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Computation of Multidimensional Poverty Index: A Case Study

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ABSTRACT

Microfinance can play important role in alleviating poverty. Most marginal people have intention and capability to start small revenue generating activities. However, they are lack of finance to materialize their dreams. Microfinance may be one of the way for potential small entrepreneurs to acquire necessary inputs to start their activities. Government and international agencies are trying to eliminate poverty through microfinance programs, services and guidelines. This effort may be able to generate revenue and new jobs that can eradicate poverty. With this concept, Microfinance had been hosted primarily in Bangladesh and later replicated in other part of the world. Grameen Bank (GB) has been serving large number of people below poverty level in Bangladesh. However, both positive and negative impacts of microfinance on poverty have been visible in several studies that make microfinance still questionable. Therefore, this study intent to construct Multidimensional Poverty Index (MPI) measuring the incidence and intensity of the poverty among GB borrowers. It compares MPI of participant borrowers with non-participant borrowers of GB for observing the effect of microfinance. The results show that microfinance has positive impacts for participant borrowers as their index is relatively lower compared to non-participant borrowers. Hence, microfinance appears as an effective instrument for poverty alleviation.

Key words: Microfinance Impact, Poverty Alleviation, Multidimensional Poverty Index, Bank.

1. INTRODUCTION

There has been major debate for impact of microfinance on borrowers in the recent years [1, 2]. Some researchers like Bhuiya, Khanam [3], Pitt, Khandker [4], Rahman, Luo [5] and Woller and Parsons [6] find microfinance positive impacts whereas some researchers like Bateman [7], Hulme [8], Roodman and Morduch [9] and [10] do not find any significant positive impact on borrowers. Furthermore, many works conclude that there has been positive impact in case of few development indicators but not for others indicators [11-17] whereas other researchers do not agree the same rather put positive impact for some else indicators [18]. Microfinance has been losing its grounds because of inadequate proofs for positive impact [19]. Therefore, finding out its impact with simple assessment method like poverty index is very much important, especially when it is used as a development tool. It is also required to observe contribution and viability of the microfinance institute. It further helps to make corrective action after measuring the magnitude of the poverty based on latest index.

The rest portion of the work will be presented as follows. It gives the overview about microfinance for poverty alleviation, poverty incidence and intensity measurement. Thereafter, it presents the methodology, analysis & interpretation followed by conclusion.

2. MICROFINANCE FOR POVERTY ALLEVIATION

Microfinance has been intended to break cycle of poverty, increase employment, enhance earning capacity and ultimately help financially marginalized people in the society. Alternatively, these borrowers need to take loan from family, friends or even from loan sharks at informal level with extremely high interest rate. However, some studies found that microfinance in not working as has been intended and it has lost its mission [1, 20]. They argued that microfinance merely creates poverty worse. Because many clients divert microcredit to pay for basic amenities rather than invest in business. This makes their businesses either stop or fail that consequently drops them into further more debt. For instance, ninety four percent of all microfinance credits have been used for consumption in case of South Africa [21]. This ultimately means that borrowers are not producing further revenue with the original credit. Consequently, they need to receive alternative credit to settle down existing credit and so forth. This plunge them into deep down more debt in spiral form. Even in some cases, they have found themselves caught up in a dangerous cycle of death like committing suicide [22]. However, microfinance may serve as a useful instrument for

the financially no served or underserved marginalized people when used appropriately. Either way, microfinance is a significant issue in the financial kingdom. If it is used appropriately, it could be an influential instrument for poverty alleviation [23]

2.1 Poverty Incidence and Intensity Measurement

Monetary indicators like income or consumption have been used to measure poverty quite often. This measurement considers only one dimension and it is monetary perspective of observing poverty conventionally. The monetary figure is calculated on the basis of goods and services valued at existing market price required to maintain a minimum life standard. If any person cannot afford funds to maintain this minimum life standard, then he deems as a poor or marginal person living below poverty line. There is no doubt that monetary measurement for poverty is an extremely worthwhile information. However, other measurement indicators such as basic amenities including food, clothing, medication, education, housing, employment, security etc. can be more useful and informative in a broad sense to define and understand poverty. Single monetary based indicator only cannot be able to capture the diversified range of phenomena contributing to poverty. Human Development Report (HDR) has re-estimated poverty in different ways apart from conventional measurement based on income indicator from 1997. It has been measured through Human Poverty Index (HPI) for the first instance and then succeeded by Multidimensional Poverty Index (MPI) in the year 2010. Human Development Report Office (HDRO) of UNDP and Oxford Poverty and Human Development Initiative (OPHI) of Oxford University collaborate designing this new multidimensional poverty index. From then on, OPHI computes and UNDP publishes the new global MPI every year. Furthermore, OPHI website displays sub-classification MPI indices of all countries divided into rural-urban, ethnicity or subnational breakdowns. More than one hundred developing countries are using MPI as an international measure of poverty incidence and intensity. MPI complements customary income based measurement through including acute deprivation that people face with reference to health, education and living standard. It is an assessment at individual poverty level [24, 25].

3. METHODOLOGY

After extending credit to microfinance borrowers, it has been expected that their respective poverty incidence and intensity will come down. This research applies a control group (non- participant borrowers) and experiment group (participant borrowers) for analyzing the effect of microfinance on borrows. Participant borrowers are successful borrowers who get loan after complying all the formalities of the concerned microfinance institute. On the other hand, non-participant borrower are the borrowers of the microfinance institute who applied for the loan but not entertained or who intended to be borrower but unsuccessful for their respective limitations. The participant borrowers have been compared with non-participant borrowers after completing one year with GB. The borrowers with better knowledge and adequate information are the best target for this study. Different microfinance schemes' borrowers from several sectors like small entrepreneurs, agricultural activities, service sectors, animal husbandry, small-scale manufacturing and fishery have been randomly selected for this research. Simple Random Sampling has been used to select and interview borrowers. With reference to Krejcie and Morgan [26], this study requires sample size of about 400 respondent from each group. We construct Multidimensional Poverty Index between participant and non-participant borrowers and compare those indices to measure their poverty level. The higher is the MPI, the more is the poverty and vice versa. If MPI shows lower number for participant borrowers compared to non-participant borrowers after completing one year with loan, then poverty seems decreasing among participant borrowers and microfinance appears successful instrument.

With reference to previous section, the benefit of MPI index is going beyond money based measurement. Many developing countries are using MPI as an international measure of poverty incidence and intensity. MPI complements customary income based measurement through including acute deprivation that people face with reference to health, education and living standard. It is an assessment at individual poverty level. If a person is deprived in a 1/3rd or more of 10 weighted indicators, MPI categorizes her as 'MPI poor' and otherwise not poor. The extent or intensity of poverty has been measured by the number of deprivations in ten factors, which contains Education (Year of Schooling and School Attendance), Health (Child Mortality, Nutrition) and Living Standards (Electricity, Sanitation, Drinking Water, Housing, Cooking Fuel and Asset Ownership). Therefore, it is a comprehensive measurement. It can also be used to compare poverty in different population. Within a country, it can measure the poverty level among different strata. It is a useful analytical technique to recognize vulnerable people who could be poorest of the poor within a particular area and time period [24, 25].

3.1 MPI Indicator

MPI includes the following ten indicators:

- Education (each indicator is weighted equally at 3/18)

1. Years of schooling: deprived if no household member has finished six years of schooling

2. school attendance: deprived if any school-aged child is not appearing school up to class 8

• Health (each indicator is weighted equally at 3/18)

3. Child mortality: deprived if any child has expired in the family in past 5 years

4. Nutrition: deprived if any adult or child, for whom there is nutritional info, is underdeveloped

• Living Standards (each indicator is weighted equally at 1/18)

5. Electricity: deprived if the household has no electricity

6. Sanitation: deprived if the household's sanitation facility is not improved

7. Drinking water: deprived if the household does not have access to safe drinking water

8. Housing: deprived if the household has a dirt, sand or dung floor

9. Cooking fuel: deprived if the household cooks with dung, wood or charcoal

Assets ownership: deprived if the household does not own more than one of: radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.

3.2 Formula

Incidence of Poverty: A person is considered poor if they are deprived in at least (33.33%) a third of the weighted indicator.

Intensity of Poverty: The intensity of poverty denotes the proportion of indicators in which they are deprived.

The MPI is calculated as MPI = H * A

Where, H indicates percentage of people who are MPI poor (incidence of poverty)

And A indicates average intensity of MPI poverty across the poor (%).

3.3 A Typical Calculation

A microfinance institution's selected respondent comprised of individual A, B and C. Table 3.1 shows the deprivation on each of the 10 indicators for aforesaid individual where "0" indicates no deprivation in that indicator, while "1" indicates deprivation in that indicator. Putting all the value for respective indicator, MPI has been calculated for a particular X Microfinance institution (Please see Table 1).

Table 1: A typical calculation for MPI [24]

Multidimensional Poverty Index for X Microfinance Institution				
Indicator	**Weight**	**Person A**	**Person B**	**Person C**
Years of Schooling	3/18	0	0	0
School Attendance	3/18	0	0	0
Child Mortality	3/18	1	1	0
Nutrition	3/18	0	1	0
Electricity	1/18	0	1	1
Sanitation	1/18	0	1	1
Drinking Water	1/18	0	0	1
Housing	1/18	1	1	1
Cooking Fuel	1/18	1	0	1
Assets Ownership	1/18	1	0	0
Weighted Score		**33.33%**	**50.00%**	**27.78%**
Status (Poor for more than 33%)		Poor	Poor	Not Poor
Score (Poor = 1, Not Poor = 0)		1	1	0
Incidence of Poverty (H)	H = (1+1+0)/3	0.667		
Intensity of Poverty(A)	A = (33.33% + 50.00%)/2	0.417		
MPI Index	H * A	0.278		
Higher Index shows higher poverty				

4. MPI ANALYSIS AND INTERPRETATION

Participant Borrowers:

• Incidence of Poverty (H): A borrower is considered poor if he/she is deprived in at least (33.33%) one- third of the weighted indicator. Through our survey of 400 participant borrowers, we found 283 poverty head count, meaning number of incidences of poverty as their respective weighted score was above 33.33%. Therefore, the incidence of poverty (H) appeared 0.7075 (283 out of 400).

• Intensity of Poverty (A): The intensity of poverty denotes

the proportion of indicators in which a borrower is deprived. Through our survey of 400 participant borrowers, we found 283 intensity of poverty with different percentages as per their magnitude. Therefore, the average intensity of poverty (A) appeared 0.4623 (Average percentage of 283 borrowers).

$$MPI = H * A = 0.7075*0.4623 = 0.3271 \quad (1)$$

Higher index shows relatively lower side of poverty level. This constructed Index implies low poverty and deprivation among participant borrowers of Grameen Bank. Their living standards are not quite below and although call for further attention. Details of the calculation are given Table 2.

Table 2: MPI for Grameen Bank -Participant Borrower

0 for "Not Poor and No deprivation" , 1 for "Poor and Deprivation"					
Indicator	**Weight**	**Borrower-1**	**Borrower-2**	**Borrower-3**	**Skipped**
Years of Schooling	1/6	1	0	0	……
School Attendance	1/6	0	0	1	……
Child Mortality	1/6	1	0	0	……
Nutrition	1/6	0	0	0	……
Electricity	1/18	0	1	1	……
Sanitation	1/18	0	0	1	……
Drinking Water	1/18	0	1	1	……
Housing	1/18	1	1	1	……
Cooking Fuel	1/18	1	0	1	……
Assets Ownership	1/18	1	0	0	……
Weighted Score		50.00%	16.67%	44.44%	……
Status (Poor > 33%)		Poor	Not Poor	Poor	…..
Score (Poor = 1, Not Poor = 0)		1	0	1	……
Incidence of Poverty(H)	H = (1+0+1+.....)/400	**0.7075**			
Intensity of Poverty(A)	A = (50.00% + 44.44%+...)/283	**0.4623**			
MPI Index	**H * A**	**0.3271**			

Non-Participant Borrowers:

• Incidence of Poverty (H): Again a borrower is considered poor if he/she is deprived in at least (33.33%) one-third of the weighted indicator. Through our survey of 400 non-participant borrowers, we found 360 poverty head count, meaning number of incidences of poverty as their respective weighted score was above 33.33%. Therefore, the incidence of poverty (H) appeared 0.9000 (360 out of 400).

• Intensity of Poverty (A): The intensity of poverty denotes the proportion of indicators in which borrowers are deprived. In the same survey of 400 non-participant borrowers, we found 360 intensity of poverty with different percentages as per their magnitude. Therefore, the average intensity of poverty (A) appeared 0.5031 (Average percentage of 360 borrowers).

$$MPI = H * A = 0.900*0.5031 = 0.4528 \quad (2)$$

Higher index shows higher poverty as well. This constructed Index implies relative higher poverty and deprivation among non-participant borrowers compared to participant borrower. Their living standards are quite below than participant borrower and call for further deep attention. Details of the calculation are given Table 3.

Table 3: MPI for Grameen Bank –Non-Participant Borrower

0 for "Not Poor and No Deprivation" , 1 for "Poor and Deprivation"					
Indicator	**Weight**	**Borrower-1**	**Borrower-2**	**Borrower-3**	**Skipped**
Years of Schooling	1/6	1	1	0	…..
School Attendance	1/6	0	0	1	…..
Child Mortality	1/6	1	0	0	…..

Nutrition	1/6	0	0	0	…..
Electricity	1/18	0	1	1	…..
Sanitation	1/18	1	0	1	…..
Drinking Water	1/18	0	1	1	…..
Housing	1/18	1	1	1	…..
Cooking Fuel	1/18	1	0	1	…..
Assets Ownership	1/18	1	0	0	…..
Weighted Score		50.00%	33.33%	44.44%	…..
Status (Poor>33%)		Poor	Poor	Poor	
Score (Poor = 1, Not Poor = 0)		1	1	1	….
Incidence of Poverty(H)	H = (1+1+1+……..)/400	**0.9000**			
Intensity of Poverty(A)	A = (55.56% + 33.33%+……)/360	**0.5031**			
MPI Index	**H * A**	**0.4528**			

5. CONCLUSION

For participant borrowers, the incidence of poverty appeared 0.7075 and the average intensity of poverty appeared 0.4623 that made MPI Index 0.3271. This constructed index implies relatively low poverty and low deprivation among participant borrowers of Grameen Bank. On the other hand, for non-participant borrowers, incidence of poverty appeared 0.9000 and the average intensity of poverty appeared 0.5031 that made MPI Index 0.4528. This constructed index implies relative higher poverty and deprivation among non-participant borrowers compared to participant borrower. Their living standards are quite below than participant borrower and call for further deep attention. Therefore, microfinance has positive impacts for participant borrowers as their index is relatively lower compared to non-participant borrowers. Hence, microfinance appears as an effective instrument for poverty alleviation.

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