



LOAN REPAYMENT AND CREDIT WORTHINESS OF MAIZE FARMERS UNDER KENECHUKWU MICROFINANCE IN ENUGU NORTH AGRICULTURAL ZONE OF ENUGU STATE, NIGERIA

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ABSTRACT

The determinant of loan repayment and credit worthiness of smallholder maize farmers under Kenechukwu Microfinance in Enugu North Agricultural Zone, Enugu State, Nigeria was studied. One hundred and twenty respondents were randomly selected using multi stage random sampling technique. A well-structured questionnaire and interview scheduled were employed to collect the data. Descriptive statistics such as frequency distribution, table and percentage responses were employed to analyze objectives. The multiple regression analysis and discriminant analysis were also used to analyze the data obtained. The determinant factors to loan repayment in the study area were educational level and distance from the bank to farmers' house. Furthermore, factor affecting credit worthiness of the farmers were educational level, farm size, off--farm income and distance from bank. The recommendations proffered were needed to ensure farmers' access to educational programmes, land for genuine farmers and off- farm activities.

Keywords: Loan repayment, Credit worthiness, Maize farmers, Microfinance Bank, Multiple regression, Discriminant analysis.

INTRODUCTION

Maize, Zea mays L. (corn), is the most abundantly produced cereal and best adapted crop in the world (Acha, 2013; Kaine *et al.*, 2015, Kaine 2016 and FAO, 2018). Maize is an important food security crop, source of income generation, livestock feed, poverty alleviation and Gross Domestic Product (GDP) (Mmbando and Baiyegunhi, 2016). In 2019, the globally total maize production was estimated at 1.05 million thousand tonnes. The United States of America (USA) was the world's largest producer of corn in the same year under review, with estimated 347, 048 million metric tons on 90 million acres, accounting for 33.11% of world production. This was followed by China; Brazil, Argentina; and Ukraine which accounted for 75.82% of the global output (Nkamigbo *et al.*, 2018).

In Nigeria, maize production according to FAOSTAT (2021) was estimated at 11,000 thousand tons in 2019 with an average annual growing rate of 6.89%. Despite the importance of maize and all efforts by successive governments in Nigeria in boosting its production, the domestic production cannot meet the demand by her populace. The resultant effect is massive imports of the grain by successive Nigeria governments to the detriments the nation's dwindling resources. For instance, between 2018 and 2019, FAOSTAT. (2021) reported that, Nigeria maize imports were 400,000 thousand US dollars, respectively.

Empirical studies shows that maize farmers' production and productivity can be enhanced through ensuring their access to credit facilities (Alihero, 2012; Eyo, Merrian,





Asuquo 2013; Ume, Ezeano and Obiekwe, 2018). The importance of credit to agriculture development cannot be overemphasized. Benard (2011) reported that credit aids in breaking vicious circle of low capital, low productivity, low income, low savings and among others. In most countries in sub-Saharan Africa, the dearth of farmers' access to credit as asserted by Alihero, (2012) could be attributed chiefly to their inability to provide the mandatory collaterals as demanded by the lending agencies in order to make the credit less risky. To avert the aforementioned problem, microfinance bank was establishment (Afolabi, 2010). In Nigeria, micro finance bank was established in 2005 with primary objective of providing timely, diversified, affordable and dependable financial services to the economically active poor farmers (Ume *et al.*, 2018).

Studies shows that microfinance bank can be distinguished from other formal financial institution among others; the smallness of loans advanced and or savings collected, absence of asset-based collateral, and simplicity of operations (Adeyemo, 2012; Aja, Eyo and Ofen, 2014; Benard, 2011). However, the MFI operation with clients according to Welderufael, Tesfatsion and Gedifew (2015) using unsecured loans (loans without any collateral) makes credit riskier, leading to the credit institution having history of high defaulting rate, especially among beneficiaries in Asia, Africa and other developing continents. The low credit repayment rate by the clients could prompt to decrease in the volume of credit availability to diverse sectors of the economy and affects smallholder enterprise credit delivery and sustainability (Meyer, and Nagarajan, 2006), high interest rate and high processing cost by the institution (Eyo *et al.*, 2013).

However, Central Bank of Nigeria (CBN, 2019) remarked that among the small-scale enterprises that have access to microfinance bank credit, agricultural ventures stand prominent. For instance, literatures show that numerous micro finance institutions grant loans for assorted agricultural production, value addition, processing, storage, marketing and transport, resulting in an increase in the employment of agricultural inputs and enhanced output of agricultural product thereby creating more job opportunities to the diverse actors, it added.

Nevertheless, according to CBN, (2019) over 300 million of smallholder farmers in Nigeria have benefited on microfinance banks credit facility but the literatures on the rate of repayment of such loan in both the principal and interest is with dismay, thus threatening the existence of many of this financial institution as problems of loan shrinkage, liquidation and ineffectiveness exist. The poor loan repayment as opined by Afolabi (2010) could be related to myriad of factors such as high interest rate, unstable prices of agricultural commodities, and the social relations and responsibilities of the borrowers. Others factors are inadequate logistics to monitor farmers, unreliable locations and other risks associated with the enterprise with regards to production and marketing have come to worsen microfinance banks loan recovery (Acha, 2012).

In Nigeria, microfinance banks are faced by numerous problems which has capacity of affecting their performance, included as dearth of knowledge and skills in micro financing, inadequate funds for intermediation owing to lack of aggressive savings mobilization, inability to attract commercial capital, and the none establishment of the microfinance development fund (MDF) (Acha, 2012; Nawai and Shariff, 2013; Nasir, 2013). However, for the micro finance bank in achieving its utmost goal of granting loans to its clients in the faces of aforesaid problems and competitiveness in banking business, there are needs in curtailing losses ensuing from loan defaults, upkeep of high loan repayment rates from the beneficiaries and detection of good and bad borrowers prior to loan disbursement.

Furthermore, an accurate assessment of each borrower's financial performance offers lenders a basis for either extending the present line of credit and for determining the amount





and kind of supervision needed. In the course of this research, the specific objectives are to identify the factors influencing the loan repayment and ascertain the credit worthiness of the respondents in the study area

MATERIALS AND METHODS

The Study Area

The study was conducted in Enugu North agricultural Zone of Enugu State, Nigeria. It is one of the agricultural zones in Enugu State. The zone is located between latitudes 6° 31' and 7° 6' North of Equator and longitude 6° 54' and 7° 54' North East of Greenwich Meridian. The population of Enugu North agricultural zone is 1,190,908 persons which comprise 678,015 males and 700,403 females (National Population Commission (NPC), 2006). The land area is about 3,404km². The zone is bordered in the North by Benue and Kogi States, in the West by Enugu East Agricultural Zone, in the South by Anambra State and in the East by Enugu West Agricultural Zone. The temperature of the area varies between $18^{0}C - 34^{0}C$ with relative humidity of 62 – 78%. Enugu North consists of six (6) Local Government Areas (LGAs) namely; Igbo-etiti, Igbo-eze South, Igbo-eze North, Nsukka, Udenu and Uzo-uwani LGAs. Enugu North agricultural zone is made up of eight (8) blocks comprising Igbo- Etiti, Igbo-Eze South, Igbo-Eze North, Uzo-Uwani block I, Uzo-Uwani block II, Nsukka block I, Nsukka block II and Udenu. About 60 – 70% of the inhabitants engage in crop and animal farming. The other non-agricultural activities engaged by people for sustenance include civil service, petty trading, vulcanizing, driving, carpentry, mechanics and others.

Sampling Procedure and Sample Size

The list of maize farmers that benefited from Kenechukwu Microfinance bank was collected from each of the six Local Government Areas (LGA), Nsukka, Igbo Etiti, Udenu, Uzo uwani, Igbo Eze South and Igbo Eze North that were used for the study., A random sample of twelve maize farmers' beneficiaries from each of the selected LGA was drawn and used for the study. A total of 120 farmers were used for the study forming the sample size.

Method of Data Collection

A structured questionnaire and oral interview were used to elicit and collect information required from the sampled farmers.

Analytical Techniques

Mean, frequency, percentages, multiple regression and discriminant analysis were used to analyze the data. The multiple regression models are implicitly stated:

 $Y = (X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 + X_8 - \dots - X_n)$

...(1)

Y = Amount of loan Repaid (N);

 $X_1 = Age of farmers (years),$

 X_2 = Education (Number of years of schooling),

 $X_3 = Off$ -farm income (N),

 $X_4 = Distance$ to the bank (Km),

 $X_5 = Access to extension (Dummy)$

 $X_n = Error Term.$

Four functional forms of the multiple regressions were employed in order to select the one that has provided the best fit. The functional forms tried were:

Linear function; $Y = b_0 + b_1 x_1 b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + ei$...(2) Double log function : ln (y) = lnb₀ + b₁lnx₁ + b₂lnx₂ + b₃lnx₃ + b₄lnx₄ + b₅lnx₅ + ei ...(3) Semi log : Y =lnb₀ + b₁lnx₁ + b₂lnx₂ + b₃lnx₃ + b₄lnx₄ + b₅lnx₅ + ei ...(4) Exponential function; lnY = b₀ + b₁x₁ + b₂x₂ + b₃x₃ + b₄x₄ + b₅x₅ + ei ...(5)





The choice of the best functional form was based on the magnitude of the R^2 value, the high number of significances, size and signs of the regression coefficients as they conform to *a priori* expectation. Discriminant analysis was used in classifying farmers into the same set of independent variables in estimating the loan repayment equation into two mutually exclusive and exhaustive categories. Using loan repayment values as basis, small holder beneficiary farmers are categorized into two groups. The first group consist of farmers who had repaid less than 50%, the second group had repaid at least 50% The farmers that can repay up to 50% of their loan is regarded as credit worthy, while those that cannot repay less than 50% is taken as non-credit worthy. Gender, borrowers' age, educational level in years, distance from bank, loan – asset ratio, off – farm income, extension Services, farm size, outstanding loan – asset ratio. The discriminant analysis can be represented as;

 $Do = bo + b_1Zi + b_2iZ_2 + b_3Z_{i...}bn Z_n$ Ziis derived by the formula; $Z = X_{ij}X_I$

...(6)

 $z_i = i^{th}$ = Individual discriminant score or the contribution of the explanatory variable to the determinant score (D)

 $Di = Total discriminant score, Xij = i^{th}$ is the individual values of ...independent variables b. = the discriminant coefficient for ...variable, X = Mean values of independent variables

 $\dot{\alpha}$ = Standard deviation of independent variable,

Let the individual scores, Z_1 be a function of each of explanatory variables, that is $ZI = bo+b_{1i}x_1+b_{2i}X_{2i+...}bnXn$ (8)

The classification procedure is as follows

If $Z_i = Z_{crit}$, classify individual i as belong to group 2(Credit worthy farmers), and $Z_i > Z_{crit}$, classify the individual I as belong to group 1(non- credit worthy farmers), The classification boundary is the locus of point where $b_{1i}x_{1} + b_{2i}X_{2i} + ...bnXn_i = Z_{crti}$ (Onyenucheya and Ukoha, 2007)(9)

RESULTS AND DISCUSSION

The socio-economic characteristics influencing farmers' loan repayment ability is shown in Table 1. Based on statistical and econometric criteria, semi log was selected. The coefficient of determination (\mathbb{R}^2) was 0.8209. This implies that 82.09% of the variations in the model were as result of the explanatory variables included in the model, while the remaining 17.91% were due to error term. Result of the age of the farmer showed a positive relation with loan repayment and was statistically significant at 5% alpha level. Age could be related to experiences in management of farm resources or inputs leading to high production and productivity, hence improving the farmer's loan repayment probability. The finding of Ibrahim and Alihero (2012) did not concur to the above assertion. They opined that the usual nature of aged farmers, including risk averse, less adoptability and frail in terms of manual strength to conjure the necessary high farm profits to off- set principal and interest rate from the borrowed loan at the right time.

The educational level had a positive coefficient, implying that as the number years of schooling increases, the higher the probability of loan repayment. The above assertion supported the *a priori* expectation and finding of Aja, et al; (2014), who purported that farmers' educational attainment enhances their farm productivity through being receptive to improved innovations adoption, more amenable to risk taking and change, ability to access, evaluate, and understand new production techniques and prudent in resource use, hence higher likelihood of non - default would ensue.

The coefficient of off – farm income was positive to loan repayment and supported the a priori expectation that availability of income generated from off – farm employment





improves on farm output through enhancing farming operations. Ume, et al (2018) opined that farmers that engross in off – farm activities, usually have multiple streams of f income to offset the principal and the accruing interest rates from the borrowed loan at appropriate time.

In line *a priori* knowledge, the distance from the bank to the farmer' farm or residence had positive sign, implying that farmers that reside close to the lending agency have high propensity of loan repayment through effective supervision by bank officials. However, the finding of Eze, (2003) was not in consonance with that obtained in this study.

Determinant of the credit worthiness of the respondents were determined using discriminant function Here farmers were grouped into credit worthy group and non - credit worthy group farmers based on the loan repayment level. Credit worthy farmers were those farmers that were able to repay at least 50% of the loan they borrowed, while non- credit worthy ones were those that repaid less than 50%. Based on this classification, only 50 farmers were classified as credit worthy, while 70 farmers were non- credit worthy. The estimated centroid for non-credit worthiness maize farmers was found to be 0.6876, while for credit worthy farmers was 0.7890. This implies that farmers that has high composite score were categorized as credit worthy farmers and vice-versa.

Variable	Linear	+Semi-log	Double log	Exponential
Constants	1.3467800	2.098297	0.110920	4.239068
	(5.13)***	(4.96)***	(5.06)***	(7.02)***
Age	0.0537574	0.4325786	- 0.4782489	0.0832248
	(-1.61)	(-2.15)**	(-2.09)**	0.213)
Education	0.2747533	-0.2038984	0.3576907	-0.0001869
	(3.36)***	(4.59)***	(4.01)***	(-3.02)***
Off-farm income	0.00960933	0.0765740	0.2295770	-0.1253020
	(0.61)	(2.07)**	(1.10)*	(-0.17)
Distance to bank	-0.3139918	-0.2167944	-0.1161257	-0.20190455
	(-0.40)	(1.51)*	(-0.49)	(-3.38)***
Extension	-0.1864323	0.1020032	0.2390999	0.1501258
Services	(-0.52)	(0.68)	(2.68)**	(2.07)**
\mathbb{R}^2	0.5442	0.8209	0.6714	03356
F-Value	7.27***	9.48***	9.15***	5.08***

Table 1: Factors influencing Farmers' Loan Repayment Ability

Source: Field Survey, 2021.

Table 2: Standard Canonica	l Discriminant Funct	ion Coefficients
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Variable	Discriminant Function
Gender	-0.123
Age	-0.241
Educational Level	0.412
Distance from Bank	0.476
Loan – Assert ratio	0.032
Off – farm income	0.321
Extension Services	0.230
Farm Size	0.007
Outstanding loan – Asser ratio	-0.009

Source: Field Survey, 2021





The discriminant function as used in measuring the credit worthiness of the maize farmers in this study contains all the relative data in determining the desired function because of high canonical correlation and low Wilk Lambda values as shown in Table 3. The canonical coefficient was subjected to chi square test of significances at 5% and value of 36.007 was realized, the tabulated T was 17.849. However, since the calculated chi square is greater than the tabulated, the hypothesis that all the discriminant function coefficient are equal to zero. This could connote that the discriminants' function coefficients used in this study show goodness of fit

Table 3: Tests of significance	es of the discriminant	Functions Coefficients
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Canonical Correlation	0.5908
Wilks Lambda	0.6008
Chi Square	36,797
D.F	8

Source: Field Survey, 2021

Table 4 reveals that the coefficient of educational level, distance to the bank, off – farm income, access to extension services and farm size had positive contribution to the farmer borrower being classified as group of credit worthy ones. The influence of these factors increases with the higher the value of their coefficients. In addition, the negative sign of the coefficient of age was against *a priori* expectation. Aged farmer borrowers are usually having the attribute of not compromising to the tarnishing to reputations built over life time to be tagged loan defaulter compared to youths that are less bothered over such issue. The finding of Oladeed and Oladabo (2008) was not synonymous with aforementioned statement. They are of the view that youthful farmers are usually innovative, risk averse, adoptive individuals and energetic to make living out of farming with enough savings to service their debts.

Furthermore, the negative sign identity of gender was in line to a priori knowledge that women in most traditional society of African continent for instance as reported by Ume *et al.* (2018) has poor access to productive resources such as land, credit, seed and labour to enhance their production and productivity, hence often considered as non – credit worthy The negative signs of the coefficients of loan – asset ratio and outstanding loan - asset ratio could infer to the possibility of the farmer borrowers belonging to non – credit worthy group as the value of their coefficients increases.

Diserminating variables			
Variable	Correlation Coefficient		
Gender	-0.346		
Age	-0.451		
Educational Level	0.654		
Distance from Bank	0.146		
Loan – Asset ratio	-0.227		
Off – farm income	0.521		
Extension Services	0.212		
Farm Size	0.317		
Outstanding loan – Asset ratio	-0.012		
Source: Field Survey, 2021			

Table 4: Pooled within group correlation between the canonical discriminant Function and Discriminating Variables

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Table 5 shows the classification performance of the discriminant function. The effectiveness of the discriminant function in classifying farmers into credit worthy and non – credit worthy depends on the rate of the functions being employed. Literatures shows that functions with high rates are often preferred as they have more predictive power. The possibility of miscalculation error could be easily be abated as result of high classification performance of the function, 78.2% as obtained in the work. The result is comparable to Onyenucheya and Ukoha (2007) who had 75.6% and Eze (2003) with 75%.

Table 5. Classification reformance of the Discriminant runction			
Actual group	No of Cases	Predicted Group	Membership
Group 1		1	2
Non-credit worthy Farmers	70	57	13
Sub File group 1		81.4%	18.6%
Group 2			
Credit worthy farmers	50	12	38
Sub file group 2		24%	76%
Under group cases	0	0	0
Sub files of under group cases	0	0	0

Table 5: Classification Performance of the Discriminant Function

Source: Field Survey, 2021

CONCLUSION AND RECOMMENDATIONS

Based on the study, the coefficient of level of farmers' education and distance to the bank was positive to loan repayment. In addition, the factors that affect the farmers' credit worthiness were education, farming experience, membership of organization, farm size, off – farm income, distance to the bank and extension services. Also, the classification performance of the discriminant function revealed that 18.6% of the 70 farmers that known to be credit worthy were non - credit worthy, while 24% of 50 farmers acknowledged to be non- credit worthy were credit worthy. Based on the results, the following recommendations were made:

- 1. There is need to reinforce the current policies on education such as the universal basic education, adult education and nomadic education by government agency concerned and non-government organization.
- 2. Furthermore, farm size had positive influence on credit worthiness of the farmer. It is important that the land use Act of 1990 be revisited and reviewed to stem down constraints to land acquisition for agricultural purposes for genuine farmers.
- 3. Rural infrastructures should be developed in the rural areas to create opportunities for farmers to engage in off farm employment to off set borrowed loans especially the chances of defaults is very vivid.
- 4. Regular supervision for borrowers should be in place to increase loan repayment performance of the clients.

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