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Cassava Farmers Access to Microfinance Services in Abia State, Nigeria: Implication for Technical Efficiency

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Abstract

This study examined access of cassava farmers to microfinance services in Abia state, Nigeria and discussed the Implication for technical efficiency. A multistage random sampling technique was adopted in collecting cross – sectional data from a sample of 120 cassava farmers who benefitted from services of MFIs. Data was collected with administered questionnaire on cassava farmers. The result showed that MFI micro credit beneficiaries had better level of access to micro credit; more time was spent processing microfinance services; a good proportion (43.33%) of beneficiaries paid a processing cost of ₦1,000 - ₦3,000. The probit regression estimates proved that cassava farmers' accessing MFI services was influenced by gender and age of household head at 10.0% level while education, farming experience and amount of loan repaid influenced accessibility at 1.0% probability level. Ownership of house, household size and annual farm income influenced accessibility at 5.0% and 10.0% respectively. The MFI beneficiaries were found to be technically efficient in cassava production. It was recommended that cassava farmers be encouraged through extension agencies to join/form groups or cooperatives to enhance their access to MFI services and in turn increase technical efficiency in cassava production in Abia state, Nigeria.

Keywords: Technical Efficiency; Microfinance Institution; Access to Credit

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Introduction

One important staple crop in Nigeria is cassava (IITA, 2004). This crop has a good comparative production advantage over other staples which serves to encourage its cultivation even by resource poor farmers. Cassava production generally requires less labour per unit output than other staples. Cassava is able to grow and give reasonable yields in low fertile soils (marginal lands). It is a good staple whose cultivation if encouraged can provide the nationally required food security minimum of 2,400 calories per ca put per day (FAO, 2000). Not too long ago, production figures projected Nigeria as leading producer of cassava in the world (FAO, 2000). In 2004, the estimated cassava output from Nigeria was approximately 34 million tones. This feat was sequel to an ongoing cassava multiplication programme as part of presidential initiatives on cassava crop, Root and Tuber Crop Expansion Programme (RTEP, 2002). The initiative was aimed at using cassava production as an engine of growth in the Nigerian economy. In recent times, Nigerian government has encouraged the use of cassava crop to produce a wide range of industrial products such as ethanol, glue, glucose, syrup and bread. In addition, the Nigerian government had promulgated a law making it mandatory for confectionaries and bakers to use composite flour of 10 percent cassava and 90 percent wheat for bread production. This regulation which came into effect on January 2005, stipulated that large flour mills that supply flour to bakers and confectionaries must pre – mix cassava flour with wheat flour (CTA, 2005).

Despite Nigeria's ranking as the highest cassava producing country in the world, its yield per hectare of 9.98 tonnes (FAO, 2003) is lower than the world average of 10.76 tonnes per hectare (FAOSTAT, 2004). Cases of higher productivity of cassava in the world include Brazil (14.8 tonnes per hectare), Indonesia (12.94 tonnes per hectare) and Thailand (18.3 tonnes per hectare) (IITA, 2004). Relatively therefore, the productivity of cassava in Nigeria is on the lower side.

As part of rural development and enhancement of flow of financial services to Nigeria's rural areas where cassava is mostly grow, Nigerian government had initiated series of publicly financed micro / rural credit programmes and policies targeted at the poor, including the defunct Rural Banking Programme, Sectoral Allocation of Credit, Concessionary Interest Rate and the Agricultural Credit Gurantee Scheme (ACGS), defunct Nigeria Agricultural and Cooperative Bank (NACB), defunct Peoples Bank of Nigeria (PBN), Community Banks (CBS) and Family Economic Advancement Programme (FEAP). (CBN, 2006). In year 2000, the Federal Government of Nigeria merged NACB, PBN and FEAP to form the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) to enhance provision of finance to the agricultural sector. It also created the National Poverty Eradication Programme (NAPEP) and transformed Community Banks to Microfinance Banks (Obike, 2006) with mandate of providing financial services to alleviate poverty (Obike, 2006). CBN (2006) reported that less than 2.0% of the rural households where agricultural activities predominate have access to financial services. Furthermore, eight (8) leading microfinance Institutions (MFI) in Nigeria were reported to have mobilized a total savings of ₦222.6 million and advanced ₦2.624 billion as credit with an average loan size of ₦8,206.90 in 2004 to 320,000 membership based customers that enjoyed one form of credit or the other from the leading Nigeria microfinance institutions (CBN, 2006).

To boost cassava production, the Federal Government of Nigeria and the Central Bank of Nigeria prevailed on the Bankers committee of the commercial banks to invest about ₦10 billion from the Small and Medium Enterprise Equity Investment Scheme (SMEEIS) to the cassava empowerment fund (CBN, 2005). In spite of the above efforts, cassava production still suffers some setbacks. One of the biggest obstacles is paucity of funds to strengthen its production. Farmers have limited access to microcredit. Access to farm credit refers to the right or opportunity to get, use, manage and control loans meant for farming. Limited access to credit or microfinance services is believed to have significant negative consequences for various aggregate and household – level outcomes, including technology adoption, agricultural production and efficiency, food security, nutrition, health and overall household welfare (Ogundari and Ojo, 2007). According to Akiram, *et. al*., (2008), important issues that relate to farmers decision for accessing loans or micro credits are interest rate, collateral, time lag in the disbursement of loans, distance of banks (MFIs), procedural and bureaucratic lending processes and large transaction costs that favour influential farmers in the rural sector.

The nation spends huge sum of money in research to develop new varieties that improve with attendant resistance to endemic cassava diseases (NRCRI, 2008). This has encouraged the cassava empowerment fund to disburse about ₦100 million microcredits to over 1000 cassava growers in the six geopolitical zones of the country to empower cassava growing capacities. It was believed that this exercise would increase cassava output by 2.3 percent (CBN, 2004). The private sector through informal loans by NGO had as well assisted cassava farmers.

In spite of the role of government and private sector in the micro financing activities more grounds need to be covered. The existing MFIs serve less than a million out of the over 40 million people who need their services (CBN, 2005). Also, aggregate microcredit facilities account for 0.2 percent of the GDP and less than one percent of the total credit in the economy (CBN, 2005). MFIs particularly those sponsored by the government adopted the traditional supply – led subsidized credit approach. The objectives of this study therefore are to analyze the level of access enjoyed by cassava farmers to microfinance institutions services in the study area, identify determinants of accessibility of Cassava farmers to Micro- loan from MFIs in the study area and estimate technical efficiencies of farmers in cassava production in the study area.

Materials and Method

This study was carried out in Abia State Nigeria. Abia is a state located in the South Eastern zone of Nigeria. The state was chosen for the study because of its agrarian disposition and endowment with land suitable for growth of various tropical food crops including cassava. In the state, it has been observed that major Clients of Microfinance Institutions (CMFI) are mostly cassava farmers (ABSADP, 2005). The climate is essentially tropical humid with average annual rainfall of 229.20 mm distributed evenly throughout its wet season, which covers a period of seven months (April to October). Its annual rainfall range is 1500-2600 mm on a mean elevation of 122 m above sea level (NRCRI, 2008). Diurnal temperature varies between 27^0C and 31.9^0C. Abia state is located between longitudes 7^0 23´ E and 8^0 02´ E and latitudes 5^0 47´ N and 6^0 12´ N (NRCRI, 2003).

Abia state was created on 22nd August, 1991 out of the then Imo state and has its capital at Umuahia. It is bounded by Enugu state in the North, Rivers state in the South, Akwa Ibom and Cross River states in the East and Imo State in the West. The state covers a total land area of 7677.20 square kilometers, with a population of 2,833,999 persons made up of 1,434,193 or 55.0% males and 1,399,806 or 45.0 % females (NPC, 2006). The state has 17 Local Government Areas (LGAs) clustered in three 3 agricultural zones namely Aba, Ohafia and Umuahia zones.

About seventy five percent (75.0%) of the State population live in rural areas and engage in agricultural production (Emerole, 2004) producing food crops which include Cassava and Yam, Rice, Plantains, Maize, Melon, Pepper, and vegetables. Some cash crops grown in the state include Cocoa, Rubber, Cashew and Oil Palm (ABSADP, 2005).

This study adopted multi- stage random sampling method in selecting the respondents for the survey. Firstly, random sampling method was adopted in selecting two (2) Local Government Areas (L.G.As) from each of the three (3) agricultural zones. From Ohafia zone (Ohafia LGA and Bende LGA), from Umuahia zone (Umuahia North LGA and Isiala Ngwa South LGA) and from Aba zone (Ukwa East LGA and Ugwunabo LGA). This gave a total of six (6) local government areas in all. The list of all Microfinance Institutions was obtained from local government area offices. The composite formed a sampling frame used in selecting MFIs (banks). Secondly, a simple random sampling was carried out in selecting three (3) MFIs from each of the six chosen Local Government Areas. Thus, a total of 18 MFIs were selected and involved in this study. These MFIs are Ohafia (Microfinance Bank) MFB, Arochukwu MFB, Abiriba MFB, Uzuakoli MFB, Umuneochi MFB and Abia State University MFB. From Abia central, Umuchukwu MFB, Deccency MFB, Ovuma MFB, Ohha MFB, Chibueze MFB and LAPO MFB. While from Aba agricultural zone we chose Ukwa MFB, Ecosal MFB, Easygate MFB, Ugwu MFB, Swift MFB and Umuike MFB.

Thirdly, the list of small scale cassava farmers who are contemporary beneficiaries of services of MFIs was obtained from the chosen MFIs. This formed a frame for a simple random selection of credit beneficiaries of MFIs credit. Forty (40) cassava farmer MFI loan beneficiaries were randomly selected from the composite list from each agricultural zone. This gave a sample of 120 farmer MFI loan beneficiaries. Data for this study was obtained from both primary and secondary sources. Primary data was collected through field survey using a pre- tested structured questionnaire. The researcher with the help of some extension staff of the ADP administered the questionnaire in the 3 agricultural zones of the state. In addition 8 enumerators who are indigenes of the areas were trained and they assisted in data collection. Cross sectional socio-economic survey was conducted on the selected cassava farmers who had benefitted from MFI credit facilities. Information collected included socio-economic variables of the households, the volume of loans received from microfinance banks in naira, volume of deposits (savings) made in microfinance banks in naira, number of training and advisory services received, access to information and management services rendered by microfinance banks to the farmers, amount of microcredit used for cassava production, microcredit processing duration, microcredit processing cost, interest rate, total amount of loan repaid, amount of microcredit diverted to other uses problems encountered in cassava production, output of cassava in kg, the area of land cultivated with cassava (hectares), total labour (household/hired labour) used in man-days, fertilizer used in kg (or bags i.e. 50kg/bag), value of other agrochemicals used (naira); and some farmer specific variables like household size, educational status of the household head, experience of the head of cassava farmer household in years among others.

Other information gathered are market interest rate, lending interest rate, annual average loan portfolio. Secondary data sources included existing publications of Central Bank of Nigeria, Microfinance Institutions, Abia State Agricultural Development programme, Journals, Bulletin, Proceedings, Magazines, Periodicals and other unpublished materials relevant to the study were consulted.

Analytical Technique

The Probit regression model was adopted following maximum likelihood approach, and an ordinary Least Square (OLS) from where a Cobb Douglas functional form was used to estimate the technical efficiency in production and other tests. The model chosen allowed for the test of technical efficiency while accepting random shocks.

Probit Regression Model was stated as follows:

Loan accessibility determinant were isolated from a credit demand model defined by probit regression. A cassava farmer either had access to MFI credit or not. Thus the probability was either 1 for access or 0 for no access. As applied by Amaniya (1981) and corrected for bias in participation decision (Heckman, 1976), we adopted thus:

$$Y_{ij} = a_i + \beta_i \sum_{k=1}^{s} H_{ijs} + e_{ij} \ldots (9)$$

Where,

Y_{ij} = vector of binary dependent variable (Accessibility) since that $Y_{ij} = 1$ if the j[th] cassava farmer had access to MFI microcredit, and 0 otherwise.

The expected probability was defined as follows:

$$E(Y_{ij}) = E\left[a_j + \beta_j \sum_{k=1}^{s} H_{ijs} + e_{ij} \right]$$

$$= a_j + \beta_j \sum_{k=1}^{s} H_{ij} E(H_{ij}) \ldots (10)$$

H_{ijs} = vector of socio-economic factors of the i[th] cassava farmer

β = vector of unknown parameters of the H_{ij} variable

e_{ij} = Error terms

Explanatory model was defined:

$E(Y_{ij}) = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \ldots\ldots\ldots + \beta n \ln Xn + e_{ij}$ …(11)

Variables considered in this model included:

HGEN= Gender of Household head (Male=1, Female =0);
HAGE = Age of Household Head (yrs);
HEDU = Years of Schooling of Household Head;
HHS = Household Size (Number);
FMS = Farm size (ha);
DSFH = Distance of the farmers house to the source of credit (km);
EAR = Number of Household Family members participating in economic activities;
INC = Yearly income earned by Household (farm + off farm income) (₦);
OWNH = Ownership of House (owned house = 1, otherwise =0);EXP = Cassava farming experience of household (years);
PLR = Amount of loan repaid so far (₦).

The stochastic frontier production function according to Coelli (1996) is stated as follows:

$Y_i = X_i , \beta + (V_i - U)$ ... (1)

Where:

Y_i = logarithm of the cassava output of the i[th] farmer;
X_i = Vector of (transformed input quantity) of the i[th] farmer;
β = Vector of unknown parameters estimates;
V_i= is the usual symmetric noise associated with random variable which are not under the control of the farmer (such as rainfall, natural hazards) and which are assumed to be iid~N (O, σ_v^2) and independent of the U_i, which refers to negative random errors assumed to account for the technical inefficiency in cassava production and often assumed to be iid~ N (O, σ_v^2).

The parameters estimate (β) and the variance of the parameters in term of $\delta^2 = \delta v^2 + \delta u^2$ and $\gamma = \delta u^2 / \delta^2$ were obtained through a maximum likelihood estimation procedure.

The Cobb Douglas logarithm model for clients of microfinance institution (CMFI) estimated in this study was defined following (David and Okoye, 2010) as follows:

$$InY_i = \beta_0 + \sum_{j=1}^{4} \beta_j InX_i + \sum_{i \geq j=1}^{4} \sum_{k}^{4} \beta_j kInXj_i InXk_i + (V_i - U_i)$$

Where

$\ln Y$ = Natural logarithm of Quantity of cassava harvested by farmer (kg);
$\ln X_1$ = Natural logarithm of Total land area planted with cassava (ha);
$\ln X_2$ = Natural logarithm of Total labour (household and non- household) used in cassava production (man days);
$\ln X_3$ = Natural logarithm of Quantity of fertilizer used on farm (kg);
$\ln X_4$ =Natural logarithm of Cassava stems planted (in bundles); A bundle of cassava stems (equivalent to 50 cassava stems);
$\ln X_5$ = Natural logarithm of Amount of borrowed funds invested (₦)

Technical inefficiency determinant model for CMFI was generated from Cobb Douglas production frontier model as follows:

$$\mu_i = \delta_0 + \sum_{j=1}^{11} \delta_j M_{ji} \quad \ldots 3$$

Where:
δs are unknown scalar parameters to be estimated;
M_1 = Total amount of micro loan used in cassava production (Naira);
M_2 =Total amount of deposits (mobilized savings + equity contribution) used in cassava production (Naira);
M_3 = Training and advisory services (Number of times);
M_4 = Membership of group / cooperative (number of groups to which a farmer belongs);
M_5 = Access to insurance policy (1 for access to insurance policy, otherwise=0);
M_6 = Microfinance access (accessed=1, otherwise=0);
M_7 = Age of the household head (years);
M_8 = Household size (in number);
M_9 = Experience of the head of household in cassava production (years);
M_{10} = Educational level of the head of household (years);
M_{11} = Health status of the household (1 for sick, 0 otherwise);

The technical efficiency of individual farm was determined as ratio of the observed output (Yi) to the corresponding frontier output (Yi*) given the available technology. That is,

$$TE = Y_i / Y_{i*} \quad \ldots (4)$$
$$= f(X_i, \beta) + \exp(V_i - U_i) \quad / f(X_i, \beta) + V_i \quad \ldots (5)$$
$$= \exp(-U_i) \text{ such that } 0 \leq TE \leq 1 \quad \ldots (6)$$

Estimates of the parameters for the stochastic frontier production function model was obtained using the computer program, FRONTIER version 4.1, written by Coelli (1996) in which the variance parameters are in terms of $\sigma^2 = \sigma v^2 + \sigma u^2$ and $\gamma = \sigma u^2 / \sigma^2$.
Tests of hypotheses for the parameter of the frontier model was carried out using the generalized likelihood ratio statistic, λ, defined as
λ = -2ln … (7)
Where L(Ho) is the value of the likelihood function for the frontier model, in which the parameters that are stated by the appropriate hypothesis, H_0, will be imposed; and L (H_1) is the value of the likelihood function for the general frontier model.

Result and Discussion
Table 1 shows the distribution of respondents according to benefit received from accessed Microfinance institutions. The result showed that 100.0% of the MFI microcredit beneficiaries benefitted from microcredit. A large proportion (94.17%) were encouraged to be cooperative members, and another large proportion (92.50%) received training and advisory services, just like 91.67% were encouraged to save, and 68.33% had insurance policy. Low proportion (34.17 %) acquired skill and entrepreneurial aptitude and 10.83% were encouraged to have access to information and communication technology services. The implication of this higher percentage of MFI microcredit beneficiaries having reasonable level of access to MFI services is the expectation to having higher efficiency. This is in agreement with Yaron, (1992) who linked accessibility of microfinance to productivity and efficiency

Table 2 shows that majority of the MFI microcredit beneficiaries (52.5%) processed their loan request for a period of between 3-4 months. Also 42.5% of MFI microcredit processed their microfinance services within a period of 1 –2 months. It took 5-6 months for 50.0% of MFI microcredit beneficiaries to process microfinance service. The implication of this is that a lot of time is been spent in processing microfinance services. The use of electronic technology in this regard could reduce the processing period of most microfinance services to enable farmers' access services for their farms and to reduce the micro loan processing period to enhance productivity of such resources. Table 2 also shows the distribution of the processing cost of microfinance service. The result reveals that a good number of MFI microcredit beneficiaries (43.33%) pay a processing cost of ₦1000 - ₦3000 this is followed by ₦7000 - ₦10000 and ₦4000 - ₦6000 respectively. Whereas 5.83% of MFI microcredit beneficiaries pay over ₦10000 as processing cost. By implication, majority of the farmers (MFI microcredit beneficiaries) obtained services at low processing cost on the average since some of them obtained various kinds of service more than one time. This could be because cassava farmers in the area were members of more than one cooperative which may have facilitated their getting the loans as well as enabling them to gain cost advantage. These farmers are most likely expected to be technically efficient since high cost of processing loan did not hinder their access to microfinance services. As processing cost have been shown to have negative relationship with accessibility of credit and efficiency of farmers (Brian, 2001)

More so, Table 2 shows the distribution of respondents according to total amount of microcredit obtained (₦). The result reveals that a good proportion of MFI microcredit beneficiaries (35.0%) obtained a total microcredit of ₦161000 - ₦240000. About 25.0% of MFI microcredit beneficiaries obtained a total microcredit of between ₦241000 – ₦320000, 6.67% of them got microcredit of ₦321000 - ₦400000. The table further shows that 13.33% of MFI microcredit beneficiaries obtained a total microcredit of between ₦1000 and ₦80000. The implication of this is that majority (35.0 %) of MFI beneficiaries had access to higher amount of micro credits. This could probably be because most MFI beneficiaries belong to more than one cooperative and were able to obtain microcredit from several microfinance sources. This also implies that if these micro credits are effectively utilized farmer's level of technical and economic efficiency will improve. This is in line with the view of Ogundari (2007) that microcredit could improve the efficiency of small scale food crop farmers in Nigeria.

Table 3 shows the estimated result of the determinants of cassava farmers' access beneficiaries to microfinance credit. Four explanatory variables namely education, ownership of house, farming experience, gender and amount of loan repaid were found to be statistically significant at 1.0% level of probability with positive signs. Gender was significant at 10.0% level of probability with positive sign, and age was also significant at 10.0% level of probability but with negative signs. In consonance with expectation gender, education, ownership of house, farming experience and amount of loan repaid were shown to have positive coefficients, indicating that these variables are directly associated with the probability for increase in accessibility to microfinance credit. The implication of this is that male cassava farmers had relatively higher chances of accessing microfinance services than their female farmer counterparts. This is in tandem with work done by Nwaru (2003) who opined that the male farmers have better chances of accessing loans than the female farmers. Education increases the probability of having access to microfinance services, since educational attainment is a contributory factor to demand for better quality service and support to any farmer. Educated farmers have better perception of service delivery and greater access to input distribution and utilization (Adereti, 2005). Ownership of house increases the probability of having access to microfinance. This may be because a house owned is consolidated collateral (Chirinko, 1993). Farming experience and total amount of repaid loan increases the probability of having access to microfinance. The implication is that farming over the years may have made farmers to imbibe a culture of prompt repayment practice which in turn give them advantage to accessing MFI microcredit (Kohansal *et al*., 2008) as amount of loan repaid places a farmer at an advantage position for more access to microcredit (Pitt and Khandker, 1998).

The negative coefficients of age of household head means that old age tends to reduce or inhibit the probability of accessing microfinance credit. Younger farmers stand better chance than older farmers in accessing microfinance from institutional sources. This however is in agreement with Adeyemi (2008) who showed that older farmers stand less chance of accessing microfinance due to their declining productivity in farming activities.

The result of maximum likelihood estimates (MLF) of the parameters of the stochastic frontier production function and their levels of significance is presented in Table 4. As expected the system of the coefficient for total area of cassava farm (ha), total labour used (mandays), cassava cuttings bundle and quantity of fertilizer (kg) were all positive. This implies that any increase in these variables with positive coefficients would lead to increase in technical efficiency. The result shows that the coefficient for total land area of cassava (ha) was positive and statistically significant at 1.0% level which implies that technical efficiency increases with increase in the total area cultivated with cassava (ha). This however disagrees with Onyeweaku (1994) that technical efficiency increases with small farm size. The implication of this could be that these farmers may be experienced farmers who have maximized their resource allocation. Total labour used for cassava farming and cassava cuttings bundles had positive coefficients of 0.101 and 0.288 and were significant at 10.0% and 1.0% levels of probability respectively. This implies that any increase in labour and cassava cutting would positively influence technical efficiency of cassava farmers. This is in line with *a priori* expectation and agrees with Okoye *et. al.,* (2007) that increase in the supply of labour and quantity of cassava cutting leads to increase in technical efficiency. The positive coefficient of labour was significant at 1.0% level implying that increase in labour would lead to increase in technical efficiency, agreeing with *a priori* expectation and confirms the finding of Ohajianya and Onyenweaku (2001), Onyenweaku (1994), Nwaru (2004) and Rahji (2005) opined that labour positively influences the production of arable crops.

In the efficiency model, the negative sign of the parameters indicates that the associated variables have an inverse effect and vice versa. Training and advisory services, age, household size and educational level have a negative effect of increasing technical efficiency for MFIs microcredit cassava farmer beneficiaries. While total microloan used, total amount of deposit, membership of group, access to insurance, level of microloan accessibility, farming experience and health status have a positive effect on technical efficiency. Table 4 shows that the total amount of deposit is statistically significant at 1.0% level with a positive estimated coefficient (0.028). This indicates that cassava farmers who increases their amount of deposit tends to secure quick loan for cassava production and such farmers use at lower technical inefficiencies. This is presumably because these farmers could get microcredit at appropriate time for proper execution of their farm plans. This agrees with David and Okoye (2010) that farmers deposit in microfinance institution increase their chances of securing loan which positively influence high efficiency in farming activities. Training and advisory service is significant at 1.0% level with a positive coefficient (0.022). This indicates that farmers with high level of training and advisory services tend to have high technical efficiency; this result is in tanderm with *a priori* expectation. This probably is because farmers tend utilize information gotten from MFI advisory service and training plus the advantage of their farming experience including adequate application of the knowledge gained to their unique farming locality and situation. The level of microloan accessibility is significant at 1.0% level with a positive estimated coefficient (0.001). This indicates that farmers with high

level access to microloan tend to have higher technical efficiency. This may be as a result of adequate usage of the microloan available for farming purposes instead of diverting it to other nonproductive course. This also agrees with David and Okoye (2010) that high level of microloan accessibility encourages higher technical efficiency.

The age of the farmers is significant at 1.0% level with a negative estimated coefficient. This indicates that older farmers tend to have lower level of technical efficiency. The variable age maintained *a priori* expectation, that the older a cassava farmer becomes the more his efficiency drops. This result agrees to the findings of Habibullah and Ismail (1994), Ogundari and Ojo (2007), and Umoh (2006) which opined that innovativeness of a farmer, his mental capacity to cope with the daily challenges and demand of farm production, processing / activities and his production efficiency tend to decrease as the farmer becomes older. Household size is statistically significant at 1.0% level with a negative estimated coefficient (-0.001). This indicates that farmers with larger household size tend to have lower technical efficiency. This is probably because these farmers tend to use loans meant for cassava production to financing consumption because of the large family size. This is in agreement with Amaza and Olayemi (2002) that large family size can be instrumental to diversion of loans meant for productive processes to financing consumption. Educational level of farmers was statistically significant at 1.0% with a positive estimated coefficient (0.012), indicating that farmers with high level of education tend to have increase technical efficiency. This shows that enhanced educational attainment increases technical efficiency in cassava farming in the area, by implication, this result conformed to *a priori* expectation; the reason for this may be that literate cassava MFI farmers may have taken advantage of details necessary for high productivity due to education. This may mean that lack of education may be regarded as a factor causing technical inefficiency in the study area.

The estimate of the variance parameter (r^2) (0.474) was significantly different from zero at 10.0% level of probability. This indicated a good fit and correctness of distribution assumption specified. The variance ratio (r) (0.853) which was significantly different from zero at 1.0% probability level .This result indicates a good fit and the correctness of the specified distribution assumption of the composite error term, suggesting that more than 85.0% of the variation in technical efficiency for MFI microcredit beneficiaries was due to the presence of technical inefficiency in resource use and not related to random variability (Nwaru, 2004).

Table 5 showed that the mean credit by microcredit beneficiaries is estimated at 0.825 maximum value of 0.965 and minimum value of 0.426. More than 74.0% of the microcredit beneficiaries fall within the range of 81.0 – 100% technical efficiency showing that a high proportion was technically efficient.

Conclusions and Recommendations

This study explored the accessibility of microfinance services by cassava farmers in Abia state Nigeria; and discussed implication for technical efficiency. A reasonable level of access to MFIs was established by cassava farmers in the study area. MFI services were found to be technically influenced by MFI variables and farmers' socio-economic variables. The study discovered that MFI service beneficiaries were technically efficient in cassava production, with MFI variables influencing cassava farmers' accessibility and in turn influencing technical efficiency of cassava farmers. Cobb-Douglas production frontier was estimates were found to be asymptotically efficient and consistent. On the average cassava farmers were efficient in resource use even though none of them attained optimal production level, given their level of technology and capacity. It is therefore recommended that since gender, age, farming experience, household size and education of cassava farmers influenced access to MFI services, extension intervention should emphasize these variables to farmers so as to enhance accessibility and possibly reduce inefficiency in cassava production. Government policies should encourage female cassava farmers' access to MFI services to help increase cassava production and counter the low turnout and poor listing of women in MFI services. Efforts should be geared to encourage farmer membership cooperative and saving organization to increase their accessibility to MFI credit services. Government incentives in encouraging low interest rate for MFI should be sustained to encourage higher technical efficiency in cassava production.

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Tables

Table 1: Distribution of Cassava Farmers by Source of Loan characteristics in Abia State, Nigeria.

MFI Loan Characteristics	**Frequency**	**Percentage (%)**
Processing Period(Months)		
1 – 2	51	42.50
3 – 4	63	52.50
5 – 6	6	5.00
Total	120	100
Mean	3.0	
Processing cost (₦)		
1000 - 3000	52	43.33
4000 - 6000	29	24.17
7000 - 10000	32	26.67
>10000	7	5.83
Total	120	100
Mean	4,925	
Total Amount of Credit Obtained (₦)		
1000 – 80000	16	13.33
81000 – 160000	24	20.00
161000 – 240000	42	35.00
241000 – 320000	30	25.00
321000 – 400000	8	6.67
Total	120	100.00
Mean	193,833.33	100.00

Source: *Field survey, 2012*

Table 2: Distribution of Cassava Farmers by Benefits Received from Microfinance Institutions.

Microfinance Services	**Frequency**	**Percentage**
Received Microcredit	120	100
Saving Mobilization	110	91.67
Training and advisory services	111	92.50
Cooperative Membership	113	94.17
Insurance Policy	82	68.33
Skill and Entrepreneurial Development	41	34.17
Information and Communication Technology	13	10.83

Source: *Field survey, 2012***.**

Table 3: Probit Estimates of Determinants of Farmers Access to MFI microcredit in Abia State, Nigeria

Variable	Parameter	Coefficient	Standard Error	T - Value	Probability
Gender	GEN	0.810	0.108	1.684*	0.053
Age of Household Head	AGE	-0.003	0.002	-1.969*	0.012
Education (years)	EDU	0.020	0.002	12.395***	0.000
Household Size	HHS	-0.013	0.031	-0.424	0.672
Farm Size (ha)	FMS	0.071	0.238	0.297	0.767
Distance to source of Credit	DSFH	1.4E-04	2.1E-05	-0.399	0.690
Number of household member participating in economic activity	EAR	-0.012	0.056	-0.211	0.833
Annual Income	INC	2.3E-05	1.2E-07	-0.663	0.507
Ownership of House	OWN	0.033	0.015	2.275**	0.007
Farming Experience	EXP	0.007	0.001	5.841***	0.000
Amount of Loan repaid so far.	PLR	2.5E-06	1.8E-06	2.952***	0.003
Intercept	Bo	-3.136	0.427	-7.343***	0.000
Chi- square	202.302***				

Source: *Field Survey, 2012*.

Table 4: Maximum Likelihood Estimates for Technical Efficiency by Stochastic Frontier Production Function of Farmer microcredit Beneficiaries in Abia State, Nigeria

Variables of Cobb- Douglas Frontier Model	**Parameters**	**Estimates and t – ratios**
Constant	β_0	7.130*** (15.771)
Total area of cassava farm(ha)	β_1	0.394*** (6.038)
Total labour used for cassava farm	β_2	0.101* (1.929)
Quantity of Cassava (kg)	β_3	0.040 (0.699)
Cassava cuttings Bundle	β_4	0.288*** (4.424)
efficiency Function		
Constant	δ^0	-0.190 (-1.167)
Total Microloan used (M_1)	δ^1	-0.386 (-1.0930
Total amount of deposit (M_2)	δ^2	0.028*** (12.998)
Training and advisory service(M_3)	δ^3	0.022*** (7.892)
Membership of group(M_4)	δ^4	-0.134 (-1.160)
Access to Insurance (M_5)	δ^5	-0.831 (-0.128)
Level of microloan accessibility(M_6)	δ^6	0.001*** (6.959)
Age (M_7)	δ^7	-0.036*** (-4.382)
Household size(M_8)	δ^8	-0.001*** (-8.815)
Farming experience(M_9)	δ^9	-0.168 (-0.662)
Educational level(M_{10})	δ^{10}	0.012*** (6.394)
Health Status(M_{11})	δ^{11}	1.3E-06 (0.431)
Diagnostic statistics		
Sigma – squared	r^2	0.474* (1.766)
Gamma	**r**	0.853*** (10.070)
Log likelihood function	**LLF**	54.980
Likelihood ratio test	**LRT**	20.209
Mean technical efficiency	**MTE**	0.825

Source: *Field Survey, 2012.figures in parenthesis are t - ratios*

, **, * Significant at 10.0%, 5.0%, and 1.0% levels respectively*

Table 5: Estimates of Technical Efficiency Ranges for MFI microcredit beneficiaries

Technical Efficiency Level	**MFI microcredit Beneficiaries**	**Percentage**
≤ 0.20	-	-
0.21 - 0.30	-	-
0.31 - 0.40	-	-
0.41 – 0.50	3	2.63
0.51 – 0.60	8	7.02
0.61 – 0.70	8	7.02
0.71 – 0.80	10	8.77
0.81 – 0.90	40	35.09
0.91 – 1.00	45	39.47
Mean	0.825	
Minimum	0.426	
Maximum	0.965	

Source: *Field Survey, 2012***.**