Perceived Impact of Microfinance Cooperatives on Women Empowerment: Application of Tobit Model

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Abstract

An econometric analysis of Perceived Impact of Microfinance on Women Empowerment (PI) was conducted using the Tobit model. Capabilities are latent variables which cannot be directly observed and measured. However, functionings can be measured. Women empowerment is a capability enhancement process for women. In this study, several functionings are considered, namely, income, savings, amount of Household assets, amount of Productive assets, employment opportunities, power of decision making, confidence to face problems, better awareness, knowledge about banking operations, social status, level of education for children, nutrient and health of household, employability skills and participation in community activities. The study analysed the perceived impact of microfinance on women empowerment in Tsholotsho District. The investigation was based on a population of 2,233 microfinance cooperatives members in Tsholotsho District, Zimbabwe and assuming a 10% level of precision, a sample size of 100 respondents was derived using the Yamane's approach. A majority of the microfinance cooperatives participants who were part of the representative sample indicate that microfinance improves their ability to meet functionings under study. Spouse income, Family business background, Household size, Birth order or position in the family of birth have a positive effect on microfinance participant's perception. The study recommends packaging of microfinance taking into account birth order and family business history effects in Tsholotsho and also spreading of informal microfinance models to other districts and provinces. Further studies are needed, namely, assessing the economic impacts of male folk migration to South Africa on women empowerment and general poverty alleviation in rural areas, especially Tsholotsho.

Keywords: Perceived Impact, Microfinance Cooperatives, Women Empowerment, Tobit Model

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INTRODUCTION

The notion of microfinance as a development strategy is ancient. It can be traced back to the time of money lenders, savings and lending groups (ROSCAs) as well as local co-operatives (Armendariz de Aghion and Morduch, 2005). Nonetheless, the contemporary version of microfinance initiatives is usually credited to Mahammed Yunus who started providing small loans to bamboo furniture makers and basket-weavers to help them with their business in rural Bangladesh during the 1970s (Churchill *et al*., 2016). The microfinance products include microcredit, microsavings, microinsurance, microenterprise, financial education, and remittances. Interestingly, two factors are attributed to the existence of

modern microfinance organisations: the reluctance of formal financial institutes to lend to the poor and failure of agricultural credit. It is worth mentioning that microfinance is regarded by some as an instrument for women empowerment.

It is common knowledge that poor households are excluded from formal banking services because of collateral requirements, high-interest rates, red tape on admissions processing, and complicated application procedures. Notably, about 3 316 microfinance institutes managed to provide financial products and services to 155 million customers in nearly 100 countries around the world by the end of 2007 (Daley-Harris, 2009). In order to reach the poor people, microfinance was developed by the Grameen Bank in Bangladesh, NGOs as well as village banks of the Bank Rakyat Indonesia as a new lending scheme. In particular, Grameen Bank of Bangladesh was created in 1976 by Muhammad Yunus, a Nobel Peace Prize winner, as he implemented the microcredit idea as a strategy to provide banking services to the rural poor (Kristen, 2013). The Lending Model by the Grameen Bank has been replicated around the world, including in countries such as Bolivia, India, China, Ethiopia, Sri Lanka, Malaysia, Thailand, United States of America, Vietnam and Philippines. Allen (2007) argues that banks and other formal organisations are failing to offer sustainable rural financial services. Lending to the poor has been made difficult by information asymmetry resulting in banks failing to come up with reasonable interest rates to cover these risks as well as higher costs (De Aghion and Morduch, 2005). The problems result in credit rationing issue, the adverse selection issue as well as moral hazard issue which further makes the formal system fail to reach the poor.Microfinance deals with those problems of credit rationing, adverse selection and moral hazard through peer selection within the groups, peer contract enforcements which are guided by contracts too costly to breach, peer-forced savings and dynamic incentives in the form of repeat loans (Roodma and Quareshi, 2000).Allen (2007) identified two groups of short-falls of banks and MFIs as providers of Microfinance arising from information asymmetry problems which aregaps in service delivery and gaps in product composition: MFIs focus on providing credit. To cover the gaps left out by MFIs and banks, Allen (2007) argues that informal microfinance groups are an answer as they are based on members' own savings and have the potential to reach underprivileged women in large numbers since they can be set up in different forms and institutional settings and can contribute to women empowerment.

Maholtra *et al.* (2002) define empowerment as the freedom and ability of people to make strategic decisions in all aspects of their lives and they identify two central factors in the process of empowerment which is control over resources (conditions for empowerment) and agency (the ability to formulate choices). In addition, Sara Longwe, a consultant from Zambia developed the Sara Longwe's Women Empowerment Framework aimed at provoking the meaning of women's empowerment and equality in real life and the extent a development project is improving this empowerment (Wallace and Manh, 1991). According to Longwe's Framework, the level of women empowerment is influenced by the extent to which the five levels of equality are present in one's life and the highest level is that of control of the factors of production. Scholars argue that microfinance can contribute to the lower levels of equality in the Sara Longwe Framework as well as the higher level. However, based on the critical review of the empirical literature, it can be noted that prior studies have yielded mixed results. Several studies show a positive association linking microfinance to women empowerment (Akhter *et al*., 2018; Alemu *et al*., 2018; Rahman *et al*., 2017; Addai, 2017; Wijewardana and Dedunu, 2017; Brody *et al*., 2017; Karlan *et al*., 2017); Nandhini *et al*., 2017; Kapila *et al*., 2016; Rani and Yadeta, 2016; Loth and Jeckoniah, 2015; Gelan and Nigussie, 2016; Fernando and

Azhagaiah, 2015) while others (Hossain *et al*., 2016) reveal a negative association linking microfinance to women empowerment. Given the inconsistent results from prior studies, further scholarly examination is needed to advance the appreciation of the association between microfinance and women empowerment.

According to Zimstat (2012) women-headed households encounter more deprivation than men-headed ones in Zimbabwe in general and Tsholotsho district in particular. There is a great concern in Tsholotsho district regarding women empowerment. However, there are many microfinance cooperatives which were formed with the main aim of assisting women to become empowered. Tsholotsho district is a necessary field for the current investigation as it has more women population than men while women are underrepresented in formal employment. The study aims at analysing the perceived impact of microfinance on women empowerment in Tsholotsho District. As a result, the main research question is: what's the perceived impact of microfinance on women empowerment from the members' viewpoint and what are the factors determining the perceived impact of microfinance on women empowerment among participants in Tsholotsho District?

METHODOLOGY

Study Area: Tsholotsho district in Zimbabwe was chosen as the study area.

Data Collection and Data Sources: Through questionnaires, primary data was collected from women participants of microfinance in Tsholotsho district.

Population, Sample Size and Sampling Technique: A Target population of 233 women under ORAP's Amalima programme was adopted. According to ORAP, Tsholotsho had 246 Microfinance cooperatives composed of 227 men as well as 2,233 women at the period of investigation. Utilizing Yamane's (1967) approach, the sample size derived was 100 individuals.

Data Analysis Method: Using STATA software package, an econometric analysis of Perceived Impact of Microfinance on Women Empowerment (PI) was conducted based on the Tobit model. Capabilities are latent variables which cannot be directly observed and measured. However, functionings can be measured. Women empowerment is a capability enhancement process for women. In this study, several functionings are considered, namely, income, savings, amount of Household assets, amount of Productive assets, employment opportunities, power of decision making, confidence to face problems, better awareness, knowledge about banking operations, social status, level of education for children, nutrient and health of household, employability skills and participation in community activities.

The study investigated what respondents believe about the impact of microfinance on women empowerment. A perceived impact on each of the functionings is ranked on a Likert scale ranging from 1 to 5. As a result, the study conducted descriptive statistics, namely, finding the central tendency which implies what most respondents believe as well as the spread/dispersion of the responses i.e how strongly respondents agree with each other. Since the Likert Scale produces ordinal data, the median and the Inter-Quartile Range (IQR) for each item becomes relevant. The median which is a number found exactly in the middle of a distribution, measures the central tendency i.e it depicts the perception of the 'average' respondent or the 'likely' response. The IQR which is a measure of spread depicts whether responses cluster or scatter over the range of possible responses. The scores of the respondent on each of the functionings are added together and compared to the total possible score on all the functions to derive a ratio. The derived ratio represents the perceived impact of microfinance on empowerment measure for the respondent. The variable for the perceived impact was labelled PI.

The Tobit Model

$$Y_i \quad {}_i x_i \quad {}_i \text{ .....3}$$

$$Y_i \begin{matrix} L \\ Y^* \\ U \end{matrix} \quad {}_i x_i \quad {}_i \; if \begin{matrix} if\, Y \quad L \\ L \quad Y \\ if\, Y \quad L \end{matrix} \quad U$$

Y_i^* is the latent variable

X_i is the independent variable

L and U are lower and upper limits (L=0 and U=1)

${}_i$ are the unknown parameters

${}_i$ are the residuals

Where Y_i is the dependent variable

The log-likelihood for the 2-limit Tobit Model adopted is given as:

$$Log\ L \quad \frac{1}{2} {}_{j \ L} \quad {}_j \quad \frac{Y_i \quad x_i}{} \quad {}^2 \quad \log 2 \quad {}^2 \quad {}_{j \ L} \quad {}_j \log \quad \frac{Y_{Lj} \quad x}{}$$

$$\quad {}_{j \ L} \quad {}_j \log \ 1 \quad \frac{Y_{Rj} \quad x}{} \quad {}_{j \ L} \quad {}_j \log \quad \frac{Y_{2j} \quad x}{} \quad \frac{Y_{1j} \quad x}{}$$

Where L represents the left-censored observations

I represent intervals

${}_j$ represents the normalised weight for jth observation

The model cannot give the actual marginal effects of the respective exogenous variables on the perceived impact on women empowerment. The signs of the coefficients denote the direction of change in the likelihood of high perceived impact (1) or non-perceived impact (0).

McDonald and Moffit (1980) as outlined by Itaile (2012) gives the procedure of computing marginal effects of the variables which are as follows:

The change in probability of the perceived impact as an exogenous variable, x_i changes is:

$$\frac{(\ )}{x_i} \quad (\ ) \frac{\ _i}{} \quad \text{.....4}$$

$$\frac{E(Y_i / U \quad Y_i^* \quad L, X)}{x_i} \quad {}_i \ 1 \quad \frac{{}_L \ (\ {}_L) \quad {}_U \ (\ {}_U)}{(\ {}_U) \quad (\ {}_L)} \quad \frac{(\ {}_U) \quad (\ {}_U)}{{}_U \quad {}_L} \quad {}^2 \quad \text{.....5}$$

The marginal effect of an exogenous variable on the dependent variables is:

$$\frac{E(Y / X_i)}{X} \quad {}_i \quad {}_u \quad {}_L \quad \text{.....6}$$

Where,

X_i = independent variable

= cumulative normal distribution

$\frac{}{{}_i X_i}$ The z score for the area under the normal distribution

${}_i$ = a vector of maximum likelihood estimates

$${}_L \quad \frac{L \quad X_i}{}$$

$${}_L \quad \frac{U \quad X_i}{}$$

L and U being the left-hand limit and right-hand limit respectively (L=0 and U=1). and are probability density and cumulative density functions and standard normal distribution respectively.

The Tobit model on perceived women empowerment had 12 variables described in Table 1.

Table 1: Description of Variables for Tobit Model

Variable	Description	Type of variable
Perceived Impact of Microfinance on Women Empowerment (PI)	PI is a limited variable representing the ratio of an individual's total score on the Likert scale questions on women empowerment to the total score possible on all the questions on women empowerment. The variable is a continuous variable which is limited between 0 and 1.	Dependent Variable
Age	Age is a continuous exogenous variable representing the age of the respondent.	Independent Variable
Land size (LANSIZ)	Land Size is a continuous variable showing the size of land owned by the household.	Independent Variable
Marital Status (MSTAT)	Marital status is a categorical variable showing the marital status of the respondent.	Independent Variable
Membership in other social groups (MEM)	It is a categorical variable showing whether or not the respondent is a member of other social groupings. The variable takes the value of 1 if the respondent holds membership of other social groupings and 0 otherwise.	Independent Variable
Family business background (FBNS)	It is a categorical variable showing whether or not the respondent comes from a family with business history. The variable takes the value of 1 if the respondent has a family business background and 0 otherwise.	Independent Variable
Position in a family of business (PSTN)	It is a categorical variable showing whether or not the respondent is a firstborn in the family of birth. The variable takes the value of 1 if the respondent is a firstborn in the family of birth and 0 otherwise.	Independent Variable
Spouse income (SPOUY)	Spouse Income is a continuous exogenous variable representing the income of the respondent's spouse.	Independent Variable
House size (HSES)	Household size is a continuous exogenous variable representing the number of within the respondent's household.	Independent Variable
Cattle number (CATNO)	Cattle number is a continuous exogenous variable representing the cattle herd size owned by the respondent's household.	Independent Variable
Education (Edu)	The study treated Education as a categorical variable assuming the value of 1 for the respondents with secondary education and above while it takes the value of 0 for respondents with primary education and below.	Independent Variable
Training (TRAIN)	It is a categorical variable showing whether or not the respondent received training on microfinance issues	Independent Variable

FINDINGS AND DISCUSSION

Descriptive results are outline in Table 2. Perceptions are in favour of a positive impact of microfinance on income (Median=5; IQR=1). The median of 5 shows that the perception of the 'average' respondent is strongly agreed on which the majority of responses (N=67, 67%) cluster as indicated by the interquartile range of 1. Many of the respondents (N=55, 55%) were in agreement with the perception that microfinance increases savings as the most likely response was 'agree' (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (31%) regarding the perceived impact of microfinance on savings.

Perceptions are in favour of a positive impact of microfinance on household assets (Median=4; IQR=2). The median of 4 shows that the perception of the 'average' respondent is 'agree' with many responses (N=40, 40%)

indicating that they strongly agree with the perception that microfinance increases the number of household assets. Regarding the impact of microfinance on productive assets, many respondents (N=64, 64%) hold the perception that a positive impact exists. The likely response among respondents is 'agree' (Median=4, IQR=2) implying that there is a positive perceived impact of microfinance on productive assets.

Table 2: Median and interquartile ranges on Likert Scale items

Element of Perception	Median	Interquartile range (IQR)
Participation in microfinance increases income	5	1
Participation in microfinance increases savings	4	2
Participation in microfinance increases the number of household assets	4	2
Participation in microfinance increases the number of productive assets	4	2
Participation in microfinance provides employment opportunities	4	2
Participation in microfinance increases the power of decision making	4	2
Participation in microfinance increases confidence to face problems	4	2
Participation in microfinance creates better awareness	4	2
Participation in microfinance creates knowledge about banking operations	4	2
Participation in microfinance improves social status	4	2
Participation in microfinance improves the level of education for children	4	2
Participation in microfinance improve nutrient and health of the household	4	2
Participation in microfinance improves employability skills	4	2
Participation in microfinance improves participation in community activities	4	2

Perceptions are in favour of a positive impact of microfinance on employment opportunities (Median=4; IQR=2). The median of 4 shows that the perception of the 'average' respondent is 'agree' with many responses (N=61, 61%) indicating that they strongly agree with the perception that microfinance provides employment opportunities. Many of the respondents (N=59, 59%) were in agreement with the perception that microfinance increases the power of decision making as the most likely response was 'agree' (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (28%) regarding the perceived impact of microfinance on the power of decision making.

A large portion of respondents (N=68, 68%) hold the perception that microfinance improves the confidence to face problems (Median=4; IQR=2). Majority of the respondents (N=60, 60%) were in agreement with the perception that microfinance creates better awareness as the most likely response was ‘agree’ (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (27%) regarding the perceived impact of microfinance on awareness.

A sizeable number of the respondents (N=66, 66%) were in agreement with the perception that microfinance creates knowledge about banking operations as the most likely response was 'agree' (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (27%) regarding the perceived impact of

microfinance on knowledge about banking operations. Microfinance participants' perceptions are in favour of a positive impact of microfinance on social status (Median=4; IQR=2). The median of 4 shows that the perception of the 'average' respondent is 'agree' with many responses (N=40, 40%) indicating that they strongly agree and others (N=21, 21%) showed that agree with the perception that microfinance improves social status.

Perceptions are in favour of a positive impact of microfinance on the education of children (Median=4; IQR=2). The median of 4 shows that the perception of the 'average' respondent is 'agree' with many responses (N=35, 35%) indicating that they strongly agree and others (N=29; 29%) showing that they agree with the perception that microfinance provides employment opportunities. Many of the respondents (N=61, 61%) were in agreement with the perception that microfinance improves nutrient and health of household as the most likely response was 'agree' (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (25%) regarding the perceived impact of microfinance on the nutrient and health of the household.

A large portion of respondents (N=54, 54%) hold the perception that microfinance improves the employability of skills (Median=4; IQR=2). However, a relatively large number of respondents were indifferent (44%) regarding the perceived impact of microfinance on employability skills. Perceptions are in favour of a positive impact of microfinance on participation in community activities (Median=4; IQR=2). The median of 4 shows that the perception of the 'average' respondent is 'agree' with many responses (N=67, 67%) indicating that they strongly agree and others (N=14; 14%) showing that they agree with the perception that microfinance provides employment opportunities.

Tobit model

The Table 3 shows the results of the Tobit model of the perceived impact of microfinance on women empowerment.

Table 3: Tobit regression results

Variable	Coef.	STD ERR	T	P> I t I	95% Confidence Interval		Marginal Effects
ME	0.2255	0.412403	5.47	0.000	0.1435951	0.3075081	0.2255
AGE	0.0005	0.00066	0.82	0.413	-.0007725	0.0018636	0.0005
MSTAT	0.0272	0.0224479	1.22	0.2227	0.0173132	0.719077	0.0272
HSES	0.533	0.0068	7.81	0.000	0.0397494	0.0668904	0.533
EDU	0.025	0.0239198	-1.05	0.298	-0.07258	0.0224874	0.025
SPOUY	0.0001	0.0000599	-2.48	0.015	-0.00027	-0.00003	0.0001
LANSIZE	0.0083	0.0093473	0.90	0.372	-0.01019	0.0269613	0.0083
CATNO	0.00156	0.004373	-0.36	0.722	-0.010253	0.0071281	0.00156
TRAIN	0.06979	0.689698	-1.01	0.314	-.2068592	0.0672668	0.06979
FBNS	0.12085	0.0445109	2.72	0.008	0.032395	0.2093073	0.12085
PSTN	0.8364	0.0299991	2.79	0.006	0.0240266	0.1432604	0.8364
MEM	0.039166	0.0345222	-1.13	0.260	-.1077717	0.0294396	0.039166
Constant	0.1392	0.1098805	1.27	0.209	-0.079159	0.3575698	0.1392054
Sigma	0.0894301	0.0063237			0.0768631	0.101997	

Number of observations = 100; LR Chi2(12) = 80.38; Prob > chi2 = 0.000; Pseuo R2 = -0.6773; log likelihood = 99.535997

Five variable, namely, micro-entrepreneurship (p=0.000), household size (p=0.0000), spouse income (p=0,015), family business background (0.008) and position in the family of birth (0.006) were found to be significant in affecting the perceived impact of microfinance on women empowerment as their p-values are all below 0.05. On the other hand, age (p=0.413), marital status (p=0.2227), education (p=0.298), land size (p=0.372), Cattle number (p=0.722) and Training (p=0.314) are insignificant as shown by the p-values which are above 0.05. Microentrepreneurship has a positive effect on microfinance participant's perception. The increase in microentrepreneurship by a unit improves the perceived impact of microfinance on women empowerment by 22.55%. This is consistent with the assertion that microfinance works well for those who are entrepreneurial. As the microentrepreneur use microfinance services, capabilities are improved and they become empowered. Household size has a positive effect on microfinance participant's perception. The increase in household size by a unit improves the perceived impact of microfinance on women empowerment by 53.3%. Spouse income has a positive effect on microfinance participant's perception. The increase in spouse income by a dollar improves the perceived impact of microfinance on women empowerment by 0.01%. This may imply that as the spouse income increases, the women feel the need to be productive also to have power and control within the household. Family business background has a positive effect on microfinance participant's perception. Those with a family business history increase the likelihood by 12.08% of having a positive perceived impact of microfinance on women empowerment. This is consistent with the assertion that microfinance works well for those who have a family business history as they have an entrepreneurial mentality. Birth order or position in the family of birth has a positive effect on microfinance participant's perception as firstborns have an 83.64% likelihood of having a positive perceived impact of microfinance on women empowerment.

CONCLUSION

A majority of microfinance cooperatives participants who were part of the representative sample indicate that microfinance improves income, savings, amount of Household assets, amount of productive assets, employment opportunities, power of decision making, confidence to face problems, better awareness, knowledge about banking operations, social status, level of education for children, nutrient and health of household, employability skills and participation in community activities. This shows that women participants believe microfinance cooperatives empower them. Spouse income, Family business background, Household size, Birth order or position in the family of birth have a positive effect on microfinance participant's perception. Overall, microfinance was found to be a tool that can enhance capabilities in the context of capabilities approach as it enhances women empowerment. The study recommends packaging of microfinance taking into account birth order and family business history effects in Tsholotsho and also spreading of informal microfinance models to other districts and provinces. The study identified areas which require further study, namely, assessing the economic impacts of male folk migration to South Africa on women empowerment and general poverty alleviation in rural areas, especially Tsholotsho.

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