Chapter 16
The Effect of Microfinance on Inequality and Household Shocks Easing in Nigeria

Ezebuilo R. Ukwueze
University of Nigeria, Nigeria

Henry T. Asogwa
University of Nigeria, Nigeria

Augustine C. Odoh
Godfrey Okoye University, Nigeria

ABSTRACT

The chapter aims at finding the microfinance effect on households' shocks easing of Nigerians, and estimating the inequality in the use of MFIs' services under the backdrop that rural farmers do not have access to credits to boost productivity and this affects their income and widens inequality. Based upon the World Bank microdata on financial inclusion survey for 2014 (the Global Fundex survey data set), the study employed the Heckman selection model and concentration index. The results show that households in urban areas have more access to MFIs services than rural households in terms of mobile money accounts, emergency funds, and receiving remittances to smooth their consumption shocks. The results also show wide disparities in deprivation of owning accounts, in loans for apartment, in trend of saving habits, in capacity to participate in MFIs services between the rich and the poor. The study, therefore, recommends that more MFIs can be established in rural areas and more awareness campaign be carried to reach out to the targeted households.

INTRODUCTION

Generally, microfinance programmes are basically meant to provide financial services to the poor especially those that are under-served by mainstream financial service providers. These services include microcredit, micro-savings, micro-leasing, and micro-insurance and payment transfer (Babajide, 2011).

DOI: 10.4018/978-1-5225-5240-6.ch016

Microfinance impact analysis is the process by which one determines the outcomes (effects) of microfinance as an intervention (Ledgerwood, 1999). Microfinance Institutions (MFIs) do the provision of financial services to low-income individuals, and also the self-employed. The services include credit, savings, insurance and payment. However, Koveos and Randhawa (2004) argued that the main idea behind microfinance is to reduce and ultimately eliminate poverty by providing credit to individuals who are too poor to access fund from the formal financial institutions. Microfinance has come to replace or reduce the activities of private money lending activities with their high interest-charging capacities which are mostly usurious, and other illicit activities beclouding it.

It should be noted that it is not only the very poor that benefit from the microfinance credits; the "working poor" also patronize the MFIs. The working poor are those who are working but have little earned income or those whose earned income cannot meet their household needs. They cannot also borrow from the formal financial institutions, due to their inability to provide collaterals. The links between microfinance development and improvement in lives and welfare of households have come to focus in empirical studies, especially as this plays veritable role in reducing inequality in the areas of consumption smoothening. Developing countries are characterized by disparities: income gaps, inequality, poverty, vulnerability and welfare levels. Greater households depend on subsistence income accrued from rural faming and other related economic activities. These rural farmers do not have access to credits to boost productivity and this affects their income and widens inequality.

Providing effective financial services to low-income households often requires social intermediation, the process of creating social capital as a support to sustainable financial intermediation with poor and disadvantaged groups or individuals (Bennett, 1997). Also, some MFIs provide enterprise development services such as skills training and basic business training (including bookkeeping, marketing, and production) or social services such as health care, education, and literacy training. These services can improve the ability of low-income households to operate microenterprises either directly or indirectly. It should be noted that the type of services rendered by the MFIs depend on the MFI's objectives, the demands of the target market, the existence of other service providers, and an accurate calculation of the costs and feasibility of delivering additional services (Ledgerwood, 1999).

According to Ledgerwood (1999), there are four cardinal services which may be provided to microfinance clients and include: first, financial intermediation, or the provision of financial products and services such as savings, credit, insurance, credit cards, and payment systems. Second, social intermediation is the process of building the human and social capital required by sustainable financial intermediation for the poor. Third, they provide enterprise development services or non-financial services that assist micro-entrepreneurs. They include business training, marketing and technology services, skills development, and subsector analysis. Fourth, social services or non-financial services that focuses on improving the well-being of micro-entrepreneurs. They include health, nutrition, education, and literacy training.

Since microfinance is believed to ease the microcredit constraints on the poor, it is expected to have equalizing effects on income disparity and by extension has the capability of cushioning the effects of shocks on poor households' consumption. Shock easing effect of microfinance is easily manifested in the consumption smoothening potential of the microfinance institution (Dunford, 2013). The ability of households to smoothen consumption portrays an important dimension of wellbeing as it shows people's capability to satisfy their basic needs despite the occurrence of shocks (Sugiyanto, Kusumastuti & Donna, 2012). According to Hashemi and Rosenberg (2006:1), microfinance enables poor people to use loans, deposits, and other financial services to reduce their vulnerability, seize opportunities, and increase their earnings, hence alleviating their poverty.

Microfinance has also some safety nets built in it. According to Padró (2004:1) "a social safety net is there to meet the needs of those who need assistance in one form or another." This implies that although welfare does form a part of social safety nets, these programmes also concern other factors such as education, labour welfare and workplace conditions, health care, quality of life, amongst others (Padró, 2004). However, the World Bank (2010) also refers to the fact that some people see social safety nets as welfare programmes or as providing social assistance. This is far from that, but when thinking about the introduction of safety nets in a country or region, there is the need to carefully access the needs of the people living there. This is because each kind of safety net has certain attributes and covers some aspects better than other programmes (Vella, 2011). Following from this, Grosh et al. (2008) said, "A good safety net system is more than a collection of well-designed and well-implemented programmes." They went on to argue that safety net systems are linked to one another by complementing both other safety net programmes and social policies within the country.

Government of Nigeria has at one time or the other implemented many poverty reduction strategies/ policies through the establishment of what seemed like microfinance and which eventually metamorphosed into microfinance institutions (MFIs). These include: Agricultural Credit Guarantee Scheme (ACGS); Nigerian Agricultural and Co-operative Bank (NACB) and the National Directorate of Employment (NDE), Nigerian Agricultural Insurance Corporation, National Poverty Eradication Programmes, and the Family Economic Advancement Programme. These were modified into Peoples Bank, (1990-2002), Community Banks and now to full blown microfinance institutions in 2005. This study, from literature search, extends the research beyond the relationship between microfinance and poverty to the effect of microfinance on inequality and household shocks easing.

REVIEW OF RELATED LITERATURE

Conceptual Framework

Generally, microfinance programmes are basically meant to provide financial services to the poor and the vulnerable, especially those that are under-served by mainstream financial service providers. These services include microcredit, micro-savings, micro-leasing, and micro-insurance and payment transfer (Babajide, 2011). The vulnerable are most affected by the lack of or insufficient access to these services. Who are the vulnerable?

Vulnerability is a concept that has been viewed differently by researchers and thus has been given varied definitions and measures. Prowse (2003: 9) sees vulnerability as a condition which can cause poverty or hinder people from escaping poverty. Some other researchers who support that poor people are generally more vulnerable are Cannon and Rowell (2003), and Feldbrügge and von Braun (2002). It is observed that this view opines that vulnerability is the cause of poverty. However, the other group of researchers views vulnerability as stemming from poverty: they view this concept as being caused by poverty (Cardona, 2004). Calvo (2008) treats vulnerability as a dimension of poverty itself and define it as a threat of suffering any form of poverty in the future.

In Calvo and Dercon's (2005) analysis, vulnerability is seen as a combination of poverty (failure to reach a minimum outcome) and risk (dispersion over states of the world) that translates into a threat of being poor in the next period. The notion of vulnerability is found upon the probability of outcomes failing to reach the minimal standard as well as on the uncertainty (risk of falling into poverty) about

how far households may fall below that threshold. This uncertainty is a source of distress and impinges directly on well-being (Swain & Floro, 2012).

Ligon and Schechter (2003) took a utilitarian approach in defining vulnerability, arguing that it depends not only on the mean of household consumption but also on variation in consumption in the context of a risky environment. The risk faced by the household, according to them, is decomposed into aggregate and idiosyncratic risk. Researchers have used various measures and/or proxies for vulnerability. Some have used household panel data, while others have used the extent of consumption fluctuations over time as households' experience income fluctuations (Morduch, 2005; Kamanou & Morduch, 2005). Still, others have examined the impact of various forms of shocks on households' consumption (Ligon & Schechter, 2003; Carter et al., 2007), or other aspects of household well-being, such as health (Dercon & Hoddinott, 2005). These measures have been used to estimate the effects of shocks on households' variations in income and thus be able to determine how microfinance has been able to mitigate the harsh effects on the poor households.

The intervention can come in the form of the services provided by the microfinance institutions (MFIs). As noted above, these services include micro credits, savings, insurance and transfer of funds. Microcredit refers to the ratio of loan amount to average per capita income (which differs across country but lies within 60-150% of the GDP per capita ratio) while micro-savings refers to savings account with a balance of less than 20% of the average annual income per capita (USAID, 2004). This shows that in 2016, loans of up to N290,000 was regarded as micro-loan in Nigeria while micro-savings with a balance less than N59,300 was regarded as micro-savings. Since microfinance is believed to ease the microcredit constraints on the poor, it is expected to have equalizing effects on income disparity and by extension has the capability of cushioning the effects of shocks on poor households' consumption.

Shock easing effect of microfinance is easily manifested in the consumption smoothening potential of the microfinance institution (Dunford, 2013). The ability of households to smoothen consumption portrays an important dimension of wellbeing as it shows people's capability to satisfy their basic needs despite the occurrence of shocks (Sugiyanto, Kusumastuti & Donna, 2012).

Household can employ either ex ante or ex post strategies consumption smoothing and it involves any or combination of these: employing additional income generation activities, sourcing for credit/loans, or seeking transfers (Aryeetey, 2004). The ex-ante uncertainty about shocks enables households to have reserves of money through additional income generation activities and as well engage in ex post activities such as sales of assets, credit or insurance claims when ex-ante income turns out to be lower than the minimum level of disposable income required to satisfy the needs for food and other basic necessities (Zeller, 1999). Udry (1994) noted that ex ante strategy is used by household to reduce variance in income while ex post enables household to stabilize consumption in the case of volatility of income. This is similar to income smoothing or risk-management and consumption smoothing or risk-coping strategies as identified by Berg and Schrader (2009) which refers to income diversification by households and dealing with the effect of shocks respectively. Three different consumption smoothing mechanisms that have been identified in the literature to help reduce poverty and inequality include assets liquidation, adjustment in the investment in human capital and the use of external credit. Among these, it has been argued that access to external credit has been given least attention (Murdoch & Roodman, 2009). In line with Murdoch and Roodman, (2009), Zeller (2001) further argued that microfinance can smooth income and consumption in two different ways: (1) by raising the expected income and consumption and future investment assets and, (2) by decreasing the downward semi-variances of income and consumption.

The economics literature on the consumption smoothing behaviours follows two fundamental models: the first one models household behaviour based on the permanent income hypothesis and focuses on the aggregate consumption smoothing versus income (Deaton, 1992). The second, on the other hand, pays closer attention mostly on specific group of households. This study is basically on the effect of microfinance on the households and therefore hinges on the second model. In other words, the concern of this study is more on idiosyncratic shocks than covariate shocks. The idiosyncratic shocks include economic shocks, crime shocks, health shocks and familial shocks (Laws, 2016).

EMPIRICAL LITERATURE

Effect of Microfinance on Consumption Smoothing in Nigeria

Theoretically, microfinance is meant to reduce inequality, poverty, cope with shocks especially by smoothing income and generally improving the welfare of household, however in Nigeria, few evidence exist. Below, the study presented few empirical evidence. Findings by Carlos, Dabla-Norris, Saito and Shi (2015) for Nigeria revealed that household that have access to finance have more smooth consumption than those without. Specifically, the study found that those households that have access to finance and experienced negative shocks will have their consumption fall by 15 percentage point less than those with no access to finance. The study pointed out that the result is more robust for household that have more access to informal finance than those with access to formal financing. Microfinance access has also been found to have impacted positively on the rural farmers in Akwa-ibom through increasing their consumption, increase in their income and better nutrition for their children (Okon, Etim & Offiong, 2012). However, a contrary result was arrived at by Adebayo, Sanni and Baiyegunhi (2012) who investigated the impact of UNDP microcredit scheme on food security in Kaduna State. The study used Propensity Score Matching (PSM) and found that crop production by farmers who benefitted from the credit scheme was lower than those that never benefited from it. Those that benefited from the programme were also found to eat less calories of food than those that did not benefit. The implication is that the credit scheme negatively impacted on the beneficiaries and this cast doubt on the scheme in ensuring stability in consumption behaviour. Nyiatahger, Umeh and Ocholi (2015) worked on the mechanisms that households adopt in smoothing their consumption in adjustment to health shocks. A multi-stage sampling was applied to select 600 households that formed the sample. Evidence from the study indicated that the one of the adjustment strategies adopted by households in smoothing their consumption was micro-credit which played significant role in the short-run. Urdy (1990) found that in the Northern Nigeria, household shocks are mitigated through state-contingent loan contract entered by households within the same village. According to him, such loan provides a repayment procedure targeted to take care of the production and consumption shocks that affect both the borrower and the lender. In the event of shocks, the loan contract provides for renegotiation, especially if there is common knowledge about the shocks or their probability of occurring. This type of loan arrangement provides the opportunity to easily absorb either the production shock or the consumption shocks. Based on the 198 households that were used, it was found that about 42 percent of the households were affected by idiosyncratic shocks while 58 percent was hit by both the village shocks and other village related shocks. Ikpe (2016) considered various issues, which include sources of accessing microcredit, factors that determine access, the amount of credit, frequency of credit and the effect of microcredit on food security. The study found

that 87.76 percent of the households are food secured while the remaining are not and that about 45.57 percent considered to be food secured achieved that through microcredit facilities. Microcredit was found to have a coefficient of 0.749 which explained most changes in food security compared to every other factor that affects food security. Similarly, Aideyan (2009) analyzed the effect of Lift Above Poverty Organization(LAPO) and Nigeria Agricultural Cooperative and Rural Development Bank(NACRDB) programmes on the households and the comparison households. The study concentrated on the impact of the two programs on the households' nutritional welfare by considering regularity of food, frequency of special food and the average weekly spending on food. For the LAPO program, it was found that only 12.4 percent of the program group (treated) have food deficit while up to 51.4 percent of the comparison group (control group) have food deficit. In case of NACRDB, 33.3 percent of the control group have food deficit while only 8.6 percent of the treated group have food deficit. For the frequency of special food, LAPO program shows 18 percent for treated group and 7 percent for the control group and for NACRDB, the treated group and the control group were 9.7 percent and 3.7 percent respectively. The weekly expenditure on food for both programs appeared to be higher for the treated group than the control group.

Furthermore, for the two programs, the study showed a significant difference between program households and the comparison with respect to average weekly expenditure and the regularity of daily feeding. This is evidence that the two microcredit programs helped in the smoothing of the household consumption. The United Nations Capital Development Fund (UNCDF) (2004) report based on the UNCDF-supported microfinance institution (MFIs) loan for Nigeria, Malawi, Haiti and Kenya showed that households divert programme loans meant for investment enterprise to smoothen their consumption. Evidence showed that for Nigeria, Malawi, Haiti and Kenya a positive association existed between the consumption smoothing (food security) and participation in the UNCDF-supported MFIs programme. For the four countries, higher food security was common among the household that are in the treatment group compared to the control and the difference was found to be significant at 6 per cent level of significance.

Effect of Microfinance on Consumption Smoothing in Other Countries

Islam and Maitra (2012) looked into the role of micro finance in absorbing the effect of health shocks in the consumption behaviours of households in rural Bangladesh. In their study, they identified that households either sell productive assets such as livestock or borrow from microfinance to cushion the effects of health shocks on consumption. The study also revealed that households that have access to microcredit do not need to sell as much livestock as those household that do not have access to in order to smoothen their consumption against health shocks. The implication of this study is that household can maintain stable consumption pattern despite shocks as far as they have access to microfinance. Pitt and Khander (1998) used quasi-experimental survey design in their study found that access to microcredit increases significantly consumption of poor households in Bangladesh. Berg and Emran(2011) found for Bangladesh that households that have access to microfinance have better chance for survival in the famine (Monga) period and that microfinance increases the probability that household will have three meals a day but reduces the probability that household will survive on one meal a day during Monga. This implies that microfinance can help household smoothen food consumption despite seasonal famine. Similarly, evidence from Khan, Khalily and Scheyvens, (2015) for North-Western Bangladesh is that households adopt various coping strategies against Monga, such as advance labour sale, asset sale, informal borrowing and migration and that all depend on the household ex-ante access to microfinance. For instance, it was found that for those with ex-ante access to microfinance, the number of days sold in

advance was 3.52 days lower compared to a case without ex-ante access to microfinance and this was found to be significant at 1 percent. Further finding from the work is that an ex-ante access to microfinance brought about household selling of 20,967 days overlaboring advance, which is an average of nine days per household. However, when switching regression technique was used for analysis, it was revealed that about 73,803 more labour days were sold in advance for household with no ex-ante access to microfinance. This implies that having ex-ante access to microfinance reduces the labour days sold in advance. Ex-ante access to microfinance also reduces the dependence on selling of assets, informal borrowing and lowers the probability of migrating to another place to cope with Monga. Therefore microfinance reduces the choice of household using counterproductive coping strategies during Monga. For the same Bangladesh, Muhumed (2016) used a household survey data generated by the Bangladesh Bureau of Statistics (BBS) and applied various techniques which include direct OLS, direct 2SLS, probit OLS, probit 2SLS and marginal treatment effect (MTE) to check for the effects of microfinance on the food consumption and non-food consumption between borrowers and non-borrowers of microcredit. The result from the direct OLS showed that borrowers of microcredit have higher food and non-food consumption compared to non-borrowers. This was evidence that borrowing positively correlate with food and non-food consumption and by extension implies that microcredit can be used to smoothen consumption. To avoid the bias from direct OLS due to potential endogeneity problem in the dummy variable borrowed, other techniques, direct 2SLS, probit OLS, probit 2SLS and marginal treatment effect (MTE) were used and their estimates indicted no difference in both the food consumption and non-food consumption of borrowers and non-borrowers of microcredit. Furthermore, the result of direct OLS was later adopted after the endogeneity test using Hausman proved that the variable borrowed is truly exogenous. The study concluded based on direct OLS that microcredit borrowers have approximately 122 Taka higher weekly food consumption than non-borrowers, and about 34 Taka higher non-food consumption than non-borrowers. Evidence from Santos,Sharif, Rahman, and Zaman, (2011) is similar to that by Romero and Nagarajan, (2011) in that the result shows that Bangladesh poor are affected more by shocks than the non-poor which according to the study is because the poor tend to use the copping strategy that affect them negatively unlike the non-poor. The result from the study identified that microfinance impact significantly on the coping ability of the households. In a very recent work, Berg and Emran (2017) investigated the effect of microfinance on seasonal famine in Bangladeshusing a number of techniques which include Minimum Biased Inverse probability (MB-IPW) estimator, instrumental variable based onLocal Biprobit (LBiprobit) which provide for average treatment effect on treated(ATET) and Local Two-stage least squares(L2SLS) which provide local average treatment effect(LATE). Based on the MB-IPW, microfinance increases the probability of 3 meals by 1 per cent and decreases the probability of one meal by 5 per cent. It also increases the probability of not selling labour in advance by 2 per cent and increases the probability of migration by 2 per cent. The results from the L2SLS shows that households that are member of microcredit are more likely to have 3 meals in a day but reduces the likelihood of starving with only one meal a day. Evidence from the L2SLS however shows that microcredit membership does not have any effect on the propensity of household selling labour in advance as a coping mechanism but was significant in reducing the chance that household will migrate in a short term to avoid starvation during Monga. The estimate of the LBiprobit model were in line with the L2SLS that microfinance membership improves food security during the Monga period, and that microfinance does not have any significant effect on the probability that household will sell labour in advance to ensure resilience during Monga. Moreover, it was also revealed based on LBiprobit that microfinance reduces the probability that household will migrate in short term to cope with hunger.

It was also found forIndonesia that households that live closer to financial institution are able to insure consumption against health shocks than households that a relatively farer. Specifically, it was revealed by the study that for communities with Bank Rakyat Indonesia (BRI) branch, health shocks do not have significant impact on consumption but for areas not served by BRI health shocks lower consumption by 2 to 3 percent (Gertler, Levine & Moretti, 2003). Another study byGertler, Levine and Moretti, (2003) for Indonesia, shows that in the event of shocks, especially health shocks, microfinance provides an efficient way of insuring a smooth consumption and that the closer a household to financial institution the more the household can save to ensure consumption smoothing. Still for Indonesia, Deloach and Lamanna (2009) found that consumption smoothing in response to income shock is one of the channels through which microfinance can affect health of a child.

For Malawi using randomized encouragement trial design it was found that access to mobile banking, Opportunity International bank of Malawi (OIBM) was more effective for household with high level of wealth to cope with shocks than the household with low level of wealth as the low income households use sub-optimal coping strategies (Romero and Nagarajan, 2011).

The Self-Help microfinance groups(SHG) in India was found to have helped members of household in coping with shock through increasing household earnings, training, provision of consumption and providing support for women (Bali & Floro, 2010). Bergand Schrader (2009) found a significant evidence of microfinance contribution to shock easing in Ecuador. However, the study pointed out that it could only help to cushion the effect of shock when the household has an established relation with the institution before shocks, but for the first-timer, the probability of receiving credit in the event of the shock is low and thus will not help in cushioning the effects of the shocks. Janzen and Carter (2013) analysis of the impact of microinsurance (drought-induced insurance) on household consumption smoothing behaviours for Kenya revealed that household that holds such insurance is 36 percent point less tendency of selling asset in order to cope with shocks and 25 percent point less that the meal formula will be adjusted downwards. It was also explained that micro insurance reduces food security by reducing malnourishment and undernourishment especially during drought. The study further revealed that at some threshold level of asset holding, households that are not holder of such insurance are likely to sell their asset to cope, but about 64 percent point less likely when they are holder of such insurance policy.

The impact of microcredit for Ethiopia based on the study by Siyoum, Hilhorst and Pankhurst (2012) depend on the income level or group, that is whether a household is poor or not. Generally, they believe that credit is meant to be used by poor households to develop their potential that will move them out of poverty, but most of them (poor households) use it to as a means to smoothen their consumption within a short period. Thus, microcredit does not provide for food security of the poor in the long term since they use it for immediate consumption smoothing rather than in productive resources that guarantees long term food security.

Yasuharu, and LaStarria-CorNhieL (2015) investigated the impact of credit programme on consumption in Malawi using propensity score matching and the treatment effect model. In the preliminary results it was found that Malawi Rural Finance Company(MRFC) clients with in the programme village have a total mean consumption of 9252 MK(Malawi Kwacha) while non MRFC clients has a total mean of 9060MK. However, test of significance revealed no difference in the consumption between the MRFC clients and non-clients. The result from the propensity score matching and treatment effect model appear similar with respect of the impact of the programme in which none showed any significant improvement on food consumption and expenditure consumption due to the programme. Furthermore, both the propensity score matching and treatment effect model showed evidence non-food expenditure grew by

47.6 and 47.2 respectively at 1 per cent significant level due to the programme. For the total food expenditure, the propensity score matching indicated that total food expenditure grew by 16.6 percent as a result of the programme while the treatment effect model on the contrary revealed that MRFC agricultural scheme did not have any significant effect on the total food consumption. Banerjee, Duflo Glennerster and Kinnan (2015) found for Hyderabad India that household suffered different shocks which include shock resulting for illness, job loss and death of household member. Using a randomized evaluation, it was found that household borrowed from Spandana to cushion the effect of these shocks, though it seemed no significant difference was found between the treated group and control group because of other sources of borrowing aside Spandana. However, treatment group was found to be more likely to borrow from the Spandana to cushion the effects of shocks. Based on the randomized field experiments Attanasio, Augsburg, Haas, Fitzsimons and Harmgart, (2014) found evidence for Mongolia that access to group loans impact positively and significantly on food consumption especially items such as fruits and vegetable, and entrepreneurship while for individual lending, no evidence of significant increase in the food consumption. The positive and significant impact as evidenced for the group loan implies that microfinance can be used to cushion the effects of shocks.

OBJECTIVES OF STUDY

The broad objective of this study is to estimate the effect of microfinance of households' welfare. However, the specific objectives of the chapter are stated as follows:

1. To estimate find the effect of microfinance on households' shocks easing of Nigerians.
2. To estimate the inequality among households who benefit from the services of microfinance in Nigeria.

DATA AND METHODOLOGY

Analytical Framework

To ideally consolidate on policies and effort of government in Africa that is targeted at reducing inequality gap and poverty among households, there is an urgent need on improving mechanisms that improve on household per capita income which must be gender inclusive. Hence, to articulate a framework that could possibly develop a links between microfinance development and improvement in lives and welfare of households. This is expected to estimate the microfinance effect on households' shocks easing of Nigerians.

Therefore, the Heckman Selection Model is adopted for this study. And, this is because the Heckman's sample selection model is among the more significant work in 20th-century program evaluation. The sample selection model triggered both a rich theoretical discussion on modeling selection bias and the development of new statistical procedures that address the problem of selection bias. Heckman's key contributions to program evaluation include: (a) he provided a theoretical framework that emphasized the importance of modeling the dummy endogenous variable; (b) his model was the first attempt that

estimated the probability (i.e., the propensity score) of a participant being in one of the two conditions indicated by an endogenous dummy variable, and then used the estimated propensity score model to estimate coefficients of the regression model; (c) he treated the unobserved selection factors as a problem of specification error or a problem of omitted variables, and corrected for bias in the estimation of the outcome equation by explicitly using information gained from the model of sample selection; and (d) he developed a creative two-step procedure by using the simple least squares algorithm.

A sample selection model always involves two equations: (1) the selection equation, considering a portion of the sample whose outcome is observed and mechanisms determining the selection process; and (2) the outcome equation considering mechanisms determining the outcome variable (Heckman, 1978, 1979). The model is expressed in two equations as follows:

$$z_j Y + u_{1j} > 0 \tag{1}$$

$$y_j = X_j \beta + u_{2j} \tag{2}$$

Where: y_j is the observed outcome of the jth household; X_j are factors determining y and uj are the error term. Given that equation 1 and 2 are the selection and outcome equations, respectively.

Model Specification

Having reviewed the Heckman's model first becauseit not only offers theoretical framework for modeling sample selection but is also based on what was at the time pioneering approach to correcting selection bias. More so, that the Heckman's model lays the groundwork for understanding the treatment effect model therefore, in other to estimate objective one of the study which is to analyze the factors that determine households' shocks easing in Nigeria.

Therefore, suppose we assume that households in rural areas are most likely not to have access to credits to boost productivity and this affects their income and widens inequality as given in the data set such that the probability of households' shocks easing is function of mobile money account (account mob), payments online using internet (online payment q16), emergency fund, domestic remittances, government transfer, savings, borrowing abilities and so on hence, to express the model, the researcher write two equations, the regression equation of indicators that determine households' shocks easing and the selection equation of indicators that determine households' shocks easing as represented on model 3.

$$hhshocks = \beta_0 + \beta_1 actmob + \beta_2 onlpa + \beta_3 emfun + \beta_4 remt + \beta_5 tran + \beta_6 savins + \beta_7 borr + \tag{3}$$

Thus, households' shocks easing are observed if;

$$hhshocks = \beta_0 + \beta_1 actmob + \beta_2 onlpa + \beta_3 emfun + \beta_4 remt + \beta_5 tran + \beta_6 savins + \beta_7 borr + U_2 > 0 \tag{4}$$

where equation three (3) is the regression equation and equation four (4) is the selection model. However, for this study selection equation indicates that households shocks easing is observedonly for those households whose households shocks easing were greater than0.

To estimate objective two this is the effect of microfinance on inequality among household shocks easing in Nigeria. The study employ concentration index as a measure of socioeconomic-related inequality among households in quintile. Thus the concentration index (c) can be computed very simply by making use of the convenient covariance:

$$C = 2\,\mathrm{cov}(y, R_i) \,/\, \mu \tag{5}$$

where y_i is the category variable, whose disparity is being measured, μ is its mean, R_i is the ith individual's fractional rank among household distribution (that is, in this case the household's wealth distribution factor as covered in the data set), and *cov(.,.)* is the covariance.

Justification of the Model

In most theoretical studies, Health sector variables are seldom continuous and fully observed. For example, they can be discrete (e.g., death), censored (e.g., health care expenditure), integer counts (e.g., visits to doctor), or durational (e.g., time to death). Multivariate analysis of such dependent variables requires nonlinear estimation.In this study, we consider the main (parametric) nonlinear estimators that are of relevance to the analysis of household shocks easing.Therefore, the study employs the 'Heckman two step' selection model to control for sample selection bias as the only standard measure to capture the objective of the study.

DATA AND SOURCES

The study employs cross sectional secondary data from the World Bank micro data on financial inclusion survey for 2014 (the Global Fundex Survey Data set) set to attain its objectives. The Global Fundex database provides in-depth data on how individuals save, borrow, make payments, and manage risks. It is the world's most comprehensive database on financial inclusion that consistently measures people's use of financial services across countries and over time. The 2014 Global Findex consists of over 100 indicators, also shown by gender, income, and age hence, was instrumental to this study.

RESULTS AND DISCUSSION

To achieve objective one, a Heckman estimation selection model was employed. Table 1 shows results from the Heckman Selection model and explains that households in urban areas are more likely to participate in microfinance services considering the indicators that determine households' shocks easing than households in rural areas. The results show that households in urban areas are open to mobile money account targeted to smooth shocks by 0.1414967 indexes when compared to rural households by 0.0650428 indexes despite that the outcome is not significant at 5% level. Similarly, households in

Table 1. Results of Heckman's estimation

Household shocks	Coefficient	Standard error	z-statistics	P>(z)
Regression	**Rural**			
Account_mob	0.0650428	0.2675965	0.24	0.808
Online payment	-0.1886112	0.1978283	-0.95	0.340
Emergency fund(q24)	0.2233616	0.0411357	5.43	0.000
Remittance(q28)	0.1364558	0.0855965	1.59	0.111
Transfer received (q39)	0.1725238	0.1440804	1.20	0.231
Savings	-0.1527843	0.1077207	-1.42	0.156
Borrowed abilities	-0.1281957	0.0943206	-1.36	0.174
_cons	4.327151	0.6312241	6.86	0.000
Selection	**Urban**			
Account_mob	0.1414967	0.3916182	0.36	0.718
Online payments(q16)	-0.3366953	0.3416145	-0.99	0.324
Emergency fund(q24)	0.4638246	0.0892685	5.20	0.000
Remittance(q28)	0.2302115	0.1314553	1.75	0.080
Transfer received (q39)	0.1838265	0.2330168	0.79	0.430
Savings	-0.2215005	0.1557572	-1.42	0.155
Borrowed abilities	-0.1898435	0.1363709	-1.39	0.164
_cons	3.833635	0.3246644	11.81	0.000
MillsLambda	277.82	40.92		3.08 0.000
Rho = 0.00000	Wald chi2(7) =57.18	Prob> chi2 =	0.0000	Lambda = 277.16 Sigma = 1.4102085
No of obs = 1000	Censored obs =423	Uncensored obs = 577		

Source: authors' computation, 2017

urban areas are more likely to access emergency fund on the average of ₦0.4638246than households in rural areas that spend on the average ₦0.2233616. However, this indicator (emergency funds) is shown to be statistically significant at 5% level.

However, the results also show that other indicators that determine that households shock easing is domestic remittances. Householdsin urban areas receive on the average of 0.2302115 indexesas remittances when compared to households in rural areas which receive as much as0.1364558indexes. All the indicators are statistically significant at 5% level except indicators like household online payments, transfer received, savings and borrowing abilities that were not statistically significant at 5% level, possibly due to the age variations and other households' characteristics like level of education, awareness of households of the existence and benefits of microfinance.

The results also show that the absolute rho value to be less than 1 indicate that the Heckman model was appropriate for the analysis. Outof the 1000 households sampled 423 were censored (not included in the analysis) while the remaining 577 households who are residents in rural areas were uncensored. And given the test Wald chi-square statistics of 57.18, which has a probability value of 0.000, implies that the results of this model is statistically significant at 5% level.

The second objective of the study which is to estimate the inequality among households, who have benefited from microfinance in Nigeria, was estimated using the Concentration index. The results of the estimation are shown in table 2.

Table 2. Concentration index model:using convenient covariance

	CIF	CISEF	Mean	Variance
Category variable				
Fin account disparity	-0.0088749	0.00642429	1.463	0.2488799
Loan disparity	0.00732252	0.00261597	1.948	0.0853814
Savings with informal club	0.0327806	0.00422694	1.832	0.197974
Mobile money	0.00206094	0.00148138	1.97	0.0291291
Savings disparity	0.00803114	0.00678472	1.298	0.2094054
Borrowing disparity	0.0191026	0.00580451	1.557	0.246998

The table shows the estimates from the concentration index.
CIF: concentration index using formula/covariance method
CISEF: standard errors of the concentration index using formula/ regression method

The results on Table 2 above indicate that microfinance accesses have created huge disparities among households in Nigeria and these have affected shocks easing as well. This is clearly displayed in table 5.2 as the CIF coefficients that the proportion of households who are more deprived of not having account with MFIs are more concentrated among the poor given by the concentration index of-0.0088749, and this is considered to present a reasonably high level of disparity. The results further show that among household levels, the disparity stillexistswith regard to loan from microfinance institutions for house, apartment or land given the concentration index of 0.00732252 across different households. This is also a reasonably high level of disparity.

Similarly, the results indicate weak disparity level between the poor and the rich households that inculcate savings attitude with informal club and some microfinance establishment by an index of 0.0327806. The results also show that among poor and rich household members that operate a mobile money account, clear disparity exists among them as shown by the index 0.00206094. While the index of 0.00803114 show the level of disparity that exist among poor and rich household members with trend of savings habits in microfinance institutions, which appear to favour more among rich household members. And, then the index of 0.0191026 showing the level of disparity among household members that borrowed from microfinance institutions to smoothen consumption shocks, implying that inequality is less between poor and rich households.

This indicates that households with more wealth capacity and higher per capita expenditure pattern have the potential to participate in financial services provided by microfinance institutions as compared to households with low wealth capacity and lower per capita expenditure pattern as shown by the disparity indexes that households in the highest quintile level have higher participation in financial goods as compared to households in the lower quintile level.

CONCLUSION AND POLICY SUGGESTIONS

So far, we have been able to showcase the Heckman's selection model the households' shocks easing in term of their expenditures. The urban householders benefit more from mobile money account targeted to smooth shocks than the rural dwellers. Also, urban households benefit more from access to emergency

funds which place them better to smooth the consumption and/or expenditures. Similarly, households in urban areas receive more remittances to smooth the expenditures/consumption (shocks easing) than those in rural areas.

It has also been shown that the proportions of households who are more deprived of not having account with MFIs are more concentrated among the poor; they tend to have a higher concentration index. There also appeared a higher disparity among the households in their access to loans for land, houses and apartment. In the same vein, the level of disparity that exists among poor and rich household members with trend of savings habits in microfinance institutions, which appear to favour more among rich household members; this results show credence to the dictum that the rich have a higher propensity and capacity to save. Finally, households with more wealth capacity and higher per capita expenditure pattern have the potential to participate in financial services provided by microfinance institutions as compared to households with low wealth capacity and lower expenditure per capita. We therefore recommend that more microfinance banks/institutions be established in rural areas and more awareness campaign be carried out so that those households in these areas will participate more actively in the services of the MFIs, and their welfare improved.

REFERENCES

Adebayo, C. O., Sanni, S.A., & Baiyegunhi, L.J.S. (2012). Microcredit Scheme Impact and Food Security Status of Beneficiaries in Kaduna State, Nigeria: A Propensity Score Matching Approach. *African Journal of Agricultural Research, 7*(37), 5191-5197.

Aideyan, O. (2009). Microfinance and Poverty Reduction in Rural Nigeria. *Savings and Development*, 293-317.

Aryeetey, E. (2004). *Household Asset Choice among the Rural Poor in Ghana*. Paper Presented at the Authors' *Workshop for the Project on Understanding Poverty in Ghana, Organized by the Institute of Statistical, Social and Economic Research*, University of Ghana and Cornell University.

Attanasio, O., Augsburg, B., De Haas, R., Fitzsimons, E., & Harmgart, H. (2014). *Group Lending or Individual Lending? Evidence from A Randomized Field Experiment in Mongolia* (No. SP II 2014-303). WZB Discussion Paper.

Babajide, A. (2011). Impact Analysis of Microfinance in Nigeria. *International Journal of Economics and Finance*, *3*(4).

Bali, S. R., & Floro, M. (2010). *Reducing Vulnerability through Microfinance: Evidence from Indian Self-Help Group Program.* Working Paper 2010:23.

Banerjee, A., Duflo, E., Glennerster, R., & Kinnan, C. (2015). The miracle of microfinance? Evidence from a randomized evaluation. *American Economic Journal. Applied Economics*, *7*(1), 22–53. doi:10.1257/app.20130533

Bennett, L. (1997). *A Systems Approach to Social and Financial Intermediation with the Poor*. Paper presented at the Banking with the Poor Network/World Bank Asia Regional Conference on Sustainable Banking with the Poor, Bangkok, Thailand.

Berg, G., & Schrader, J. (2009). *Can Microcredit help to cope with Aggregate Shocks? Evidence from Ecuador.* First European Research Conference on Microfinance, Brussels, Belgium.

Berg, C., & Emran, M. S. (2015). *Does Microfinance help the Ultra-Poor cope with Seasonal Shocks? Evidence from Seasonal Famine (Monga) in Bangladesh.* Working Paper.

Calvo, C. (2008). Vulnerability to Multidimensional Poverty: Peru, 1998-2002. *World Development*, *36*(6), 1011–1020. doi:10.1016/j.worlddev.2007.10.001

Calvo, C., & Dercon, S. (2005). *Measuring Individual Vulnerability*. Department of Economics Working Paper Series, 229. Oxford, UK: Oxford University.

Cannon, T. T., & Rowell, J. (2003). Social Vulnerability, Sustainable Livelihoods and Disasters. Report to DFID. Conflict and Humanitarian Assistance Department (CHAD) and Sustainable Livelihoods Office.

Cardona, O. D. (2004). The Need for Rethinking the Concepts of Vulnerability and Risk from a Holistic Perspective: a Necessary Review and Criticism for Effective Risk Management. In G. Bankoff, G. Frerks, & D. Hilhorst (Eds.), *Mapping Vulnerability: Disasters, Development and People* (pp. 37–51). London: Earthscan publications.

Carlosn, S., Dabla-Norris, E., Saito, M., & Shi, Y. (2015). *Household Financial Access and RiskSharing in Nigeria.* IMF Working Paper. WP/15/169

Carter, M., Little, P., Mogues, T., & Negatu, W. (2007). Poverty Traps and the Long term consequences of Natural Disasters in Ethiopia and Honduras. *World Development*, *35*(5), 835–856. doi:10.1016/j.worlddev.2006.09.010

Deaton, A. (1992). *Understanding Consumption*. New York: Oxford University Press. doi:10.1093/0198288247.001.0001

Deloach, S. B., & Lamanna, E. (2009). *Measuring the Impact of Microfinance on Child Health Outcomes in Indonesia Revision 3*. Department of Economics Elon Univerity Working Paper Series, 2009-02r3.

Dercon, S., & Hoddinott, J. (2005). *Health, Shocks and Poverty Persistence*. Oxford, UK: Oxford University Press.

Dunford, C. (2013). *Evidence that Shocks are Managed Better with the Help of Microfinance*. Retrieved from http://microfinanceandworldhunger.org/2013/01/evidence-that-shocks-are-managed-better-with-the-help-of-microfinance-the-recent-rcts/

Feldbrügge, T., & von Braun, J. (2002). *Is the World Becoming A More Risky Place? Trends in Disasters and Vulnerability to Them. Discussion Papers on Development Policy No.46*. Bonn: Center for Development Research.

Gertler, P., Levine, D. I., & Moretti, E. (2003). *Do Microfinance Programs help Families insure Consumption against Illness?* Centre for International and Development Economics Research.

Grosh, M., del Ninno, C., Tesliuc, E., & Ouerghi, A. (2008). *For Protection and Promotion: The Design and Implementation of Effective Safety Nets*. Washington, DC: The International Bank for Reconstruction and Development /The World Bank. doi:10.1596/978-0-8213-7581-5

Hashemi, S., & Rosenberg, R. (2006). *Graduating the Poorest into Microfinance: Linking Safety and Financial Service, CGAP*. Washington, DC: World Bank.

Heckman, J. (1978). Dummy Endogenous Variables in A Simultaneous Equations System. *Econometrica*, *46*(4), 931–961. doi:10.2307/1909757

Heckman, J. J. (1979). Sample Selection Bias as A Specification Error. *Econometrica*, *47*(1), 153–161. doi:10.2307/1912352

Ikpe, O. U. (2017). *Effects of Access to Microcredit on the Food Security Status of Crop Farm Households in Niger Delta, Nigeria* (Doctoral dissertation).

Islam, A., & Maitra, P. (2008). *Health Shocks and Consumption Smoothing in Rural Households: Does Microcredit have a Role to Play?* Department of Economics, Monash University Discussion paper 22/08.

Janzen, S. A., & Carter, M. R. (2013). *The impact of microinsurance on consumption smoothing and Asset Protection: Evidence from A Drought in Kenya*. Selected paper prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC.

Kamanou, G., & Morduch, J. (2005). *Measuring Vunerability to Poverty in: Stefan Dercon* (I. A. Poverty, Ed.). Oxford, UK: Oxford University Press.

Khan, Khalily, & Scheyvens. (2015). *Impact of Ex-Ante Access to Microfinanceon the Coping Strategies to cope with Monga of Poor Households in North-Western Bangladesh*. Institute of Microfinance (InM) Working Paper. No 43.

Koveos, P., & Randhawa, D. (2004). Financial Services for the Poor: Assessing Microfinance Institutions. *Managerial Finance*, *30*(9), 70–95. doi:10.1108/03074350410769281

Laws, E. (2016). *Social Assistance and Idiosyncratic Shocks*. GSDRC Helpdesk Research Report, 1383.

Ledgerwood, J. (1999). *Microfinance Handbook: An Institutional and Financial Perspective*. Washington, DC: The World Bank.

Ligon, E., & Schechter, L. (2003). Measuring Vulnerability. *Economic Journal (London)*, *113*(486), 95–102. doi:10.1111/1468-0297.00117

Morduch, J. (2005). *Consumption Smoothing Across Space: Testing Theories of Risk-Sharing in the ICRISAT Study Region of South India*. Oxford, UK: Oxford University Press.

Muhumed, M. M. (2016). The impact of microfinance on consumption in Bangladesh. *Journal of Economics and Sustainable Development*, *7*(12).

Murdoch, J., & Roodman, D. (2009). *The Impact of Microcredit on the Poor in Bangladesh: Revisiting the Evidence*. Working paper 174, 2009 (June).

Nyiatahger, Z.T., Umeh, J.C., & Ocholi, A. (2015). Socio-Economic Effects of Malaria on Households' Consumption in North-Central Nigeria. *Journal of Agriculture and Veterinary Science, 8*(7), 65-72.

Okon, D.P., Etim, N., & Offiong, A.A.A. (2012). Impact of Micro Credit Scheme on Rural Farmers in Akwa-Ibom State, Nigeria. *Journal of Agriculture & Social Sciences, 8*(2).

Padró, F. (2004). *Statistical Handbook on the Social Safety Net*. London: Greenwood Press.

Pitt, M. M., & Khandker, S. R. (1998). The Impact of Group-Based Credit Programs on Poor Households in Bangladesh: Does the Gender of Participants Matter? *Journal of Political Economy*, *106*(5), 958–996. doi:10.1086/250037

Prowse, M. (2003). *Towards a Clearer Understanding of 'Vulnerability' in Relation to Chronic Poverty*. CPRC Working Paper No 24, University of Manchester.

Romero, J. M., & Nagarajan, G. (2011). *Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi*. Retrieved from http://www.fsassessment.umd.edu/

Santos, I., Sharif, I., Rahman, H. Z., & Zaman, H. (2011). *How do the Poor cope with Shocks in Bangladesh? Evidence from Survey Data?* Policy Research Working Paper 5810.

Siyoum, A. D., Hilhorst, D. J. M., & Pankhurst, A. S. A. (2012). The Differential Impact of Microcredit on Rural Livelihoods: Case Study from Ethiopia. *International Journal of Development and Sustainability*, *1*(3), 1–19.

Sugiyanto, S., Kusumastuti, Y. S., & Donna, D. R. (2012). *Managing Risks: How do Poor Households Smooth their Income and Consumption? An Examination of Poor Households in Yogyakarta, Indonesia.* IMTFI Working Paper.

Swain, R. B., & Floro, M. (2012). Assessing the Effect of Microfinance on Vulnerability and Poverty among Low Income Households. Journal of Development Studies.

Udry, C. (1990). Credit Markets in Northern Nigeria: Credit as Insurance in A Rural Economy. *The World Bank Economic Review*, *4*(3), 251–269. doi:10.1093/wber/4.3.251

Udry, C. (1994). Risk and Insurance in a Rural Credit Market: An Empirical Investigation in Northern Nigeria. *The Review of Economic Studies, 61*(3), 495-526.

USAID. (2004). *Assessment of the Micro, Small and Medium Enterprises Sector in Nigeria: PRISMS: Promoting Improved Sustainable Microfinance Services.* Retrieved from http://www.usaid.gov/ng/downloads/reforms/ assessmentofthemsmesectorinnigeria.pdf

Vella, S. (2011). *The Link between Microfinance and Social Safety Net Programmes* (Bachelor's dissertation). University of Malta.

World Bank (2014). *Micro Data on Financial Inclusion Survey for 2014 (the Global Fundex Survey Data Set)*. Author.

Yasuharu, S., & LaStarria-CorNhieL, S. (2015). Agricultural Microcredit and Household Vulnerability in Rural Malawi. *Journal of International Cooperation Studies*, *22*(2), 3.

Zeller, M. (1999). *The Role of Micro-Finance for Income and Consumption Smoothing*. Paper presented at the Inter-American Development Bank Conference on Social Protection and Poverty, Washington, DC.

Zeller, M. (2001). The Safety Net Role of Microfinance for Income and Consumption Smoothing. *Shielding the Poor: Social Protection in the Developing World*, 217-238.

KEY TERMS AND DEFINITIONS

Consumption Smoothing: Consumption smoothing is a process that seeks to achieve a between the desire for a and the need to accumulate sufficient for a secure by "smoothing" out behavior during the years. Consumption smoothing means balancing out spending and saving to maintain the highest possible standard of living over the course of one's life. The big reason in favor of consumption smoothing is that it in theory balances between the two extremes. On one end, over-spending means that you consistently spend more than you earn, while over-saving means that you consistently spend less than you earn. Consumption smoothing is the process of managing your spending so that you feel like you always have roughly the same level of disposable income, even if your income is unsteady.

Income Variation: People's incomes do not remain constant. As one starts work, one's continues to rise as one gets promoted. His income continues rising until he gets to the peak of his career, beyond which it declines. The poor does not experience this continuous rise in income; his income dwindles always. He experiences income variation at all time most of his life. He cannot predict his income and is always vulnerable to vagaries of his environment. The poor cannot guarantee the next period he will earn the same or more income. In this case, his income is always varying.

Microfinance Institutions: Microfinance is often defined as financial services for poor and low-income clients offered by different types of service providers. The term is often used more narrowly to refer to loans and other services from providers that identify themselves as "microfinance institutions" (MFIs). A microfinance institution is an organization that offers financial services to low income populations. Almost all give loans to their members, and many offer insurance, deposit and other services. These institutions commonly tend to use new methods developed over the last 30 years to deliver very small loans to unsalaried borrowers, taking little or no collateral. These methods include group lending and liability, pre-loan savings requirements, gradually increasing loan sizes, and an implicit guarantee of ready access to future loans if present loans are repaid fully and promptly.

Policy Intervention: Due to the conditions and/or the circumstances of the poor, policies are designed to mitigate the harsh conditions for the poor's wellbeing to improve. Microfinance institutions (MFIs) are part of the policies which are designed for alleviation of the harsh conditions of the poor. Through this policy, the poor can borrow from the MFIs and establish small and medium scale enterprises (SMEs) at little or no collaterals; they can save to pay school fees of their children, etc. In fact, they can have access to all the services which the formal banks render to their customers, which, hitherto, have been difficult for them. These types of policies which are made to mitigate or palliate the sufferings of the poor are called policy intervention. The government has used policies to intervene to reduce hardships which the poor and masses suffer.

Sample Selection Bias: In a linear regression model, sample selection bias occurs when data on the dependent variable are missing non-randomly, conditional on the independent variables. A sample that is restricted on the dependent variable is effectively selected on the error of the regression equation; at any value of X, observations with sufficiently large positive errors are eliminated from the sample. As we know, the independent variable increases, the expected value of the error becomes increasingly negative, making these two elements negatively correlated.

Vulnerability: Vulnerability describes the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Vulnerability in this context relates to susceptibility to the shackles of poverty and related conditions. Some experts say that poverty is the cause of vulnerability, while others view vulnerability as stemming from poverty. Yet, some others are of the view that poverty and vulnerability are mutually related and are inseparable.