Women Empowerment and Credit Control
An Empirical Analysis on Credit Recipients of Grameen Bank in Bangladesh

Rafiqul Bhuyan Rafiq* , Shahnaz Abdullah and Hamid Ahmadi*****

This paper analyzes the relationship between women's decision-making regarding loan use, and their empowerment. Using a new analytical framework, it reassesses the effect of decision-making on empowerment index. It also presents the hypotheses and tests contrasting situations: decision-making by men, by women and by both together, with regard to the empowerment index. Using primary data from Grameen Bank, the pioneer of microfinance institutions, the authors conclude that women are more empowered when they are involved in decision-making, either solely or jointly with their husbands. On the contrary, when the women are not involved in the decision-making of the loan use, they are less empowered.

Introduction

The microfinance institutions, such as Grameen Bank, Bangladesh Rural Advancement Committee (BRAC), and Association for Social Advancement (ASA), have been playing a pivotal role in the poverty alleviation in Bangladesh, since the early 1970s. With the explosive growth of population and limited available resources, the country has been suffering from high rates of poverty, since its emergence as an independent country in 1971. When it comes to filling a position at any job vacancy, men applicants dominate in number and landing with a job, than women applicants. In the context of literacy, women have also been behind men. Opportunities for women, therefore, have always been limited in the past. This problem is even worse in the rural areas, which consist of over 80% of the total population of the country.

The focus of microfinance institutions is on the poor, and specially rural women, who suffer most because of economic disadvantages. Most of these women are not educated and

* Assistant Professor of Finance, College of Business Administration, California State University, Sacramento, USA. He is the corresponding author. E-mail: ahmadih@csus.edu
** Associate Professor, Finance Department, University of Dhaka, Bangladesh. E-mail: sabdullah@yahoo.com
*** Professor of Finance, College of Business Administration, California State University, Sacramento, USA. E-mail: bhuyanr@csus.edu

do not belong to wealthy families, which are the two most vital causes of their economic hardship and social crisis. Microfinance institutions realize, that money is one of the most important factors responsible for the socioeconomic problems and family crisis in the country. If these women are given the opportunity to be engaged in economic activities, and to contribute financially to the family, the men will be satisfied and will not create unnecessary family problems, like second marriage for money, physical torture, etc.

Microfinance institutions target women not only for giving them loans, so that they can provide financial asset to the family, but also to give them the opportunity to explore their own talents of doing economic activities, so that they can become an earning member of the family, like their husbands, and other working members of the family; and can remain self-sufficient in case family crisis arises in the future. In other words, women will be able to control their life, be active participants in their family, and be respected in the family—this is what we call as 'women empowerment'.

The focus of attention is women's use of the loan and ability to take decisions about her business, as the most direct impact of Microfinance Institutions' (MFI) program. Nirdhan Utthan Bank Ltd. in Nepal found that most of their women clients were taking decisions about business investments jointly with their husbands, which represents a step forward, because previously the husbands would take such decisions alone.[1] This is debatable on a number of levels. Many women who borrow money from MFIs, do not have the control over their income; and increased income does not mean increased spending power for them. The definition of empowerment differs amongst the different researchers. Some scholars suggest that increased income can be considered as an indicator of empowerment, while others claim that increased income is synonymous to empowerment (Blumberg, 1995).[2] This economic empowerment is expected to generate increased confidence, decision-making authority and other forms of empowerment for the women. Involvement in successful income-generating activities should translate into greater control and empowerment. However, many researches on micro-credit revealed mixed outcomes. In a study based on Bangladesh, about 63% of women's loans are actually invested by their male relatives, while women bear the formal responsibility of repayment (Goetz and Gupta, 1996). Out of 151 sample households of Grameen Bank loans to women, it was found that 12% surrender the entire loan to the male family members (ILO, 1998).[3] A similar study in Bangladesh by Action Aid discovered that out of 140 sample households where loans were issued to women, about 50% were used for men's productive activities. In a more recent study, of women borrowers in the Grameen Bank by Todd (1996)[4] it was found that, 10 out of 40 women in the sample, passed on all

[1] PLAN International, "Mid-term Evaluation of Nirdhan/PLAN Microfinance Program in Nepal", PLAN International, 2001, p. 37.

[2] Blumberg Ray Lesser (1995), "Gender, Micro-enterprise, Performance, and Power based Studies from the Dominican Republic, Ecuador, Guatemala, and Swaziland", pp. 194-226 in Christine E Bose and Edna Acosta Belen (eds.), Women in Latin American Development Process, Temple University press, Philadelphia.

[3] "Women in the Informal Sector and Their Access to Microfinance", paper prepared by ILO for the Inter-Parliamentary Union (IPU) Annual Conference, Windhoek, Namibia, April 2-11, 1998.

[4] Todd H (1996), Women at the Center: Grameen after One Decade, University Press Limited, Dhaka, Bangladesh.

or most of their loans to the male family members, under circumstances that gave them little control over the use of this capital.

This paper links empowerment of women and their decision making regarding the use of their loan. Further more, it focuses on the problem, of women losing control over the loan use, by addressing the issue that who actually takes the decision regarding the loan usage—only the wife (the borrower), or only the husband, or jointly by both. An empowerment index is constructed based on a series of eight equally weighted indicators for each women borrower of the sample, who are the customers of Grameen Bank. This paper reassesses the effect of decision-making on empowerment index, using a new analytical framework. It presents the hypotheses and tests contrasting situations like, men taking decisions, women taking decisions or both taking decisions, with regard to the empowerment index. It also discusses the analytical framework of the study which is used to examine the relationship between decision-making of the loan usage and women (borrower) empowerment. It presents the data, the methodology; and tests the hypotheses, by using the data collected from Grameen Bank; and finally concludes with some new insights that emerge from this exercise.

Framework for the Study

Construction of Empowerment Index

A number of indicators have been aggregated to form an index (Mizan, 1993; Hashemi et al., 1996; and Amin et al., 1998). In this study, a composite empowerment index is constructed based on the previous similar studies, conducted in Bangladesh. This particular process has been widely used for measuring empowerment in different studies related to micro-credit and women. This study follows the same approach but with variations. Hashemi et al. (1996), in their work used an empowerment index, whose weights were based on the indepth knowledge of the households in the sample villages, which was based on two years of prior anthropological research work. Without such experiences, it is not possible to arbitrarily assign weights to the different empowerment indicators. In this study, a composite empowerment index is constructed from a list of questions. The answers to these questions are coded as 1, if the response is yes and as 0, if the response is negative. The index is composed of eight empowerment indicators and is coded accordingly. For each women borrower, an individual empowerment index is constructed based on their responses (Table 1).[5]

Rationale for Selection of Empowerment Indicators

Our choice of these indicators are based on certain assumptions and hypotheses. We believe that these indicators imply women's rights and/or their abilities to exercise their will. The rationale for each of the indicators are as follows:

[5] To construct the composite empowerment index, we calculate the total score for each borrower by simply calculating the positive responses Here the total number of indicators was eight, implying that the highest score a borrower could get is eight. One point was given to each positive response. We set our cut off point around the average score of 5.

- **Mobility (MOB)**: The first indicator for empowerment is mobility. The Bangladeshi society is conservative, and the "purdah" norm keeps women more confined to the home. The concept of mobility is perceived here, as a tool to reduce the dependency of women on their male counterpart and to exercise their freedom of will.
- **Market Visit (MKTVISIT):** Here the women are asked whether they visit the market, for buying as well as for selling purpose. Similar variables have been used in earlier studies (Amin and Pebley, 1994).
- **Economic Security:** The rationale for including this indicator is to see the ability of women. Here three questions are included: first, whether the women own a house (OWNHOUSE); second, whether they have any productive asset (PROASSET), that includes cultivable land, ownership of shop or any farm nursery, etc.; and finally, whether they have any other asset like cash, jewelry, etc., which can be used as an alternative to cash (OTHERASS).
- **Ability to Make Purchases:** This particular empowerment indicator is split into two questions: ability to make small purchases (SMALLPUR) and ability to buy for herself (OWNPUR). The question regarding the ability to make large purchases has been avoided here, because it is already included as a dependent variable, 'Women taking decisions' and 'Men taking decisions' (Hashemi et al., 1996).
- **Contraceptive Uses (CONTUSE):** This explores the use of contraception before and after the loan is taken by the sample women borrowers. Here, the study tries to find out whether the women makes the choice of using contraceptive, after taking the loan (CONTUSE A), and whether they could make the same choice, before taking the loan (CONTUSE B) (Hashemi et al., 1996).

Table 1: Discussion of the Variables Used in the Present Study

	Empowerment Indicators	Variable	Description	
1	MKTVISIT (Market Visit)	Binary	Yes (1)	No (0)
2	OWNHOUSE (If she owns a house)	Binary	Yes (1)	No (0)
3	PROASSET[6] (Ownership of any Productive Asset other than House)	Binary	Yes (1)	No (0)
4	Own Asset[7] (If she owns any asset)	Binary	Yes (1)	No (0)
5	SMALLPUR (Small Purchases)	Binary	Yes (1)	No (0)
6	OWNPUR (Ability to purchase for herself)	Binary	Yes (1)	No (0)
7	CONTUSE B (Use contraceptive before loan)	Binary	Yes (1)	No (0)
8	CONTUSE A (Use contraceptive after loan)	Binary	Yes (1)	No (0)

[6] A recurring income may accrue from ownership of any asset.
[7] Like jewelry, cash, etc.

Data and Model Specification

An econometric framework is developed to reassess the relationship between women's empowerment and participation in micro-credit programs in rural Bangladesh, using latest data, from the Grameen Bank. The survey for this research was conducted during 2000 and 2001, on 100 individual borrowers randomly selected from three villages in the Comilla district, who are participants of the credit programs of the Grameen Bank. The names of the borrowers are obtained from the offices of BRAC and the Grameen Bank in the aforementioned district. Semi-structured questionnaire is used to gather information from the borrowers.

The dependent variable is the empowerment index (EMP), constructed on the basis of eight individual empowerment indicators. There are three categories: man taking decision, woman taking decision, and both (men and women together) taking decision.[8]

The hypotheses are based on the mean of EMP for these three categories, P_0, P_W, and P_T. The global null hypothesis is that all the three are the same: $H_0^1: P_0 \quad P_W \quad P_T$, i.e., the mean of empowerment index is same for all the three groups. This imposes two linear restrictions on the means. However, these restrictions can be made up of two orthogonal contrasts.

The first is $H_0^2: P_0 \quad \frac{1}{2} \quad P_W \quad P_T$, or (1) $P_0 \quad \frac{1}{2} \cdot P_W \quad \frac{1}{2} \cdot P_T \quad 0$.

In this case, men taking decisions is not different from joint decision-making (men and women together) and women only taking decision. In other words, if the men take decisions about the loan usage, the impact on the empowerment index will be same as when women take decision, either solely or jointly with the men.

The second is $H_0^3: P_W \quad P_T$ or $0 \quad P_M \quad 1 \quad P_W \quad 1 \quad P_T \quad 0$.

In this case, decision-making of individual women or jointly with men have the same impact on the empowerment index. From our explanatory perspective, we expect to reject H_0^1, which implies that all mean are same, and find that H_0^3 cannot be rejected, but the real source of overall differences in means lies in the falsity of H_0^2. This may be interpreted as women's involvement in decision-taking either solely or jointly, have similar impacts on empowerment index, but this is different from the situation when the men take the decision alone. We set-up dummy variables for the three groups:

- D_w = if women decide solely, zero otherwise;
- D_T = if men and women decide together, zero otherwise; and
- D_m = if men decide alone, zero otherwise.

[8] Here we mean that men and women are taking decision jointly.

A fitted unrestricted model is formatted as follows:

$$EMP = \beta_0 + \beta_1 D_W + \beta_2 D_T + e \quad ...(1)$$

and note that $\begin{matrix} \mu_M = \beta_0 \\ \mu_W = \beta_0 + \beta_1 \\ \mu_T = \beta_0 + \beta_2 \end{matrix}$

From this, we can calculate the Residual Sum of Squares, and call it RSSu. Now to explore H_0^2, we impose the restriction that $\mu_M = (\mu_W + \mu_T)/2$. This is equivalent to, $\beta_1 + \beta_2 = 0$ or $\beta_2 = -\beta_1$. This we fit in the restricted model given by equation (1) and we derive,

$$EMP = \beta_0 + \beta_1 D_W - D_T + e \quad ...(2)$$

This amounts to the same as defining a new variable, Z, where, $Z = D_W - D_T$, taking on values –1, 0, +1 and fitting the regression as follows, we get:

$$EMP = \beta_0 + \beta_1 Z + e \quad ...(3)$$

We find the Residual Sum of Squares from this model and call it RSS_1. Now to explore H_0^3, first we impose the restriction $\mu_W = \mu_T$, or $\beta_1 = \beta_2$. Note that, this and the restriction $\beta_1 = -\beta_2$, together imply the global hypothesis set of two restrictions $\beta_1 = \beta_2 = 0$. Thus, we fit the model as:

$$EMP = \beta_0 + \beta_1 D_W - D_T + e \quad ...(4)$$

This amounts to the same as defining a new dummy variable, W, where, $W = D_W - D_T$, taking value 1, if either women or women and men are combined, and zero otherwise. Fitting the regression as follows:

$$EMP = \beta_0 + \beta_1 W + e \quad ...(5)$$

Then, we find the Residual Sum of Squares from this model and call it RSS_2. Finally, for the global hypothesis, H_0^1, we fit a completely restricted base model with $\mu_M = \mu_W = \mu_T = 0$, or $\beta_2 = \beta_1 = 0$. Note that, this imposes two restrictions, and is the null model as all three mean are the same. It is implied by two sub-restrictions. The model fitted is similar to an intercept like:

$$EMP = \beta_0 + e \quad ...(6)$$

And then we find the Residual Sum of Squares from this model and call it RSS_r. This is the same as Total Sum of Squares (TSS).

Results of the Tests

The Global Hypothesis: $H_0^1: \mu_M = \mu_W = \mu_T$ is a test of the completely restricted model, with similar slope parameters, as against the original unrestricted one, with three different parameters. The test statistic is:

$$F_{2,n-3} = \frac{(RSS_r - RSS_u)/2}{RSS_u/(n-3)} \quad ...(7)$$

here, No. of restrictions = 2

RSS_r = Residual Sum of Squares from Restricted Model

RSS_u = Residual Sum of Squares from Unrestricted Model

To test H_0^2 that is the restriction $P_M = \frac{1}{2}(P_W + P_T)$ or $E_1 = E_2$.

We use the test statistic, $F_{1,n-3} = \frac{(RSS_1 - RSS_u)/1}{RSS_u/(n-3)}$ ...(8)

To test H_0^3 that is, the restriction $P_W = P_T$ or $E_1 = E_2$

We use the test statistic, $F_{1,n-3} = \frac{(RSS_2 - RSS_u)/1}{RSS_u/(n-3)}$ ...(9)

In testing the global hypothesis, the following unrestricted model is used

$$EMP = E_0 + E_1 D_W + E_2 D_T + e \quad ...(10)$$

Table 2 presents the above mentioned unrestricted model, where, WOMEN01 = D_w, D3BOTH = D_t. We use ordinary least square method of estimation. We replace the result in equation (7) and get:

$$F_{2,n-3} = \frac{(RSS_r - RSS_u)/2}{RSS_u/(n-3)} \quad ...(7)$$

where, RSS_u is 263.1083, RSS_r = TSS = 327.155.[9] Incorporating the values in equation (7), we get:

Table 2: Factors Affecting Empowerment Index (Unrestricted Model)

Dependent Variable: Empowerment Index

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D1_WOMEN01	2.333333	0.519172	4.494336	0.0000
D3BOTH	1.175000	0.503490	2.333712	0.0219
C	4.000000	0.421777	9.483677	0.0000
R-squared	0.195770	Mean of Dependent Variable		5.377778
Adjusted R-squared	0.177282	SD of Dependent Variable		1.917265
SE of Regression	1.739032	Akaike Information Criterion		3.977300
Residual Sum of Squares	263.1083	Schwarz Criterion		4.060627
Log likelihood	–175.9785	F-statistic		10.58900
Durbin-Watson Statistic	1.475351	Prob. (F-statistic)		0.000077

[9] $R^2 = 1 - \frac{RSS}{TSS}$ again, $TSS = \frac{RSS}{1 - R^2}$,

$$F_{2,87} \quad \frac{(RSS_u - RSS_1)/2}{RSS_1/87} = \frac{64.04/2}{263.11/87} = 10.59$$

At 5% level of significance the critical value is $F_{2,87} = 4.98$. The computed value is more than the critical value and thus, we can reject the hypothesis.

It can be concluded that for Grameen bank, there is evidence that the impact on the empowerment index is different for the three groups: men, women and men and women together, at 5% level of significance.

Table 2 also indicates that if women take decisions about the loan usage individually, the possibility that the women are empowered, is highly significant. Again if women take decisions about the loan usage jointly with their husbands, the possibility that the women are empowered, is also significant.

To test the second hypothesis restriction, we use $\frac{1}{2}(\beta_M + \beta_W) = \beta_T$ or $\beta_1 = \beta_2$.

EMP $= \beta_0 + \beta_1 D_W + D_T + e$ where, $D_w - D_t = Z$.

In Table 3, Z_DW_DT_01=Z, and from Table 2, we have $RSS_1 = 304.6867$, $RSS_U = 263.1083$.

$$F_{1,n-3} \quad \frac{(RSS_1 - RSS_u)/1}{RSS_u/(n-3)} = \frac{304.6867 - 263.1083}{263.1083/90-3} = 13.74$$

The critical value is 3.96 (approx.) at 5% level of significance. Since the computed value is more than the critical value, we reject the hypothesis. It can be concluded that for the Grameen Bank, the test result shows that the impact of men's decision-making on empowerment index, is significantly different, when women are involved in the decision-making (either individually or jointly with the men).

In testing H_0^3, we first impose the restriction $\beta_W = \beta_T$, or $\beta_1 = \beta_2$. This amounts to the same thing as defining a new dummy variable, $W = D_W + D_T$ taking on a value 1, if either women or women and men jointly take decision, and zero otherwise, and fitting in the regression equation we get, EMP $= \beta_0 + \beta_1 W + e$

Table 3: Testing the Second Restriction

Dependent Variable: Empowerment Index

Method: Ordinary Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Z_DW_DT_01	0.561409	0.220381	2.547445	0.012600
C	5.427681	0.197115	27.53562	0.000000
R-squared	0.068679	Mean of Dependent Variable		5.377778
Adjusted R-squared	0.058096	SD of Dependent Variable		1.917265
SE of Regression	1.860739	Akaike Information Criterion		4.101796
Residual Sum of Squares	304.6867	Schwarz Criterion		4.157347
Log likelihood	–182.5808	F-statistic		6.489477
Durbin-Watson Statistic	1.479297	Prob.(F-statistic)		0.012588

where, W = DTTOGETHER in Table 4.

To test H_0^3, that is, the restriction $P_W = P_T$ or $E_1 = E_2$, RSS_2= 287.3699. Using the value in the equation, we find $F_{1,87} = \frac{(287.3699 - 263.1083)/1}{263.1083/(90-3)} = 8.02$. The critical value at 5% level is 3.96 (approx.), so, we reject the hypothesis, as the computed value is more than the critical value.

We can conclude from the present study of Grameen Bank, that the impact of decision-making of individual women in explaining empowerment, is significantly different from the impact of men and women taking decision together.

Table 4: Testing the Third Restriction

Dependent Variable: Empowerment Index

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DTTOGETHER	1.698630	0.486648	3.490472	0.0008
C	4.000000	0.438283	9.126519	0.0000
R-squared	0.121611	Mean of Dependent Variable		5.377778
Adjusted R-squared	0.111629	SD of Dependent Variable		1.917265
SE of Regression	1.807088	Akaike Information Criterion		4.043282
Residual Sum of Squares	287.3699	Schwarz Criterion		4.098833
Log likelihood	–179.9477	F-statistic		12.18340
Durbin-Watson Statistic	1.406068	Prob. (F-statistic)		0.000756

Concluding Remarks

Access and control over financial resources is essential for women's involvement in decision-making about the loan use, either individually or jointly with the men, and this is imperative for their empowerment. In this paper, we set up a new approach in order to explore the impact of women's decision-making regarding the loan use, on their empowerment. We hypothesize that women's involvement in decision-making and men's decision-making about the loan use (without consulting their wives), have the same impact on women empowerment. In other words, if the men take the decisions about the loan use, the impact on empowerment index is the same, as when women take decisions either solely or jointly with the men. Using primary data collected from the Grameen Bank, we refute the hypothesis and conclude that women involvement in decision-making either jointly or independently, is significant for their empowerment. The dependent variable is empowerment index (EMP), constructed on the basis of eight individual empowerment indicators. There are three explanatory variables, that is, the categorization of the dummy variables for three groups of sample: man taking decision, woman taking decision and both taking decision together.

The test results show that for the borrowers of Grameen bank, there is a considerable evidence that the impact of men decision-making on empowerment index is significantly different from the impact of women involvement in decision-making (either individually or jointly with the men). They also indicate that if women take decisions about the loan use individually, the possibility that women are empowered is higher relative to men taking

individual decisions about the loan use. Even if women are involved in decision-making as joint decision-makers, they are more empowered relative to the condition, where men are the sole decision-makers.

We would therefore infer from the hypothesis testing, using data from the Grameen Bank, that those women who pass the full control of decision-making regarding the loan use to their husbands are less empowered, than the women who take independent or joint decisions about the loan use.

We construct our empowerment index as a composite index of a number of indicators. The results show that women's independent decision-making increase women's empowerment. We can wrap up the analysis by saying that the women who take independent decisions about the loan use, are also able to take decisions about mobility, economic security, small purchases and contraceptive use.[10] Again, the women who pass the decision-making authority about the loan use to their husbands, are less likely to take decisions regarding these factors.

In order of empowerment, the women who are independent decision-makers of their loan use are most empowered, then the ones who are joint decision-makers; and those who have no decision-making power are least empowered. Thus, it is important for the women to involve in decision-making, either individually or jointly about the loan use, in order to be empowered, through the use of micro-credit. If women pass on the full control of the loan use to their husbands, they are less likely to be empowered. Y

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[10] The Empowerment index is composed of these indicators.