Ratio Performance Analysis and Factors Affecting Repayment Rate of Microfinance Institutions' Credit Program to Maize Farmers in Niger State, Nigeria

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Abstract

This study highlights the socio-economic characteristics of Microfinance Institutions' beneficiaries of micro-credit facility (Maize farmers in Niger State). The study also examined the ratio analysis as well as determinants of repayment rates of these institutions. To achieve the stated objectives of the study, data were obtained from 144 respondents selected through multi-stage sampling procedure. The purposive and random sampling techniques were employed at the various stages of selection. Descriptive statistics like percentages, means, frequency tables, etc, as well as production function model (Multiple Regression Analysis) were used to analyse the data that were collected using well structured questionnaires accompanied by interview schedule. The result of the analysis on socio-economic characteristics of the respondents revealed that most of the maize farmers who are microfinance institution clients were females (64.4%) and were of middle age. They have large family sizes averaging 8 people. Most of these beneficiaries (70%) had modern education. The result on ratio analysis indicates that the facility from the microfinance institutions is profitable to the clients as most of these ratios had outcomes based on a *priori* assumptions. The determinants of the repayments rate by the beneficiaries –Loan size, Dependency ratio, level of education, Enterprise type, Experience, Profitability index, Interest rate, shocks and portfolio diversity were all statistically significant at 1% level, while factors like Age, Training period, Repeat loans and Gender were not significant at both 1% and 5% level. From the institutions, factors that significantly affect loan repayment rate include, Outreach, age of institutions, methods of operations, interest rate, and credit officer's experience, however, shocks, Gender and Training period were not significant at both 1% and 5% levels. It was therefore recommended that more MFIs be established in the area as well as provision of more infrastructural facilities.

Key words: Ratio performance, Repayment rate, Maize farmers and Microfinance Institutions (MFIs).

Introduction

Economic institutions have re-emerged as the centre of attention in development economics after a long period when their existence and smooth functioning were assumed. Recent analysis suggests that the quality of institutions is the single most important difference between these economies in the developing world which have grown and those which have not (Rodrick *et al*, 2002)

Microfinance Institution (MFIs) represent institutional arrangement which provide credit to the poor to finance economic activities. These MFIs can be formal or informal. A successful microfinance program defined in terms of outreach, financial sustainability or socio-economic impact, is likely to be one designed and implemented for effective operation in particular environment (AIMS, 1997).

The case for microfinance as a poverty reduction and economic empowerment mechanism, especially for the women folks, is based on he premise that it improves accessibility to credit which is used to finance economic activities thereby allowing income to grow as there are no other binding constraints. It also provides credit to the poor who are vulnerable to income fluctuations in times of need, thereby permitting "consumption soothing (Weiss and Montgomery, 2004).

It has been documented in many development economic theories that one factor inhibiting the attainment of development goals in less developed economies (LDCs) is the populace's general inability to access factors of production, especially finance. This limits the entrepreneurial ability of the people especially the poor. Potential employment opportunities and household prospects for creating wealth and improving income are lost. Nigerian farmers like the maize producers are engulfed in the vicious cycle of small holdings, low income, low savings and low capital investment. Agricultural development in Nigeria no doubt requires some capital injection from both the formal and informal financial sector, if the vicious cycle is to be broken. Microfinance programs have significant potential for contributing to social, economic and political empowerment of farmers (Mayoux, 2002). Microfinance program like provision of credit to the farmers will enable them reap the economies of scale, discover new and better products, create demand where none existed, introduction of supplementary enterprises that could increase labour utilization and promote steady flow, and provide utilities to satisfy a widening market (Ijere, 2007). In an effort to facilitate credit flow to farmers, small and medium enterprises and rural economies, the Federal Government of Nigeria (FGN) introduced Agricultural credit and Agricultural Financial Intermediation policies to Agricultural Entrepreneurs as an intervention measures to direct the growth and development of Agriculture. However, Etsu (2007) noted that many of these interventions including those supported by multilateral agencies have diverted considerable resources to supplying cheap credit in a myriad of institutional settings, but the results have been disappointing. The financial position and operation efficiency were not encouraging. In addition to this poor financial ratio results is the critical problem of low repayment rates associated with the different schemes.

This is considered unsatisfactory and calls for urgent attention to redress the situation. It therefore has become imperative to address the problem since many of loan schemes are recycling in nature and their consequence may result in capital rationing by these institutions. Furthermore, this will definitely deny many farmers the opportunity of benefitting from these loan schemes. Poor repayment rate of credit from the financial institutions like the MFIs reduces lenders return thereby decreasing the ability of the lender to generate resources internally for institutional growth. Barseley (1994) affirmed that the issue of enforcing loan repayment constitutes a major problem in credit market.

The study therefore seeks to provide answers to the following research questions. What are the socio-economic characteristics of maize farmers that have direct and indirect effects on their enterprise, financial ratio analysis and repayment of loans from the MFIs in the area? What factors affect these repayment rates from the point of the MFIs and the beneficiaries. The study objectives therefore are to analyse the financial ratios of the beneficiaries and determine those factors that affect repayment rates.

Methodology
Study area

The study was conducted in Niger State of Nigeria. Data for the study was collected between May, 2009 and March, 2010. Niger State has a population of 3,954,772 people (N.P.C, 2006). The climate is characterized by a district dry and wet seasons with annual rainfall varying from 1,100mm in the North to 1,600mm in the south (NGSG Diary, 2003). The maximum temperatures, which do not exceed 37°C, are between March and June with the lowest minimal temperatures of usually in December and January. The seasonal variations of air temperature are constant. The duration of the wet season ranges from 150days between months of May to September in the Northern part of the state and about 210 days in the southern part of the state between the months of April to October. The climate, soil and hydrology permits the cultivation of most Nigerian State crops and still leaves ample scope for grazing and forestry, and freshwater for fishing. The dry season commences in October and the relative humidity could be as low as 1400mm between December and January (NSADP, 1997).

Niger State has covered a land area of 92,800 square kilometers (KM²) which is about 10 per cent (10%) of the total land area of the country. About 85 per cent of this area is arable. The State potential for *Fadama* development is also enormous and the *Fadama* area of the Sate is 682,33/hectares (ha), of which only 105,556 ha (15.5%) is put to use (N.G.S.G Diary, 2003).The cultivation of maize in Niger State is practiced in both lowland and fadama lands.

Sampling technique and data collection

The target population for this study was the maize farmers that have benefitted the MFIs in the study area. A multi-stage Random Sampling (MRS) technique was used to draw up the respondents and the MFIs. The sample frame was provided by the Central Bank of Nigeria (CBN) for the list of formal MFIs, Community Banks (CBs) that transform into Microfinance Banks and the informal MFIs. In stage 1 of the sampling procedure, two (2) out of the three (3) agro-ecological zones were purposively selected in consonance with the Niger State Agricultural Development Projects (NSADP) activities of 25LGAs in consonance with ecological characteristics and cultural practices. The zones selected were zone 1 and zone 3. In stage 2 of the sampling procedure, MFIs which are stratified into formal, semi-formal and informal were randomly selected. From each stratum, 6 institutions were randomly selected, thus giving a total of 18MFIs per zone and 36 MFIs for the state. Similarly, two executive members of each of the selected MFIs were interviewed. In the final selection stage, 6 respondents/beneficiaries from each of the 12 MFIs in a zone were randomly selected, thus giving a total of 72 beneficiaries per zone and 144 beneficiaries for the entire state. This represents 72 percent of the total number of LGAAs in the state.

The Data for the study were from a combination of both primary and secondary sources, but mainly through the former. The later was obtained from records and documents of the UNDP, World Bank CGAP (The Consultative Group to Assist the Poor) and their website from the internet, periodicals, magazines, journals, textbooks, annual accounts and returns from banks, etc.

Additional documents came from official documents of the State's Agency for Economic Empowerments as well as special programmes targeted at rural developments.

Primary data were obtained using two sets of structured and pre-tested questionnaires. One was for the selected institutions and their key officials who completed them. The second set of questionnaires was for the loan beneficiaries. Essentially, it was corroborative of the information in the first questionnaire and helped in determining the workability and constraints of each scheme. Other data gathered were those on the socio-economic characteristics of the respondents, such as those on types of crops grown/farming systems, farm size, age, household size etc. Other information gathered were those on the production resources and farm output during the 2009/2010 production season.

Analytical techniques

A combination of both Descriptive statistics such as tabulations, frequency distribution, means, percentages etc; and Quantitative technique like the Multiple Regression model were employed. Descriptive statistics was used in analyzing the socio-economic characteristics of the beneficiaries as well as the ratio analysis of the enterprise. Multiple regression model was employed to determine the institutional factors influencing lending and repayment behaviour.

Model specification

Performance Ratios (R) involves measuring the performance of organizations in terms of "profitability", liquidity, efficiency, and sustainability. These and other groups of ratios were employed in this respect. They are: Financial sustainability Ratio; Liquidity Ratio and others. The variants of each group are specifically stated and explained as follows:

(a)   **Portfolio Quality Ratios**: Portfolio Quality ratios focus on default risk portfolio. The risk that some of the loans will not earn revenue and may not be paid back is very real and must be anticipated. The specific ratios that were used here are:

1.   **Portfolio in Arrears (PIA)**

$$PIA = \frac{\text{Payment in Areas}}{\text{Value of Loans Outstanding}} \times 100 \quad \dots \dots \dots \dots (1)$$

This ratio focuses on the amount of loans past due loan payments. A decreasing PIA is positive (Stearns, 1991).

2.   **Portfolio at Risk (PAR)**: The International standard for measuring bank loan delinquency is portfolio at risk (PAR) (Stearns, 1991).

$$PAR = \frac{\text{Outstanding of Default loan}}{\text{Value of loan outstanding}} \times 100 \quad \dots (2)$$

$$= \sum_{i=1}^{n} \frac{a_i}{b_i} \times 100$$

Where D   =   Outstanding balance of loans with late repayments.
      T   =   outstanding on all loans
      n   =   number of beneficiaries/respondents
      i   =   1, 2, 3......nth

A PAR can be pegged to any degree of lateness. PAR 30, a common measure, captures the outstanding balance of all loans with repayment more than 30 days late. Some may report PAR O, recognizing a loan as delinquent the very next day after a payment is missed. A decreasing PAR is positive and desirable.

3.   **Loan Loss Ratio (LLR):** this measures loan delinquency, which is an amount that is not realized within the largest date.

$$LLR = \frac{Amount\ written\ off}{Volume\ of\ loan\ outstanding} \times 100 \quad \text{.........(3)}$$

It indicates adequacy of reserves in relation to portfolio. A decreasing reserve ratio is positive and most desirable.

b.   **Operating Efficiency Ratios:**

It evaluates the efficiency of the methodology. Three key factors influence the level of activities and hence the operating costs. They are: Turn-over of the loan portfolio (related to the loan term); Average loan size; and maturity of the institution. The maturity of the institution refers to how long the programme has been operating: Are staff trained? Has a reasonable scale been reached? In short, is the institution well advanced along the learning curve?

4.   **Cost per Unit of money Lent (CUML):**

$$CUML = \frac{Operating\ cost}{Total\ amount\ disbursed\ in\ the\ period} \quad \text{.........(5)}$$

It indicates efficiency in disbursing loans (in monetary terms). A decreasing cost per unit of money lent is positive and desirable.

5.   **Number of Active Borrowers per credit officer (NABPCO):**

$$NABPCO = \frac{No\ of\ Active\ Borrowers}{No.\ of\ Credit\ Officers} \quad \text{.........(6)}$$

It indicates performance of loan officers and efficiency of methodology. An increasing number of borrowers per loan officer are positive and a good development.

c.   **Financial Sustainability Ratios:**

This would answer the question, if the institution would have financial resources to continue serving people tomorrow as well as today, i.e liquidity and solvency. The specific ratios used were:

6.   **Return on Performing Assets (RPA):**

$$RPA = \frac{Financial\ income}{Average\ Performing\ Assets} \times 100 \quad \text{.........(7)}$$

It indicates financial productivity of credit services and investment activities. It is a profitability index, and an increasing return on performing asset is positive and desirable.

7.   **Operating Cost Ratio (OCR):**

$$OCR = \frac{Operating\ Expenses}{Average\ Performing\ Assets} \times 100 \quad \text{.........(8)}$$

This is a key indicator of efficiency of lending operations. A decreasing operating cost ratio is positive and most desirable.

8.   **Operating Self-Sufficiency (OSS):**

$$OSS = \frac{Financial\ Income}{Cost + Provision\ of\ Bad\ Debts} \times 100 \quad \text{.........(9)}$$

It shows the ability of institutions to cover cost of operations with internally generated income. An increasing OSS is positive and desirable.

9.   **Financial Self-Sufficiency (FSS):**

$$FSS = \frac{Financial\ income}{Financial\ \&\ operating\ costs + Provision + Imputed\ capital\ costs} \times 100 \quad \text{...(10)}$$

It shows the ability of institutions to be fully sustainable in the long-run by covering all operating costs and maintenance value of equity capital. An increasing financial self-sufficiency is positive.

10. **Annual Effective Interest Rate (AEIR):**
This is the same as Annual Interest Rate since there was no reported case of compounding interest rate, Ad-on-interest rate or Discounting interest rate by any of the institution in the study area.

d. **Liquidity Ratio:**
The last group of ratio to be used in this dispensation was the liquidity ratio. Specifically, current ratio (CR) which is sometimes called "the Acid-test ratio" was used.

$$CR = \frac{Current\ Assets}{Current\ Liabilities} \times 100 \quad .....(11)$$

It measures the degree to which anticipated sources of cash will be able to cover projected cash disbursement in the coming year. An increasing current ratio is positive and desirable.

e. **Other Ratios:**

11. **Profitability Index (PI):**
Profitability is the excess income after the expenses have been deducted from the Gross Income (GI).

For the NGOs, which are not for "profit maximization" cautious use was made of this ratio. Generally, the PI of MFIs was measured by Gross income per N1.00 (input) cost. Statistically this is measured by:

$$PI = \frac{Y_i}{C_i} \quad where\ I = 1, 2, 3....n \quad ......(12)$$

Where,

PI = Profitability Index
Y_i = Gross Income
C = Costs
n = Number of beneficiaries/respondents.

12. **Participation Rate (PR):**
The participation rate is the proportion of the number of loan applications approved to the number applied. It indicates the capability of the institution to accommodate large clientele. Accordingly,

$$PR = \frac{Number\ of\ Loans\ Approved}{Number\ of\ Applications\ Received} \times 100 \quad ......(13)$$

13. **Degree of Rationing (DOR):**
The Degree of Rationing is the proportion of the credit demand deficit to the total volume of loan applications received. It gives an insight to the degree of financial straits of the financial institutions.

$$DOR = \frac{Loan\ Volume\ Approved}{Loan\ volume\ Applied\ for} \times 100 \quad ....(14)$$

14. **Loan Delivery Intensity (LDI):**
Loan Delivery intensity highlights the ratio of the disparity between the loan amount disbursed and the volume of loan approved by he financial institutions.

$$LDI = \frac{Amount\ Disbursed}{Loan\ Volume\ Approved} \times 100 \quad ....(15)$$

For the lending efforts to be effective, it is expected that PR and LDI should be very high (close to 100), whereas DOR is expected to be low.

15. **Repayment Rate (RR):**
Repayment Rate involves measuring the rate at which loans are being repaid (i.e accumulated past due and present due loans.

$$RR = \frac{Amount\ Repaid}{Total\ Outstanding} \times 100 \quad ......(16)$$

$$= \sum_{i=1}^{n} \frac{A}{T} \times 100$$

Where, RR = Repayment rate, n = Number of Beneficiaries, A = Amount Repaid, T = Total outstanding, I = 1, 2, 3,.......... Nth, $\sum$ = Summation sign

For effective lending effort, RR should be very high, whereas Default Rate (DR) should be very low.

The Multiple Regression Model

Regression analysis was employed to determine and isolate factors which affect repayment rate and extent to which these factors or variables explain repayment. To determine and isolate these factors or variables in the study area, four functional forms: the linear, semi-log, exponential and double log functions were fitted and the best functional form selected.

The regression model employed for this study was specified as follows:

Linear function form:

$$Y_i = B_o + B_1 X_1 + B_2 X_2 + \ldots\ldots + B_8 X_8 + e \ldots\ldots(17)$$

Semi – log functional form:

$$Y_i = Log\ B_o + B_1 logX_1 + B_2 logX_2 \ldots\ldots + B_8 logX_8 + e \ldots\ldots(18)$$

Double – log functional form:

$$Log\ Y_i = Log\ B_o + B_1 logX_1 + B_2 logX_2 \ldots\ldots + B_8 logX_8 + e \ldots\ldots(19)$$

Exponential functional function:

$$Log\ Y_i = B_o + B_1 logX_1 + B_2 logX_2 \ldots\ldots + B_8 logX_8 + e \ldots\ldots(20)$$

Where,

For recipients:

Y_i = Repayment rate (%) of recipients (amount repaid)

X_i = Loan size (₦)

X_2 = Dependency Ratio (children as parentage of total household size)

X_3 = Level of Education (Years of formal education)

X_4 = Age (Years)

X_5 = enterprises type (Dummy variable: Maize farming enterprise only =; and mixed farming enterprises = 1)

X_6 = Experience (Years)

X_7 = Profitability of respondents' enterprise (₦)

X_8 = Training (Total No. of days of training per year)

X_9 = Interest Rate (%)

X_{10} = Repeat Loan (₦)

X_{11} = Gender factor (percentage of Group members who are female)

X_{13} = Shocks (No of family emergencies, crop failure income loss due to incidence of pests and diseases, major social events that occurred in the previous 18 months, etc).

X_{13} = Portfolio Diversity (Proportion of members that have secondary or more occupations).

e = error term.

For Institutions:

Y_2 = Repayment rate of institutions (Mean percentage of amount repaid by clients0

X_1 = Outreach Index (No. of participants – product of average group size and average No. of groups).

X_2 = Shocks (No. of emergencies – crop/Income losses, social events, etc in the last 18 months).

X_3 = gender dominance factor (Proportion of females in the MFIs/scheme, in %)

X_4 = Age of operations (in years)

X_5 = Methodology

X_6 = Interest Rate (in %)

X_7 = Training Period (No of Days)

X_8 = Loan Size (₦)

X_9 = Credit Officer's Experience

e = Error term

Results and Discussion

Socio – economic characteristics of respondents:

Table 1 presents the socio-economic characteristics of MFI beneficiaries that are into maize enterprise in the study area. Majority of the beneficiaries of MFIs (67.4%) were females and males constituted only 32.6%. This means that loan beneficiaries of MFIs in the study area was mostly dominated by female entrepreneurs. This is contrary to the popular belief about the study area that farming and other related businesses are dominated by the male folks.

Table 1 also shows that majority (about 55%) of the beneficiaries were of middle age with about 45% being youths. The mean age of the respondents was 41.12 years and the modal age group was 41-50 years.

The small percentage of the young beneficiaries of the MFIs in the area could be due to the migration of able-bodied youths from the rural areas to the urban centres in search of white collar job and the quest for modern education training. However, the implication of the prime age of most respondents is that most beneficiaries are within the active labour age of productivity and might utilize credit obtained for high production. Furthermore, because farming and other agribusinesses are surrounded by risks and uncertainties, such as flooding, pests/diseases infestation etc; it therefore requires people who are able and willing to take risks in expectation of profit.

Family size of respondents is another socio-economic characteristic presented in table 1. The family size of respondents on average was 8 people. The large family size could imply a probable more family labour and a consequent greater output for the farmers. The importance of large family size especially in traditional agriculture was also expressed by Olufe (1988), in his study of resource productivity in food-crop production in Kwara State of Nigeria. According to the researcher, family labour accounted for a significant proportion of the total labour force used in traditional agriculture, thereby enabling the cultivation of large hectarage of farmlands and reducing the cost of hiring labour for farm operations. However, Baba and Wando (1998) explained that the implication of large family sizes is that family expenditure tends to draw more an family income so that only a meager sum is saved and invested eventually on farming. Agriculture and other agriculture-related businesses served as beneficiaries major enterprises with most clients (over 70%) having 11 years and above of faming experience.

As posited by Osuntogun and Oludimu (1981), several factors are known to affect the credit needs of farmers. Prominent among these factors are due to their past experience. Most of the beneficiaries of MFIs (70%) were literate with one form of education or the other; having gone through at least primary school education. This suggested that the majority of the clients can read and write, and by implication can easily be educated on skills' acquisition to improve on their performance which could translate to increase productivity and income (Binswanger *et al*, 1993). In spite of high level of literacy (which is predominantly due to modern education stitches) maize farmers have little or no record kept. However, about 30 percentage of the respondents in the study area had acquired no form of formal education. These findings on the literacy level did not concur with Adewumi *et al* (2005) that although farmers are educated with one form of education or the other, majority of them do not have primary school education.

Ratio Performance Analysis of MFIs (Formal, Semiformal and Informal)

Table 2 is a summary of the performance indices of the various segments of the MFIs in the study area, including profitability, liquidity, efficiency and sustainability. For profitability ratio, the formal institutions recorded 1.34, followed by semi-formal (1.26) and informal (1.04). For the formal institution, a profitability ratio of 1.34 meant that for every ₦1.00 invested, they made a profit of 38k. This was considered moderate. For the semi-formal segment, the figure was 1.26 which was also mid-way, and for the informal . (1.04) was merely breaking-even. These figures have to be considered in the context of their organizational goals, which are not profit – driven ins semi-formal, informal institutions, and the NACRDB (Nigerian Agricultural, Cooperative and Rural Development Bank).

In the case of current (liquidity) ratio. which is a classic measure of financial position in the short run, the highest ratio was recorded by formal institutions (1.78), followed by semi-formal (1.49). However, there were no available statistical records to estimate that of informal segments of the MFIs.

The liquidity ratio of the two segments (1.78 and 1.49 respectively) was considered fair in view of the need to meet the short-term debts and obligations. Meanwhile, standards as to what is good or minimum acceptable current ratio are rather difficult to establish. In the operating efficiency ratio, two components of the ratio, namely cost per unit of money lent and Active clients per credit officer were considered. The semi-formal institutions recorded a low figure of 0.43 as against 0.83 for the formal institutions, suggesting that the former was more efficient in the loan disbursement system.

This contention was reinforced by the Active clients per credit officer of a higher figure (197) for semi-formal than 136 recorded by formal suggest on higher staff productivity of the former than the later.

Table 1: Socio-economic characteristics of MFIs clients (N = 144)

Characteristics	Frequency	Percentage
Age group		
10-20	2	1.4
21-30	7	4.9
31-40	56	38.9
41-50	68	47.2
51-60	9	6.2
61-70	2	1.2
	Mean $\overline{(X)}$ = 41.12 years	
	Model = 41-50 years	
Gender:		
Male	47	32.6
Female	97	67.4
Family size:		
1-4	42	29.2
5-8	71	49.3
9-12	22	15.3
13-16	9	6.2
	$\overline{(X)}$ = 8	
	SD = 4.6	
Farming Experience		
1-5	17	11.8
6-10	25	17.4
11-15	61	42.4
16-20	22	15.3
21-25	15	10.4
Above 25	4	2.7
	$\overline{(X)}$ = 11.4 years, SD = 8.2 years	
Highest Educational level attained:		
No formal education	43	29.9
Primary education	31	21.5
Secondary education	24	16.7
Tertiary education	46	31.9

SD = Standard deviation
Source: Field survey, 2009/2010

The sustainability ratio covered Return on Performance Assets Ratio, Operating Cost Ratios or simply Operating Ratio, operating Self-Sufficiency Ratio, Financial Self-sufficiency Ratio-without imputed cost of capital, and the Annual Effective Interest Rate on Loans. The formal institutions recorded higher return on performing assets of 25.67% than the semi-formal, 14.86%, thus suggesting the validity of the profitability ratio.

The operating Self-Sufficiency Ratio was 79.38% and 68.53% for the formal and semi-formal institutions respectively. This suggested that enough income/revenue was not earned to cover the organizational costs in the sectors and was an indication that the operations

of the organizations was below expectation. This was partly due to the fact that the three branches of the NACRDB and Afribank were used in the estimation, as data from other commercial banks were not available to the researcher. Self-Sufficiency ratios are commonly referred to in the micro-credit industry, with 100% being the target to indicate that break-even self-sufficiency (without imputed cost of capital) for both formal and semi-formal institutions. More so, the imputed cost of capital was not calculated or determined due to unavailability of data. Similarly, the figure for informal sectors, were not calculated because they did not keep records required to estimate the balance sheet.

The Table further showed the Portfolio Quality and other characteristics and ratios of the institutions. The Portfolio Quality was made up of Portfolio at risks (30 days) and Portfolio in arrears. It shows that the PAR (30), which measured the outstanding balance of all loans with a payment more than 30 days late, was lower in formal (31.62) than in informal institutions (46.29). This suggested that the incidence of loan delinquency was less in formal than informal institutions. Similarly, the Portfolio in Arrears, which indicated the amount past due, was lower in formal (23.48) than informal institutions (41.33). This suggested, also, that the formal was more effective in loan repayment efforts than the informal institutions.

Informal institutions had inadequate records consequently these asset-based ratios could not be easily estimated. Further analysis of Table 2 showed that female respondents were predominant in the semi-formal. The results of the Portfolio Quality analysis were not surprising as it affirmed the propounded hypothesis, which stipulated that females repaid loans better than males, but contrary to the findings of Christiana *et al.* (2009) and Sallawu (2011) who in their separate studies on Institutional Environment and Access to Microfinance by Self-Employed Women in the Rural Areas of Edo State and Niger State respectively, concluded that, one of the reasons why most women do not have access to microcredit facility is because they do not repay loan.

The average first loan size was highest with the formal sector (varied between ₦50,000 and ₦375,000), followed by the informal (about ₦11,000). The small loan size of the semi-formal suggested that funds might not be available within the comfort zone. This argument was reinforced by the highest Degree of rationing, which is the proportion of credit demand deficit to the total amount of loan applied; was 56.11% for the semi-formal institutions (NGOs), as against 31.02% and 40.23% recorded by formal and informal institutions respectively. The Loan Delivery Intensity, which highlighted the ratio of the loan amount disbursed and the volume of loan approved were 91.86%, 97.96% and 100% for formal, semi-formal and informal institutions respectively. This suggested an effective lending rate. Similarly, the Participation Rate, which is the proportion of the number of loan applications received to the number approved, were moderate and highest in the semi-formal sector (71.42%), followed by informal (63.04%) and formal (49.27%).

The Mean Annual Effective Interest Rate was 18.54%, 26.93% and 10.46% for the formal, semi-formal and informal sectors respectively. Portfolio Quality ratios were made up of three different components namely, Portfolio in Arrears (PIA), Portfolio at Risks (PAR at 30) and Loan Loss Ratio. The result, as indicated in the summary (Table 2) showed that PIA for formal and semi-formal were 39% and 23% respectively. The PAR for formal and semi-formal institutions was 31.62% and 46.29% respectively. The Loan Loss Ratio was about 16% for the formal segment. The first two indicators looked at delinquency from two perspectives. The PIA showed the percentage of amount of balance of loans that are delinquent by one or more payments. PAR, are reported for 30, 60, 90 and 120 days delinquency levels. The PAR (for 30 days) was 31.62% for formal and 46.20% for semi-formal institutions. The implications of this was that the formal institutions had greater amount of loans, which may not earned revenues and stood greater chance of not being paid back. Both PIA and PAR were affected by the organization's write off policy, which aimed at reducing risk assets mainly uncollectible and delinquency loans, in order not to overstate the loan portfolio. The NGO-MFIs did not have very clear policy on write-offs like the banks. On the other hand, and as earlier noted the informal institutions do not keep records to estimate most of these ratios.

Table 2: Summary of Portfolio and Key Performance Indices of the Various Segments of MFIs

S/No	ITEM	FORMAL	SEMI-FORMAL	INFORMAL
1.	Value of loans disbursed during period (N'000)	94,655.83	5,563.95	
2.	Average First Loan size (N)	50,000-		88,620.52
3.	Average Second Loan size	375,000.00	11,648.36	
4.	Average No. of Active Savers	-	26,400.82	28,600.83
5.	Average Total Value of Savings (N'000)	298.46	1,236.73	Varies 44.10
6.	Portfolio At Risk (>30 days) (%)	218,509	2,040.11	
7.	Portfolio in Arrears (%)	31.62	46.29	322.46
8.	Loan Loss Ratio (%) (6 months-period)	23.48	41.33	-
9.	Cost per Unit of Money Lent (end of period	16.22	-	-
	Active Client per Credit Officer (C.O)			-
10.	Average Interest Rate (IR) on Savings per annum (P.A) (%)	0.74	0.31	-
11.	Average Annual Effective Interest Rate on Loans (%)	136	197	-
12.	Weekly Savings	3.0	3.0	
	Return on Performance Assets (%)			2.76
13.	Operating Cost Ratio (%)	18.54	26.93	
14.	Operating Self-Sufficiency (%)	-	49.32	10.46
15.	Financial Self-Sufficiency (%)	25.67	14.86	174.36
16.	Annual Effective Interest Rate	41.67	11.36	-
17.	Current Ratio	79.36	68.53	-
18.	Profitability Ratio	79.38	68.53	-
19.	Participation Rate (%)	19.42	27.13	-
20.	Degree of Rationing (%)	1.78	1.49	11.33
21.	Loan Delivery Intensity (%)	1.34	1.26	-
22.	Prompt Repayment Rate (%):	49.27	71.42	1.04
23.	Overall Repayment Rate (%)	31.02	56.11	63.04
24		91.86	97.96	40.23
25.		47.26	51.13	100.00
		52.93	67.32	89.44
				100.00

Sources: Field Survey Data, 2009/201

Determinant of factors affecting Repayment rates of MFIs

These determinants include those of the MFIs as well as those of the beneficiaries. With respect to the beneficiaries, Table 3 is a summary of the regression analysis. The Double-log functional form was choosen because it gave the best fit of the equation with the highest R^2 (0.79356), lowest standard error of Y estimate (0.0846), and the highest F-value (37.3286). This functional form shows that 9 variables out of the 13 employed were statistically significant at 1% Level of significance (LOS) and expected signs of the regression coefficient both in terms of the economic and agricultural logic, and is considered as the appropriate form to represent the activities of the MFIs in the area.

Table 3: Summary of Regression Results: Determinants of Loan Repayment of Respondents

Variable	Unit	Coefficient	t-ratio
Loan size (X_1)	Naira	0.0736	3.4227*
Dependency Ratio (X_2)	Percentage	- 0.0265	- 3.4126*
Level of Education (X_3)	Years	0.2316	3.0101*
Age (X_4)	Years	- 0.0497	-1.3216*
Enterprise type (X_5)	Dummy	0.0573	2.8947*
Experience (X_6)	Years	0.0646	2.7561*
Profitability Index (X_7)	Number	0.0728	3.4525*
Training Period (X_8)	Days	0.0524	1.0371
Interest Rate (X_9)	Percentage	- 0.0658	-2.9667*
Repeat Loan (X_{10})	Dummy	0.0669	1.2982
Gender Factor (X_{11})	Percentage	0.0872	1.0638
Shocks (X_{12})	Ranking	- 0.0481	-3.5661*
Portfolio diversity (X_{13})	Dummy	0.0617	3.1842*
Constant	81.4219		
R^2	0.7936		
F-Value	37.3286		
n	144		
d.f	130		

*Los at 1%

Source: Field survey Data Analysis: Computer Printout, 2010.

From Table 3, it is evident that the variables that were statistically significant (1% LOS), were Loan size (X_1), Dependency ratio (X_2), Level of education (X_3), Enterprise type (X_5), Experience (X_6), Profitability Index (X_7), Interest rate (X_9), Shocks (X_{12}) and Portfolio diversity (X_{13}). However, those factors not found to be statistically significant were; Age (X_4), Training period (X_8), Repeat loan (X_{10}) and Gender factor (X_{11}).

For the loan size (X_1), the analysis reveals that the greater the size of the loan, the lower the default and the higher the repayment rate. This is because it is contended that bigger loans make possible larger investment opportunities with potentially higher returns that facilitates repayment. Njoku and Obasi (2001) isolated loan size, between two other variables as important, and have positive relationship with loan repayment under the ACGFS (Agricultural Credit Guarantee Scheme Funds) in Imo State, Nigeria. Also, Ike and Abojei (2009) revealed that the size of the loan advanced to the farmers under the Delta State Agricultural Loan Scheme has a significant relationship with the repayment efforts of the years under study – 1993, 1998, 2000 and 2004. However, this findings did not concur with Zeller et al. (2001) in their study of group-based financial institutions for the rural poor in Bangladesh found that the greater the loan size, the greater the probability of default.

Dependency ratio (Proportion of children and other dependents to the household (X_2) was statistically significant but inversely related to repayment. This suggests that high dependency ratio impaired repayments due to huge outstanding commitments. This argument was to facilitate the full utilization of production credit and ensure prompt repayment. The vulnerability of households with high dependency ratio to bear risks could turn out to be the "raison 'd' entre" to ensure minimal default. This was the finding of Zeller et al. (2001) and it was based on the fact that consequences of adverse economic shocks were more serious for children. Hence, cetris paribus the higher the dependency ratio; the less likely the default, because households with lower risk-bearing capacity would want to avoid he loss of future credit, and thus would make more sacrifices in order to repay the loans promptly and avoid default.

Level of educational attainment of the beneficiaries of MFIs credit facility was also positive significant at 1% LOS. This could be interpretated that as the level of education improved, the beneficiary also improved ability to read and write and in the process, improved dexterity in the occupation (greater potential for the adoption of improved farming technologies or expended farming activities), which concomitantly improved profit and the capacity to repay loans.

Enterprise type also has a positive statistical relationship with repayment rate. Artisans repay loans better than agricultural business like faming, poultry fisheries etc was replete with more risks/uncertainties than many other economic activities and in addition requires gestation period. These could cause repayment difficulties, if cash flow becomes untimely. However, the study by Zeller *et al* (2001) reported a contrary view, with default increasing with those groups having a greater proportion of non-agricultural income. He asserted that as the proportion of agricultural enterprises increased, incomes within groups tended to be less covariant, making it easier to bail out errant members.

The coefficient of experience was positive and significant at 1% LOS, suggesting that the length of experience in occupation was a potent factor in loan repayment. This was because experience provided the compass with which the entrepreneur like maize farmer navigated the turmoil business environment and was a veritable decision tool. This finding of positive and significant relationship between repayment capacity and coefficient of experience corroborates those of Ike (2009) who revealed that farming experience among other factors all contributed significantly to loan repayment.

The profitability Index was positive and statistically significant at the 1% LOS; and was in consonance with *a priori* expectation that profitability (ratio of income to costs) had direct and strong relationship with repayment. This was because difficulties in repayment arose whenever a business is unprofitable, and is an indication or index of management ability. Interest rate represents to a large extent cost of capital and its magnitude may seriously impair the profit margin of any enterprise, including maize farming. Accordingly, the coefficient of this variable was negatively signed and was significant at the 1% level in consonance with the *a priori* expectations. Hence, the smaller the interest rate paid the more likely the increase in loan repayment.

Shocks is another statistically significant variable and has to do with different types of farming emergencies like crop/income failures, major social events etc. The coefficient was nega.ively signed and significant at 1% LOS. In other words, as number of shocks increased, default rate of respondents also increased.

Portfolio diversity is another important determinant of repayment rates of beneficiaries

of MFIs, and is defined by the proportion of beneficiaries who have secondary occupation. It is therefore, an indicator of asset portfolio diversity of the groups/respondents. It was positively signed and statistically significant at 1%, suggesting that as the portfolio diversity increases, the ability of the beneficiaries to repay borrowed funds increases.

The other four factors (Age, Training, Repeat loan, Gender), which affected loan repayment of the beneficiaries but were not significant at both 1% and 5% LOS were positively signed, except age that was negatively signed, meaning that as the beneficiaries grow older they are no longer keen about obtaining and repaying loans. This agrees with Ajakaiye (1991) that age distribution could be used to determine loan repayment ability of farmers since effective labour availability for agricultural production declines with age. For the determinants of Loan Repayment from the institutions point – Y_2, Double-log functional form was also chosen because it equally gave the best fit of the equation with the highest R^2 (0.8413), lowest standard error of Y estimate (0.0738), and highest F – value (9.4132) as shown in table 4. The factors that significantly affected repayment rate include outreach, Age of Institution. Methods of operation, Interest rates, Loan size and Credit officer's experience. The factors found not significant were; shocks. gender and training duration.

Outreach is the number of participants in the MFIs programme within the period of study. The coefficient of the variable was positive and highly significant, suggesting that the greater the number of people covered, the greater the repayment rate. However, if MFIs cover larger clientele base in terms of number and geographical coverage without a proportionate increase in manpower development and logistic/operational faci' ties, inefficiency is likely to weep – in)th coordination and performance. Repayment will surely slide down under such circumstances.

The regression coefficient also shows a positive relationship between the repayment rate and age of the institution. This is understandable because the older the institution the more experience it has in dealing with the activities of micro – enterprises such as farming. In addition, such an institution must have acquired resources such as operational facilities and infrastructure over the period when compared with new entrants.

Table 4: Summary of Determinants of Loan Repayment by MFIs (Y₂)

Variable	Unit	Coefficient	t-ratio
Outreach Index (X_1)	Number	0.0844	3.7689*
Shocks (X_2)	Ranking	-0.0726	-1.1482
Gender Dominance factor(X_3)	Percent	0.0685	1.2383
Age of Operation (X_4)	Years	0.0176	2.6042
Methodology (X_5)	Ranking	0.0841	2.8761*
Interest Rate (X_6)	Percent	-0.0524	-2.5819*
Training Period (X_7)	Days	0.0652	0.07146
Loan size (X_8)	Naira	0.0332	2.9666*
Credit Officer's Experience (X_9)	Years	0.0876	3.7402*
Consonant	25.6138		
R^2	0.8413		
F – value	9.4132		
N	36		
d.f	26		

* = LOS at 1%
Source: Field Survey Data Analysis: Computer print-out, 2011

The regression coefficient also shows a positive relationship between the methodology (manner or operational Procedures of MFIs) and the repayment rate. This implied that improved methods through innovations and adoptions such as the use of computer facilities would engender good performance of the MFIs, particularly loan repayment.

Of importance also is the significance of the coefficient of interest rate, which was negative and this was in line with a *priori* expectations, which meant that the higher the interest charged by the MFIs the lower would be the repayment by the clients. High interest rate and sundry deductions on agricultural loans is usually considered to be high due to risks/uncertainties associated with farming enterprises.

Loan size, like interest rate has a negative relationship with repayment rate. That is the higher the loan size given by the institution the lower the repayment rate of the clients. Credit officer's experience had direct relationship with repayment rate. In other words, the higher the experience of credit officer the greater the possibility of recovering greater amount of loan. This is true because an experienced loan officer knows when, how and where to mount pressure on clients to effect payments. The other three factors, which affected loan repayment for MFIs but not significant at both 1% and 5% LOS were: Shocks, Gender and Training period. Apart from

shock, which was negatively signed, the other two factors were positively signed.

Conclusion and Recommendations

The study reveals the existence of MFIs in the study area is of different segments (formal, semi-formal and informal). They offer micro-credit facility to farmers including maize farmers in the study area. The maize entrepreneurs are small-scale farmers with scattered plots of land which were mostly rented. They depend on family labour for farm work. The Result of the Ratio performance analysis of these institutions and their beneficiaries shows that the institutions have the capacity to uplift the farmers in terms of high productivity and income and alleviate poverty in the area. However, to enhance better performance of the beneficiaries and the institutions in the area, there is an urgent need to encourage extension education in the area, more MFIs be established, good and access roads should be provided to link the rural areas by both governmental and non-governmental organizations, concessionary interest rate may be changed on these loans because of shocks associated with farming.

Importantly, MFIs should designed farmer specific credit regimes rather than the present stencil-type which all farmers are expected to fit into. Furthermore, only trained, committed hardworking and experience staff should be employed by the institutions as credit officers, and above all, defaulting beneficiaries should be denied repeat loans and should be made to face the wrath of the law.

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