Journal of Scientific Agriculture 2017, 1: 314-319
doi: 10.25081/jsa.2017.v1.869
http://updatepublishing.com/journals/index.php/jsa

REGULAR ARTICLE

Impact of microcredit program on poverty reduction among rural households in Saki East Local Government area of Oyo State, Nigeria

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Abstract

It is widely acknowledged that access to financial services plays a critical role in helping poor people strengthen their economic potentials, increase their asset base and diminish their vulnerabilities to external shocks. However, poor people have very limited access to financial services provided by the formal financial institutions due to the procedures outlined for accessing such loans. In recent time, Microcredit has received global attention owing to its claim in alleviating poverty. This study investigates the impact of microcredit program on poverty reduction among rural households in Saki East Local Government area of Oyo State using logit model and propensity score matching techniques to prove the impact. Findings revealed a negative, non-significant impact of microcredit on poverty reduction among rural households. Therefore, it is recommended that microcredit program should be implemented along with other poverty alleviation strategies.

Key words: Logit model; microcredit; poverty; propensity score matching; rural households

Introduction

Microfinance is a term used to describe financial services for those without access to formal banking. It incorporates the loans often at interest rate of 25% or more, to individuals, groups, and small business i.e. Microcredit. More recently; it has also been extended to include the provision of savings accounts-microfinance-as well as insurance and money transfer services. The main feature of microcredit is lending decisions are based on the ability of the client's microenterprise, to effectively apply the loan, to increase revenue and in turn repay the loan (www.microrate.com).

Microcredit is a successful way to increase the economic growth and, it has also empowered women by increasing their poverty gap and reduces their extent of vulnerabilities (Chavan and Rumakumar, 2002). The microcredit program proved to be influential in many developing countries (Hossain, 1988; Otero, 2000). There are some shortcomings as well as reported earlier by different scientists (Adams & Von Pischke, 1992; Buckley, 1997).

In view of the above findings, concerning the positive impact of microfinance program on the poor, there are still controversies trailing the methodological approach being used to measure the impact estimate. In this study, the method of Propensity Score Matching was used to match the treated individuals (microfinance users) with the control group i.e. non-users of microfinance (Counterfactual group). Thus, a relevant issue

Received 23 October 2017; Accepted 16 December 2017; Published 20 December 2017

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for empirical investigation is to examine the impact of microcredit program driven by Non-Governmental Organizations (MFIs) on poverty reduction among rural households. Specifically, the study will attempt to;

i. Determine the factors affecting access to microcredit program in the study area.
ii. Assess the poverty profile of the sampled households in the study area.
iii. Examine the determinants of poverty among rural households in the study area.
iv. Analyze the impact of participation in the microcredit program on poverty reduction among rural households in the study area.

Materials and methods

The study was conducted in Saki East Local Government Area of Oyo State. Saki East Local Government used for this study, was carved out of the defunct Ifedapo Local Government in I996, under the then military government of General Sanni Abacha. It is one of the Thirty-three (33) local governments in Oyo State. It has an area of 1569km² with a population of 108,957, by the 2006 Census. The headquarter of the local government is the ancient town of Ago-amodu. The local government comprises five towns and various farm settlements. The towns are: Sepeteri, Ogbooro, Ago-amodu, Agbonle, and Oje-Owode. Primary and Secondary data were used for this study. The primary data were collected from the respondents through the use of a semi-structured questionnaire with oral interview while the secondary data were obtained from various articles, publications, Journals, Annual Report of Central Bank of Nigeria, and other relevant literature materials.

A cross sectional data of users and non-users of microcredit program were obtained. Respondents were selected by random sampling. Ago-amodu, Sepeteri and Ogbooro were purposively selected based on their clients' relative length of loan cycles. Users and non-users of microcredit program in three selected communities were randomly selected proportionately from a total of eight (8) wards in the three communities. A total of one hundred and twenty-nine respondents comprising both the users and non-users of microcredit (NGO) were selected. Here, a household is considered to have access to microcredit program, if the household head or the spouse is participating in the microcredit program. Three micro-finance institutions-LAPO, SEAP and Grooming Centre- are distributed within the three local government areas that constitute the old Ifedapo local government. A SEAP microfinance institution was purposively selected because it is the only microfinance institution with the widest coverage within the local government area.

Propensity score matching

In this approach, access to microfinance is considered as a "treatment" so that an average treatment effect on the treated is estimated using the propensity score matching as explained previously (Rawlings and Schardy, 2002; Esquivel and Huerta-Pineda, 2007; Ravallion, 2001). Thus in this study, the critical assumption that was made in using this methodology, is that the decision to be treated (to access microfinance), although not random, ultimately depends upon observable variables. Therefore, for estimating the impact of microfinance services on expenditure and other indicators, two groups are identified, those with access to microfinance (denoted as Ti =1 for household i and those without $(Ti = 0)$. Those with access to microfinance (treated) are matched to those without (control group) on the basis of the propensity score: (probability of accessing microfinance (intervention) given observed characteristics).

$P\,(xi) = prob\,(Ti = 1|\,xi)(0 < p\,(x) < 1)$

given x_i, as a vector of pre-intervention control variables. If the $Ti's$ are independent over all i, and the outcomes due to intervention access are independent of access to intervention given xi, then outcomes are also independent of access to intervention given $p(xi)$, just as they would be if interventions were given randomly. After computing the propensity score, the ATT effect (τ) is estimated as follow;

$$\tau = E\,\{Yi - Y0i/Di = 1\}\tau = E\,\{E\,\{Y1i - Y0i/Di = 1, P(X)\}$$
$$\tau = E\,\{E\,\{Y1i/Di = 1, P\,(Xi)\} - E\,\{Y0i/Di = 0, P\,(X)\}/Di = 1\}$$

Y_1 is the potential outcome if the individual is treated; Y_0 is the potential outcome if the individual is not treated. The known matching algorithms in the literature are nearest neighbor, kernel matching, radius matching, local linear regression matching etc. However, in this study, nearest neighbor and kernel matching were used, since the propensity score is a continuous variable.

Results and discussion

Table 1 shows the summary statistics of socio-economic variables. Among the microcredit users, a household head has an average age of 42.5 years with an average household size of 8 members. Also, the average years of formal education among the microcredit users are 8. Most of them are found in trading activities with average of 17 years of experience. On the other hand, among the non-users of microcredit program, a household head has an average age of 45 years and household size of 8 members. The predominant activity among the non-users is farming with 19.6 mean years of experience. A non-user' household has an average of 9 years of formal education. The above analysis suggested that non-users of microcredit are more educated and experienced occupationally, than microcredit users and are therefore able to generate more income through improved productivity. This is corroborated by Mpuga (2004).

Propensity Score Matching

The result of the propensity score matching, showing the overall gain (ATT) in expenditure per capita of microcredit receiving households is presented in Table 2 above. The average overall gains in expenditure per capita of microcredit receiving households using the kernel matching is (N205.65). This implies that microcredit users are worse off by the amount in parenthesis and are made poorer by participating in microcredit program. This findings is consistent with Hulme and Mosley (1996).

Determinants of access to microcredit by the household heads

The logit regression model was used to analyze the determinants of access to microcredit. Two distinct models, used to capture the determinants of access to microcredit, were presented in table 3. The second columns of the table, gives the result of logit model with socio-economic variables, credit variables and aggregate social capital index (multiplicative index), while the third column of the table, gives the result of the logit model using the socio- economic variables and disaggregated social capital variables, to identify the significant coefficients of social capital indices. The two models are adequate, considering their chi-square values, which are highly significant at less than one 1% level. In summary, the coefficient of educational status, primary occupation, occupational years of experience, interest charged, time lag of credit delivery, payback period, credit distance, household membership density, decision making and cash contribution index, significantly influenced the households' access to microcredit, at their respective levels. These findings, are consistent with Mpuga (2004).

Table 1. Summary statistics of socio-economic variables.

Socio-economic variables	Users	Non-users	All
Age			
Mean (years)	42.5	45	43.9
Standard deviation	13.38	10.88	12.08
Household size			
Mean	8.3	8.2	8.3
Standard deviation	3.96	4.2	4.14
Years of formal education			
Mean (years)	8.2	9.4	9.0
Standard deviation	4.80	5.37	5.17
Primary occupation			
Mean	2.4	1.7	2.0
Standard deviation	1.089	1.118	1.142
Years of occupational experience			
Mean (years)	17.14	21.81	19.6
Standard deviation	13.02	12.98	12.73
Total	58	71	129

Source: Field survey, 2014

Table 2. Result of the Propensity Score Matching, Showing the Overall gain (ATT) in Monthly Per Capita Expenditure of the Microcredit receiving Households.

No of Treatments	No of Controls	ATT	Standard error	t-value
58	71	-205.65	2246.98	-0.09

Source: Computer Printout

Table 3. Logit result of determinants of access to microcredit with multiplicative social capital Index and additive social capital variables.

	Model with multiplicative social capital index		Model with additive social capital variables	
Independent variables	*Marginal Effect*		*Marginal effect*	
Sex	-1.1672	(2.1633)	-3.7920	(1.3575)***
Age	0.0840	(0.0814)	0.1015	(0.0638)*
Marital status	0.3692	(0.1396E04)	-0.4142	(1.6866)
Household size	0.0635	(0.1399)	-0.1180	(0.1443)
Education status	-0.4473E01	(0.3229)*	0.2150E-01	(0.1023)
Primary occupation	-0.3336E01	(0.1495E01)**	-2.8330	(1.0362)***
Occupation experience(years)	-0.1872	(0.0993)**	-0.7070E-01	(0.0513)
Employment sector	-1.3322	(1.9339)	-3.7454	(1.5142)
Food expenditure	0.1628E-03	(0.1964E-03)	-2.9700E-05	(0.1707E-03)
Social capital index	0.3680E-04	(0.427E-04)	-	
Meeting attendance	-		0.0428	(0.0344)
Membership density	-		3.4518	(0.9161)***
Decision making	-		-0.0435	(0.0359)
Cash contribution	-		0.0403	(0.0184)**
Heterogeneity	-		0.1055	(0.0463)**
Interest charge	0.9038	(0.4131)**	-	
Time lag	-1.5967	(0.9954)*	-	
Payback period	-0.6488	(0.3829)*	-	
Credit distance	0.2795	(0.1257)**	-	
	Model summary		Model summary	
	No. of observation = 129		No. of observation = 129	
	LR Chi^2(14)	= 149.86	LR Chi^2 (14)	= 131.63
	Prob.> Chi^2	= 0.0000	Prob. > Chi^2	= 0.0000
	Pseudo R^2	= 0.8442	Pseudo R^2	= 0.7415

Source: Computer Printout. Standard errors are in parenthesis. *Coefficients are significant are significant at * =10%, ** =5% and *** =1%.*

Poverty profile of the sampled households by socio-economic characteristics

The decomposition of poverty based on several characteristics, was done in order to relate poverty to changes in those characteristics. The characteristics are socio-economic and participation in microcredit program. The table 4 reveals the poverty status of the sampled households, using the socio-economic characteristics and participation status of microcredit program. It is evident, from the table, that female headed households are more vulnerable to poverty than their male counterparts as evident in World Bank report (2007). Households with lower level of education, who engage in trading with higher household size and whose age brackets are found above or below the productive age limit, are more vulnerable to poverty than do the otherwise households. On the other hand, microcredit receiving households show higher incidence of poverty, depth and severity than non-microcredit receiving households.

Determinants of poverty among rural households

The response of households' poverty is better captured when expressed in percentage rather than the unit of measurement of the variables. Following Tobit decomposition framework as suggested by Mc Donald and Moffit (1980), the effects of changes in the explanatory variables (Xi) on the probability of

being poor, was determined. Table 5 shows the coefficient of marginal effects of probability of being poor among households, in the study area. The second and third columns of table, present the result of the Tobit model with multiplicative social capital index and additive social capital variables respectively. Among the socio-economic variables, the coefficients of age, household size, primary occupation, occupational years of experience and food expenditure are all significantly affect the probability of being poor by the households. On the other hand, the coefficient of internal heterogeneity within the local associations only, significantly affect the probability of being poor; i.e households involving in local level associations, with diverse internal heterogeneity are less likely to be poor, than households with lower level of internal heterogeneity among their members.

Conclusions

It is evident that, the formal financial systems in Nigeria provide services to about 35% of the economically active populations while the rest 65% are often served by the informal sector through non-governmental Organizations-Microfinance institutions (CBN, 2005). The study used both primary and secondary data. Logit regression model was used to generate the propensity scores i.e. the predicted probability of microcredit access. Also, the propensity score matching was also used to find the impact estimate (ATT), Average Treatment effect on the treated. The ATT estimate shows a negative impact of microfinance access. Thus, implementing microfinance program-as a poverty reduction strategy, in isolation is a necessary, but not sufficient condition for poverty alleviation. It is therefore recommended, that education of the beneficiaries, infrastructure, and capacity development are critical to any poverty alleviation strategy.

Acknowledgements

The authors are grateful, for wonderful contributions of colleagues and senior colleagues from the department of Agricultural Economics, University of Ibadan. The material and financial contributions of Alh. Seriki Musa, to the making of this research effort, was also acknowledged.

Authors' contributions

A. Yaqoob was responsible for the conception, design, as well as the interpretation of the research findings. W.Y and S. Y. were responsible for critical revision, as well as some aspects of data analysis.

Table 4. Poverty profile of sampled households by socio-economic characteristics.

Socioeconomic Variables of Household head		N	Poverty gap (α=0)	Poverty depth (α=1)	Poverty severity (α=2)
Sex:	Male	95	0.361	0.110	0.049
	Female	34	0.617	0.281	0.163
Age:	0-35 years	37	0.514	0.193	0.104
	36-50 years	67	0.394	0.139	0.068
	51-65 years	17	0.412	0.156	0.085
	Above 65 years	8	0.375	0.116	0.047
Education Level:	No formal	19	0.684	0.199	0.077
	Primary	41	0.463	0.195	0.113
	Secondary	40	0.375	0.157	0.081
	Tertiary	29	0.285	0.066	0.029
Primary occupation:	Farming	59	0.065	0.145	0.065
	Trading	34	0.124	0.208	0.123
	Civil Servant	12	0.065	0.136	0.064
	Craft & artisans	24	0.059	0.117	0.059
Household size:	1-5	30	0.448	0.105	0.037
	6-10	75	0.365	0.141	0.072
	11-15	14	0.643	0.263	0.137
	Above 15	10	0.545	0.251	0.167
Participation in microcredit program:					
	Non-users	71	0.371	0.111	0.048
	Users	58	0.500	0.209	0.118
	All households	129	0.430	0.156	0.080

Source: Field Survey, 2014

Table 5. Result of the determinants of poverty among rural households.

Independent variables	Model with multiplicative social capital index		Model with additive social capital variables	
	Marginal effect		*Marginal effect*	
Gender	-1.1303	(3.8033)	0.8161	(3.0917)
Age	-0.3560	(0.1989)*	-0.3228	(0.1653)**
Marital status	4.1431	(4.6474)	2.4468	(3.6323)
Household size	0.7742	(0.3592)**	0.9258	(0.3046)**
Education level	0.2128	(1.7406)	-1.1926	(1.5049)
Employment status	2.9706	(5.3985)	3.7456	(4.6355)
Primary occupation	-2.8953	(1.5396)*	-3.6434	(1.3050)***
Occupational experience	0.2951	(0.1737)*	0.3189	(0.1420)
Food expenditure	-0.0012	(0.00062)*	-0.0012	(0.0005)**
microcredit participation	2.6386	(3.6533)	6.6893	(4.1669)
Social capital index	0.963 x 10-4	(0.15 x 10-3)	-	
Meeting attendance index	-		0.806 x 101	(0.1099)
Membership density index			-1.7979	(2.226)
Decision making index			0.2754	(0.1289)
Cash contribution index			-0.622 x 101	(0.558 x 10-1)
Heterogeneity index			-0.3212	(0.0636)*

Source: Computer printout. Standard errors are in parenthesis: *Coefficients are significant a*t: *** =1%, **= 5% and * = 10% levels

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