Role of Microcredit on Poverty Reduction: A Measurement on Present On-Going Process

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Abstract: *A large labor force with limited employment opportunity in formal sector induces people to get access to the available employment opportunity in the informal sector. The Public Private Partners (PPP) programs of the country give direction of generating employment through informal sector. A significant number of non-government organization, state owned commercial bank and specialized banks, and novel laureate organization known as "Grameen Bank" have been taking initiative from the very beginning of 70's decade of last century to take out of doors a significant number of male and female labor force living in the backward place and surviving with an income in the level or below $1.25 dollar in a day. These charitable activities are required evaluation for measuring quality levels in different angles for increasing the coverage levels. Now, it is time to perform both qualitative and quantitative analysis for finding and practicing precocious model. To find the optimum precocious model the study tested three different models including CPI, inflow of remittances, number beneficiaries already participating and prevailing interest rate for every advance. The available data on these influential indicators are collected from the government published documents. These are used to check the suitability of the models. The values of criteria such as: AIC, BIC, R^2, Adjusted R^2, Cp Mallows', Durbin Watson Statistic, and one ANOVA are used to identify the best precise model. The estimated values of the co-efficient and the criteria are supporting that the models have fit up the variables significantly. The study recommends that the proper attention on the growth of the selected variable (s) can influence microcredit that will lead to a positive and higher growth in gross domestic product and eventually improve the living standard of the people.*

Keywords: Microcredit, PPP, AIC, BIC, Cp Mallows'.

1. Introduction

Microcredit is one of the tools amongst the others available tools for reducing poverty creating scope for employment opportunities. This tool usually addresses the people having low income and living in the backward places, where means of arranging sustainable living standard is very limited.

In Bangladesh more than 1000 microfinance institutions, government owned commercial bank (SOCB), private commercial bank and several departments under different ministries, and non-government bank limited are extending micro lending through the country as a part of public private partnership programs. More than about several millions are included in the programs to graduate to mainstream economic activities from the upper and lower poverty lines. It is mentioned by researchers that micro credit has been identified as a successful program under certain limitations such as: interest rate, marketing of product, fixation of EMI, accounting interest rate following flat or declining balance method. Taking those constrains SOCB, Gram men Bank, microfinance institutions and government departments are operating the programs. Because, the tools have been found capable to generate savings that and forward domestic demand which induce to account higher amount of national output.

CDF (2015) mentioned that MRA has passed a regulation mentioning that an MFI can charge maximum of 27% interest on loan in declining balance method. On the other hand, GB model charge 20% interest rate in declining balance method. But, RDS, IDB bank, and government sponsored programs are outside of MRA regulation regarding the interest rate on microfinance lending.

It is also mentioned that different organizations have been supporting the credit systems applying their own strategic modus operand. This research attempted to know which model is working most effective for creation of employment opportunities. To answer this question how the output levels moving forward at the participation of beneficiaries along with other three related indicators such as: CPI, interest for advances, inflow of overseas grants, and number of beneficiary has joined in the respective programs. The study compared three models such as: grammen model, SOCB model and the model used by local microfinance institutions across the country.

The data and OLS analysis techniques are used to estimate the model selection criteria and the values of the criteria are deployed to find the best working microfinance program. The estimated values of the criteria reveals that the model used by the local microfinance institutions side by side gram men model are functioning significantly and effectively.

The whole research is presented is presented in six different sections such as: introduction, literature review, objective, data and methodology, results and analysis, and recommendations.

2. Literature Review

The draft report of NSAPR (2004) pointed that targeted poverty reduction programs imposed among others are: the provision of some initial endowment fund as grant, credit at a low interest rate, suitable repayment schedule, a spatial cushion against shocks, co-ordination among different institutions implementing poverty reduction programs to ensure efficiency and effectiveness and to avoid duplication, mobilization of domestic resources and reforms the

governance. The national strategy for accelerated poverty reduction document also pointed that the microfinance has been found as a successful program in reducing poverty in Bangladesh. In the presence of a large number of microfinance institutions and competition among them they have not succeeded in reaching the poorest of the poor at a reasonable interest rate. The issue of high interest rates and repayments procedure has been imposing burden on the recipients.

Barai, MK and Adhikary, Bisnu (2013) examines the importance of group formation, monitoring and supervision for explaining the recovery rate of microcredit. The research pointed that the socioeconomic success of microcredit was assessed on the basis of indicators of the microcredit borrowers. But the current debate on microcredit seems to understate the success.

WBG (2014) pointed that microcredit programs have been continued to creation of benefit for the poor by raising household welfare. The beneficial effects have also been remained higher for female than male borrowers. The research has found diseconomies of scale caused by higher village levels borrowing especially for male borrowers. The research also found multiple program membership which is growing with competition from microfinance institutions. But this has rather helped raise assets and net worth more than it has contributed to indebtedness.

Akter, Jannaty (2020) pointed that who have used loans for several times for several years have been able to increase their income level to a variety of extent. The research also finds that most of the borrowers stuck at bottom end of socioeconomic ladder and are struggling to manage a better living standard.

Khandker, SR (2020) pointed that microfinance is relatively cheaper than informal finance, access to microfinance is expected to reduce household borrowings from informal sources. Microfinance is also expected to increase household savings by providing an alternative facility for savings mobilization from the poor.

3. Objectives

- To find the optimum precocious model the study tested three different models including CPI, inflow international grants, and number of beneficiaries already participating at existing interest rate for every advance.
- To find the degree of relationship between the output and numbers of beneficiaries involved in the microcredit program operating under three different modalities.
- Quantification of amount of changes on output for a unit changes on CPI, number of beneficiaries involved in the program, interest rate on advances, and the inflow of overseas grants.
- To compare the amount of output through the active participation of the selected independent variables and numerical representation of the results.

4. Data and Methodology

The data on economic growth rate at current market prices, CPI (Consumer price Index), inflow of international grants, prevailing interest rate for various advance, and number of beneficiaries of different programs are collected from the government documents published by the Ministry of Planning and the publication of Bangladesh Bank. All those data are collected for the 2007-2021 periods, and the variables are taken under log transformation. To compare the performances of GB, NGO, and SOCB models multivariate models are developed including all those predictors and tested the results refereeing to the practicing values of criteria presented in the upcoming paragraphs.

4.1.1 Estimation of Parameters

Table 1: Estimates of the output model on participation of NGO beneficiary

Model	Co-efficient	Std. Error	t	Significance
Constant	3.402	0.638	5.337	0.000
Beneficiary	0.092	0.020	4.677	0.001
CPI	2.047	0.085	24.072	0.000
Advance interest rate	- 1.290	0.350	- 3.682	0.004
Inflow of Foreign grants	- 0.058	0.153	- 0.377	0.714
R^2 = 0.998; AR^2=0.997; DW=2.612; C_P Mallow's = 3 AIC = -30.485; BIC = -34.605				

Table 1 is showing the estimated values of different criterion for the model that showing relationship of output with the independent variables. All the values of the criteria excepting the values of Cp Mallows' showing very significant to point out that the selected model is very capable to fit the data.

Table 2: ANOVA table in terms NGO participation

Model	Sum of Squares	DF	Mean Sum of Squares	$F_{Calculated}$	Sig.
Regression	7.949	4	1.987	1236.123	0.000
Residual	0.016	10	0.002		
Total	7.965	14			

Table 2 showing that all the independent variables jointly and significantly influencing the output level. The values of R^2 and AR^2 are showing that that there is a rare scope to include other predictive indicators to explain the volume of output at the participation of beneficiaries working under NGO portfolio for explaining the variation in the output level.

Table 3: Estimates of the output model on participation of Grameen Bank beneficiary

Model	Co-efficient	Std. Error	t	Significance
Constant	37.801	16.304	2.318	0.043
CPI	2.832	0.258	10.975	0.000
Advance interest rate	- 2.176	0.504	- 4.315	0.002
Inflow of foreign grants	0.116	0.230	0.503	0.626
Beneficiary	- 2.296	1.097	- 2.092	0.063
R^2 = 0.996; AR^2 = 0.994; DW = 2.250; C_p Mallow's = 4 AIC = -25.969, BIC = -30.089				

Table 3 is representing the estimated values of different criteria for the model that showing relationship of output with the independent variables. All the values of the criteria excepting the value of Cp Mallows' are showing very significant to point out that the selected model is very capable to fit the data. The estimated coefficient of foreign grants showing positive but insignificant value. But the other parameters are found significant at the 5% level of significance.

Table 4: ANOVA table in terms Grameen Bank participation

Model	Sum of Squares	DF	Mean Sum of Squares	$F_{Calculated}$	Sig.
Regression	7.930	4	1.982	558.060	0.000
Residual	0.036	10	0.004		
Total	7.965	14			

Table 4 showing that all the independent variables jointly and significantly influencing the output level. The values of R^2 and AR^2 are showing that that there is a rare scope to include other predictive indicators to explain the variation in the output level at the participation of beneficiaries working under portfolio of Gram men bank.

Table 5: Estimates of the output model on participation of SOCB beneficiary

Model	Co – efficient	Std. Error	t	Significance
Constant	3.800	1.168	3.252	0.009
CPI	2.315	0.127	18.289	0.000
Advance interest rate	- 1.920	0.609	- 3.156	0.010
Beneficiary	0.004	0.021	0.167	0.871
Inflow of foreign grants	0.024	0.271	0.090	0.930
R^2 =0.994; AR^2= 0.991; DW= 1.675; C_p Mallow's = 5 AIC = -24.515; BIC =-28.635				

Table 5 is representing the estimated values of different criteria for the model that showing relationship of output with the independent variables. All the values of the criteria including the value of Cp Mallows' are showing very significant to point out that the selected model is very capable to fit the data. The estimated coefficient of inflow foreign grants is showing negative and insignificant value. But the other parameters are found significant at the 5% level of significance.

Table 6: ANOVA table in terms SOCB beneficiary participation

Model	Sum of Squares	DF	Mean Sum of Squares	$F_{Calculated}$	Sig.
Regression	7.915	4	1.979	388.498	0.000
Residual	0.050	10	0.005		
Total	7.965	14			

Table 6 showing that all the independent variables jointly and significantly influencing the output level. The values of R^2 and AR^2 presented at **Table 5** are showing that there is a rare scope to include other predictive indicators to explain the volume of output at the participation beneficiaries working under SOCB portfolio for explaining the variation in the output level. Probably, this is happening for higher delinquency rate in the disbursement process.

4.1.2 Results and Discussions

(i) Test of Autocorrelation

Statement about no autocorrelation in the disturbances is one of the assumptions of CLRM. It is ascertained by the estimated values of DW of the respective model. The model for the SOCB is showing DW= 1.642 values with the participation of same independent variables are used to compare the model with other two different models. The estimated value of DW for the model is showing doubt on the no auto correlation assumption. But the DW values of the model for GB and NGO are showing different picture which means conclusively that there is no autocorrelation in the disturbances.

(ii) Values of R^2 and AR^2

These values represents that how strongly the set of independent variables are explaining the variation in the output values. The estimated values of these criteria for all the models are showing similar behavior. Thus, it represents that the group of the independent variables has highest capacity to explain the variation in the output models.

(iii) Values of AIC, BIC, and Cp Mallows' and error variances

The values of AIC, BIC and Cp Mallows' criterion excepting the error variances showing similar behavior and are showing very significant number which represents that the models fit the data significantly. On the other hand, the value of error variance is showing little higher in the case of SOCB model. This represents that there is a scope to improve the modus of operation for the program.

(iv) Estimated values of parameter

The parameter of CPI are showing that for a unit change in CPI the resulting output are showing positive and significant values for all the models. This means, the marketing process needs to take care for improving the living standard of people. On the other hand the parameters of interest rate for advances are showing negative and significant values. This indicates that to increase the participation in the program interest rate needs to take care. The analysis are also showing that one unit change in beneficiary result positive significant values for NGO model, but the other two models are showing very in significant values.

4.1.3 Relationship amongst the program

It is attempted to find relationship of output series with the beneficiaries working under different modus of operation. The estimated results are showing that beneficiary working under GB and NGO model are positively and highly correlated with the output. The estimated values are also found highly significant. On the other hand, the beneficiary under SOCB is found weakly correlated with output level.

Table 8: Estimated labor force, employment size, and beneficiary covered by microfinance institutions, 2015-2020.

Year	Labor force	Employed Population	*Beneficiary of local NGO	Percentage of beneficiary to employed labor force
2015-16	62.1	59.5	26.43	44.44%
2016-17	63.5	60.8	26.29	43.25%
2017-18	64.9	62.1	27.77	44.72%
2018-19	66.3	63.4	27.24	42.96%
2019-20	67.7	64.7	28.73	44.40%

Source: * Bangladesh economic review, 2022.

Table 8 showing the estimated numbers of the active population of age 15+ /labor force, number of labor force accounted on formal employment for the period 2015-2020. The last column of the table is showing the number of microfinance beneficiaries' in percentage to the number of formal employments. All the data in the table is the estimated numbers. Because, the number of labor force and employed population are usually estimate through nationwide survey undertaken by the competent authority in a time interval considered suitable to the policy makers. As a result, the last column of the table estimated using the intrasurvey data and extrapolation techniques. This column expressing the total number of beneficiaries covered by the GB, NGO, SOCB and expressed it in percentage to total employed labor force size. The estimated values are showing very promising position of microfinance that it is capable to increase capacity level of the working group, increase domestic demand, increase savings, and creates formal and informal employments which ultimately increase the living standard for the people of the country.

5. Recommendations

1) Interest rates on advances should be more pertinent level so that the beneficiary can manage absolute minimum resources necessary for their well-being.
2) According to the regulations of MRA (Microcredit Regulatory Authority), MFI (Microfinance Institutions) can charge maximum of 27% interest on loan in declining balance method as practiced by the bank. GB is taking 20% applying declining balance method. To make the existing interest more comfortable, PPP programs of the government and CSR (Corporate Social Responsibility) of the company may prepare a yearly budget to extend support for the successful doers in microcredit operations. This will work in mobilizing local resources which will ultimately help them improve the living standard.
3) Microcredit for production of crops accounted for 57.85 percent to total short-term loan. To make the borrower more comfortable the superintending standard of guilds and syndicates involved in transporting products from producers to consumers should be maintained at tolerant level.

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