Mobilization of Personal Savings among Microfinance-Participating Households: A Survey in West Bengal, India

Kundu, AMIT

Department of Economics, Jadavpur University, Kolkata, West Bengal, India

11 February 2013

Mobilization of Personal Savings among Microfinance-Participating Households: A Survey in West Bengal, India

AmitKundu[1]

.

Abstract

This paper attempts to assesswhether participation ina microfinance program helps households generate personal savings, as distinct from savings through compulsory contributions to the program. We consider a microfinance programinitiated by the Government of India (the SGSY scheme),which is operated under a joint liability credit system that requires formation of Self-Help Groups (SHG).The empirical design relies on two samples of respondents: a "treatment group" of households participating in the microfinance program and a "control group" of non-participating households of similar characteristics. Using data collected at two points in time (April-July 2004baseline and September-December 2009 endline), we show that although income increases more in treatment-group households, the increase in personal savings of the microfinance-participating households over the study period is less than for the non-participating households.

Keywords: microfinance, savings, policy evaluation, Self-Help Groups, SGSY

Introduction

A popular and useful definition of a poor person is someone who earns only a small income and spends most of the earnings on consumption of necessary commodities, which leaves very little money, or sometimes nothing, for savings. It is often argued that lower income households have very little desire to save(see, e.g.,Bhaduri, 1973). Immediate consumption needs must take priority for households on the brink of subsistence, and little surplus are left to save for tomorrow. Basu (1997), however, points to a logical flaw in Bhaduri's argument: if the poor households are forward looking, they should see the virtue of savings, which over the long run can help them escape from the "poverty trap". In fact, savings deposits offer important advantages to low income households to build up assets, which eventually can be used as collateral, help reduce consumption volatility over time, and allow self-financingof investments rather than always turning to creditors (Wright, Hossain, and Rutherford, 1997). A recent study based on data from developing countries has shown that low income households experiencing difficulties and fluctuations in their life need accumulated savings to smooth income over economic shocks (Collins et al., 2009).

[1] Associate Professor, Department of Economics,Jadavpur University, Kolkata, West Bengal, India (akundu1970@gmail.com)

Poor households try to save for many different reasons. The financial savings are typically used as buffer stocks to smooth consumption during and after economic shocks. Savingshelp low income rural households to mitigate vulnerability[2].Savings can be used to facilitate large lumpy expenditures in emergency situations, including both personal emergencies (e.g., sickness, injury, sudden widowhood, loss of employment, etc.) and natural disasters (e.g., flood, fire,mudslide, etc.). Low income households use savings to pay children's school fees, to fulfill the household's essential obligations, such as a daughter's wedding, etc., and sometimes as working capital for income generating activities. As low income households face borrowing constraints, they sometimes put extra cash directly into their own business, earning a higher return than from alternative saving options. A less visible way of saving is self-financing a business or purchasing equipment and especially livestock, which similarly to jewelry can be easily sold for cash in times of distress. Yet despite their wide ranging needs, the poor lack safe, secure, and convenient institutions in which they can save. Poor householdshave meager saving capacity and conventional financial institutions are not willing to "bank"the poor. Sometimes banks are situated far from the village and rural households have to bear hightransaction and transportation costs if they wish to access the bank's savings facilities. Thus, poor households have to rely on various informal ways for saving. They keep money in the house (possibly in a lock box) or sometimes usetheir employer or a trustworthy neighbor to guard their money. They may deal with a non-banking financial institution that provides door step service – a messenger or an agent who visits the client when necessary.

Recently microfinance practitioners have begun to acknowledge the importance of savings mechanism among microfinance-program participants. Hirschland (2005) has found that most people prefer savings to credit because borrowing is often much riskier than savings. Kabeer (2001) has shown that credit is not always appropriate for poor women: a loan may become a burden asthe poor find it difficult to repay the loan because of their low income and high interest rates.From the point of view of financial literacy, one can argue that savings generation should be an important aspect of an overall microfinance program where learning to save or building a savings culture is crucial to one's economic self-reliance over a lifetime.

Every microfinance system includesa compulsory savings program whose objective is to develop asaving discipline among the low income participating households. This is based on the concept of Rotating Savings and Credit Association (ROSCA),whose primary objective is to generate savings among the participants before they can borrow. Besley, Coate, and Loury (1993) have shown that a ROSCA participant benefits more than an individual who follows autarkic saving. In theROSCA framework, which in effect works through a joint liability microcredit contract, the basic element is a group of individuals who agree to regularly

[2] Vulnerability is defined in the framework of poverty alleviation as the ex-ante risk that a household which is currently not poor will fall below the poverty line and that a household which is currently poor will remain poor. Thus vulnerability can be usefully distinguished from the concept of poverty, which is an ex-post measure of household welfare (Chaudhury et.al. 2002). A household is vulnerable if it is unable to manage any idiosyncratic risk and shocks because of inadequate assets and social protection mechanisms.

contribute money to a common "pot", and the accumulated amount is allocated as a loan to one group member in each period.This system helps the participants to accumulate savings in a regular structured way.

Arural microfinance system with ROSCA-type group lending typically involves creation of Self-Help Groups (SHG)among village women (mostly married). SHG is a voluntary association of 10-15 members, all from the same socio-economic background. The group members are encouraged to save small amounts in regular installment and then borrow from the accumulated group savings with the consent of other group members (as in ROSCA). The SHG microfinance program relies on the existing bank network to deliver financial services to the poor. The SHG members individually may not have sufficient savings to open a personal bank account, but the pooled saving enable them to open a bank account in the name of the group. Thisgroup account, however, comes with so many conditionality that it can hardly be considered a savings account. For instance, only a fraction of the accumulated savings can be withdrawn by the members and that at least one year after the formation of the group. The accumulated savings are held as collateral for the micro-lenders in the group and the entire account balance can be withdrawn only after the liquidation of the group.

In principle, the compulsory saving schemein a microfinance program is necessary to allow the participants to build up assets overtime and to develop a saving discipline. However, the compulsory regular contributions in the SHG cannot be regarded as personalsavings in a real sense. Personal savings are generated by the participating households if they manage to utilize the microfinance service in such a way that they enhance their income and retain part of the enhanced income as savings in an outside financial institution or in a personal lock box. It is thus expected that the participants will borrow from their SHG and use the loan as working capital or investment for some income generating activity, enhancingboth their income andtheir personal savings. In this way they will achieve some financial security for the future and reduce theirvulnerability.

Very few studies have attempted to evaluate the impact of a microfinance system under a joint liability credit contract onpersonal savings generation among participating rural households. Khalily (2004), analyzinga rural household survey in Bangladesh,did not find any positive impact of microfinance programs on personal savings. On the other hand,DeSilva(2012) has shown that in Sri Lanka participation in a microfinance program had a positive impact both on per capita income and on personal savings generation among low income households.

The basic objective of this article is to investigate whether participation in amicrofinance program enhances personal savings among the participating households above and beyond the compulsory regular contributions to the group. We consider the microfinance program that operates across India under the SGSY (SwarnaJayanti Gram SwarojgarYojana) scheme[3].

[3] SGSY is a government-supported microfinance program under a joint liability credit contract, which operates among village women (mostly married women) by encouraging them to form Self-Help Groups (SHG). The basic objective of this program is to provide assistance to below poverty line (BPL) rural poor for establishing microenterprises and acquiring income generating assets through microcredit and government subsidy. The Government of India requires that the SHG be formed by enrolling members

Sample design and methodology

To investigate the research problem formulated in the previous paragraph, we have to compare the enhancement of personal savings of SHG member households with that of non-participating households having similar socio-economic background. The enhancement of personal savings is calculated by collecting data at two points in time (baseline and endline). The comparison between participating and non-participating households can be done using the treatment effect model, in which the SHG member households under the SGSY scheme areconsidered as the "treatment group" and the non-member households are considered as the "control group".The control-group sample is selected so that it has almost the same distribution of observed characteristics as the treatment-group sample.

The present study is based on a survey of households in the South 24 Parganas district of West Bengal, India, one of the country's 250 economically most backward districts in 2006 (Ministry of Panchayati Raj, 2009).In a multistage sampling design,five villages ("gram panchayats") were chosen at random in two community development blocks[4] (also chosen at random out of the 29 blocksin the district).The agro-climatic and farming conditionswere almost identical inthe sample villages, wherepredominance of mono-cropping was observed. The sample villages were not particularly prosperous, and the residents in the survey area had limited opportunities for non-farm employment. A large segment of the households in the sample villages had joined the microfinance program under the SGSY scheme. We identified 33 Self-Help Groups (SHG) in the five sample villages,[5]which were formed under the SGSY scheme between April-July 2007 (the baseline period t_0 in our study), each consisting of 14-15 members. From each SHG we randomly chose 7 members (8 members from one group). The treatment group thus had total sample size of 232 respondents, all of which agreed to answer to our structured questionnaire and all of which happened to be married women.

For the control group, we first identified households in the sample villages who had not joined any SHG during the entire study period, i.e., kept their non-member status until September-December 2009 (the endline t_1)[6].From these non-member households we chose married women(like the respondents in the treatment group) with farming as the major source of earnings, sometimes supplemented with non-farm activity. We took special care to ensure that the control group closely matched the treatment group by economic, physical, and social attributes. The control group had total sample size of 156.

---

from BPL lists, which are available from the Census Bureau and the local village administration. SHGs are not generally formed through a self-selection mechanism as government agencies play a crucial role in group formation. SGSY is perhaps the largest microcredit based scheme of its kind in the world. For more details see Kundu (2008).

[4]Three villages were selected from the 15 villages in the PatharPratima block and two from the 10 villages in the Mandi Bazar block.

[5] 19 from the three villages in the PatharPratima block and 14 from the two villages in the Mandir Bazar block.

[6] All the respondents included in the treatment group at the baseline period remained SHG members at the endline period.

Impact evaluation requires data at two points in time. Socio-economic information was collected from households that joined an SHG under the SGSY scheme and households that did not join any microfinance program – in the baseline period (April-July 2007) and then againintheendline period (September-December 2009).Our objective was to estimate personal savings enhancement in the treatment and control groups: this was done by differencing the personal savings data between baseline and endline. The regression model estimated the change in personal savings as a function of the change in income and the change in Women's Empowerment Index (constructedby the author) between the two periods:[7]

$$\Delta\text{Savings}_i = \beta_0 + \beta_1 \text{SGSY} + \beta_2 \Delta\text{Mincome}_i + \beta_3 \Delta\text{EMPIDX}_i + \Delta u_i (1)$$

In equation (1),the outcome variable $\Delta\text{Savings}_i$ is the change of personal savings (measured in rupees) of respondent betweenthe baseline t_0 and the endlinet_1: this is the measure of savings enhancement. Similarly$\Delta\text{Mincome}_i$is the change of monthly income (income enhancement) and ΔEMPIDX_i isthe change of the value of Women's Empowerment Index(see Appendix for details) of respondent between the two time periods. SGSY is a dummy variable that takes the value 1 if the respondent belongs to the treatment group (a participant in the microfinance program) and the value 0 if the respondent is in the control group (not a participant). $\Delta u_i$is the error term.

Here the outcome variable$\Delta\text{Savings}_i$ may be positive, negative, or zero. Each respondent is a married woman who is part of a household and spends most of her earnings (if any) for the welfare of her family.Thereforethe respondent's "individual"personal savings are impossible to determine and instead wetakethe savings of the entire household during the relevant period as "personal" savings. The baselinepersonal savings is the amount that a household (in either treatment or control group) could save on average after paying all the necessary expenses, including loan repayment to formal or informal lenders (if required). In calculating the endlinesavings for the households in the treatment group,we excluded the compulsory monthly contributions to SHG (about Rs.30-Rs.40, less than $1 per month) and the amountsusedfor repaying microcredit loans with interest in monthly installments[8] during the endlineaveraging time.For households in the control group, the endline procedure was the same as at baseline.

Our field work shows that a substantial number of sample householdsin boththe treatment and the control group save in a nearby postalbank or local private bank, but mostly in a private lock box at home, which is managed by the head woman of the household. Uncertifiedlocal

[7]The "first differencing" technique used in (1) has the additional benefit of removing "unobserved heterogeneity" of the sample households (individual heterogeneity like willingness to be an entrepreneur, religion, social consciousness, etc., and village level heterogeneity, all of which are fixed over time but can influence the outcome variable.

[8] No household in the treatment group borrowed from any informal source to maintain its consumption in the endline period, which proves that the monthly personal savings of the households were non-negative. This conclusion was crosschecked by verifying the amount of personal savings in the households as the difference between average monthly incometotal average monthly expenditure including loan payments.

private banks play a major role in the development of saving habits of the rural households in the sample villages. They provide "door step" service by sending their representatives to collect savings from the client's home. The agent or the representative gives the client a formal receipt after collecting the money. The collection can be done each month or every fortnight. The rate of interest on these savings deposits is 5% to 6%,which is higher than the3% interest offered on savings depositsby public sector commercial banks(e.g., the Allahabad Bank in that locality). The availability of door step service minimizes the transaction cost of savings for the rural households. The rural households generally do not withdraw their savings unless they face an emergency.The financial savings are typicallyused as buffer stocks to smooth consumption during and after economic shocks.

Enhanced household savings depend on the existence of enhanced income (as reflected in model (1)). For microfinance participants the picture may be different because the major objective of joining a microfinance program is to get access to microcredit that can be utilized as working capital in some income generating activity. The enhanced income may thus be used to repay the loan with interest, leaving almost nothing for savings. $\Delta Mincome_i$ is included as an explanatory variable in Eq. (1) because Kundu (2012)has shown that the treatment-group households were able to enhance their monthly income andtheir monthly per capita consumption expenditure more than the control-group households between baseline and endline. Our objective now is to investigate whether enhanced monthly income helps the SGSY member households to enhance their savings more than the control-group households.

Anderson and Baland (2002) have shown through their village level survey in Kenya that an important motive for a woman to join ROSCA is to keep money away from her husband – the family's principal decision maker in rural India – and save for the family's future. Enhancement of women's decision-making power as reflected in the Women Empowerment Indexis therefore expected to play a role in retaining part of household income for savingsand$\Delta EMPIDX_i$– the change in the value of the index between baseline and endline– is accordingly introduced as another explanatory variable for savings enhancement in Eq. (1).

Table 1 presents the means of the explained and explanatory variables in Eq. (1) for the treatment and control groups at two points in time: the baseline (t_0) and the endline (t_1). The monthly income and savings are presented in real terms (i.e., adjusted for inflation relative to t_0 as the base period).

Table 1: Means of the explained and explanatory variables for treatment and control group in two periods

Variable	Treatment group households		Control group households	
	t_0	t_1	t_0	t_1
Savings (Rs.)	186.24	201.36	232.86	274.84
MIncome (Rs.)	1717.6	2338.99	1935.27	2187.05
EMPIDX*	5.74	10.26	6.01	8.04

*The maximum value of the Women Empowerment Index is 20 (see Appendix).

Source: Calculated by the author from primary survey data.

The differences in the baseline values of MIncome and EMPIDX between the treatment and control groups were not statistically significant. All three variables in Table 1 are observed to have increased between baseline and endline. Income enhancement between baseline and endline for households in the treatment group was statistically significantly greater than for households in the control group.The change in EMPIDX between baseline and endline was also statistically significantly greater for treatment group households than for control group households. To test for differences in savings enhancement for the two groups of households (a dependent variable) we now shift to a multiple regression paradigm.

Testing for sample selection bias

Unlike Banerjee et al. (2010), who fully controlled the microfinance program and could carry out impact evaluation on the basis of a fully randomized scheme, we had no control over the microfinance program because SGSY is a Central Government's policy operated through local authorities. We could only choose the "baseline" and the "endline" for policy impact assessment between two time points, but could not rely on a randomized evaluation process.[9] Our sampling was done on the basis of an observed characteristic (e.g., membership in the SGSY microcredit program at the baseline April-July 2007) and non-members were not included. The sample was non-random and there was danger of selection bias due to censoring or truncation of the non-member observations.

To deal with the possibility of sample selection bias, we apply the two-step treatment effect methoddeveloped by Heckman (1976). This methodestimates two regressions simultaneously(see, e.g., Guo and Fraser, 2010). The first regression is the selection equation – a probit regression predicting the probability of being a SGSY member (i.e., being included in the treatment group) from strictly exogenous variables. The second equation (Eq. (3)) uses the original dependent variables from Eq. (1) plus an additional explanatory variable– the inverse Mill's ratio or the hazard rate – which is derived from the estimated coefficients of the probitregression (Eq.(2)). The two-step treatment effect method is intended to correct for sample selection bias and it is the proper method to use if its results are significantly different from the OLS estimates of Eq. (1), i.e., if the estimated coefficient of the inverse Mill's ratio in Eq. (3) is significantly different from zero.

It is expected that the participation of rural women in the SGSY microfinance program may be influenced by the following baseline variables: the woman′sbaseline age ($\mathrm{AGE}_{\mathrm{it}_0}$), whether or not the womanearns income in the baseline period ($\mathrm{EARORNOT}_{\mathrm{it}_0}$), the value of

[9]This is usually the situation for impact evaluation in social sciences, where research relies on "non-experimental," or "econometric," approach that uses a variety of microdata sources, statistical methods, and behavioral models to compare the outcomes of participants in social programs with those of nonparticipants. Because of its prevalence in social sciences, this approach is sometimes characterized as "social experiment," to distinguish it from randomized experimental designs in experimental sciences (see Heckman and Smith, 1995).

assets the respondent household owns in the baseline period ($VASSET_{it_0}$), and the education levelof the prospective member in the baseline period ($EDULEVEL_{it_0}$, measured by number of years in schooling). The baseline market value of household assets(in rupees)is the sum total of the market value of the land owned by the household (if any), the house (if owned bythe household), the livestock (a typical store of value in rural households), the bicycle (a highly liquid asset which can be easily sold in distress), and the approximate value of jewelry owned by household members (also highly liquid).

The selection equation thus has the form

$$SGSY = \alpha_0 + \alpha_1 AGE_{it_0} + \alpha_2 EDULEVEL_{it_0} + \alpha_3 VASSET_{it_0} + \alpha_4 EARORNOT_{it_0} + \mu_i \qquad (2)$$

The treatment effect equation is Eq. (1) with an additional explanatory variable $\widehat{\lambda_1}$– the inverse Mill′s ratio constructed from the estimated coefficients of the selection equation (2):

$$\Delta Savings_i = \gamma_0 + \gamma_1 SGSY + \gamma_2 \Delta Mincome_i + \gamma_3 \Delta EMPIDX_i + \gamma_4 \widehat{\lambda_1} + \varepsilon_i \qquad (3)$$

The inverse Mill's ratio corrects for the correlation between the error terms in equations (2) and (3) and thus produces unbiased estimates (Heckman, 1976). If the estimated coefficient of the inverse Mill's ratio $\widehat{\lambda_1}$ in regression (3) is not significantly different from zero, there is no correlation between the error terms in equations (2) and (3) and the OLS estimates from the original one-step treatment effect model (Eq. (1)).The estimation resultsfor the selection equation(2) are presented in Table2. The results for the treatment effect model – both the two-step procedure (Eqs. (2)-(3)) and the OLS procedure(Eq. (1)) are presented in Table 3.

Table 2: Estimation of SGSY from selection equation (2)

Variable	Sample means	Parameter estimates (Standard Error)
AGE_{t_0}(years)	39	-0.037*(0.007)
$EDULEVEL_{t_0}$ (years of schooling)	4.2	-0.027(0.019)
$EARORNOT_{t_0}$(= 1 if respondent earns income in the baseline period, 0 otherwise)	0.157	-0.2934(0.185)
$VASSET_{t_0}$(in rupees)	69,372	-0.0000134*(0.000006)
Constant		1.76*(0.32)

* Significant at 1% level.

Table 3: Estimation of ΔSavings from two-stepprocedure (2)-(3) and from OLS regression (1)

Variable	Parameter estimates (Standard Error)	
	Two step procedure (Eqs. (2)-(3))	OLS estimates from Eq. (1)
SGSY	-44.652 (28.72)	-23.37*(9.91)

ΔMincome	0.019*(0.0037)	0.019*(0.0037)
ΔEMPIDX	1.12 (1.38)	1.27(1.37)
Constant	56.32* (16.68)	44.56* (7.49)
Inverse Mill's ratio $\widehat{\lambda_1}$	14.83 (18.77)	
$\overline{R}^2$		0.26

* Significant at 1% level.

We observefrom Table2that households with more assets (higher $VASSET_{t_0}$)are less likely to join the SGSY microfinance scheme.The age of the head woman in the household also has a negative effect on the probability of joining a microfinance group. Education level of the prospective member or whether the prospective member is an earning member at the time of group formation does not influence the decision to join the microfinance program.

The estimated coefficient of the additional explanatory variable $\widehat{\lambda_1}$ in regression (3) is not statistically significantly different from zero, which establishes absence of sample selection bias (see, e.g., Guo and Fraser, 2010).As there is no evidence of sample selection bias from regressions (2)-(3), the simple OLS methods based on Eq. (1) produces valid unbiased estimates(see the results in the last column of Table 3).

Discussion

The results of the OLS regression based on Eq. (1) show that income enhancement has a positive effect on personal savings enhancement (the regression coefficient is positive and statistically significant). Increase of the Women Empowerment Index also tends to increase personal savings (the estimated coefficient is positive), but the effect is statistically not significant. Finally, the coefficient of SGSY is statistically significant and negative, which shows that personal savings enhancement is lower for microfinance participants (SGSY=1) than for non-participants (SGSY=0).

Most of SGSY member households borrowed from their microcredit group during the study period either for income generating activities or for consumptionactivities (Table 4). The loan amount varied from Rs.500 to Rs.2000. Many microcredit borrowers were still repaying their loans even at the endline of our study. Thus, a major share of the enhanced income of the treatment-group households is spent on loan repayment,on consumption, and on regular contributions to their respective group. As a result, the microfinance member households have very little income left for savings. For the control-group households, which are not members of any microcredit scheme,Table 4shows that very few borrowed (e.g.,frommoney lenders or commercial banks) within the study period.Nor do they have to contribute a fixed amount regularly to a SHG. Hence, at the end of the month, they have on average some income left after all necessary expenses, and this residual income can go into savings.

Table 4: Number of households in the treatment and control groups who borrowed[a] for different purposes during the study period (between baseline and endline)

Uses of credit	SGSY members (treatment)	Non-members (control)
Credit taken for income generating activities		
Agriculture	75	0
Business	44	0
Fishery	7	0
Agriculture and business	15	0
Buying a van	5	0
Animal husbandry	2	0
Bidi(Indian cigarette) business	1	0
Buying a shop	1	0
Buying a tractor	1	0
Subtotal	*151*	*0*
Credit taken for consumption purposes		
Building a house	18	0
Advance for house repairs	4	4
Medical treatment	25	10
Bribe	0	0
Son's education	18	0
Household purposes	0	2
Subtotal	*65*	*16*
Credit for both income-generating and consumption purposes		
Business and building a house	2	0
Agriculture and medical treatment	4	0
Agriculture and son's education	1	0
Subtotal	*7*	*0*

[a]All SGSY member households borrowed only from their respective SHGs; the non-member households had no to borrow from commercial banks and money lenders.
Source: Information from the survey.

Conclusions

Ourstudy shows that participants of the SGSY microfinance program manage to increase the average monthly income between baseline and endlineto a greater extent than non-member households do.But when we look at savings enhancement between baseline and endline, we observe that microfinance participating households achieve smaller saving enhancement than non-participating households.It seems that a major part of the enhanced income of microfinance participating households is spent on loan repayment and various consumptionneeds, leaving very little for household savings.

References

Anderson, S. and J.-M.Baland (2002).“The Economics of ROSCAs and Intra-Household Allocation.”*Quarterly Journal of Economics* 117(3): 983-995.

Banerjee A., E. Duflo, R.Glennerster, and C.Kinna (2010).“The Miracle of Microfinance?Evidence from a Randomized Evaluation.”AbdulLatifJameel Poverty Action Lab at MIT (June 30).

Basu, K. (1997).*Analytical Development Economics: The Less Developed Economy Revisited*. Cambridge, MA: The MIT Press.

Besley, T., S. Coate, and G. Loury (1993). “The Economics of Rotating Savings and Credit Associations,.” *The American Economic Review* 83(4): 792-810.

Bhaduri, A. (1973).“A study in Agricultural Backwardness under Semi-Feudalism.”*Economic Journal* 83:120-137.

Collins, D., J.Morduch, S. Rutherford, and O. Ruthven (2009).*Portfolios of the Poor: How the World’s Poor Live on $2 a Day*. Princeton, NJ: Princeton University Press.

Chaudhuri S., J. Jalan, and A.Suryahandi (2002).*Assessing Household Vulnerability to Poverty from Cross Sectional Data: A Methodology and Estimates for Indonesia*.Discussion Paper, New York: Columbia University.

DeSilva, I. (2012).“Evaluating the Impact of Microfinance on Savings and Income in Sri Lanka: Quasi-Experimental Approach using Propensity Score Matching.”*Margin – The Journal of Applies Economic Research* 6:47-74 (May).

Guo,S. and M. F. Fraser (2010). *Propensity Score Analysis: Statistical Methods and Applications*. SAGE Publications (Chapter 4).

Heckman, J. (1976). “The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for such models.”*Annals of Economic and Social Measurement* 5(4): 475-492

Heckman,J. and J. Smith (1995).“Assessing the Case for Social Experiment.”*Journal of Economic Perspective*9: 85-110.

Hirschland, M., ed. (2005).*Savings Services for the Poor: An Operational Guide*, Hartford, CT:Kumarian Press.

Kabeer, N. (2001). “Conflict over Credit: Re-Evaluating the Empowerment Potential of Loans to Women of Bangladesh.” *World Development* 29: 63-84.

Khalily, M. A. Baqui (2004).“Quantitative Approach to Impact Analysis of Microfinance Programme in Bangladesh – What have We Learned?”*Journal of International Development,* Special Issue on Social Impact of Microfinance 16(3): 331-354 (April).

Kundu, A. (2008).“Impact of SGSY Scheme on Self-Help Group Members in West Bengal, India.”*Afro-Asian Journal of Rural Development* 41(2):83-104 (July-December).

Kundu, A. (2012). “Can Microfinance Programme and NREGS Jointly Improve the Economic Condition of the Participating Rural Households? A Social Experiment.”*Asian Journal of Empirical Research* 2(2): 40-54.

Ministry of Panchayati Raj (2009). *A Note on the Backward Regions Grant Fund Programme*.National Institute of Rural Development, Hyderabad, India (September 8).

Wright, G., M. Hossain,andS. Rutherford (1997).“Savings: Flexible Financial Services for the Poor” in G. Wood and I. Sharif (eds.), *Who Needs Credit? Poverty and Finance in Bangladesh.* Dhaka University Press.

Appendix: Calculation of Women's Empowerment Index

Questions posed to the respondents (all women)	Points
1. Decision about utilization of microcredit	Female:2, Both:1, Male:0
2. Decision on purchase of daily food items	Female:2, Both:1, Male:0
3. Decision on purchase of livestock	Female:2, Both:1, Male:0
4. Decision on purchase of utensils and other household items	Female:2, Both:1, Male:0
5. Decision on child education, child vaccination, and other health related matters	Female:2, Both:1, Male:0
6. Does the woman earn regularly and contribute to her family?	Yes: 2, No:0
7. Can the woman participate in different village assemblies (gram sabhas) according to her will?	Yes: 1, No:0
8. Can the woman spend on consumable goods (cosmetics) according to her will?	Yes: 1, No:0
9. Can the woman go outside without asking permission from her husband or elder son?	Yes: 1, No:0
10. Can the woman cast her vote according to her will?	Yes: 2, No:0
11. Can the woman protect herself against domestic violence?	Yes: 1, No:0
12. Decision on family planning	Female:2, Both:1, Male:0

Note: The index is constructed by the author from the answers provided by the respondents. Maximum index value 20 points; more points indicates more women's empowerment or more intra-household decision-making power of the respondent within her household.