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# Microcredit Programs and Economic Indicators: Are the Higher Income Borrowers Better Off? Evidence from Bangladesh

Sayma Rahman*

*Microcredit program in Bangladesh provides small loans to rural people especially to the poor with the purpose of eradicating poverty. This study investigates the impact of microcredit on economic indicators of the borrowers and compares if the impact is the same across borrowers having different income levels. Household savings, assets and income are considered as causal factors that may contribute towards eradicating poverty. To estimate the impact of microcredit on such indicators we have used simultaneous equations model. Primary data has been collected from the Grameen Bank and the Bangladesh Rural Advancement Committee (BRAC) borrowers of some selected villages from three major districts in Bangladesh. The Two-Stage Least Squares (2SLS) estimation results show that the microcredit programs is effective in generating higher income, assets and savings for the borrowers in general. However, that impact is not found to be uniform across income levels of the borrowers and higher income borrowers seem to be better off compared to the middle and lower income borrowers. This study further shows that the age and education of the household head and his/her partner in the family are significant in bringing about better household impact.*

**Field of Research:** Economics

## 1. Introduction

The microcredit program in Bangladesh is a unique innovation of credit delivery technique to enhance income generating activities. Its uniqueness is reflected in its collateral-free group-based lending strategy (Hulme and Mosley, 1996; Yunus, 1999; World Bank, 1994). The program extends small loans to poor people, mainly women, for self-employment activities thus allowing the clients to achieve a better quality of life (Hussain, 1998; Morduch, 2000; Rahman, 1995). It is the most sensational anti-poverty tool for the poorest, especially for women (Micro-credit Summit 1997). Microcredit in Bangladesh has drawn attention of researchers throughout the world because of its distinctive credit delivery system, high recovery rate and its special focus on women. The Grameen Bank - the largest microcredit institution - and the Bangladesh Rural Advancement Committee (BRAC) - the largest non-governmental organisation (NGO) - are the pioneers of microcredit in Bangladesh for almost three decades.

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* Sayma Rahman, University of Western Sydney, Australia
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The impact of microcredit on poverty alleviation is so far found to be controversial in the literature. Several studies have found that microcredit program has a positive impact on eradicating poverty (Hossain, 1988; Khandker, 1998; Wahid, 1993; Yaron, 1994) but other studies, for example Morduch (2000), Weiss and Montgomery (2005), report a negative impact. To substantiate such a controversy, it is important to assess the impact of microcredit programs on economic and/or household indicators of the borrowers. In doing so, *first,* it is necessary to identify factors that are essential measures/indicators of poverty *second,* to find out whether these factors are ultimately affected by these microcredit programs and finally, to compare the impact across borrowers with different income-levels.

Khandker (2000) considers *savings* as an indicator and finds that this factor has an influence on eradicating poverty. He argues that credit programs do stimulate savings because microcredit borrowers make mandatory savings every week, which they are entitled to withdraw at the end of their membership. In addition, he finds microcredit program has a positive impact in generating not only voluntary savings but also additional savings among the borrowers. Apart from savings, it can be argued that there are other factors that may contribute towards eradication of such poverty. For example, *income* and *accumulation of assets* of the household may be considered as additional causal factors. It is likely that with the introduction of microcredit programs, borrowers may have better income, better savings and more assets. In this backdrop, it is necessary to analyse how these microcredit programs can influence income, savings and assets for the borrowers.

In this study we have investigated the impact of microcredit on household indicators using the simultaneous equations model suggested by Pitt and Khandker (1996). The Two-Stage Least Squares (2SLS) estimation is used to estimate the model. We also have divided the borrowers into three groups based on their income level to assess the impact on borrowers from different income groups. The underlying research question for this study is as follows: “Do the microcredit programs in Bangladesh improve the savings, income and assets of the borrowers?” In order to examine this we have used primary data from the borrowers of the two major institutions, the Grameen Bank and the BRAC.

The rest of the paper is structured as follows. Section two provides the background literature. Section three describes the data and its sources. Section four specifies the model. The results are discussed in Section five. A conclusion is drawn in the final section.

## 2. Background Literature

Microcredit program have appeared in the literature as a popular source of financing that provides small loans in rural and remote regions of developing countries (Bornstein, 1998; Johnson and Mosley, 1997; Zeller and Sharma, 2000). As far as developing countries are concerned, Bangladesh may be considered as the pioneer that started this financial innovation that provides loans to the poor especially to women engaged in self-employment projects allowing them to generate income and in many cases, begin to build wealth and eliminate poverty (Hulme and Mosley 1996; Yunus 1983; World Bank 1994).

World Bank (Microcredit Summit 1997), classified the microcredit program in Bangladesh as one of the most effective anti-poverty tools for the poorest. The program extends small loans to unemployed poor people that are not bankable. These individuals lack collateral, stable employment and therefore cannot meet even the most minimum qualifications to gain access to formal credit.

Since loans are provided in a group, according to Stiglitz, (1993); Varian, (1990); and Ghatak (1999), the members in a group are well placed to umpire the creditworthiness and to scrutinise the actions of their peers, as a consequence mitigating the problems of adverse selection and moral hazard. Group lending also gives incentives to the members to avoid excessively risky projects (Stiglitz, 1993). It also provides insurance to other members in the event their projects fail (Coleman, 1999). However, mutual trust among group members created by their long association with each other provides strong inducement to self-monitoring which reduces the monitoring cost down to zero.

Several empirical studies support that credit market involvements improve both consumption and production of the poor via smoothing consumption and reducing constraints in production (Feder et al., 1988 and Foster, 1995). Even though it is evident from the literature that not all money borrowed is invested by the households, a portion of it is used for consumption. Therefore, it may be assumed that microcredit may benefit households in terms of income as well as consumption.

Many studies have attempted to measure the impact of microcredit on poverty, income, employment, contraceptive use and fertility (Hossain, 1988; Hulme and Mosley, 1996; Schuler and Hashemi, 1996). One of the limitations of these studies is that they fail to address the causality effect of program participation on the quality of life.

Existing literature on the impact of microcredit on poverty in Bangladesh provides a mixed picture. Khandker et al. (1998) have used data from three most important microcredit programs in Bangladesh namely, the Grameen Bank, BRAC and RD-12 project run by the Bangladesh Rural Development Board (BRDB). The authors have attempted to quantify the village-level impacts of these programs using OLS estimates. Their econometric analysis shows that these programs have positive impacts on income, production and employment particularly in the rural non-farm sector.

Pitt and Khandker (1998), in a separate study, have estimated the impact of participation by gender in each of the three group-based credit programs on women and men's labour supply, boys and girls schooling, expenditure and assets using *weighted exogenous sampling maximum likely-hood information maximum likelihood-fixed effects* (WESML-LIML-FE). They have found that microcredit is a significant determinant of many outcomes such as household expenditure, non-land assets held by women, male and female labour supply, and boys and girls schooling. Furthermore, credit provided to women is more likely to influence these behaviours than credit provided to men.

Apart from the studies that suggest access to credit has the potential to significantly reduce poverty (as mentioned above) others argue that microcredit has a minimal impact on poverty reduction (Morduch, 1999 and 2000; Wiess and Montgomery 2005). Morduch (2000) using the same data set but obtains very different result. Morduch's result indicates that program participants do not benefit in terms of greater consumption level, but they participate because they benefit form risk reduction.

To substantiate such a controversy, it is important to assess the impact of these credit programs on some economic indicators. In this study we used income, asset accumulation and savings patterns of the microcredit borrowers as economic indicators.

## 3. Data

In this study we used data from the borrowers of two major microcredit institutions in Bangladesh such as the Grameen Bank and the BRAC. These two large institutions have coverage all over the country. Based on different agro-climatic and socio-economic conditions we have selected three districts of Bangladesh to collect data. The districts are Gazipur, Dinajpur and Chokoria. Gazipur is close to Dhaka, the capital city and Dinajpur and Chokoria are chosen from far north and south part of the country to have different socio-economic effect. From each districts five villages are chosen at random. The borrowers are selected in a cluster from each village. The samples of borrowers are randomly selected without replacement from the list of households available from the programs' local office of each village. Randomness and socio-economic and cultural background are used as control variables to facilitate better comparison. From all three districts 387 borrowers were interviewed through a structured questionnaire.

## 4. Model Specification

The primary focus of this study is to estimate the impact of microcredit on various household outcomes such as income, assets and savings from two major microcredit institutions in Bangladesh, viz., the Grameen Bank and BRAC.

To analyse the impact of microcredit using data from borrowers of the above mentioned institutions, we have adopted the model suggested by Pitt and Khandker (1996).

Pitt and Khandker (1996) consider the credit $C_{ij}$ (endogenous variable) depends on some household characteristics, some villages specific characteristics and on some other variables. So the model used by them is:

$$C_{ij} = \alpha + \beta_c X_{ij} + \gamma_c V + \pi Z_{ij} + \varepsilon_{ij}^{C} \quad \text{.....(1)}$$

Where $X_{ij}$ is the vector of exogenous household characteristics (e.g., some demographic factors of the household), $V_{ij}$ is the vector of village characteristics (community infrastructure), $Z_{ij}$ is also a vector of a set of household or village characteristics which are different from the X's and V's in that they affect $C_{ij}$. $\beta_c$, $\gamma_c$ and $\pi$ are unknown parameters, and $\varepsilon_{ij}^{c}$ is a random error composed of three components

$$\varepsilon_{ij}^{c} = \eta_j + \mu_j + e_{ij}^{c} \quad \text{..... ..... ..... ..... ..... ..... ..... .....( 2)}$$

Where $\eta_j$ and $\mu_j$ are unobservable household-specific and village-specific effect respectively, and $e_{ij}^{c}$ is a non-systematic error uncorrelated with the other error components or the regressors.

According to Pitt and Khandker (1996), the household outcome $Y_{ij}$ (we have used 'income', 'savings' and 'assets' whereas Pitt and Khandker have used 'savings' alone) depends on amount of $C_{ij}$ as well, which may be explained as:

$$Y_{ij} = \beta_y X_{ij} + \gamma_y V_j + \delta C_{ij} + \varepsilon_{ij}^{y} \quad \text{.....(3)}$$

Where $\beta_y$, $\gamma_y$ and $\delta$ are unknown parameters and $\varepsilon_{ij}^{y}$ is the error term.

Models containing simultaneous equations are estimated through instrumental variables in general. However, maximum likelihood estimates could also be a possible alternative, which provides efficient results. In this study we have used 2SLS to estimate the above mentioned simultaneous equations model.

***Specification of the Instruments and the Variables***

In the above-mentioned model, the exogenous regressors $Z_{ij}$ are the instrumental variables. General norms of choosing instruments are to use variables, which are uncorrelated with the error term but correlated with the explanatory variables (independent variables). Vectors of the dependent and

independent variables, as well as the instrumental variables that are used in the model are specified below.

### *Description of the Variables*

In this study we consider that 'the amount of borrowing' depends on *demographic variables* such as the 'age of the male household head' and the 'age of the partner of the household head'. It may also depend on the education of both female and male household head. Unlike Pitt and Khandker (1996), we consider the number of adult male/female as a percentage of family size (MAPFS/FAPFS) instead of the number of adult male/female (ADMALE/ADFEM). Since family size is likely to vary, we consider MAPFS/FAPFS as an appropriate measure compared to ADMALE/ADFEM. We also have considered 'gender of the household head' as a determining factor of the amount of borrowing.

In relation to *village specific variables*, we consider the amount of borrowing depends on infrastructural facilities of the village such as 'electricity', 'paved roads' and 'clean drinking water'. Dummy variables are used to construct these variables. We have used the empowerment index[1], number of earners and the types of houses[2] as instrumental variables.

### *Specification of the Variables*

$X_{ij}$ = vector of demographic characteristics are:

- Number of adult females in the household (ADFEM).
- Number of adult males in the household (ADMALE).
- Number of male as percentage of family size (MAPFS).
- Number of female as a percentage of family size (FAPFS).
- Age of the female household head (AFHH).
- Age of the male household head (AHH).
- Education of the female household head (EFHH).
- Education of the male household head (EHH).
- Gender of the household (GHH).
- Land size of the household (LANDSIZE).

$V_{ij}$ = vector of village level characteristics (community infrastructure) are:

- Village has electricity (V1 =1, if there is electricity and zero otherwise).
- Village has paved road (V2 =1, if there is pave roads and zero otherwise).
- Villagers have access to clean water, arsenic free tube well (V3=1, if yes and zero otherwise).

$Y_{ij}$ = dependent variable are the sets of outcomes like:

- Income of the households.

- Assets of the households without land.
- Savings of the households.

$Z_{ij}$ = the instruments are the sets of variable other than X's and V's.

- Empowerment Index (for empowered EAI=1, and zero otherwise).
- Number of earners in the household.
- Types of houses (for household with tin/brick roofs and/or walls =1, zero otherwise).

The following table shows the correlation matrix of the variables. It is observed that most of the variables are not correlated to each other except for the 'the education and age of the male household head' and female household head'. These two variables are found to be highly co-related. To avoid the possible multicollinearity we have not used these two variables at the same time in any estimation process.

**Table 1**

**Correlation Matrix of the Variables**

| | Credit | Income | Asset | Saving | AFHH | EFHH | EHH | AHH | GHH | Land size |
|---|---|---|---|---|---|---|---|---|---|---|
| Credit | 1 | | | | | | | | | |
| Income | 0.4363 | 1 | | | | | | | | |
| Asset | 0.3268 | 0.6879 | 1 | | | | | | | |
| Saving | 0.1344 | 0.1644 | 0.1279 | 1 | | | | | | |
| AFHH | 0.2549 | 0.1519 | 0.1402 | -0.0149 | 1 | | | | | |
| EFHH | -0.0153 | 0.0158 | 0.0773 | 0.0876 | -0.2326 | 1 | | | | |
| EHH | 0.2389 | 0.1612 | 0.1354 | -0.0292 | 0.9317 | -0.1918 | 1 | | | |
| AHH | 0.0526 | 0.1059 | 0.1025 | 0.1598 | -0.1759 | 0.6447 | -0.1098 | 1 | | |
| GHH | -0.0528 | 0.0621 | -0.0906 | 0.0116 | -0.3336 | 0.1429 | -0.1381 | 0.2149 | 1 | |
| Land Size | 0.3608 | 0.5430 | 0.3875 | 0.1691 | 0.1325 | 0.0205 | 0.1622 | 0.0776 | 0.0986 | 1 |

## 4. Results and Discussion

The descriptive statistics of the dependent variables and the independent variables are provided in Table 2. Table 3 shows the impact of microcredit on household outcomes such as income, assets[3], and savings[4]. Borrowers are divided into three equal groups based on their income level. Each group contains 33.33 percent of the sample and are classified as high, medium and low income groups. Table 4 provides estimation results based on different

income group borrowers using 2SLS. White heteroscedasticity corrected standard errors are reported. STATA 8.0 is used for the estimation purpose.

***Descriptive statistics of Dependent and Independent Variables***

Table 2 provides the summary statistics of the variables. The average age of the female in the study is 37 years with the highest age of 75 years and the lowest of 16 years. The average education of the female is 4 years of schooling with the highest education to the level of a bachelor degree (14 years of schooling). Average age of the male household head is 43 years with highest of 80 and lowest of 20 years. Average education of the male household head is approximately 5 years of schooling with the maximum of a masters degree (16 years of schooling). 91 per cent of the household is headed by a male while the rest by female. Average number of adult male in the household is 1.53, while average number of adult female in the household is found to be 1.38. Average number of adult males as a percentage of family size is 29 while for female it is 27. Average number of earners in a family is 1.73 and the average family size is 5.4. Out of total sample of observations 56 percent of female are found to be empowered. Average amount of borrowing is eight thousand, seventeen taka[5] and fifty-one paisa[6] with the highest of one hundred thousand Taka. Average land size of the families is 49.68 decimals[7] with the highest of 950 decimals. Average monthly income of the household is found to be 6,743 Taka with the highest of 27,000 Taka. Average accumulated savings (amount of money in their bank account or saved at home till date) of the households is 7,126 Taka with the lowest of zero and the highest of 16,25,000 Taka. 52 per cent of the houses are found to have tin or brick roofs and/or walls and the rest are built with other endogenous housing materials such as straws, mud etc.

In this study we have estimated the simultaneous equations model to see the impact of borrowing on different household outcomes such as income, savings and asset accumulation. The equation 3 of Section 4 is estimated separately for income, savings and assets as the dependent variables. Variables (amount of credit, income, savings and assets) are log transformed. Table 3 show the impact of credit household savings, income and assets without differentiating the income level of the borrowers.

From Table 3 we see that the impact of microcredit on income is significant and positive. It implies that as the amount of credit increases, income of the borrowers also increases. Age of the male household head is found to be negative and significant. This implies that as age increases, income of the household decreases. Education of the male household head is found to be positive and significant, which means that the income of the household increases as education of the male household head increases. Number of male as a percentage of family size is also found to be positive and significant.

Table 3 further shows that the microcredit program has a positive influence in increasing the assets of a household. Age of the male household head is significant and negative on assets that has no plausible explanation for this

result. A positive and significant coefficient of education of the male household head on assets implies as education increases asset accumulation also increases. Further it shows that the microcredit program is effective in accumulating savings for the borrowers.

**Table 2**

**Descriptive Statistics of Dependent and Independent Variables**
(Figures are in years; number of schooling; Taka and in decimals in respective areas)

| Variables | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Age of the female household head | 36.88 | 10.28 | 16 | 75 |
| Education of the female household head | 3.82 | 3.28 | 0 | 14 |
| Age of the male household head | 43.02 | 10.43 | 20 | 80 |
| Education of the male household head | 4.60 | 3.90 | 0 | 18 |
| Gender of the household head | 0.91 | 0.27 | - | - |
| Number of adult males in the household | 1.53 | 0.92 | - | - |
| Number of adult females in the household | 1.38 | 0.67 | - | - |
| Number of male as a percentage of family size | 29.48 | 16.77 | - | - |
| Number of female as a percentage of family size | 27.18 | 13.78 | - | - |
| Number of earners in the household | 1.73 | 0.70 | 1 | 5 |
| Family size | 5.4 | 1.95 | 2 | 15 |
| Empowerment Index | 0.56 | 0.49 | - | - |
| Amount of borrowing | 8017.51 | 10268 | 0 | 100,000 |
| Land size | 49.68 | 94.21 | 0 | 950 |
| Income | 6743.89 | 4289.02 | 1300 | 27000 |
| Savings | 7126 | 68931 | 0 | 16,25,000 |
| Type of houses | 0.52 | 0.49 | - | - |

It may be concluded from Table 3 that the credit program is successful in increasing income, assets and saving of the borrowers. Age and education of the male household head has a significant positive impact on income and assets of the household.

**Table .3**

**Two-Stage Least Square Estimation of Amount of Borrowing on Household Outcome (Log of Income, Log of Assets and Log of Savings)**

(Figures in the parentheses show the t-value on white corrected standard error)

| Explanatory Variables | Log of Income | Log of Asset | Log of Savings |
|---|---|---|---|
| Constant | 0.14* | -7.37* | -5.85 |
| | (0.07) | (-1.68) | (-1.43) |
| Log of amount of credit borrowed | 0.95*** | 1.94*** | 1.52*** |
| | (3.74) | (3.66) | (3.13) |
| Age of the male household head | -0.012** | -0.02** | -0.003 |
| | (-2.05) | (-2.00) | (-0.39) |
| Education of the male household head | 0.022** | 0.03** | 0.019 |
| | (2.28) | (2.00) | (1.01) |
| Gender of the household head | 0.16 | 0.32 | 0.007 |
| | (1.42) | (1.13) | (0.03) |
| Number of male as a percentage of family size | 0.008*** | 0.009 | 0.006 |
| | (2.89) | (1.41) | (1.09) |
| Village has electricity | -0.20 | 0.31 | -0.19 |
| | (-1.49) | (1.09) | (-0.73) |
| Village has paved road | 0.02 | -0.031 | 0.10 |
| | (0.28 | (-0.19) | (0.64) |
| R-squared | 0.66 | 1.38 | 0.21 |
| F-statistics (7, 377) | 7.64 | 14.88 | 7.43 |
| Number of observations | 385 | 385 | 385 |

(***) Significant at 1 percent level, (**) Significant in 5 percent level, (*) Significant in 10 percent level and the t-statistics are shown in the parentheses.

### *Impact of microcredit on different income group borrowers*

Table 4 shows the 2SLS estimation of the effects of microcredit programs on various household outcomes based on different income levels of the borrowers. From the table we see that microcredit affects income positively. This can be seen from positive and significant co-efficient of credit program on income. The table also shows that the age of the male household head and gender of the household head is significant. It further shows that there is a difference in terms of impact of credit on different income groups.

Table 4 shows the high-income group borrowers are better off compared to middle and low-income group borrowers. The table further shows that as the amount of credit increases, income of the low and middle income group borrowers decreases relative to the high-income group borrowers. This is an interesting finding that confirms that microcredit is helping only the wealthier borrowers and not effective in generating higher income for the low and

middle income borrowers. It is also evident that having electricity in the village is significantly enhancing the income of the borrowers.

From table 4 it can further be inferred from positive and significant co-efficient of the amount of credit that it has a significant role in increasing household assets. Age and education of the male household head are significant. As education of the household head increases, amount of assets of the household also increases. The table further shows that credit program has a differing impact in terms of asset accumulation depending on the income level borrowers. High-income group borrowers are better off in terms of asset accumulation relative to low and middle income group borrowers. For the low and middle income group borrowers, as the amount of credit increases, asset accumulation decreases relative to high-income group borrowers.

Table 4 also shows the impact of credit on household savings. Credit program has significant impact on savings accumulation of the borrowers. However, by looking at different income level of borrowers it is observed that the impact of credit on savings does not vary between different income groups.

**Table 4**

**Two-Stage Least Square Estimation of Amount of Borrowing on Different Income Level Borrowers**

(Figures in the parentheses show the t-value on white corrected standard error)

| Explanatory Variables | Log of Income | Log of Asset | Log of Savings |
|---|---|---|---|
| Constant | 5.00*** | -4.89 | -3.86 |
| | (3.69) | -(0.96) | -(0.74) |
| Log of amount of credit borrowed | 0.455*** | 1.69*** | 1.32** |
| | (2.86) | (2.85) | (2.22) |
| Age of the male household head | -0.005* | -0.02* | -0.001 |
| | -(1.70) | -(1.73) | -(0.13) |
| Education of the male household head | 0.005 | 0.03* | 0.01 |
| | (1.18) | (1.67) | (0.55) |
| Gender of the household head | 0.18*** | 0.33 | 0.02 |
| | (3.17) | (1.25) | (0.12) |
| Number of male as a percentage of family size | 0.002 | 0.006 | 0.004 |
| | (1.53) | (0.95) | (0.61) |
| Low income dummy | -0.99*** | -0.56* | -0.39 |
| | -(13.56) | -(2.02) | -(1.40) |
| Middle income dummy | -0.51*** | -0.24 | -0.31 |
| | -(8.29) | -(1.01) | -(1.15) |
| Village has electricity | -0.12* | 0.34 | -0.16 |
| | -(1.68) | (1.19) | -(0.59) |
| Village has paved road | 0.01 | -0.03 | 0.11 |
| | (0.40) | -(0.26) | (0.74) |
| R-squared | 0.63 | 0.017 | 0.27 |
| F-statistics(9, 375) | 85.39 | 17.75 | 10.90 |
| Number of observations | 385 | 385 | 385 |

(***) Significant at 1 percent level, (**) Significant in 5 percent level, (*) Significant in 10 percent level and the t-statistics are shown in the parentheses.

## 5. Conclusion

In this study we analyse the impact of microcredit on various household outcomes such as income, assets and savings. We have modified the simultaneous equations model suggested by Pitt and Khandker (1996) in this study by assessing the impact of microcredit separately on household, savings, income and assets. We have further differentiated the impact of credit on different income level borrowers. In addition to that we also have used some refined variables to estimate the model compared to previous studies.

From the estimation it may be concluded that the microcredit program is effective in generating higher income, assets and savings for the borrowers. Our estimation also suggests that the age of the male household head has a positive impact on income and assets but not on the household savings. Education of the male household head is also an important factor in effecting income and assets positively. The household outcomes due to credit program have been different across income groups. Microcredit program helps bringing better outcomes for the high-income group borrowers compared to medium and low-income group borrowers. Income and assets decrease as amount of credit increases for the middle and low-income group borrowers relative to high-income group borrowers. This is a very important finding in terms of impact of microcredit as it shows that the microcredit program is only effective for the high income group borrowers. Our findings suggest, therefore, the low and middle income group borrowers may have to make further borrowing to pay-off their outstanding loans.

Infrastructural facilities such as electricity and paved roads in the villages are important factors for credit program to be more effective to bring about better outcomes. Also the age and education of the female household head is significant in having better household outcomes. The number of earners in a family also has a significant positive impact on household outcomes. Consistent with Pitt and Khandker (1996) our study also suggest that credit program enhances savings.

In general in may be concluded that microcredit has a pronounced positive effect on income, assets and savings of the borrowers. However, microcredit seems to be more effective for the higher-income group borrowers compared to the middle and low-income group borrowers. Microcredit is more effective for younger and educated borrowers compared to older and less educated borrowers. Infrastructural facilities facilitate household outcomes of credit program. It is also found that families having more earning members enjoy better household outcomes. Over all this study suggest that even though microcredit is an attractive tool to produce better outcomes in terms of income, assets and savings but it is more effective for relatively wealthier borrowers compared to non-wealthy borrowers. It would be a good research

question to peruse in future to uncover why this is the case. At the same time, our results suggest that there should be some adjustment to the existing microcredit programs to achieve the intended outcome, that is, to serve the purpose of those who are at the bottom of the society.

## End-Notes

[1] Empowerment index has been derived but not reported in the study and will be available from the author.
[2] The variable 'types of houses' is expressed in terms of a dummy, where the dummy is one for brick and/or tin (roofs and walls) houses and zero for non-brick and non-tin houses.
[3] Asset is defined here as values of furniture, television, radio and other household items other than land and houses.
[4] Savings is defined here as money saved by the households in banks or cash saved at home.
[5] Taka is the currency of Bangladesh.
[6] Paisa is the lowest denominator.
[7] One decimal equals 1/100 acre.

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