forms of groups that have been encouraged among farmers as instruments of social and economic transformation. According to the cooperative membership model, farmers were encouraged to become members of cooperative associations, which would be registered, elected and would meet regularly with documented minutes (Ofuoku and Urang, 2009). The belief was that, working in associations and groups, farmers would be empowered to speak and act with one voice, and would therefore have to deal with loans through financial institutions. As long as the members of the cooperative societies wish to remain in the group, they are expected to live up to the expectations, norms and values of the group (Ofuoku and Urang, 2009).

However, despite the significant role expected of cooperative groups in promoting the repayment of its members' loans, limited studies have attempted to investigate the competence to repay loans from cooperative farmers in Nigeria. The specific objectives of the study are as follows: To describe the socio-economic characteristics of farmers who have obtained a loan from microfinance in the study area, to examine the source of loans, to determine the link between the attitude risk and socio-economic characteristics and determine the factors affecting the loan repayment of farmers in the study area.

METHODOLOGY

Data source and sampling technique

Mbaitolu and Owerri West are areas of local government in Imo State, Nigeria. Owerri West has an area of 295 km² and a population of 99,265 inhabitants at the 2006 census, while Mbaitolu has an area of 204 km² and a population of 237,555 inhabitants at the 2006 census, although the state government claims 234 km² and a population of 255,000 people in 2004. The main occupations in

Mbaitolu are agriculture and handicrafts such as basketry, broom making, hair weaving, etc., while Owerri West are mainly farmers. Data were obtained from a primary source using structured questionnaires administered to smallholder farmers. A total of 60 farmers from both L.G.A. who received a loan during the 2016/2017 production year were randomly selected for the study, using the multi-stage sampling technique.

Analytical methods

Two main analytical tools were used in this study: Descriptive analysis and multi-nominal regression model. The determinants of the respondents' risk attitude were estimated using multinomial logistic regression. The attitude towards risk is generally divided into three distinct categories: risk aversion, risk neutrality and risk seeking. A simple way to distinguish these three different attitudes is to measure the expected mathematical value that one is willing to give up to obtain greater certainty. If this expected value is strictly positive if one is willing to pay a premium to avoid risk, this is the intuitive case of risk aversion. If the expected value is equal to zero, we do not want to give up any value to obtain greater certainty: this is the case of risk neutrality. If the expected value is strictly negative, the absolute expected value must be received to accept greater certainty; this is the case of the search for risk. A more standard way of defining a risk attitude is to consider a choice between a result obtained with certainty and a risky prospect with the same expected value. Individuals who prefer the former are less inclined to take risks, while those who prefer the latter look for risks. Indifference defines the neutrality of risks. However, most smallholder farmers in Nigeria are not exposed to the principles outlined above. It is therefore necessary to use a more pragmatic method to classify farmers in different risk groups. As a result, farmers received a set of ten questions related to food security and their risk-seeking behavior. Each farmer should rank their answer to the five (5) questions indicating high acceptance of one (1) low acceptance indication. The average response of each farmer was determined and was used to rank the nature of the farmer's risk as follows: 1.00-2.49 opposed to risk, 2.5 risk-neutral and 2.51-5, 00 Search for risk. The size of the farm is another way of categorizing farmers according to their level of risk. The philosophy behind this classification is that the level of risk that a farmer is willing to take is directly related to the size of the farms he owns. In order to rank farmers in the top three safety categories, each farmer was asked a series of questions about his level of food security. Each farmer should rank their answer to the five (5) questions indicating high acceptance of one (1) low acceptance indication. The average response of each farmer was determined and then used to rank the food security of each farmer: 1.0 - 2.49 In food

insecurity, 2.50 in food security and insecurity, and 2.51 - 5.00 in food security.

Behavioral response models involving more than two possible outcomes are multinomial or multivariate. Multinomial models are appropriate when individuals can only choose one outcome from a set of comprehensive and mutually exclusive alternatives. Therefore, in order to determine how the risk status of the farmer is affected by his food security status, the multinomial logistic regression model was used. The choice of this method is based on the fact that the risk behavior (dependent variable) is a categorical variable that can take three (3) levels (0, 1 and 2), as previously indicated (Pennings and Garcia, 2001, Ayinde et al. ., 2010). The probability that the *i*th farmer belongs to the *j*th risk behavior group reduces to:

$$P_{ij} = \frac{e^{\beta_j X_i}}{1 + \sum_{k=j} e^{\beta_k X_i}} \dots\dots (1)$$

The generalized multinomial model is expressed as (Babcock et al., 1995)

$$P_{ij} = \frac{e^{\beta_j X_i}}{1 + \sum_{k=0} e^{\beta_k X_i}} \dots\dots\dots (2)$$

While the probability of being in the base outcome group or group 0 is

$$P_{i0} = \frac{1}{1 + \sum_{k=0} e^{\beta_k X_i}} \dots\dots\dots (3)$$

Where *i* = 1, 2n variables; *k* = 0, 1, .. groups; and β_j = a vector of parameters connecting *X_i* to the probability of belonging to the group *j* where there are *j* + 1 groups. The different independent variables included in the final model are *X₁* = Sex (1 if masculine, 0 otherwise), *X₂* = Age (years), *X₃* = Marital status (1 if married, 0 otherwise), *X₄* = Formal and informal financial credit institutions (Naira), *X₅* = Educational status (1 if primary level is reached, 0 otherwise), *X₆* = Educational status (1 if secondary level is reached, 0 otherwise), *X₇* = Educational status (1 if level of education) adult education is reached, 0 otherwise), *X₈* = educational status (1 if higher education level is reached, 0 otherwise), *X₉* = household size (number), *X₁₀* = breeding status (1 if farmer in full-time, 0 otherwise), *X₁₁* = years of agricultural experience (years), *X₁₂* = Land acquisition method (1 if inherited, 0 otherwise), *X₁₃* = Farm size (ha), *X₁₄* = Income agricultural (Naira), *X₁₅* = Total investment capital (Naira), *X₁₆* = Labor used (man / day), *X₁₇* = Food security status (1 if food security or insecurity, 0 otherwise), *X₁₈* =

Number of extension contacts, *X₁₉* = Members of cooperative societies (1 if member, 0 otherwise).

To estimate the model, the coefficients of the basic result are normalized to zero (0). This is because the probabilities for all choices must sum to unity. Therefore, for only 3 choices (3-1), distinct sets of parameters can be identified and estimated. The natural logarithms of the odd ratio of equations (1) and (2) give the estimation equation as

$$\ln \frac{P_{ij}}{P_{i0}} = \beta_i X_i \dots\dots\dots (4)$$

This denotes the relative probability of each of groups 1 and 2 in relation to the probability of the base result. The estimated coefficients for each choice therefore reflect the effects of *X_i* on the probability that farmers will choose this alternative over the base result. Stata Statistical / Data analysis software 11.2 (Stata, 2009) was used to estimate the model. The final estimates were selected on the basis of the variables giving the highest pseudo R². The coefficients of the basic result were then found according to Hill (1983) as

$$\beta_3 = - (\beta_1 + \beta_2) \dots\dots\dots (5)$$

Where β_3 = coefficient of the basic outcome variable (risk aversion), β_1 = estimated coefficient of the neutral risk group, β_2 = estimated coefficient of the risk-seeking group. After estimation, the partial derivatives or marginal effects and quasi-elasticities of the model were obtained from the software (Greene, 2003, Hill, 1983, Basant, 1997, Rahji and Fakayode, 2009, Maddala, 1990, Kimhi , 1994). Finally, the likelihood index (LRI) of McFadden (1974), also called pseudo R², similar to R² in a classical regression, was calculated as follows:

$$LRI = 1 - \frac{\ln L}{\ln L_0} \dots\dots\dots (6)$$

Where, lnL = log-likelihood function
lnL₀ = log-likelihood computed with only the constant term.

Factors' affecting the loan repayment of farmers in the study area was achieved using the Tobit two-limit model. A two-bound model was used to select the variables that most significantly distinguished non-defaulted farm loans from a set of personal and socio-economic variables that were thought to influence repayment behavior. Different studies of loan repayment performance in different countries have identified the most likely causes of default. In addition, key independent variables such as age, gender, credit experience, credit diversion, level of education, insufficient supervision, etc. were analyzed using different models. such as the logit, probit and ordinary multiple regression method. However, most of the studies conducted in the modeling of loan repayment determinants have used discrete choice models (Logit and Probit) in which the

dependent variable is a manikin taking a value of zero or one depending on whether a producer is in default or not. However, Lynne et al. (1988) highlighted the possibility of information loss if a binary variable was used as a dependent variable because the dependent variable could have more than two outcomes. In addition, binomial models only explain the probability that a person has made a certain choice (ie default or default) and does not take into account the degree of loan recovery. The linear probability model (LPM), although simpler and simpler conceptually and informally than binary choice models, relies on the use of ordinary least squares (OLS). The application of the least squares method to a censored model, however, inherently produces a heteroscedastic perturbation term (i) and, therefore, the standard deviations of the estimates are biased. These deficiencies are minimized with the use of the Tobit model (Tobin, 1958). Therefore, this study used two maximum-limit regression models to determine factors affecting loan repayment performance in the study areas.

In this study, the value of the dependent variable is the repayment ratio that has been calculated as the ratio of the amount of the loan being repaid to the total amount due from formal credit sources. Thus, the value of the dependent variable is between 0 and 1 and a two-limit Tobit model was chosen as the appropriate econometric model. The two-limit Tobit was originally introduced by Rossett and Nelson (1975) and discussed in detail by Maddala (1992) and Long (1997).

Specification of the Two limit Tobit

The model derives from an underlying classical normal linear regression and can be represented as:

$$y^* = \beta'x_i + \varepsilon_i, \quad (1)$$

$$\varepsilon \sim N [0, \sigma^2].$$

Denoting Y_i as the observed dependent (censored) variable

$$Y_i = \begin{cases} 0 & \text{if } Y^* \leq 0 \\ Y^* = X\beta + \varepsilon_i & \text{if } 0 < Y^* < 1 \\ 1 & \text{if } Y^* \geq 1 \end{cases} \quad (2)$$

Where,

Y_i = the dependent variable observed, in our case the repayment rate (ratio of the amount refunded to the amount due)

Y_i^* = the latent variable (not observed for values less than 0 and greater than 1).

X_i = is a vector of independent variables (factors affecting loan repayment and loan recovery intensity)

$i\beta$ = vector of unknown parameters

ε_i = residual residues that are independently and normally distributed with zero mean and common variance σ^2 , and $i = 1, 2 \dots n$ (n is the number of observations).

X_1 = agro ecological zone (Dummy, highland = 1, 0 otherwise)

X_2 = Farmer Age (years)

X_3 = gender (Dummy, male = 1, 0 otherwise)

X_4 = use of experience credit (years)

X_5 = family size (number)

X_6 = off-farm (fictitious, participation out of business = 1, 0 otherwise), this is small business, selling charcoal, selling firewood, etc.

X_7 = loss of production during the production period of the loan period (Dummy, 1 = failure of crop or livestock or disease occurring 0, otherwise)

X_8 = Informal credit during the formal credit period (Dummy, 1 = if HH uses informal credit, 0 otherwise)

X_9 = membership extension package (Dummy, extension package household member = 1, 0 otherwise)

X_{10} = Distance from credit source (minute)

X_{11} = Social festivals during the loan period (Dummy, social festival organized by the house = 1, 0 otherwise)

X_{12} = contact with development agents (number of contacts per day)

X_{13} = Number of livestock (TLU)

X_{14} = Ratio of loan income (Ratio of total loans received to annual income)

X_{15} = size of the land (hectare)

X_{16} = Model of Education (model, literate = 1, 0 otherwise)

Using the two-limit Tobit model, the repayment ratio has been regressed on the various factors that are thought to influence the repayment performance of small farmer loans in the study area. The regression parameters do not directly correspond to changes in probability or changes in the expected level of use. However, their signs indicate the direction of change in the probability of non-default and the marginal intensity of loan recovery as a change in explanatory variable (Amemiya 1984, Goodwin 1992, Maddala 1985).

The Tobit model has the advantage of being able to further decompose its coefficients to determine the effect of modifying the variable i on changes in the probability of being non-defaulting (Mc Donald and Moffit, 1980) as follows:

1. The change in the probability of repaying the loan as an independent variable X_i changes is:

$$\frac{\partial \Phi(\delta)}{\partial X_i} = \phi(\delta) \frac{\beta_i}{\sigma}$$

2. The change in intensity of loan recovery with respect to a change in an explanatory variable among non-defaulters is:

$$\frac{\partial E(Y_i / U > Y_i^* > L, X)}{\partial X_i} = \beta_i \left(1 + \frac{\delta_L \phi(\delta_L) - \delta_U \phi(\delta_U)}{\Phi(\delta_U) - \Phi(\delta_L)} - \left[\frac{\phi(\delta_L) - \phi(\delta_U)}{\Phi(\delta_U) - \Phi(\delta_L)} \right]^2 \right)$$

3. The marginal effect of an explanatory variable on the expected value of the dependent Variable is:

$$\frac{\partial E(Y / X_i)}{\partial X} = \beta_i (\Phi(\delta_u) - \Phi(\delta_L))$$

Where,

X_i = explanatory variables,

$\Phi(\delta)$ = the cumulative normal distribution

$\delta = \frac{\beta_i X_i}{\sigma}$ = the Z-score for the area under normal curve

β_i = a vector of Tobit maximum likelihood estimates

σ = the standard error of the error term.

$$\delta_L = \frac{L - X_i \beta}{\sigma}$$

$$\delta_U = \frac{U - X_i \beta}{\sigma}$$

L and U are threshold values (L =0 and U=1)

ϕ and Φ are probability density and cumulative density functions of the standard normal distribution, respectively.

Results and discussion

Loan source

Table Table 3.1. Table 4.4: Distribution of Farmers According To Loan Source

Loan obtained	Frequency	Percentage
Micro Finance Bank	10	17
Commercial	10	17
Cooperatives	20	33
Issusu	5	8
Money Lender	1	2
Government Support	4	7
Friends	8	13
Others	2	3
Total	60	100

Source; Field Survey Data, 2018

Table 4.4 shows that 33% of those interviewed obtained loans from cooperatives, 17% from microfinance banks and commercial banks, 13% from friends, 5% for issuu, 4% to government assistance. , 3% to other sources and only 2% to the lender money. This shows that a higher percentage (33%) of these respondents obtained their loan from cooperatives, which could be an

advantage for loan repayment and risk attitude, most of these famous members being cooperatives.

Identification of constraints to the repayment of loans to farmers

The result of the analysis of the constraint on repayment of the farmer's loan is presented in Table 3.2.

Table 3.2: Constrain to Loan Repayment.

Loan obtained	Frequency	Percentage
Low Productivity and yield	24	20
Natural hazard	9	7.5
High interest rate	21	17.5
Shot Loan Repayment	6	5
Tax	0	0
Price Fluctuation (drop in market price)	31	25.8
Others	8	13

Source; Field Survey Data, 2018

Multiple responses recorded

Table 3.2 shows that the constraints faced by smallholder farmers in the study area revealed that 25% of respondents in the study area were confronted with a price function (lower market price), while that 20% of respondents were facing a

productivity and yield problem of 1000. 17.5% were faced with a problem of high interest rate. But none has been confronted with taxation as a constraint. This implies that the farmer was faced with constraints that could have prevented him from repaying 10 and that he was being collected on time.

Table 3.3. Coefficient estimates of the variables determining risk attitude of small holder farmers

Variables	Risk Neutral		Risk takers		Risk averse	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Sex	-1.596	-1.966*	0.68	2.42**	-1.318	-1.33
Age	-1.389	-0.37	1.183	1.02	-0.178	-0.27
Marital status	-0.775	-2.84***	0.325	0.48	-0.22	-0.54
Credit	0.307	0.9	-0.379	-6.04***	-0.237	-0.95
Education	0.703	1.31	0.111	2.31**	1.149	6.42
Household size	0.282	1.87*	0.525	1.11	0.431	1.1
Farming status	0.452	1.18	-0.779	-1.63	0.238	0.89
Farming experience	0.105	1.96*	-1.828	-3.92***	0.674	0.84
Method of land acquisition	-13.149	-0.48	2.174	2.31**	3.723	1.09
Farm size	0.195	0.96	0.458	1.22	.178	1.010
Farm income	.017	.058	.178	1.010	-0.455	-0.45
Capital	-1.103	-0.672	0.525	2.01*	0.282	1.23
Labour	0.452	1.18	-0.779	-1.63	0.238	0.89
Food security status	-0.160	-1.046	0.674	0.84	-0.081	-0.510
Extension contact	.127	.441	0.325	0.48	.441	.748
Memership of cooperative society	-1.596	-1.39	-5.098	-3.02***	-1.318	-1.33
Constant	4.724	-3.10***	0.68	2.42**	-0.455	-0.45

Log Likelihood ratio = -47.935 $\chi^2(30) = 52.00$ $Pro > \chi^2 = 0.0076$ Pseudo $R^2 = 0.8517$
Predictions -Risk neutral 44.17% Risk seeking 0.34% Risk aversion 51.55% Total 54.63%

NB: Values in parenthesis are standard errors, ***P<0.01, **P<0.05, *P<0.10;

Source: Data from field survey, 2018

The results in Table 3.3 show that the probability ratio (2) is statistically significant at the 1% level, which means that the variables considered together have a very significant influence on the risk status of the respondents. This indicates that all or some of the slope coefficients are significantly different from zero. This means that the model is able to show and explain the determinants of respondents' risk status. This indication is also confirmed by the LRI of

0.8517 which is similar to the quantity obtained by Rahji and Fakayode (2009), Abadi Ghadim and Pannell (1999) and Hill (1983), but much higher than that obtained by Zepeda (1990). Zepeda (1990) reported that a ratio of 0.25 is a good fit for the multinomial Logit model. The model, through the included explanatory variables, correctly predicts 44.17% of the risk-neutral respondents, only 0.34% of the risk applicants and 51.55% of the risk-averse

respondents. The overall forecast was 54.63%, which makes the estimates obtained good enough for further analysis.

The result of the estimates of the explanatory variables shows that the set of significant explanatory variables and their sign vary from one group to another. The coefficient for sex, primary education level, and years of experience in agriculture was significant for both groups compared to baseline, but with different signs and levels of importance. While sex is significantly negative at 10% for the risk-neutral group, it is positively significant at the 5% level for the at-risk group, compared to the base result. Moreover, although the primary education level is significant at 10% for both groups, it is negative for the neutral risk and positive for the risk research, the number of years of experience in agriculture is negatively related. risk status at 10% for the neutral and 1% for the research groups. Finally, if marital status is significantly significant at the 5% level and household size is negatively significant at the 10% level for neutral risk, credit and co-op membership are negatively significant at the 1% level. %; and the acquisition of inherited land and total investment capital are significantly significant at the level of 10% for the at-risk group, respectively.

According to the results, the probability of risk neutrality is reduced according to the sex of the respondents, while the probability of risk seeking is increased according to sex with respect to the risk aversion group. As the majority of respondents are women, it appears that some women are looking for risk and some of them tend to be neutral or opposed to the basic characteristics of the male sex. In addition, the probability of risk neutrality is increased by marital status. This suggests that marriage encourages risk neutrality, probably because of increased responsibility for caring for women and children. Taking risks involves mortgaging certain assets, physical or social. In some primitive societies, even wives are pledged as collateral for loans or loans contracted by households. This could even be the reason why the probability of risk seeking is reduced by the credit taken. The result also indicated that the probability of risk neutrality is increased when respondents reach the primary education level. This is hardly surprising, as only more educated farmers would have acquired

the knowledge base needed to understand the nature of the risks and the various technologies available to combat them, which will of course encourage risk-seeking. This tends to confirm why the probability of risk seeking is reduced by the level of primary education. Household size tends to reduce the probability of risk neutrality despite the large size of the family. The result here seems to suggest that risk aversion is that which is encouraged by the size of the household tending to contradict the estimate of marital status. However, the possibility that larger households escape their responsibilities, such as the payment of taxes, levies, royalties and even the repayment of credit taken, is greater and Afolabi (2010) indicates that this corresponds to this result. Years of experience in the agricultural sector reduce the likelihood of risk neutrality and risk-seeking respondents, which is completely contrary to expectations, because with the experience gained in the agricultural sector, the farmer is able to better understand the production technology and all the associated challenges, thus forming models of the to face such challenges intuitively. However, in view of the socio-economic challenges faced by respondents, in particular the low level of education, experience does not seem in itself to be sufficient to combat risks, so that the farmer tends more to aversion to risk factors. Land acquisition by inheritance and total investment capital increases the likelihood of respondents seeking risk, as expected. Since the land is not purchased, the defendant can afford to use it as security or collateral for any risky transaction. In the same vein, with capital accumulation and an increase in farm assets, the farm business is at higher risk, so the farmer has to engage in some risky businesses. In such circumstances, the search for risk is a natural step. Finally, belonging to the cooperative society reduces the probability of behavior of respondents in search of risk, which is completely contrary to expectations. It is thought that when farmers associate with members of similar social and economic status, the knowledge base to manage the risks associated with the agricultural production environment is improved, which enhances risk-seeking capabilities, although it's the opposite. This may indicate that the determinants of the risk status of these respondents are as diverse as their differences in socio-economic status and otherwise.

Table 3.4: Two limit Tobit regression for factors affecting loan repayment

Variables	B	SE	t-value	p-value	Prob	Expect value
X ₁	0.164	0.0623	2.632**	0.012	0.2372	0.1267
X ₂	-0.002	0.003	-0.667	0.431	0.0036	0.0021
X ₃	0.051	0.41	1.244	0.246	0.0702	0.0397
X ₄	0.024	0.014	1.714	0.174	0.0353	0.0191
X ₅	-0.013	0.013	-1.000	0.324	0.0176	0.0101
X ₅	0.089	0.043	2.070**	0.038	0.1381	0.0763
X ₇	-0.239	0.054	-4.426***	0.000	0.3508	0.1781
X ₈	-0.092	0.042	-2.190	0.031	0.1222	0.0732
X ₉	-0.024	0.058	-0.414	0.686	0.0339	0.0180
X ₁₀	0.000	0.000	-0.53	0.589	0.0005	0.0004
X ₁₁	-0.140	0.056	-2.500**	0.023	0.2119	0.1052
X ₁₂	0.059	0.025	2.360**	0.029	0.0823	0.0467
X ₁₃	-0.004	0.016	-0.250	0.812	0.0049	0.0035
X ₁₄	-0.425	0.154	-2.760**	0.008	0.5938	0.3311
X ₁₅	0.081	0.065	1.246	0.220	0.1131	0.0635
X ₁₆	-0.015	0.053	-0.283	0.808	0.0183	0.0121
_con	0.968	0.156	6.205***	0.000		

Number of obs = 60
 LR chi2(10) = 12.45
 Prob>chi2 = 0.0061
 Pseudo R2 = 0.8524
 Log likelihood = 112.57558

3.4 Factors Affecting Loan Repayment

The two-way regression model was estimated to determine explanatory variables that are good predictors of rural smallholder loan repayment performance in Mbaitolu and Owerri North Local Government Areas in Imo State. . The results of the analysis are presented in Table 7. The econometric model took into account 16 explanatory variables, of which 7 significantly influenced the probability of being non-defaulting and the intensity of loan recovery among households. farm. probability level less than 5%. The result of the tobit regression model shows that the agro-ecological zone (X₁), the non-agricultural activity (X₆), the production loss (X₇), the informal credit (X₈), the celebration of social ceremonies (X₁₁), the number of days of farm contact the head of household with extension agents (X₁₂) and the ratio of loan income (X₁₄) are important factors influencing the repayment performance of smallholder farmers' loans. study zone. Obtaining non-farm income (X₆) is another economic factor that has a positive and significant relationship with the repayment performance of smallholder loans. This may be due to the fact that non-farm activities are an additional source of income for smallholders and that the income generated by these activities could enable farmers to pay their debts to pay their debts, even during bad periods of time. harvest and when the repayment period coincides with a period of low agricultural income. prices. Meanwhile, non-agricultural farmers can repay their loans faster than those with little or no non-farm income. Participation in non-farm activities increased the probability of

being non-defaulting by 13.81% and, on average, the loan repayment rate of 7.63% for all respondents. Chirwa (1997) and Bekel (2001) also obtained similar results on the repayment of agricultural credit in Malawi and Ethiopia, respectively.

The agro-ecological difference (X₁) was one of the factors that significantly influenced farmers' loan repayment performance. The results of the econometric model revealed that living in a sufficient agro-ecological rainfall zone reduced the probability of default by 23.72% and increased the average reimbursement rate by 12.67% for all respondents in the sample. Loss of production (X₇) due to inclement weather, diseases and parasites, among other factors, also negatively affects loan repayment performance. Agriculture is generally considered more risky than other commercial activities. So,

it is not surprising that agricultural lending projects have had poor repayment performance. For example, farmers who had probably lost their products for the reason mentioned above were less likely to repay their loans than other farmers. For a discrete change in the dummy variable from 0 to 1, the loan recovery rate decreases by 17.81% and the probability that a borrower will not default also decreases by 35.08%. The results of the tobit model reveal that informal lending (X₈) negatively affects loan repayment performance for a formal institution. A farmer borrowed from informal sources influences the repayment of credit to official institutions because he prefers to settle loans with lenders and close relatives rather than distant and non-traditional financial institutions. As a result, informal borrowers

would tend to abstain from formal institutions as compared to those who do not borrow from informal services. The total marginal effect sample indicates that if a borrower receives a loan from an informal source, the probability of being in default is reduced by 12.22%, the loan recovery rate will decrease by 07.32% for the first time. whole sample. The results of the tobit model reveal that the celebration of social ceremonies (X_{11}) had a negative impact on loan repayment performance. The possible explanation is that celebrating one or more social ceremonies requires a lot of material and financial resources, which go beyond what borrowers could afford. For a discreet change in the dummy variable from 0 to 1, the loan recovery rate decreases by 10.52% for all respondents. In addition, the probability of a borrower being declared default also increases by 21.19%. The number of contact days of the farm household head with extension agents (X_{12}) is another important institutional factor, positively related to the dependent variable. This means that farmers who have greater access to technical assistance in agricultural activities have been able to repay their loans as promised more than those who received reduced or no assistance. The reason is that farmers who have frequent contact with development agents are better informed about markets and production technologies. As a result, they are motivated to repay their loans in a timely manner compared to those who have little or no contact with the extension. Each additional contact increases the probability of being non-defaulting by 8.23% and the reimbursement rate of 04.67 for the entire sample. Similar results were also obtained by Chirwa (1997), Belay (2002), Roslon and Abdkarin (2009). The loan-to-income ratio (X_{14}) is assumed to negatively affect loan repayment performance. The results of the tobit model also indicate that borrowers with a high loan-to-income ratio had poor repayment performance. The possible explanation is that borrowers with a high ratio received a high loan relative to their economic situation regardless of annual income or output. Indirectly, this finding reveals that farmers with higher annual income from agriculture and non-farm activities were more likely to repay their loans on time. For a unit increase in the loan income ratio, the loan recovery rate decreases by 33.11%, while the probability of non-default decreases by 59.38%.

CONCLUSION AND RECOMMENDATION

The study found that smallholder farmers in the study area obtained credit from formal and informal credit institutions. The results of the Tobit model also indicated that the study area, non-farm activity, production loss, informal credit, celebration of social ceremonies, number of days of contact of the head of household with extension and loan income ratio, determined the repayment performance. The specified multinomial logistic model correctly

specifies the probability of attitude towards risk and emphasizes that there are more than observed socio-economic variables that explain the attitude towards farmers. Attitudes towards risk can therefore only be explained by individual social, economic and cultural factors, and psychological factors, and it may be important to estimate individual risk preferences or to identify factors that affect a person's ability to bear the risk or take into account their risk environment. Based on these findings, it is necessary to increase the number of development agents to change farmers' attitudes towards agricultural transformation and early debt resolution. In rural areas, sufficient attention should be paid to policies and strategies aimed to develop and promote new technologies adapted to water-deficit areas. Finally, the agricultural insurance sector in Nigeria should be properly organized and empowered to manage the most risky agricultural enterprises that can attract higher risks if farmers move from unsustainable agriculture to commercial farming.

REFERENCE

- AbadiGhadimE.D& Pannell, A. (1988). Loan Delinquency Among Small Farmers in Developing Countries: A Case Study of the Small Farmers Credit Programme in Lagos State, Nigeria. *Economic and Financial Review*, 26(3), 36-44.
- Afolabi J.A (2008). Analysis of loan repayment among small scale farmers in south western Nigeria – a discriminant approach. *Journal. Soc. Sci.*, 17(1): 83-88.
- Awoke M.U (2004). Factors affecting loan acquisition and repayment patterns of small holder farmers in Ika North West of Delta State, Nigeria. *Journal. Sustain. Trop. Agric. Res.*, 9: 61-64. In: Oboh VU.
- Ayinde, M., &Adano, S. K. (2010). The impact of credit risk management on the financial performance of banks in kenya for the period 2000-2006. *International Journal of Business and Public Management*.
- Basant, A.S. (1997) "Bank Loan Loss Provision: A re-examination of Capital Management, Earnings management and signaling Effects" Syracuse University, Syracuse 1-37.
- Bekel B. N. (2001). Determinants of Loan Repayment: A study of Rural Women Fish Traders in Akwa-Ibom State, Nigeria. *British J. Econ. Manage. Trade* 4(4):541-550.
- Chirwa P. S (1997). Problems in the Implementation of Agricultural Credit Guarantee Scheme Fund. A Case Study of Selected Credit Institutions in Kaduna State. An Unpublished M.Sc. Thesis, Department of

- Agricultural Economics, ABU, Zaria, Kaduna.
- Eze O.A, and Ibwke, I.K (2007). Analysis of factors influencing farmers in Ogun state Nigeria. Dept of Agricultural Economics, University of Ibadan Nigeria.
- Green C. (2003). Relationship between Loan Default and Repayment Schedule in Microfinance Institutions in Ghana: A Case Study of Sinapi Aba Trust. *Research Journal of Finance and Accounting* -Vol.4, No.19, 2013
- Hill, J., (1993). *The Lending Performance of Community Development Credit Unions*. University of California, Davis.
- Kimhi, O. K. (1994). Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria, *Journal of Emerging Issues in Economics, Finance and Banking*, Arab Infotech FZLLC.
- 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.
- Long, S. (1997). Incorporating Strategic Risk into Enterprise Risk Management: A Survey of Current Corporate Practice, *Journal of Applied Corporate Finance*, 18(4), 81-90.
- Lynne, A. N., &Udell, G. F. (1958). Relationship Lending and Lines of Credit in Small Firm Finance. *Journal of Business*, University of Chicago Press, 68(3), 351-81.
- Maddala, H. B. (1990). A Survey of Credit Risk Management Practices by Commercial Banks in Kenya. Unpublished MBA Thesis, University of Nairobi.
- McDonald, J. F. and Moffat, R. A.,(1974). The use of Tobit Analysis, *Review of Economics and Statistics*, 62: 318- 320.
- Nwagbo E.C, Ilebani D, Erhabor P.O (2009). The role of credit in agricultural development: A case study of small-scale food production in Ondo State, Nigeria. *Samarujournal. Agric. Educ.*, 3(1 and 2): 29-35.
- Oboh V.U, Ekpebu I.D (2011). Determinants of formal agricultural credit allocation to the farm sector by arable crop farmers in Benue State, Nigeria. *Afr. Journal. Agric. Res.*, 6(1): 181-185.
- Ofuoku A.U, Urang E (2009). Effect of cohesion on loan repayment in farmers' cooperative societies in Delta State, Nigeria. *Int. Journal. Sociol. Anthropol.*, 1(4): 070-076
- Oladeebo J.O, Oladeebo O.E (2008). Determinant of loan Repayment among smaller holder farmers in Ogbomoso Agricultural zone of Oye Nigeria. *Journal of social science* 17(1):59-62.
- Olagunjournals F.I, Adeyemo R (2007). Determinants of repayment Decision among Small Holder Farmers in Southwestern Nigeria. *Pakistan Journal. Soc. Sci.*, 4(5): 677-686.
- Oni, M.O (2005). Prospects of Nigerian Cooperatives. Enugu. ACENA Publishers. In: Ofuoku AU and Urang E (2009). Effect of cohesion on loan repayment in farmers' cooperative societies in Delta State, Nigeria. *Int. Journal. Sociol. Anthropol.*, 1(4): 070-076.
- Pennings, P., & Garcia, M. D. (2001). Bank-specific, industry specific and macroeconomic determinants of bank profitability. *Journal of international financial Markets, Institutions and Money*, 18(2), 121-136.
- Rahji, M. S. &Fakayode, M. (2009). Strategic Risk Management: Creating and Protecting Value. *Strategic Finance*, 29. May 2007. Retrieved from: [StrategicRiskManagement_Creating_and_ProtectingValueStrategicFinance_May 2007.pdf](#)
- Rosset, S. H., & Nelson, S. K. (1975). Credit Risk and Profitability of Selected Banks in Ghana, *Research Journal of Finance and Accounting*, 3 (7), 6-15. Retrieved from: <http://2628-4635-1-PB.pdf>.
- Udoh E. (2008). Land Management and Resource-use Efficiency among Farmers in South-eastern Nigeria. PhD Thesis, Department of Agricultural Economics, Faculty of Agriculture and Forestry, University of Ibadan, Nigeria.
- Zeller M, Sharma M (2008). Rural Finance and Poverty Alleviation. Food Policy Report. International Food Policy Research Institute (IFPRI), Washington, D.C.
- Zepeda, A. (1990). Performance of Non-Performing Assets (NPA) In Indian Commercial Banks. *International Journal of Marketing, Financial Services & Management Research*, 2(9). Retrieved from: www.Indianresearchjournals.Com.