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COMPARATIVE PROFITABILITY ANALYSIS OF MICROFINANCE CREDIT AND NON-CREDIT BENEFICIARIES IN NORTH EASTERN, NIGERIA

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ABSTRACT

This study investigated the effect of microfinance on improving the profit level of credit beneficiaries (CB) and compares it with non-credit beneficiaries (NCB) in North-Eastern Nigeria. Descriptive statistics, gross margin and t-test were used to analyze the data. The results of both groups showed that male mostly undertake maize production activities in the area as they are educated, experienced and are in their most productive ages. The total revenue accrued to CB per cropping season was ₦197,100, with a gross margin of about ₦104,123.55 and net farm income of ₦95,834.40, while NCB realized a total revenue of only ₦108,602.10, the gross margin of ₦53,961.60 and a net farm income of ₦50,724.05 which indicates that maize farming was generally profitable in the study area. The t-test results showed that there is a significant difference between the production inputs used, maize yield and profit gained by CB and NCB at varying levels of probability. The study recommends that microfinance beneficiaries should increase their loan size to invest more in their production activities and NCB should be encourage to obtain loan in order to complement their income and enhance their yield and profit levels.

Keywords: Microfinance; Maize producers; Gross margin; Net farm income

INTRODUCTION

Microfinance is a small amount of loan and other basic financial services given by microfinance banks, NGOs or credit cooperatives to the poor in alleviating their poverty (Obisesan & Oyedele, 2015). Microfinance has witnessed a speedy growth over the previous few decades and has become a prevalent development instrument among policy makers. The concern of governments, national and international development agencies to the economically deprived individuals create an opening for microfinance (Swamy, 2009). In recent times, both government and NGOs in several low income countries have introduced credit programs in order to improve the welfare of the poor. The World Bank in the year 2018 defines low income countries as those whose living standard is around US$995 per capita or less, while the high income countries had a gross national income of above US$12,056 (World Bank). Empirical literatures reveal that poverty is most prevalent in the developing countries where only a few percent of the population are rich and comfortable, while the remaining are suffering (Fosu, 2012; Santos-Paulino, 2012).

Nigeria being one of the developing countries has fallen in to poverty trap where about 70% of her population lives in abject poverty which is higher in the rural areas than in urban centres (Omotola, 2008). In an effort to combat poverty, government over the years have introduced a number of policies and programs which include; Nigeria Industrial Development Bank (1964), Nigeria Bank for Commerce and Industry (1973), National Economic Reconstruction Fund (1990), Nigeria Agricultural and Cooperative Bank (1975), People's Bank (1989), National Poverty Eradication Program (2001), Small and Medium Enterprise Development Agency of Nigeria (2003), National Economic Empowerment and Development Strategy, the millennium development goals (2000) and in 2005, the Microfinance Policy Regulatory and Supervisory Framework (CBN, 2005). Microfinance banks differ from other financial institutions because of ease of operations; it targets the marginalized group of debtors to grant loans, it encourages savings and absence of collaterals to guarantee the loan (Igbinedeon & Igbatayo, 2006).

Microfinance beneficiaries in Nigeria, include low-income recipients' households, the un-banked and underserved people especially vulnerable individuals such as women, disabled, youths, SMSs, informal sector workers, and smallholder farmers in urban and rural areas (Sanusi, 2012). The loans are usually indiscreet, but basically issued on the basis of candidate's personality and the collective cash flow of the occupation and households. First loan disbursement starts at least four weeks after enrolment as a client or member of a solidarity group. First repayment instalment begins at about 15 days of disbursement. The repayment period is usually within six months (6) and a maximum of 12 months. However, in a case of special projects, longer period of twenty-four (24) months is acceptable (CBN, 2012). The loans may also combine a number of guarantees of single or several people. The repayment may be daily, weekly and monthly basis except for agricultural loans or in accordance with repayment agenda in the loan agreement (Sanusi, 2012).

North Eastern zone of Nigeria comprised of six states which has an estimated population of 25.4 million people, with only 32 or 3.68% microfinance banks to offer basic financial services (Ibrahim, 2012; Abdulsalam and Tukur, 2014). It is expected that the amount of credit provided by microfinance banks will increase farmers' financial capacity to devote more in to their production activities and consequently lead to high returns. Increase in income level will raise their purchasing power which can enable them to attain high level of utility and thus, improve their standard of living (Stewart *et al*., 2010). The rest of the paper is divided into four sections. Section ii consists of empirical literature review, section iii explained the methodology, while section iv presents the findings and section v contains conclusion and recommendations.

The introduction of microfinance has produced large theoretical literatures to address the specific problems that poor people experienced in gaining access to financial services at a reasonable price mainly due to lack of collaterals (Littlefield et al., 2003; Khan, 2005). Empirical studies such as that of Stewart et al. (2010), Nosiru (2010), Abdulsalam & Tukur (2014), Babajide & Joseph (2011), Afrin et al. (2008), Akande (2012), Babajide (2012), Girabi & Mwakaje (2013), Khandker & Faruqee (2003), Masud et al. (2001), Olutunla & Obamuyi (2008) and Ahmed et al. (2017) indicated that microfinance has positive impacts on credit borrowers. Though, their findings examined micro-credit programs by focusing mostly on variables such as household earnings, consumption, investments, household spending, education, food security, employment creation, women empowerment and shelter using multiple regression analysis, Tobit regression, switching regression, extended linear expenditure system (ELES), descriptive statistics, chow test, logistic regression, chi-square,

correlation analysis, weighted least squares (WLS) and two stage least squires (TSLS) methods. This study investigated the effect of microfinance in maize production in order to cover the existing gap using Independent samples t-test as well as compares the gross margin and net farm income of credit and non-credit beneficiaries in the North Eastern zone of Nigeria.

MATERIAL AND METHODS

Study Area

The study was conducted in North East Geopolitical Zone of Nigeria which covers close to one third (280,419km^2) of Nigeria's land area (909,890km^2). It comprises of six states: Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe with a total population of 25.4 million. Rainfall duration in this area lies between three to six months a year with about 883 mm to 1,500 mm per annum. The wettest months are August and September, while the driest months are February and March with a relative humidity of about 37% [Nigerian Meteorological Agency (NiMet, 2015)]. The Zone shares international borders with three countries: Republic of Cameroon to the East, republic of Chad to the North East and Niger Republic to the North. Majority of the people are farmers, herdsmen and fishermen. Agriculture is therefore, the mainstay of the economy. Crops grown in the area include: maize, sorghum, millet, rice, guinea corn, wheat, groundnut, cassava, soybeans and cowpea. Others are vegetables (onions, okra and tomatoes). In addition to crop farming, some farmers keep livestock such as cattle, sheep, goats, pigs and poultry (Sajo and Kadams, 1999).

Sampling Procedure

Data used for the study were collected from a survey of smallholder maize farmers during 2018 cropping season using a multi-stage sampling technique. In the first stage, Adamawa, Bauchi, Gombe and Taraba states were selected due to the prevalence of poverty and their prominence in maize production as well as the existence of microfinance institutions (Kale, 2012). This is followed by the selection of two Local Government Areas (LGAs) based on the prominence of microfinance and maize farming activities. Thirdly, the sample of credit borrowers were randomly selected from the lists of borrowers (1,072) collected from the microfinance banks offices situated in each of the surveyed Local Government headquarters. Similarly, the list of non-borrowers (1,131) were obtained from the department of agricultural development projects of each LGA to provide a control group for comparison with borrowers. Finally, a total of 479 farmers were selected from a sampling frame of 2,203 farmers of which 234 of them were the microfinance credit borrowers, while 245 farmers were the non-credit borrowers. The table for determining sample size needed to be true representative of a given population of Krejcie and Morgan (1970) was used in estimating the required sample size for the study.

Method of Analysis

To achieve the objectives of this study, descriptive statistics, gross margin, net farm income analysis and independent samples t-test were used to analyse data collected. Descriptive statistics was used to summarize the farmers' socio-demographic profile.

The gross margin technique is given by:

$$GM = GI - TVC \quad (1)$$

Where;
GM = Gross margin of CB and NCB/ha (₦)
GI = Gross income of CB and NCB/ha (₦)
TVC = Total variable costs of CB and NCB/ha (₦)
Net farm income of CB and NCB were calculated as follows:

$$NFI = GM - TFC \quad (2)$$

Where;
NFI = Net farm income of the farmers (₦)
TFC = Total fixed costs incurred by the farmers (₦).
Note: fixed cost is determined using straight line method of depreciation.

Independent Samples t-test

T-test is a hypothesis testing procedure that uses separate samples for each group to compare whether the two groups have different average values. In this study, there are two different samples each of CB and NCB and therefore T-test analysis is being used to determine if there is a significant difference between the inputs used; maize yield and profit level of CB and NCB.
The formula for t-test analysis is given by:

$$t = \frac{(\bar{x}_1 - \bar{x}_2)\,(u_1 - u_2)}{(S_{\bar{x}_1 - \bar{x}_2})} \quad (3)$$

Where:
$u_1 and\ u_2$ = the difference between CB and NCB
$\bar{x}_1 and\ \bar{x}_2$ = the estimated samples of CB and NCB

RESULTS AND DISCUSSION

Socio-Demographic Profile of the Farmers

Table 1 shows the demographic profile of farmers which include age, gender, marital status, household size, education level and farming experience. The study reveals that 58.97% of CB were male and female constituted only about 41.03%, while that of NCB were 64.49% and 35.51% respectively. This shows that men mostly undertake maize production activities in the area mainly because it is labour intensive and it could be because male are stronger and more active, and have the potential to work for longer hours than their female counterparts. The mean age recorded by each group (CB 42 and NCB 45) indicates that majority of the farmers were in their productive ages and could put in their best in their agricultural activities. Most of the CB (65.81%) and NCB (37.96%) were married with only

16.67% and 23.67% respectively, being single indicating that they are responsible since they have family to manage apart from farming business.

Table 1: Socio-demographic profile of the respondents

Variables	(CB=234)		(NCB=245)	
	Frequency	Percent (%)	Frequency	Percent (%)
Gender				
Male	138	58.97	158	64.49
Female	96	41.03	87	35.51
Age				
Mean	42		45	
20 – 30	32	13.68	39	15.92
31 - 40	63	26.92	72	29.39
41 – 50	87	37.18	75	30.61
51 – 60	43	18.38	48	19.59
> 61	9	3.85	11	4.49
Marital Status				
Married	154	65.81	93	37.96
Single	39	16.67	58	23.67
Divorce	16	6.84	42	17.14
Widow	18	7.69	39	15.92
Widower	7	2.99	13	5.31
Household Size				
Mean	7		8	
1 – 5	63	26.92	85	34.69
6 – 10	98	41.88	98	40.00
11 – 15	57	24.36	48	19.59
> 16	16	6.84	14	5.71
Education				
Non-formal	33	14.10	33	13.47
Primary	41	17.52	43	17.55
Secondary	99	42.31	97	39.59
Tertiary	61	26.07	72	29.39
Experience				
Mean	9		7	
1 – 5	42	17.95	79	32.24
6 – 10	93	39.74	94	38.37
11 – 15	68	29.06	55	22.45
> 16	31	13.25	17	6.94

Source: Computed from field survey, 2019

The finding reveals that 85.90% of CB attained one form of education or the other, while NCB recorded about 86.53% and that 14.10% of CB and 13.47% of NCB did not attend formal education at all. This implies that education could have positive effect on the way farmers manage their farm inputs and adopt new innovations. The mean years of experience spent by CB were 9 years, while NCB had 7 years of farming experience. This implies that the farmers have experience in maize production and might know the good practices involved and hence, tend to be more efficient than those with less experience. It was also observed that

the mean household size of CB was 7 members, while that of NCB was 8 members. Large number of people per household can bring about increase in agricultural production as it could be an indication of a household's ability to have several information sources that can have positive impact on profit.

Comparative Net Income Analysis of CB and NCB (per/ha) in the Study Area

Comparative net income analysis of CB and NCB per hectare was computed using gross margin as well as net farm income techniques (Table 2). The results showed that total variable cost (TVC) incurred by CB was ₦94,440.10, while NCB spent ₦54,823. The total amount of money expended on fixed cost by CB was ₦8,712.55 and the total cost of production stood at ₦103,152.65, while NCB spent about ₦3,288.65 on fixed cost and ₦58,111.65 as the total cost of production.

Table 2: Net income analysis of CB and NCB/ha/farmer

Item/ha	CB (n=234)	Percent	NCB (n=245)	Percent
Variable costs	Naira (₦)		Naira (₦)	
Rented land	10,698.15	11.33	6,263.40	11.42
Fertilizer	22,538.75	23.87	10,716.40	19.55
Labour	36,437.95	38.58	23,998.75	43.77
Transportation	6,639.35	7.03	3,945.65	7.20
Seed	5,504.20	5.83	3,117.10	5.69
Agrochemicals	6,186.75	6.55	3,368.95	6.15
Empty sacks	4,091.65	4.33	2,303.15	4.20
Cost of storage	1,492.85	1.58	642.40	1.17
Tax	850.45	0.90	467.20	0.85
Total Variable Cost (TVC)	94,440.10	100.00	54,823	100.00
Fixed Costs				
Land	6,705.05	76.96	2,890.80	87.90
Axes	240.90	2.76	36.50	1.10
Cutlasses	292	3.35	29.20	0.89
Rakes	310.25	3.56	43.80	1.33
Sprayers	646.05	7.42	171.55	5.22
Shovels	251.85	2.89	18.25	0.55
Hoes	266.45	3.06	98.55	3.00
Total Fixed Costs (TFC)	8,712.55	100.00	3,288.65	100.00
Total cost of production (TC) (a + b)	103,152.65		58,111.65	
Returns				
Maize yield in kg	1,872.75		987.91	
Price per kg	113.15		113.15	
Returns from maize sales	211,900.75		111,782.02	
Returns from sale of haulms/husks	7,964.30		2,967.45	
Total revenue (TR = P x Q)	219,865.05		114,749.47	
GM (TR-TVC)	125,424.94		59,926.47	
NFI = GM – TFC	116,712.40		56,637.82	
Total hectare of land	1,060		837	

Source: Computed from field survey, 2019

The high cost of production for both CB and NCB could not be unconnected with the high cost of inputs such as labour, fertilizer and land. Maize output recorded for CB was 1,872.75kg/ha, while NCB recorded about 987.91kg/ha at an average selling price of ₦113.15/kg. The total revenue (TR) accrued to CB was ₦219,865.05, with a gross margin of about ₦125,424.94 and net farm income of ₦116,712.40, while NCB realized a TR of only ₦114,749.47, the gross margin of ₦59,926.47 and a net farm income (NFI) of ₦56,637.82 which indicated that maize farming was generally profitable in the study area.

This is a good development and it supports the notion that microfinance credits have positive effects on the well-being of the borrowers as reported by Masud *et al*. (2001), Bao & Izumida (2002), Khandker and Faruquee (2003), Littlefield *et al*. (2003), Khan (2005), Girabi & Mwakaje (2013). Interestingly, even though CB spent more on capital inputs, but they received higher revenue of about twice the total cost incurred during the entire production process as compared to NCB. This revenue differential was due to higher yields made possible by the loan received from microfinance banks which qualified CB to maximize the purchase of farm inputs. Thus, greater efforts in maize production will enhance the income of farmers and consequently their well-being.

T-test Analysis of CB and NCB

The t-test analysis presented in Table 3 was used to compare the mean difference between CB and NCB. The variables that were chosen in this study include maize yield, quantity of fertilizer applied, quantity of seeds, litres of agrochemicals and profit accrued to the respondents.

The results showed that maize yield, quantity of fertilizer applied, seeds, litres of agrochemicals and profit are significant at 1% and 5% levels of probability. This implies that there is a significant difference between CB and NCB in the study area. The results also showed that CB have higher maize yield (772.55kg/ha) than their NCB counterparts and respondents who obtained credit have higher production inputs in terms of fertilizer (22.97), seeds (1.76kg/ha) and agrochemicals (1.02 litres/ha) than those without credit most likely because they have money to buy adequate inputs. In regards to profit analysis, respondents who received credits from microfinance banks tend to have a higher profit ($174.47) than those without credit during the production season. The results support the findings of Ambali et al. (2012), Sossou et al. (2014) and Martey *et al*. (2015) who also reported that credit have positive effect on the profit and yield of farmers.

Table 3: Test of statistical differences between CB and NCB

Variables	CB	NCB	Mean Difference	T-ratios
	Mean	Mean		
Yield	1,787.35	1,014.80	772.55	19.43*
Fertilizer	111.13	88.16	22.97	6.74*
Seeds	17.21	15.45	1.76	2.21**
Agrochemicals	2.32	1.89	1.02	1.97**
Profit	$319.76	$145.29	$174.47	13.16*

Source: Computed from field survey, 2019; NB. * and ** denotes significant at 1% and 5% probability levels

CONCLUSION

The study concludes that microfinance banks credit has increased the profit level of CB as compared to NCB due to the variation in access to capital. The analysis of socio-demographic profile of farmers shows that men mostly undertake maize production activities in the area and majority of them were married, educated, experienced and are in their most productive ages. The t-test analysis established that there is a significant difference between CB and NCB in terms of production inputs used, maize yield obtained and profit of respondents at varying levels of probability.

The study recommends that microfinance credit beneficiaries should increase their loan size in order to invest more in their production activities and NCB should be encourage to obtain loan so as to complement their income for increase yield and profit. Government should become actively involved in agricultural microfinance schemes via incorporating it in to the national agricultural credit policies as an agricultural development strategy in Nigeria.

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