THE ROLE OF MICROFINANCE BANKS IN POVERTY REDUCTION IN BENUE STATE

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Abstract
The study was carried out to assess the role of microfinance banks (MFBs) in poverty reduction in Benue State, Nigeria. The study employed a survey design where the Taro Yamen's formula of sample selection was used to determine the sample size of 367 loan beneficiaries of MFBs. A simple random sampling method was used to select the respondents from the nine functional MFBs in Benue State namely, Apa, Gboko, Jamis, Okpoga, Orokan , Otukpo, Pillar ,Ugboju and Zion MFBs. The Satterthwaite-Welch t-test of equality of means showed that there is significant difference between the beneficiaries and non-beneficiaries in terms of profit, income, number of children of school age enrolled in school, housing ownership status, the quality and quantity of food intake and the ability to absorb health shocks. The logit regression model results showed that loans from MFBs have the probability of reducing poverty among the loan beneficiaries. Thus, it was concluded that MFBs could be used as a potent tool of poverty alleviation in the state and as such the government, through the CBN, should evolve policy measures to make MFBs viable with a view to reducing the scourge of poverty in the country.

Keywords: *Poverty, Microfinance Banks, Logit Regression, Satterthwaite-Welch t-test*

Background to the Study
Over the years, the conventional deposit banks have deprived the poor access to credit facility for investment on the account collateral securities and high interest rate charges. The poor, apart from being unable to provide adequate collateral, borrow small amounts whose processing costs are very high and whose repayments are not guaranteed. The microfinance bank was instituted as an alternative source of funding for the financially excluded but economically active poor (Ajegi, 2014).

Apart from providing financial intermediation for the poor, microfinance banks (MFBs) also provide insurance and other payment services in addition to social intermediation services such as group formation, development of self-confidence and training in management capabilities between group members (Ortega, 2008). MFBs have thus come to be widely recognized as veritable tools for poverty reduction and economic development, a point buttressed by the United Nations' declaration of the year 2005 as the International Year of Microfinance.

But the realization of the need to make special provisions that will ease access to financial services by the poor predates the 2005 UN declaration. In fact, the history of modern microfinance is often traced to the success story of Prof. Mohamed Yunus loan experiment and the eventual establishment of Grameen Bank in Bangladesh in the late 1970s. Since the establishment of that bank, literature on microfinance as well as global discourse on the industry has grown in leaps and bounds. In performing its role of poverty alleviation and financial intermediation, MFBs must not only advance credit but must also reach out to a significant proportion of the poor, while at the same time ensuring that they remain sustainable. The welfare impact of credit, the level of outreach to the poor and the extent of sustainability of the MFBs together form what has come to be known as the critical triangle of microfinance. In this paper, the welfare component of the critical triangle is central as the study is aimed at examining the role MFBs have played in reducing poverty in Benue state.

The Role of Microfinance in an Economy
Microfinance institutions are often seen as a manifestly effective means of improving the economic and social position of the poor. The reduction of poverty is an integral component of the United Nations' global mission, and microfinance is increasingly recognized as an effective strategy towards this goal (Ajegi, 2014). Poverty itself is a multidimensional phenomenon, and its solutions, just as its causes, are as diverse as the people and the places in which it is found. In spite of this, there is a general consensus about the fundamental linkage between microfinance and poverty eradication, in that the latter depends on the poor gaining access to, and control over, economically productive resources, which include financial resources. When properly harnessed and supported, microfinance can scale up beyond the micro level as an indispensable part of the process of economic empowerment by which the poor can lift themselves from poverty (UN/OSCAL, 1995).

Littlefield, Morduch and Hashemi (2003) argue that microfinance, and the impact it has, go beyond business loans. According to them, the poor use financial services not only for business investment in their micro enterprises, but also to invest in health and education, to manage household emergencies and to meet a variety of other cash needs which they might encounter from time to time. Conclusively therefore, microfinance acts, not only as an economic stimulator for small enterprises, but also has far reaching social impacts (Khawari, 2004). While microfinance alone cannot and does not improve roads, housing, water supply, education and health services, when properly harnessed and supported, it can make these and other sustainable contributions to the immediate community. Perhaps the greatest contribution of microfinance is that it empowers people, providing them with confidence, self-esteem, and the financial means to play a larger and more active role in their development. Thus UN/OSCAL (1995) is of the view that the potential role of microfinance far exceeds the micro level, scaling up to address macro-problems associated with poverty eradication.

In helping to eradicate poverty, microfinance directly contributes to the process of development, a term Todaro (1992) defined as the process of improving the quality of all human lives which incorporates three equally important aspects, viz, raising incomes and consumption; fostering self – esteem through institutions that promote human dignity and respect; and increasing peoples' freedoms. Using this criterion to define development agrees with Robinson's (2001) contention that "the first thing that many poor families do when their incomes rise is to improve their nutrition and send their children to school". This is fundamental to economic development. In addition, financial services through microfinance help the poor expand their economic activities and increase their incomes and assets while at the same time their self- confidence grows. The contribution of microfinance to the poverty eradication struggle, as well as the intricate relationship between microfinance, entrepreneurship, poverty reduction and sustainable development are amply exemplified by Mohammed Yunus. According to Yunus (1999), "if we are looking for one single action which will enable the poor overcome their poverty, I would go for credit. Money is power". This is in agreement with the proponents of the virtuous circle, since credit invested in an income –generating enterprise as working capital or for productive assets leads to the establishment of a new enterprise or the growth of an existing one. Profit from the enterprise provides income and a general strengthening of income sources.

According to Carty (2010), microfinance lenders provide small loans to current and aspiring small business owners. These loans help give people who may not have the credit or the access to traditional financing, the opportunity to earn a higher income and provide jobs to their local communities. In the course of providing these small loans, the microfinance institutions contribute to economic development by:

i.   Enhancing Credit Delivery: This appears to be the most important role of microfinance institutions, as the loans extended are used to expand existing businesses or start new ones. Ketu (2008) observed that in   Nigeria, microfinance banks had, by 2007, disbursed loans worth about N800 million to some 13,000 farmers

across the country to empower their productive activities. The multiplier effect of this action is obvious.

ii.   Generating Employment: Agriculture and other forms of micro enterprises contribute immensely to job creation. By extending to small scale entrepreneurs, microfinance institutions assist in creating new jobs and sustaining existing ones especially in the rural areas. The promotion of employment in the rural areas covers such activities as black smithing, carpentry, mat and basket weaving, hair-dressing, etc. These few jobs that are created in the rural areas are significant especially because jobs are usually scarce in those areas. As people in these local communities are earning more income, the more likely it is that they will spend their incomes within their communities thereby stimulating local economic growth through a multiplier process.

iii.   Improving Skills Acquisition: The improvement of skills acquisition and adult literacy is another role performed by microfinance. This is done through building capacity for wealth creation among enterprising poor people and promoting sustainable livelihood by strengthening rural responsive banking methods and the introduction of simple cost-benefit analysis in the conduct of businesses (Umar, 2008).

iv.   Empowering Women: In many countries of the developing world, microfinance is especially targeted at women. Women, having to take charge of the house and family, are usually more mentally inclined to plan and organize. This makes them more apt to manage the resources obtained as a loan. Efficient use of loan facilities ends up benefiting the immediate family, and subsequently the entire community and the economy. Most importantly, access to financial services through microfinance helps women to become more assertive, more likely to participate in family and community decision making, and better able to confront systemic gender inequities (Littlefield, Morduch and Hashemi, 2003).

v.   Ensuring Financial Stability: Helping to provide low- income and poor families with the means to becoming financially stable is one of the most important roles that microfinance institutions play in local economies. Small microfinance loans give people the opportunity to generate enough income to pay for necessities such as food, clothing and basic medical needs. Providing poor families the opportunity for long-term financial stability helps reduce the number of people on public assistance programmes, which benefits both the local and national economies.

vi.   Reducing Global Poverty: By giving low-income families the opportunity for long-term financial stability through small loans, MFIs help break the cycle of poverty in the current generation and work toward ending global poverty for future generations. As more communities begin to grow and the local communities begin to prosper, the world's GDP will increase, and eventually the income gap between the rich and the poor will decrease.

In all these and the various other roles which microfinance performs, it acts as a catalyst in the achievement of the Millennium Development Goals (MDGs) whose umbrella target is poverty eradication by the year 2015.

A schematic presentation of the community economic impact of microfinance is as shown in Figure 1

MFI

Salaries and wages to MFI staff

Local Merchants

Loans to Clients

Leakages of purchases in other communities

Induced Economic Impact. The turnover of expenditures generate additional economic impact and employment through the multi multiplier

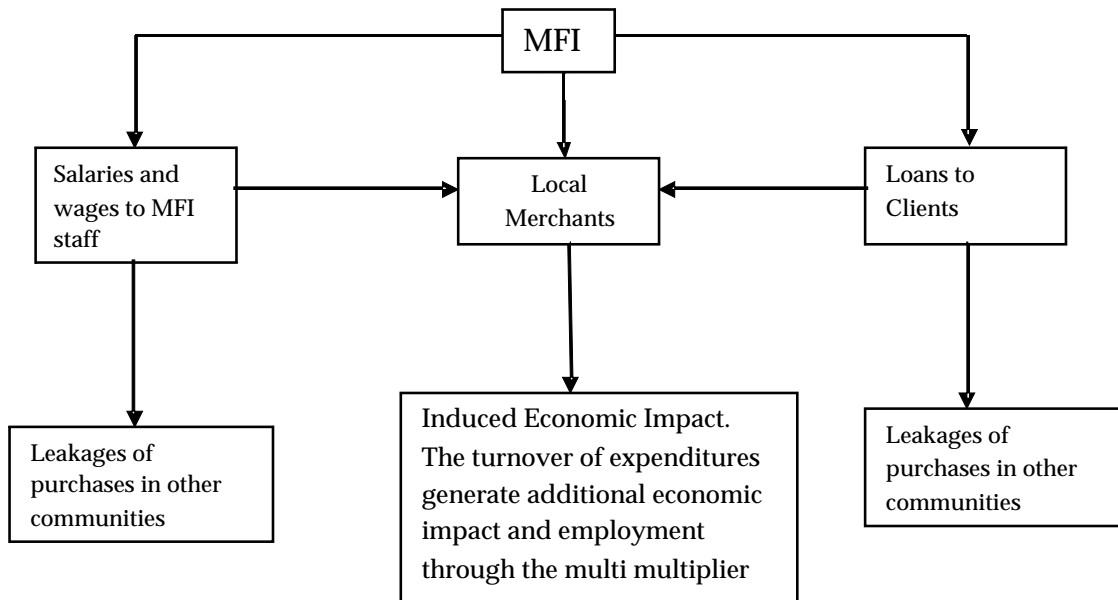Leakages of purchases in other communities

Figure 1: The Community Economic Impact of MFBs
Adapted from Woller and Parsons, 2002.

Microfinance targets both economic and social poverty. Thus an assessment of the effectiveness of an MFB requires a measurement of the economic and social impacts of the MFI programme on borrowers. The impact analysis of microfinance programmes aims at gauging what Ghalib (2009) refers to as the 'wider impacts' which the practice of micro- lending has on the lives of the poor. These wider impacts benefit the society in its entirety – the MFIs themselves, donors (where applicable), borrowers as well as non-borrowers, and relate to the common target which is human development geared towards both the economic and social upliftment of the people they cater for. The World Bank (1980, cited in Ghalib, 2009) captures these wider impacts in its definition of poverty as 'a condition of life so characterized by nutrition, illiteracy and disease as to be beneath any reasonable definition of human decency'. This definition mentions nothing about income, savings or assets, all of which are indices of economic poverty. Instead, it focuses more on social poverty which is multidimensional in nature.

Traditionally, economic impact assessments look for indicators and variables that measure prosperity in terms of material and tangible assets that can be quantified, seen and felt. Some of such variables include increased income, greater employment, enhanced savings, access to more resources, ownership of physical assets, changes in the pattern of expenditure and consumption, etc. While these economic impacts might give a fair view of the effectiveness of a microfinance programme intervention, they fail to

measure the social impact that follows such interventions. Thus an assessment of the impact of a microfinance programme intervention using any of these two variables (social impact and economic impact) in isolation of the other will seriously underestimate the full impact of the programme. This is why Zohir and Matin (2004) argue that:

> *The impact of microfinance interventions is generally underestimated through conventional impact studies which do not take into account the possible positive externalities on spheres beyond households, and the consequent feedback effects on both the participant and non-participant households.*

Social impacts, as opposed to economic impacts, are the impacts that result from the operations of MFIs which cannot be easily quantified but which affect the totality of the lives of microcredit beneficiaries. These include individual control over resources, involvement in household and community decision-making, changing levels of participation in community activities and social networks, electoral participation, access to health care services, nutritional levels as well as educational status. For many practitioners in the MFI industry, while growth (an economic impact) is important, it is equally important that the poor, and especially the very poor people, are reached with quality services that improve client lives. In other words, both economic performance and social performance matter. This is especially true for MFIs that are sponsored by donors and social investors who explicitly aim for broader social objectives.

Unlike economic impacts, these social impacts are much more complicated in terms of measurement. For instance, an attempt to measure a shift in gender relations or allocate percentages to elements such as social wee-being or enhanced self - perceptions will certainly prove extremely difficult. Therefore, devising a universally acceptable methodology for social impact assessment is almost impossible since such impacts are deeply rooted not only in human behavior, perceptions, beliefs and values, but also in external elements such as cultural, social and political factors.

Methodology of the Study
Area of Study
The study was carried out in Benue State; the state has a land area of about 32,000 square kilometers, is located on the eastern side of the Middle Belt Region of Nigeria. It shares boundaries with five States, namely Nasarawa to the north, Taraba to the north-east, Cross River to the south, Enugu to the south-west and Kogi to the west. In addition, the State shares an international boundary with the Republic of Cameroon on Nigeria's south-east border (BENSEEDS, 2004). Benue State was created out of the former Benue Plateau State in February, 1976 by the military administration of late General Murtala Mohammed. As at the time of its creation in 1976, the major ethnic groups were the Tiv, Igala, Idoma and Igede. Other smaller ones were the Agatu, Akpa, Etulo, Ufia and Nyifon. Each of these ethnic groups is identified by distinct dialect. The Igala ethnic group has since been relocated to Kogi State during the 1991 state creation exercise.

The State derives its name from the River Benue which is the second largest river in the country, and the most prominent geographical feature in the State. With Makurdi as its capital, Benue State is presently made up of twenty three Local Government Areas (LGAs) spread among its three geo-political zones – Zones A, B and C. While Zones A and B are mostly inhabited by the Tiv, Zone C is made up of the Igede and Idoma ethnic groups.

Population of the Study

This research work covered all the nine registered and functional microfinance banks operating in Benue State. The study population is thus made up of the nine functional microfinance banks in the State, though there are twelve registered ones. But there is uneven distribution of the functional microfinance banks according to Senatorial Zones with six located in Zone C, three in Zone B and none in Zone A. However, it is worth noting that in each of the three Senatorial Zones, hundreds of informal MFIs of varying sizes are in operation alongside the formal ones. The target population for this study consists of clients who have obtained loan(s) from the MFBs in Benue State. The nine functional microfinance banks with the number of loan beneficiaries in each is as shown in Table 1.

Table 1: Loan Beneficiaries of MFBs in Benue State

Name of MFB	Number of Loan Beneficiaries
Apa	467
Gboko	349
Jamis	283
Okpoga	484
Orokan	964
Otukpo	543
Pillar	405
Ugboju	310
Zion	500
Total	4,385

Source: Field Survey, 2013.

The total population of the study is therefore the 4,385 loan beneficiaries from the nine registered and functional MFBs in Benue State.

Sampling Technique and Sample Size

Since the client sizes of the banks differ, simple random sampling was used to select the number of respondents. This was done in order to avoid the possible problem of selection bias and ensure that every client had an equal opportunity of being selected. The Taro Yamen's formula as presented by Nwaogazie (2009) was adopted to help determine the sample size. This is because it is the most appropriate formula for a heterogeneous population like the one being studied in this work.

The formula is as stated below:

$$n = \frac{N}{1+N(e)^2},$$

where

n = Sample size

N = Population size

e = Level of significance   (at 0.05 level)

Thus n = $4385/1+4385(0.05)^2$

= 367

Thus the total number of 367 loan beneficiaries of MFBs in Benue State was sampled in this study

Measuring the Impact of MFBs in Benue State

After classifying the clients into beneficiaries and non-beneficiaries using the RCT approach, the two groups were then statistically compared using the t-test statistical tool.

Generally, MFBs may generate impacts on the client's business, the client's well-being, the client's family and the entire   community. This study traced the impacts in some of these domains.

Specifically, the study's statistical comparison was hinged on the following:

i)   Enterprise Income – The most direct outcome of participation in a microfinance programme is the change in household income and business profit. However, business profit is the preferred measure of financial impact (Karlan and Goldberg, 2006).

ii)   Consumption/Income Levels (Poverty)- This determined the number of clients moving out of poverty and requires measuring income or consumption against a standard poverty line. Several studies (see for example Zeller, 2005) have developed their own measures of poverty based on a summary statistic of indicators such as housing conditions, acquisition of assets and quality of food intake.

iii)   Consumption Smoothening – In addition to changes in income, it was also necessary to measure the reduction in risk. Many clients of the MFIs may use credit as an insurance devise that helps to absorb negative shocks (Udry, 1994). Here, this study measured the number of times an individual was able to cope with health shocks such as sudden illness, death and theft or fire outbreak and to estimate the extent to which such an individual coped with each situation. If individuals in the treatment group are better able to cope, this is regarded as a positive impact of the access to credit.

iv)   Wider Impact - This has to do with benefits accruing to MFI clients which are not directly monetary in nature. Some of these wider aspects which this study intends to investigate include:

1. Nutrition and children's education
2. Housing stock.

The common indicators which were used to assess the quality of nutrition, children's education and housing stock, according to Hussain, (1998), Pitt and Khandker, (1998) Mc Nelly and Dunford, (1998) , and Mustala, (1996); are:

a) instances per week/month of consumption of specific nutritious foods such as meat, fish, dairy, vegetables;
b) percentage of children enrolled in school
c) ability to treat children's illnesses such as diarrhea, malaria, etc; and
d) ownership of house

The second step involves evaluating the proxies for their power to predict the levels of poverty. This requires the use of binary logit models where the dependent variable classifies the clients into poor and non-poor, taking the values of 1 and 0, respectively. The independent variables are variables that measure the impact of credit facilities of the MFBs on their beneficiaries

The binary logit model specification is given as follows:

$$ln.\frac{P_e}{P_n} = Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + I_i \dots\dots\dots\dots\dots\dots\dots (1)$$

Where: P_e = Probability that the households are non-poor

P_n = The base alternative where households are extremely poor

Z = A discrete dependent variable representing poor and non-poor

= A vector of parameters

$X = (X_1, X_2, X_3)$ = vector of explanatory variables

$?_i$ = Error term.

In line with Meyer et al (2000), this study has analyzed the marginal effects from the multinomial logit. Five models were estimated. In model 1, income as an explanatory variable was estimated. In the second model, the explanatory variable estimated was housing index. The third model estimated household size as an explanatory variable, while in the fourth model food intake was estimated. In the last model, school enrolment was estimated.

The explicit expression of each of these models is as indicated below.
For the Income model, poverty (POV) was expressed as a function of income, that is,
$POV = f (INC) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.. (2).$

Its stochastic form is stated as:
$POV = \beta_0 + \beta_1 INC + U_1 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(3)$

where:

POV = poverty status measured as 1 for poor and 0 for non-poor on the basis of \$1.5(or N240.00) classification

INC = the annual income measured in Naira

β_0 and β_1 = parameters to be estimated

U_i = the stochastic term.

For the Housing model, its estimated form is expressed as;

$$POV = f(TYDW, OCPS, CONSTM, FLM, RM, LM) \ldots\ldots\ldots\ldots (4)$$

The stochastic form of the model is stated as:

$$POV = \beta_0 + \beta_1 TYDW + \beta_2 OCPS + \beta_3 CONSTM + \beta_4 FLM + \beta_5 RM + \beta_6 LM + U_2 \ldots\ldots (5),$$

Where:

POV = poverty status measured as 1 for poor and 0 for non-poor on the basis of \$1.5 Classification

TYDW = the total amount used in building the house measured in Naira

OCPS = occupancy status of respondent (1 if the respondent owns the house; 0 if Otherwise)

CONSTM = the construction materials used in building the house (1 if cement blocks/Burnt bricks and cement; 0 if otherwise)

FLM = the flooring materials used in the house (1 if cemented floor/tiles; 0 if Otherwise)

RM = the roofing materials used (1 if zinc/asbestos; 0 if thatched roof)

LM = the lighting source (sources) (1 if electricity; 0 if otherwise), and

$\beta_0, \ldots, \beta_6$ are the parameters to be estimated

U_2 = the stochastic term.

For the Health model, it is expressed as:

$$POV = f(HIS, THFP, GHF, ASH) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (6)$$

The stochastic form of the model is stated as:

$$POV = \beta_0 + \beta_1 HIS + \beta_2 THFT + \beta_3 GHF + \beta_4 ASH + U_3 \ldots\ldots\ldots\ldots\ldots (7)$$

Where:

POV = poverty status measured as 1 for poor and 0 for non-poor on the basis of \$1.5 Classification.

HIS = membership of a health insurance scheme (1 if respondent is a member of any Such scheme; 0 if otherwise).

THFP = the type of health facility patronized by the respondent (1 if modern health Establishments; 0 if herbalists, etc).

GHF = the general health status of the family (1 if good; 0 if otherwise).

ASH = the total amount spent on health, measured in Naira.

$\beta_0, \ldots, \beta_4$ = parameters to be estimated

U_3 = the stochastic term.

For the Food Intake model, it is expressed as :
$$POV = f(ASP, NMTPD, BNM) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (8)$$

The stochastic form of the model is stated as:
$$POV = \beta_0 + \beta_1 ASP + \beta_2 NMTPD + \beta_3 BNM + U_4 \dots\dots\dots\dots\dots\dots\dots\dots.. (9)$$

Where:
ASP = the total amount spent on feeding in a month measured in Naira
NMTPD = the number of meals taken per day
BNM = the balanced nature of the meals measured in terms of calorie intake
$\beta_0, \dots.., \beta_3$ = the parameters to be estimated
U_4 = the stochastic term.

Regarding the School Enrolment model, its expression is indicated as:
$$POV = f(ASEDU, NCS, LEDU, STYP) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (10)$$

The stochastic form of the model is given as follows:
$$POV = \beta_0 + \beta_1 ASEDU + \beta_2 NCS + \beta_3 LEDU + \beta_4 STYP + U_5 \dots\dots\dots\dots\dots.. (11)$$

Where:
POV = the poverty status of respondent measured as 1 for poor and 0 for non- poor on the basis of $1.5 classification.
ASEDU = the total amount spent on education measured in Naira
NCS = the number of children of school age enrolled in school
LEDU = the level of education of the respondent (1 if acquired tertiary education; 0 if Otherwise)
STYP = the type of school attended by the children of the respondent (1 if private School;0 if otherwise).
  Models 3, 5, 7, 9 and 11 were estimated using the maximum likelihood estimating technique.

Empirical Results
In evaluating the impact of MFBs on beneficiaries, t-test was to compare them with non-beneficiaries who act as a control group. The comparison was done using parameters such as profit, poverty status, house ownership status, balance diet intake and ability to absorb shock. The Satterthwiate-Welch t-test was used for the comparison.

Differences in Business Profits between Beneficiaries and Non-Beneficiaries
The levels of average monthly business profits for the two classes of respondents were compared for the period under study. The information obtained is presented in Table 2.

Table 2: Average Monthly Business Profits of Beneficiaries and Non-Beneficiaries of MFB Loans in Benue State

Profit Level (N)	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Below 10,000	32	9.09	51	12.81
10,000 – 20,000	57	16.19	39	9.80
20,001 – 30,000	79	22.44	87	21.86
30,001 – 40,000	124	35.23	159	39.95
40,001 – 50,000	33	9.38	42	10.55
Above 50,000	27	7.67	20	5.03
Total	352	100	398	100

Source: Field Survey, 2013

As can be seen from Table 2, majority (35.23%) of MFB loan beneficiaries earn monthly profits of between N30,000 and N40,000 which is lower than the corresponding figure of 39.95% for non-beneficiaries, even though the range is close. However, it is observed that a higher percentage of MFB loan beneficiaries (7.67%) are in the upper profit margin of above N50,000 than their non- MFB loan beneficiaries (5.03%).

In order to test statistically and ascertain whether there exists any significant difference in the business profits of beneficiaries and non-beneficiaries of MFB services, the Satterthwaite-Welch t-test was employed. The results are as shown in Table 3.

Table 3: The Satterthwaite-Welch t-test for Equality of Means

	N	$\bar{X}$	Std. Dev.	d.f	t-value	Probability
Beneficiaries	352	31,456.74	4.01649	748	2.083	0.2791
Non-Beneficiaries	398	32,353.30	7.6644			
Total	750	37,810.52	12.6048			

Source: Extract from E-views print out

Table 3 shows mean profits of N31,456.74 and N32,353.30 per month for beneficiaries and non-beneficiaries respectively. The t-value of 2.083 is not significant with the probability value of 0.2791. This led to the acceptance of the null hypothesis and the rejection of the alternative hypothesis. The implication is that there is no significant difference in the profit margins of the beneficiaries and non-beneficiaries sampled for this study. It can therefore be concluded that business profit as a measure of financial impact which shows the direct impact of participation in MFB programmes has not yielded a significant change in the business profits of the beneficiaries.

Differences in Income Levels between Beneficiaries and Non- beneficiaries
Information relating to the annual incomes of beneficiaries and non-beneficiaries was obtained and is presented in Table 4. The distribution of annual incomes for both classes reveals that majority of both the beneficiaries and non-beneficiaries (51.99% and 63.32% respectively) fall within the income bracket of N200,000 to N300,000.

Table 4: Average Annual Incomes of Beneficiaries and Non-Beneficiaries of MFB Loans in Benue State

Annual Income (N)	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Below 200,000	36	10.23	39	9.80
200,000 – 300,000	183	51.99	252	63.32
301,000 – 400,000	59	16.76	60	15.07
401,000 – 500,000	43	12.22	31	7.78
Above 500,000	31	8.81	16	4.02
Total	352	100	398	100

Source: Field Survey, 2013

Income level was used as a measure of the level of poverty among the respondents. In comparing the poverty levels between beneficiaries and non-beneficiaries, the Satterthwaite –Welch t-test was employed with a view to ascertaining whether there is a statistically significant difference in poverty levels between beneficiaries and non-beneficiaries.

Using the standard 1.5 US dollars per day (N240 at an exchange rate of N160 per dollar) adopted by the World Bank, mean incomes of N250,011.43 and N239,844.26 were recorded for beneficiaries and non-beneficiaries respectively. This placed both classes of respondents above the poverty level. The t-test result is shown in Table 5.

Table 5: The Satterthwaite – Welch t-test for Equality of Means

	N	$\bar{X}$	Std. Dev.	d.f	t-value	Prob.
Beneficiaries	352	250,011.43	0.486155	748	-2.6904	0.1173
Non-Beneficiaries	398	239,844.26	0.500207			
Total	750	489,855.69	0.986362			

Source: Extract from E-views print out

Table 5 above shows the mean incomes of N250,011.43 and N239,844.26 for beneficiaries and non-beneficiaries respectively. The t-value of –2.6904 with the probability value of 0.1173 is not statistically significant. Consequently, the null hypothesis was accepted, implying that there is no significant difference in the poverty level of the respondents using income levels as a measure.

Differences in the Number of Children of School age Enrolled in School
One other approach that can be used to measure the impact of MFB services is to statistically test the difference between beneficiaries and non-beneficiaries, in the number of children of school age who are actually enrolled in school. In order to do this, the Satterthwaite – Welch t-test was again employed. The results are as presented in Table 6.

Table 6: The Satterthwaite – Welch t-test for Equality of Means

	N	$\bar{X}$	Std. Dev.	d.f	t-value	Prob.
Beneficiaries	352	484	2.6743	748	8.6729	0.0245?
Non-Beneficiaries	398	356	4.7221			
Total	750	840	7.3964			

Source: Extract from E-views print out

Table 6 indicates mean numbers of 484 and 356 for beneficiaries and non-beneficiaries respectively of school age children that are actually attending school. The t-value of 8.7629 with a probability value of 0.0245 is statistically significant at 5% level. This suggests that there is a significant difference between beneficiaries and non-beneficiaries in the number of children of school age who are enrolled in school. This can be interpreted as meaning that access to credit provided by MFBs has a positive impact on the ability of clients to enroll their children in school.

Differences in Housing Ownership Status
In order to further assess the impact of MFB services, it was considered necessary to establish if there was any significant difference in the housing ownership status between beneficiaries and non-beneficiaries. The objective was to compare beneficiaries with non-beneficiaries who live in owner- occupied houses. The Satterthwaite – Welch t-test was again employed and the results are presented in Table 7.

Table 7: The Satterthwaite – Welch t-test for Equality of Means

	N	$\bar{X}$	Std. Dev.	d.f	t-value	Prob.
Beneficiaries	352	124	3.7284	748	7.2381	0.0441?
Non-Beneficiaries	398	93	2.5342			
Total	750	217	6.2646			

Source: Extract from E-views printout

As can be seen from Table 7, the mean number of beneficiaries who live in their own houses is 124, while that of non-beneficiaries is 93. The t-value of 7.2381 with a probability value of 0.0441 is statistically significant at 5% level of significance. This is an indication that there is a significant difference in the housing stock occupancy status between beneficiaries of MFB loans and their non-beneficiary counterparts.

The important conclusion to be drawn from the table is that access to credit provided by the MFBs has impacted positively on clients. This is in conformity to apriori expectations since the loans financially empower the beneficiaries to expand their businesses and subsequently improve their profit margins. Improved profits eventually translate improved standards of living with quality housing as an example.

Differences in the Quality and Quantity of Food Intake
The quality and quantity of one's diet is an important variable in the determination of one's health just as it can also be used in measuring the standard of living. Using a balanced diet, defined as 'a wide variety of foods and drinks containing more of fruits, vegetables and whole grains, as well as low or no-fat dairy products and lean animal proteins'(Katz and Gonzalez, 2004), the intake of such a diet is taken as a measure of the standard of living . For the purpose of comparing the number of times beneficiaries and non-beneficiaries have taken a balanced diet in the last six months preceding this study, the Sattertwaite – Welch t-test for equality of means was used to ascertain whether there was a significant difference between the two classes of respondents. The results of the t-test are presented in Table 8.

Table 8: The Satterthwaite – Welch t-test for Equality of Means

	N	$\bar{X}$	Std.Dev.	d.f.	t-value	Prob.
Beneficiaries	352	146	6.8721	748	3.9284	0.1127
Non-Beneficiaries	398	159	4.6119			
Total	750	305	11.484			

Source: Extract from E-views print out

Table 8 reveals a mean number of 146 times in the last six months preceding this study that beneficiaries of MFB credits have taken balance diets, while the corresponding figure for non-beneficiaries is 159 times. The t-value of 3.9284 with a probability value of 0.1127 is not statistically significant. This suggests that there is no significant difference in the number of times the two classes of respondents have had balanced diets in the last six months.

Differences in Ability to Absorb Health Shocks
Respondents were asked to indicate whether or not they were able to absorb health shocks within the past twelve months preceding this study. For the purpose of comparison of the number of times beneficiaries and non-beneficiaries were able to cope with health shocks in the past twelve months, the Satterthwaite – Welch t-test was again employed. The results are presented in Table 9.

Table 9: The Satterthwaite – Welch t-test for Equality of Means

	N	$\bar{X}$	Std. Dev.	d.f	t-value	Prob.
Beneficiaries	352	215	0.7024	748	9.6827	0.0306?
Non-Beneficiaries	398	184	1.2117			
Total	750	399	1.9141			

Source: Extract from E-views print out

As indicated in Table 9, the mean number of times that beneficiaries and non-beneficiaries were able to cope with or absorb negative health shocks within the twelve months preceding this study was 215 and 184 respectively. The t-value of the Satterthwaite – Welch test of equality of means is 9.6827 with a probability value of 0.0306. The interpretation is that there is a significant difference in the mean number of times that beneficiaries and non-beneficiaries devise ways of coping with health shocks in the twelve preceding the survey.

The implication of the result is that many beneficiaries of MFB credit facilities have used such credit as insurance devise that helped them to absorb negative health shocks. Thus an important conclusion to be drawn from the result is that since the treatment group is better able to cope, this is considered as a positive impact of the access to credit from the MFBs in the study area.

Logit Regression Analysis
The marginal effects of MFB loans on the beneficiaries in the study area were measured. In order to do this, logit regression analysis was employed. The logit regression analysis was decomposed into five indices – income, housing, health, quality of food intake and school enrolment indices.

Binary Logit Model for Income
In order to measure the marginal effect of MFB loans on the poverty status of the beneficiaries through income channel, the binary logit model for income was estimated and the result is presented in Table 10.

Table 10: Results for Logit Model for Income

Dependent Variable:	POV			
Variable	Coefficient	Std. Error	Z- Statistic	Prob.
INC	-1.087322	0.423621	2.5667	0.0468 ?
C	2.097971	0.209249	10.02619	0.0000 ?
McFadden R-Squared		0.33597		
LR Statistic	3.820082	Prob (LR Statistic)	0.06515	

Source: Extract from E-views print out

As can be noted from Table 10, there is a negative relationship between income derivable from the loans provided by MFBs and the poverty status of the recipients of such loans. This implies that as the incomes of the beneficiaries increase, consequent upon the loans received from the MFBs, their poverty levels tend to decline as confirmed by the probability value of 0.0468 which is significant at 5% level of significance. The McFadden R-squared value of 0.33597 implies that about 33.6% of the variation in the poverty status of MFB loan beneficiaries is explained by the increase in their incomes as a result of the loans received. But given the multidimensional nature of poverty, an increase in income alone is not considered a good enough measure of poverty reduction. As a result, additional models were developed to reflect the specific uses to which the increase in income was put, with a view to improving the welfare of the beneficiaries. These specific uses relate to housing, health feeding and enrolment of children in school.

Binary Logit for Housing
In order to measure the marginal effect of housing on the poverty status of the beneficiaries, given the increase in income due to loans received from the MFBs, the logit regression was estimated and the result is as presented in Table 11.

Table 11: Results for Logit Model for Housing
Dependent Variable: POV

Variable	Coefficient	Std. Error	Z- Statistic	Prob.
TYDW	$1.08 E-06$	$1.17 E-06$	0.917874	0.3537
OCPS	- 8.603107	0.672706	-12.788807	0.0041 ?
CONSTM	$-2.93 E-07$	$2.96 E-07$	- 0.991137	0.3216
FLM	$-2.80 E-06$	$2.65E-06$	- 1.054807	0.2915
RM	0.011412	0.015522	0.735230	0.4622
LM	$-3.27 E-05$	0.009923	- 0.003291	0.9574
C	1.932507	1.018495	1.897414	0.0578
McFadden	R-Squared	0.420853		
LR Statistic		2.474230		
Prob (LR Statistic)		0.071340		

Source: Extract from E-views print out

From Table 11, it can be seen that occupancy status (OCPS), construction materials (CONSTM), flooring materials (FLM) and lighting materials (LM) of the dwellings of beneficiaries, given an increase in income as a result of MFB loans, are negatively associated with the poverty status of the beneficiaries. This suggests that these housing indices reduce the probability of the beneficiaries being poor. However, it is only the occupancy status that is statistically significant at 5% level of significance. The interpretation is that as the income of the loan beneficiary increases, and such a beneficiary lives in his own house, rent payment is removed from his expenditure profile, thus making more income available for other welfare packages. The McFadden R-Squared value of 0.420853 suggests that about 42.1% of variation in the poverty status of

beneficiaries of MFB loans is explained by the housing indices included in the model. The LR statistic value of 2.47423 which is statistically significant at 5% level of significance shows a relatively strong joint effect of the explanatory variables on the dependent variable of the model

Binary Logit Model for Health
To measure the marginal effect of health on the poverty status of MFB loan beneficiaries in the study area, given a rise in their income level, a logit regression model was employed. The results are as presented in Table 12.

Table 12: Results for Logit Regression Model for Health
Dependent Variable: POV

Variable	Coefficient	Std. Error	Z- Statistic	Prob.
HIS	0.102579	0.391384	0.262094	0.7952
THFP	-3.145716	0.367118	-8.568619	0.0014 ?
GHF	-2.563673	0.377141	-6.799566	0.0350 ?
ASH	-0.043625	0.362200	-0.120445	0.9041
C	2.525060	0.350037	7.213687	0.0000
McFadden R – Squared	0.311727			
LR Statistic	4.673477			
Prob(LR Statistic)	0.013864			

Source: E- views Extract

Table 12 above reveals that participation in a health insurance scheme (HIS) appeared with a positive sign. The rest of the variables such as the type of health facility patronized (THFP), the general health status of the family (GHF) and the amount spent on health (ASH) all appeared with the negative signs. However, it is only THFP and GHF that are statistically significant at 5% level of significance. The implication is that the type of health facility patronized by the loan beneficiaries as a result of the increase in their incomes (due to the loan facility from the MFBs) tends to reduce the probability of such beneficiaries being poor.

In addition, the general good health status of the family members as a result of income effect from MFB loans has the tendency of reducing the probability of the beneficiary being poor. The McFadden R- Squared with a value of 0.311727 implies that about 31.2% of the variation in the poverty status of loan beneficiaries is explained by the independent variables in the model. The LR- Statistic of 4.673477 which is statistically significant at 5% level indicates a very strong positive joint effect of the explanatory variables on the dependent variable.

Binary Logit Regression Model for Food Intake
The marginal effect of an increase in income on the poverty status of the beneficiaries was also measured using food intake as an indicator. To do this, a logit model was estimated and the results are shown in Table 13.

Table 13: Results for Logit Regression Model for Food Intake
Dependent Variable: POV

Variable	Coefficient	Std. Error	Z- Statistic	Prob.
ASP	-1.03 E-07	1.30 E-07	-0.793935	0.4272
NMTPD	-0.143245	0.362765	-0.394872	0.6929
BNM	-0.612125	0.375133	-1.631752	0.1027
C	2.677014	0.368862	7.263393	0.0000
McFadden R-Squared	0.314017			
LR Statistic	7.155622			
Prob (LR Statistic)	0.002436			

Source: E-views Extract

The results from Table 13 above show that all the variables namely, the amount spent on feeding (ASP), the number of meals taken per day (NMTPD) and the balanced nature of the meals (BNM) are negatively associated with the poverty status of the MFB loan beneficiaries. However, it is observed that their coefficients are not statistically significant. The interpretation of the negative signs is that as the amount of money spent on feeding increases due to the income increase arising from the MFB loans, the probability of the beneficiaries being poor is reduced. The same interpretation applies with regard to the number of meals taken per day and the balanced nature of the meals.

The McFadden R-Squared value of 0.314017 suggests that about 31.4% of the variation in the poverty status of loan beneficiaries is explained by the explanatory variables. Also, the LR- Statistic value of 7.195622 which is statistically significant at 5% level suggests a strong joint effect of the explanatory variables on the poverty status of the loan beneficiaries.

Binary Logit Regression for School Enrolment
The marginal effect of the increase in income on the poverty status of loan beneficiaries was also measured using school enrolment as an indicator. A logit regression model was estimated and the results are presented in Table 14.

Table 14: Results for Binary Logit Regression Model for School Enrolment
Dependent Variable: POV

Variable	Coefficient	Std. Error	Z- Statistic	Prob.
ASEDU	1.00 E- 06	1.17 E- 06	0.858566	0.3906
NCS	-4.122099	0.362695	-11.365162	0.0000?
LEDU	-0.539398	0.365895	-1.474189	0.1404
STYP	-0.037947	0.361971	-0.104836	0.0165
C	2.431397	0.361418	6.727376	0.0000
McFadden R- Squared	0.214961			
LR Statistic	5.410729			
Prob (LR Statistic)	0.091581			

Source: Extract from E-views print out

From Table 14, it can be seen that the number of children of school age enrolled in school (NCS), the level of education of the loan beneficiaries (LEDU) and the type of school the children of loan beneficiaries attend as a result of income increase arising from MFB loans, are all negatively related to the poverty status of the beneficiaries. However, it is only the NCS with a value of –4.122099 that is statistically significant at 5% level of significance. The implication is that given the increase in income, and the more children of school age are being enrolled in school, the probability of reducing the poverty status of loan beneficiaries is high.

The McFadden R- Squared value of 0.214961 suggests that the explanatory variables in the model explain about 21.5% of the variation in the dependent variable which is the poverty status of the beneficiaries. At the same time, the LR – Statistic value of 5.410729 which is statistically significant at 10% level of significance shows a fairly strong joint effect of the explanatory variables on the dependent variable.

Conclusion
From the foregoing analysis, it was concluded that MFBs have positively impact on the welfare of the beneficiaries in terms of poverty reduction. The policy implication is that the government through the central bank evolves policy measures to make the MFBs in the country viable; so that the MFBs can be used as a potent tool of poverty alleviation. This is so because the poor can easily access loans from MFBs than they can from the conventional commercial banks.

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