

A Human Development Approach to Sustainable Financial Inclusion: The Case of Microfinance in Rural Bangladesh

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Human development typically refers to the set of opportunities that allow individuals to flourish in their lives. This study explores whether the provision of human development opportunities such as education and primary healthcare contributes to economic well-being among poor households who obtain microfinance loans. Using panel data from over 1,700 households in rural Bangladesh, this study analyzes the interaction effect between credit and human development opportunities. The findings suggest that when access to credit is coupled with conditions for human flourishing, household earnings are further enhanced.

Keywords: sustainable financial inclusion, human development approach, freedoms, material well-being, poverty, microfinance, Bangladesh

INTRODUCTION

According to the United Nations Development Programme (UNDP), people and their capabilities should be the most important criteria for evaluating the development of a country and not economic growth exclusively (UNDP, 2018). To assess human development, the Human Development Index was created to measure achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a good standard of living. In light of the perceived importance of human development in ascertaining a higher standard of living, the fundamental research questions addressed in this study are whether access to microfinance makes a positive contribution to “a decent standard of living”, and whether the provision of capabilities in the form of primary healthcare, basic literacy, marketing training, skill training and other services is important for the economic success of microfinance borrowing households in Bangladesh.

The conventional view that income or expenditure growth leads to development is not in itself flawed since higher income and expenditures allow an individual to consume more and thus improve her living conditions. However, this view can be limited in scope since such goals should be viewed as a means to development but not an end in itself. According to Sen (1999), a view of development that relies solely on the increase of incomes would be a narrow view of development and would fail to measure development in terms of what individuals are able to do and the freedoms they enjoy (Sen, 1999: 3). Development, according to Sen, requires the removal of the major barriers that cause “unfreedoms” such as tyranny, poor economic opportunities, systematic social deprivation, neglect of public facilities, as well as oppression (Sen, 1999: 3).

In light of Sen's capability approach (CA), this study bridges a gap in the literature on microfinance and the CA by tracing the effect of sustainable financial inclusion and household material well-being. Sustainable financial inclusion for the purpose of this study is defined as small-scale credit that is combined with human development opportunities (i.e. a capability set). In this study, the aim is not to measure how freedoms or human capabilities are expanded by microfinance but rather how the co-existence of human development opportunities (i.e. capability set or freedoms) and access to microfinance enhance economic outcomes for poor households. In this framework, the effectiveness of microfinance loans in creating economic development is conditional upon the presence of human development opportunities.

The findings in this study show that financial inclusion in combination with the provision of human development opportunities, are instrumental in expanding economic achievement for individual households. To my knowledge, this is the first empirical analysis of microfinance programs in the realm of the CA framework.

Sen's Capability Approach

Amartya Sen received the 1998 Nobel Prize in Economic Sciences for his work on welfare economics and social choice theory, and for his focus on finding solutions to the problems associated with poverty and food shortages. Sen's most influential book, *Development as Freedom*, was published in 1999 and since then, it has been cited by many scholars, particularly, in the field of development economics. Sen's unique view about what should be the main goal of development is centered on a bottom-up approach to economic and human development. His capability approach is based on the idea that people should be able to live the life they choose and value and should have the "capability" and/or "freedom" to do so in the absence of socially imposed deprivations. In this context, an example of a capability would be access to food or freedom from hunger. Sen would argue that access to food is a basic human right and would enable people (make them capable of) to become nourished and productive members of society.

According to Sen, the expansion of freedom should be both the primary end and the principal means of development. Furthermore, he believes that development should aim to remove the kinds of "unfreedoms" that prevent people from having choices and opportunities to exercise their reasoned agency. In this context, Sen contends that true development is that which removes substantial unfreedoms (Sen, 1999, p. xii).

Sen argues that social opportunities of education and health care complement individual opportunities of economic and political involvement as well as the chances of overcoming deprivation. In this sense, the process of development should aim at providing these social opportunities as a point of departure (Sen, 1999, p. xii).

Sen's CA approach is especially relevant to the use of microfinance as a tool for development. The present study suggests that the provision of social and economic opportunities would complement access to credit by allowing poor borrowers to fully utilize the funds in a manner that would be efficient and beneficial to income growth and individual empowerment.

Substantive and Instrumental Freedoms

Sen identifies two broad categories of freedoms. The first group comprises the substantive freedoms. Included in this category are elementary capabilities such as being able to avoid deprivations like starvation, undernourishment, escapable morbidity, premature mortality and the freedoms that are related to being literate and numerate and having freedom of the press and speech (Sen, 1999, 36). The other freedoms are placed in the instrumental freedoms category. There are five distinct types of freedoms in the instrumental freedom category that are comprised of rights and opportunities that help advance the general capability of an individual. Instrumental freedoms include political freedoms, economic facilities, social opportunity, transparency guarantees and protective security. These freedoms, Sen argues, are not only the primary ends of development but they are in essence its principal means. In this context, the instrumental role of freedom is related to the way different types of rights, opportunities and entitlements

contribute to the expansion of overall human freedom and thereby promote development (Sen, 1999, p. 10, 37).

LITERATURE REVIEW

Capability Approach: Empirical Evidence

Sen's version of the Capability Approach was developed to provide a normative framework for policymakers to assess well-being and the process of economic development (Robeyns, 2006, p. 352). In this context, development is measured in terms of whether there has been expansion of human ability and enhancement of freedoms that would allow individuals to live the life they choose and value (Stewart & Deneulin, 2002, p. 64).

There are few empirical studies on the CA framework. Such studies focus on issues such as the ability of people to utilize the opportunities that are available to them and the incorporation of socio-economic and environmental factors. One study used data from the British Household Panel Survey combined with a list of values outlined by Martha Nussbaum to operationalize and test the CA. The authors found that many capabilities exhibit statistically significant relations to well-being (Anad, *et al*, 2008).

Another study examines how Sen's approach to welfare measurement can be implemented to account for poverty and inequality in affluent societies. The study develops econometric techniques to measure the concepts of functionings and capability and show how these statistical models can be useful in monetary analysis with respect to capability-deprived individuals (Kuklys, 2005).

In recent studies, researchers have also incorporated the idea of 'technology' in the CA (see Anderson & Hatakk, 2013, p. 288; Heeks & Molla, 2009, pp. 33-40; Oosterlake & van den Hoven, 2012, p. 7). These studies investigate the role of technology in development, economic growth and how technology is valued by individuals (see Birdall, 2011; Johnstone, 2007, Ranis & Zhao, 2013, pp. 468, 469). A more recent study contributes to the theoretical development of the CA by making the case for the explicit inclusion of technology in the CA framework. The authors argue that access to technology have a generative and transformative dimension that directly contribute to capabilities and functionings (Haenssge & Proochista, 2017).

Microfinance in Bangladesh

Despite the documented impact microfinance has had on poverty alleviation and the considerable progress Bangladesh has made in reducing poverty during the 1980s and the 1990s, the country is still among the poorest countries and a significant percent of the population still lives below the national poverty line (World Bank, 2018).

In Bangladesh, as well as in other countries, microfinance programs are typically targeted towards poor women who are self-employed in the informal sector. Microfinance involves small-scale credit and savings transactions that allows the poor to obtain start-up capital with little or no collateral in place. Some microfinance programs also provide education and working skills to women and the poor in order to improve production capabilities and decision-making.

A number of microfinance institutions (MFIs) and non-governmental organizations (NGOs) lend predominately to women. About 97 percent of Grameen Bank's seven million borrowers are women (Grameen Bank). Other major microfinance programs such as FINCA and ACCION also lend predominately to women (Mix Market, 2018). Many MFIs and NGOs lend predominantly to rural women because, on average, they are perceived to be poorer than men (see Burjorjee *et al.*, 2002).

In rural Bangladesh, microfinance is given to poor rural women because women tend to be excluded from formal banking and the labor market (see Schuler & Hashemi, 1995 and Abdullah & Zeidenstein, 1982). Additionally, given Bangladesh's system of 'purdah,' "a system for the seclusion of women" (Khan, 1988, p. 33), many rural women are not encouraged to be educated and they do not own land or borrow from the formal sector without their husband, (Papa, *et al.*, 1995).

Microfinance: Empirical Evidence

Although the link between microfinance as an instrumental freedom has not been made formally, there are studies that suggest that access to microfinance is beneficial in expanding instrumental freedoms and capabilities. Pitt and Khandker (1998), for instance, examined the relationship between microcredit and labor supply and schooling by girls (both which would fall in the realm of capabilities and functionings as defined by Amartya Sen). Their findings suggest that microcredit has a positive impact on women's labor supply and that participation in the Grameen Bank credit program has a positive impact on schooling by girls. Another study that indirectly links the relationship between human development and microcredit is that of Gertler et. al. (2003). In this study, the results suggest a significant positive correlation between microfinance, household consumption and health. Other more recent studies find evidence of the role of microfinance in empowering women. Mahmood et al., (2014) for instance, found that access to finance promotes female entrepreneurship and is instrumental in helping them realize their goals.

Kaboski and Townsend (2005) is one of the few studies that considers how financial intermediation provided by MFIs and their institutional policies (or within the context of the present study, human development opportunities) impacts social and economic development. Their study used variation in policies and institutional characteristics to evaluate the impacts of microfinance institutions at the village-level in rural Thailand. They used a two-staged LS and MLE test of microfinance impact on asset growth, level of consumption/input use, probability of being a business owner, probability of being a rice farmer, and probability of borrowing from a money lender. They found that institutions with good policies (such as providing services to borrowers) can promote asset growth, consumption smoothing, occupational mobility and can decrease moneylender reliance.

Similar to Kaboski and Townsend (2005), this study begins with exploring whether good policies and/or opportunities, such as those that are expected to enhance the defined capabilities or freedoms described by Amartya Sen, have any effect on household per capita income. To do this, the regressions include dummy variables representing the various human development opportunities provided to households that borrow from the Grameen Bank, BRAC and RD-12 microfinance programs in Bangladesh.

DATA

This study uses quasi-experimental surveys from the World Bank for the periods 1991/92 and 1998/99. This older dataset is ideal for this study compared with more recent data because finance money is fungible. In this context, the three microfinance institutions in the survey had strict rules that required loan money be used for production purposes only and that borrowers abstain from borrowing from other programs. This strict requirement contributes to the efficiency of the estimates. With the significant increase in microfinance providers after the current survey period, it is more likely for exogenous injections of money to obscure impact findings. The surveys include 1,798 households from 87 villages in 29 thanas in Bangladesh. A thana is an administrative unit that is smaller than a district and consists of a number of villages. The surveys were conducted by the Bangladesh Institute of Development Studies (BIDS) and the World Bank to facilitate analysis of three major credit programs: The Grameen Bank, the Bangladesh Rural Advancement Committee (BRAC), and the Bangladesh Rural Development Board's (BRDB) Rural Development-12 project. Program and non-program villages were surveyed. To identify target and non-target households, an exogenous eligibility criterion for microfinance participation was used. This methodology also addresses self-selection issues. To participate in microfinance programs, a household could only own a half an acre of land or less.

A total of 29 thanas were covered. From these thanas, 24 were program thanas and 5 were non-program thanas. The survey thanas were drawn from 391 rural thanas out of 460 thanas. Three villages in each program thanas were randomly selected from a group of program villages where a program had been in operation for at least three years. Three non-program thanas were also surveyed. These villages were drawn from the village census of the Government of Bangladesh. Table 1 in the Appendix exhibits the

summary statistics from the sample. Only households that were available for the 1998/99 resurvey were included in the analysis. As we can observe, household per capita income increased dramatically over the two periods and so did lending to women from the Grameen Bank.

In terms of the human development opportunities offered by the three microcredit programs, the opportunities are in the categories of education and healthcare which fall in the realm of the basic human assets defined by the UNDP and the substantive freedoms described by Sen (1999). In the sample, not every household received human development opportunities. For the Grameen Bank, 67% of the households received skill training in 1998/99 and over 60% received basic literacy in both periods. The Grameen Bank also provides primary healthcare to its borrowers and over 50% of the borrowers received this service in both periods. BRAC and (BRDB) RD-12 also provide human development opportunities but household coverage is under 50% for most services (see Table 2 in Appendix).

ESTIMATION STRATEGY

Model I: Policy Impact on Household Economic Outcome

The functional form of the estimated income equation is based on the foundations of the Household Production Function (HPF) of Becker (1965). A reduced form equation is used to relate household per capita income (outcome variable) to the household's production inputs, namely, the endowment of assets, microcredit, human development opportunities and other household characteristics that can affect the outcome variable.

The estimation method begins with an income equation that relates income y_t in year t to the household's assets and characteristics X , the amount of loan received M , and a random error ε :

$$y_{ijt} = \beta_1 X_{ijt} + \beta_2 M_{ijt}^F + \beta_3 M_{ij(t-1)}^F + \beta_4 M_{ijt}^M + \beta_5 M_{ij(t-1)}^M + \beta_6 Z + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is household i per capita income in village j , at time t which is assumed to depend on household characteristics and current and past borrowing. X is a vector of household assets and characteristics. M^F and M^M are vectors of current and past microfinance received by female and male borrowers from different programs. Parameters β_2 , β_3 , β_4 and β_5 measure the effects of current and past credit (stock) for loans given to female and male borrowers by each of the microfinance programs.

The term Z is a vector of the various human development opportunities provided by each MFI and the parameter β_6 captures the effect these opportunities have on the household's ability to generate income. Z is a dichotomous variable that equals one when the household has access to the human development opportunity and zero when it does not.

According to equation (1), the marginal return to per capita income in any given time period is the combined returns from past credit and current credit. The model assumes that even if current credit is zero, that is, the household did not borrow in period t , past credit $t-1$ can still have an effect on income. Structuring the model in this way allows for differential impacts from borrowing over time.

Impact evaluation studies face empirical challenges that arise from endogenous participation in development programs. These methodological issues include program placement bias and household selection bias (Pitt, et. al., 1993; Ravallion, 1999). A household selection bias occurs if participation in the program is correlated with unobserved individual characteristics (Hsiao, 1986). If equation (1) is estimated using a cross section model such as Ordinary Least Squares (OLS), the estimate could potentially be biased by exogenous factors that will also affect household and village level income. To eliminate the potential biases, panel data is used and, the income equation is expanded to capture household and village level unobserved heterogeneity. The income equation is rewritten:

$$y_{ijt} = \beta_1 X_{ijt} + \beta_2 M_{ijt}^F + \beta_3 M_{ij(t-1)}^F + \beta_4 M_{ijt}^M + \beta_5 M_{ij(t-1)}^M + \beta_6 Z + \varphi_{ij} + \mu_j + \varepsilon_{ijt} \quad (2)$$

where φ_{ij} is the household unobserved effect, which include household characteristics such as managerial ability, land quality and μ_j is the village unobserved effect that captures external factors such as local conditions or the presence of other government programs. The error term is ε_{ijt} . To estimate the above equation, a household fixed-effect (FE) estimator is used.

Model II: Analysis of Interaction Between Microcredit and Human Development Opportunities

To account for the correlation between access to credit and the provision of human development opportunities, interactions in a multiple linear regression (MLR) model are used. To measure the effect of microcredit when human development opportunities are in place, the regression model in equation (2) is expanded to include interaction terms. According to Greene (2003, p. 123-124), a model relating household income, Y , to microcredit M and the simultaneous provision of human development opportunities Z can be specified as follows:

$$Y = \beta_1 + \beta_2 M + \beta_3 Z + \beta_4 MZ + \varepsilon \quad (3)$$

The hypothesis to be tested here is whether an increase in Y (income) is associated with M (micro loans) when condition Z (existence of human development opportunities) is met. To explore possible associations between the policies of the three microfinance programs, similarly to equation (2), an income equation is used relating income y_t in year t to the household's asset endowment and characteristics X , the amount of loan received M , the services provided by the MFIs Z and a random error ε . When interaction terms are added to account for the association between credit and the human development opportunities provided by the MFI, equation (2) becomes:

$$y_{ijt} = \beta_1 X_{ijt} + \beta_2 M_{ijt}^F + \beta_3 M_{ij(t-1)}^F + \beta_4 M_{ijt}^M + \beta_5 M_{ij(t-1)}^M + \beta_6 Z + \beta_7 M_{ijt}^F Z + \beta_8 M_{ij(t-1)}^F Z + \beta_9 M_{ijt}^M Z + \beta_{10} M_{ij(t-1)}^M Z + \varphi_{ij} + \mu_j + \varepsilon_{ijt} \quad (4)$$

As before, y_{ijt} is household per capita income in village j , which is assumed to depend on household characteristics and current and past borrowing. X is a vector of household assets and characteristics. M^F and M^M are vectors of current and past microcredit received by female and male borrowers from different programs. Parameters β_2 , β_3 , β_4 and β_5 measure the effects of current and past credit (stock) for loans given to female and male borrowers by each of the microcredit programs in the absence of human development opportunities (i.e. $Z=0$).

The term $\beta_6 Z$ is a vector of the various human development opportunities provided by each MFI and parameter β_6 captures the association between these opportunities and household income. Parameters β_7 , β_8 , β_9 , and β_{10} capture the relationship between credit, human development opportunities and household income when $Z=1$. Similarly, to the first household model, a household fixed effect method is employed to account for unobserved household heterogeneity.

RESULTS

Empirical Model I: Policy Impact on Household Economic Outcome

The results from the household FE estimation of equation (2) (See Table 3 in Appendix) show that the coefficients for labor assets (i.e. number of adults in household), and infrastructure (i.e. electricity present in village) are positive and statistically significant. These results are consistent with Amartya Sen's contention that the provision of adequate economic facilities such as good infrastructure are instrumental in the process of development (Sen, 1999, p. 10, 37).

According to the results presented in Table 3 in the Appendix, microcredit borrowing from the Grameen Bank, benefits both male and female borrowers in the household. Previous studies using this data-set found that the benefits of microcredit borrowing accrued disproportionately to women rather than

men (see Pitt & Khandker, 1998; Khandker, 2005). Based on the fixed-effect estimation, a 10 percent increase in the stock of female borrowing from the Grameen Bank in 1998/99, increases per capita income by about .6 percent for women and .7-.9 percent for men (see regressions 1-5, Table 3, Appendix).

The results for the human development opportunity variables are not statistically significant for all programs, and effects differ from program to program. For the Grameen bank, primary health care, basic literacy and skill training services have a statistically significant effect on household income (Table 3, only the results for the Grameen Bank are included). Marketing training and other services are not typically emphasized with the issue of Grameen Bank credit, hence it makes sense that these two opportunity variables do not have a statistically significant effect on household outcome.

In terms of the effect of BRAC loans on household income only the men benefit from this credit (regression table omitted). The coefficients for the loans disbursed to women by BRAC are not statistically significant. The results suggest that a 10 percent increase in borrowing by men from BRAC in period (t), increases per capita income by 1.6 percent. Loans disbursed to men in the earlier period (t-1) also had a positive and statistically significant effect on household per capital income. In this period, a 10 percent increase in the stock of male borrowing from BRAC, increases per capita income by 1.7 percent.

The institutional design of each MFI in this study is different in some aspect and this can have an impact on household outcomes. According to the results, credit has differential effects in terms of gender and the distinct institutional design of the MFIs may play a role in the impact of credit. BRAC for instance, has larger solidarity groups as compared to the Grameen Bank. BRAC has solidarity groups of 57 members compared to Grameen groups of five members. It is possible, that group size matters in terms of the impact credit will have on household outcomes. Another distinct feature of BRAC is that membership requires that at least one household member work for wages. This feature can serve as collateral for borrowing and as such, borrowers from this institution will have to provide collateral as a condition for borrowing. The requirement of wage labor can potentially reduce the time for entrepreneurship and as such, the return of credit to the household may not be large enough to contribute to poverty reduction in a significant way. Finally, BRAC contributes significantly less time for social development than Grameen does (see Table 2 in Appendix).

In terms of the (BRDB) RD-12 program, the coefficients for the credit variables for this program were not statistically significant (regression table omitted). The institutional design of the (BRDB) RD-12 program is that of a cooperative that requires members to both contribute five percent of each loan to a group fund and mandatory purchase of cooperative shares. Similar to BRAC, this MFI requires that one household member work for wage labor and large solidarity groups. It is possible that for very poor borrowers both the requirement of wage labor and the purchase of shares may not be adequate. Both requirements can impose burdens that may not be conducive to income generation at the household level. In this context, the larger retention of the borrowed funds by the institution while it increases savings, it reduces the amount of funds the borrower can invest in productive activities.

In the case of the (BRDB) RD-12 program, basic literacy services, skill training and other services have a positive and statistically significant effect on household outcome (regression table omitted). While none of the credit variables in the regression for (BRDB) RD-12 were statistically significant, the results suggest that human development opportunities play an important role in income generation. This result highlights the possibility of complementarities between access to credit and access to human development opportunities. The insignificant result for marketing training could be due to the small percentage of households that receive this service in the sample (regression output omitted).

The results obtained for human development opportunity effects in all of the regressions for all of the three programs suggest that for the most part, policies that are instrumental in expanding the capability set and/or the social and economic prosperity of an individual play an important role in economic development. In the case of using microfinance as a tool to reduce poverty, this study suggests that both access to credit and the provision of human development opportunities are positively associated with poverty reduction at the household-level. The findings in this study suggest that Grameen credit is associated with a positive impact on household economic outcomes and that Grameen loans are more

effective in alleviating poverty than the credit disbursed by similar programs such as BRAC and (BRDB) RD-12.

Empirical Model II: Interaction Between Microcredit and Human Development Opportunities

The regression model in equation (4) was estimated separately for each of the microcredit programs. Similar to the results presented in the previous section, the credit coefficients for BRAC are only statistically significant for the stock of credit disbursed to male borrowers but not to female borrowers. The credit coefficients for the (BRDB) RD-12 program were not statistically significant (regression tables omitted). One feature of the MLR model is that even though the coefficient of the relevant variables are not statistically significant on their own, once subjected to a set of conditions, this variable may gain statistical significance. In other words, the coefficient for microcredit, M , may not be statistically significant when the condition $Z=0$ or namely, when human development opportunities are absent. However, the effect of microcredit on household income Y may become statistically significant when $Z=1$ or when human development opportunities are in place. Another possible outcome which is observed in the results, is that the coefficient for microcredit, M is statistically significant on its own ($Z=0$) but becomes larger when $Z=1$.

Table 4 in the Appendix, outlines the empirical associations between credit and the provision of primary health care services by the Grameen Bank. According to the results, microfinance disbursed to women in the period 1998/99 when combined with primary health care services is positively associated with increases in household income. The results further suggest that the positive effect of credit is magnified when primary health care services are provided. In this context, a 10 percent increase in the stock of female borrowing increase household income by .8 percent when the borrower receives primary health care services, but when primary health care services are not provided, the effect is not statistically significant. Here, credit and primary health care services are complementary and this human development opportunity augments the return of credit to household income.

The result outlined above, is similar for male borrowing in the period 1991/92. In this instance, the provision of primary health care services significantly augments the effectiveness of credit to increase income. Here, a 10 percent increase in the stock of Grameen credit given to men and the provision of health services increases income by .10 percent. The results imply that both men and women from the Grameen Bank program benefit from receiving primary health care services.

In the case of the provision of basic literacy, none of the coefficients are statistically significant although the coefficient for this dummy variable was positive and statistically significant for equation (2) where it was regressed on household income (see Table 3 in Appendix). One of the caveats to this model is that the use of dummy variables may omit important information.

According to the findings, the effect of marketing training provided by the Grameen Bank suggests that when the opportunity variable is interacted with credit, the effect is positive for loans given to men and women and the magnitude of the effects of credit in the absence of marketing training is smaller than when credit and marketing training are provided simultaneously (see Table 5 in Appendix). Credit alone provided to women is associated with a .6 percent increase in income while the combination of the two variables yields a marginal effect of 1.36 percent. The effect of credit and marketing training is similar to that of women for the men.

An interesting result is observed for the interaction effect of Grameen Bank credit and other services (Table 6 in Appendix). For credit disbursed to women in the earlier period, the provision of other services augmented the effectiveness of past loans in increasing income. Without these services, the effect of credit on household income is not statistically significant. However, when this credit is complemented with other services, the increase in income becomes 1.4 percent and this interaction effect is statistically significant. This result highlights the complementarity between the provision of human development opportunities and the expansion of functionings in the form of higher income or a higher standard of living.

For BRAC, (Tables 7-8 in Appendix) the interaction terms for marketing training and other services are statistically significant for credit disbursed in the second period. The combination of credit and human

development opportunities augments the effectiveness of credit in increasing household income. We see that the effect of current BRAC loans given to women borrowers is not statistically significant but when the loans are combined with marketing training, the coefficient becomes positive significant. This interaction yields one of the strongest results in terms of magnitude. When BRAC loans given to women borrowers are combined with marketing training, a 10 percent increase in credit from BRAC results in a 2.3 percent increase in household income. A similar result is obtained for male borrowers where without marketing training, a 10 percent increase in current credit from BRAC results in a 1.7 percent increase in household income but when this credit is complemented with marketing training, the magnitude of the impact increases to 2.5 percent.

The coefficients for the (BRDB) RD-12 program credit variables are not statistically significant in the simple regression or in the interaction model (regression tables omitted). In terms of the institutional design of (BRDB) RD-12 as an MFI, the structure of the institution is that of a cooperative with large separate solidarity groups for men and women. As previously noted, this institutional set up may be contributing to the different impact this credit has as compared to other institutions like the Grameen Bank and BRAC. The requirement of a 5 percent deposit to a group fund and the purchase of shares may be causing more saving than investment and this can adversely impact the return on the funds borrowed and hence overall household income. As noted earlier, one caveat of using dummy variables to represent policies is that we could potentially omit important information.

The results presented in this section suggest that the combination of human development opportunities and credit, particularly, the provision of primary healthcare, marketing training and other services by the Grameen Bank (Tables 4-6 in Appendix) contribute to increases in household income. Similarly, marketing training and other services provided by BRAC (Tables 7-9 in Appendix), are associated with increasing the effectiveness of microcredit in increasing household income. The results are robust which suggest that the human development opportunities provided by the MFIs matter and that these opportunities can complement the effectiveness of microcredit in poverty reduction.

In terms of the stability of the results, one of the issues that arises with using interactions in a multiple linear regression model is that the model tends to be vulnerable to spurious multicollinearity. This issue can cause the coefficients of the variables to be unstable across methods, which can complicate the interpretation of the results. To circumvent this challenge, the correlation matrix for each regression method was explored to see if multicollinearity was an issue. In each correlation matrix, most correlations among the predictors did not exceed .4 and the few that were .9 were dropped from the regression to see if the results changed.

CONCLUSION

Amartya Sen argues that social opportunities of education and health care complement individual opportunities of economic and political involvement as well as the chances of overcoming deprivation (Sen, 1999, p. xii). In this study, the hypotheses were that microfinance has a positive impact on household per capita income (i.e. economic well-being) and that when credit and human development opportunities (capabilities) are combined, the effect is positive and household outcomes are enhanced.

The regression results suggest that the empirical association between access to credit and household per capital income is enhanced by the provision of both substantive and instrumental freedoms. The substantive freedoms in the study comprised of basic literacy, marketing training, primary healthcare and other services. Access to credit on the other hand, contributed to the expansion of instrumental freedoms such as the capability to borrow funds to obtain working capital and ultimately augment household per capita income.

The present study contributes to the literature on microfinance and sustainable financial inclusion in important ways. First, it explicitly defines microfinance as an instrumental freedom and secondly, it explores empirically the contribution a capability set (i.e. human development opportunities) make to achieving a higher standard of living. While other studies on microfinance have indirectly explored

impacts related to the CA approach, this study makes a direct link by examining the impact the services (i.e. capability set) provided by the MFI have on economic functionings.

The survey used in the study, while extensive, is of a quasi-experimental design rather than a randomized controlled trial (RCT). This poses a limitation to the study in that the estimates are not as reliable as they would be in an RCT. To maximize reliability of the results, the program eligibility criteria imposed allowed us to identify control and treatment groups. Secondly, following the same subjects overtime to form a panel, allowed us to reach more reliable conclusions from the results. Finally, the fixed effect method, allowed us to control for unobserved heterogeneity which provides more efficient estimates.

The conclusions in this study highlight important policy items. The results suggest that sustainable financial inclusion (i.e. microfinance coupled with services) and the provision of a capability opportunity set matters in the process of development. The results found in this study support Sen's assertion that human development plays a positive role in helping the poor overcome deprivation. When the poor can realize a higher standard of living as a result of access to education, primary healthcare and other capability enhancing services, they can improve their lives socially and economically. The empirical exercise employed in this study should inspire further research on the operational measure and implementation of the CA in financial inclusion and development tools and programs. Randomized controlled trials for development initiatives should include measures and analysis of the role of the CA in reducing poverty and the expansion of capabilities.

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APPENDIX

TABLE 1
SUMMARY STATISTICS OF INCOME, CREDIT AND HUMAN
DEVELOPMENT VARIABLES

Variable	1991/92		1998/99	
	Mean	Std. Dev.	Mean	Std. Dev.
Household per capita yearly income	3046.808	8837.298	11380.91	28409.02
Number of adults in Household (15-59yrs)	2.652778	1.318552	3.144324	1.684209
Avg. years of education of household adults	2.773777	3.057403	2.502537	2.708624
Bank in village (dummy)	0.1105072	0.3136157	0.1630435	0.3695169
Electricity in village (dummy)	0.5096618	0.5000576	0.2057387	0.4010778
Avg. household holding of equipment & livestock (taka value)	1051.614	1445.173	252.8308	1688.683
Avg. household holding of transport assets (taka value)	9141.644	19296.06	1120.601	6828.165
Avg. household holding of nonagricultural assets (taka value)	990.6817	2459.643	1360.181	45034.63
Land assets (decimals)	34.05528	276.3581	54.71744	127.7051
Women's loans from Grameen, (t)	402.6219	1091.663	720.4798	1660.28
Men's loans from Grameen, (t)	174.275	780.3449	171.3315	929.2802
Women's loans from Grameen, (t-1)	0	0	402.6219	1091.663
Men's loans from Grameen, (t-1)	0	0	174.275	780.3449
Women's loans from BRAC, (t)	265.1234	833.6114	401.5155	1162.914
Men's loans from BRAC, (t)	97.3694	543.0897	16.40459	259.8861
Women's loans from BRAC, (t-1)	0	0	265.1234	833.6114
Men's loans from BRAC, (t-1)	0	0	97.3694	543.0897
Women's loans from (BRDB) RD-12, (t)	168.7802	640.3247	133.2195	703.1621
Men's loans from (BRDB) RD-12, (t)	281.7089	897.7147	106.0139	640.6023
Women's loans from (BRDB) RD-12, (t-1)	0	0	168.7802	640.3247
Men's loans from (BRDB) RD-12, (t-1)	0	0	281.7089	897.7147
Primary Health Care	0.32	0.47	0.35	0.48
Basic Literacy	0.31	0.46	0.35	0.48
Marketing Training	0.11	0.31	0.04	0.19
Skill Training	0.17	0.37	0.37	0.48
Other Services	0.16	0.37	0.04	0.19
Number of Observations	1656		1656	

Source: Author's computations based on 1991/92 and 1998/99 household surveys in Bangladesh.

TABLE 2
HUMAN DEVELOPMENT OPPORTUNITIES

<u>Opportunities Offered by the</u> <u>MFI</u>	Grameen		BRAC		RD-12	
	% of Households		% of Households		% of Households	
	Receiving Services		Receiving Services		Receiving Services	
	1991/92	1998/99	1991/92	1998/99	1991/92	1998/99
Primary Healthcare	64%	58%	51%	56%	30%	42%
Basic Literacy	63%	62%	48%	52%	36%	38%
Marketing Training	28%	9%	7%	6%	16%	4%
Skill Training	12%	67%	25%	54%	62%	47%
Other Services	7%	2.5%	36%	9%	31%	4%

Source: Author's calculations from the 1991/92 1998/99 surveys

TABLE 3
HOUSEHOLD FIXED-EFFECTS ESTIMATES OF THE IMPACT OF GRAMEEN CREDIT
AND HUMAN DEVELOPMENT OPPORTUNITIES ON HOUSEHOLD INCOME

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Inincome Primary Health Care	Inincome Basic Literacy	Inincome Marketing Training	Inincome Skill Training	Inincome Other Services
Number of adults in Household (15-59yrs.)	0.183** (0.0710)	0.202*** (0.0696)	0.193*** (0.0694)	0.187*** (0.0690)	0.197*** (0.0691)
Avg. years of education of household adults	0.0487 (0.0462)	0.0417 (0.0457)	0.0401 (0.0460)	0.0457 (0.0450)	0.0386 (0.0458)
Bank in village (dummy)	0.176 (0.165)	0.164 (0.165)	0.201 (0.173)	0.158 (0.168)	0.193 (0.164)
Electricity in village (dummy)	0.398** (0.192)	0.433** (0.207)	0.329* (0.193)	0.291 (0.192)	0.327* (0.191)
Log of women's loans from Grameen, (t)	0.0457 (0.0341)	0.0568* (0.0335)	0.0623* (0.0339)	0.0504 (0.0331)	0.0628* (0.0344)
Log of women's loans from Grameen, (t-1)	0.0234 (0.0461)	0.0172 (0.0464)	0.00943 (0.0454)	-0.0110 (0.0440)	0.00859 (0.0462)
Log of men's loans from Grameen, (t)	0.0730* (0.0391)	0.0820** (0.0394)	0.0910** (0.0399)	0.0609 (0.0400)	0.0933** (0.0403)
Log of men's loans from Grameen, (t-1)	0.0883* (0.0529)	0.0840 (0.0536)	0.0800 (0.0530)	0.0444 (0.0514)	0.0803 (0.0537)
Primary Health Care (dummy)	0.438*** (0.161)				
Basic Literacy (dummy)		0.297* (0.154)			
Marketing Training (dummy)			0.0989 (0.141)		

Skill Training (dummy)				0.575***	
				(0.161)	
Other Services (dummy)					-0.168
					(0.206)
Observations	878	878	878	878	878
Number of hhcode	439	439	439	439	439
F-statistics	18.70	19.36	18.38	19.72	18.62
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Author's computations based on 1991/92 and 1998/99 household surveys in Bangladesh.

Note: Robust standard errors are in parentheses.

TABLE 4
MARGINAL EFFECT OF GRAMEEN BANK CREDIT AND PRIMARY HEALTH CARE ON HOUSEHOLD INCOME

Variable	(M)	(M*Z)
	Credit	Interaction Term
Log of women's loans from Grameen, (t)	0.0609	0.0767**
	(0.0436)	(0.0387)
Log of women's loans from Grameen, (t-1)	-0.0389	-0.0308
	(0.0540)	(0.0523)
Log of men's loans from Grameen, (t)	0.0007	-0.0297
	(0.0518)	(0.0606)
Log of men's loans from Grameen, (t-1)	0.1120	0.0978*
	(0.0703)	(0.0554)

Source: Author's estimations

Note: Robust standard errors are in parentheses

TABLE 5
MARGINAL EFFECT OF GRAMEEN BANK CREDIT AND PRIMARY HEALTH CARE ON HOUSEHOLD INCOME

Variable	(M)	(M*Z)
	Credit	Interaction Term
Log of women's loans from Grameen, (t)	0.0609	0.0767**
	(0.0436)	(0.0387)
Log of women's loans from Grameen, (t-1)	-0.0389	-0.0308
	(0.0540)	(0.0523)
Log of men's loans from Grameen, (t)	0.0007	-0.0297
	(0.0518)	(0.0606)
Log of men's loans from Grameen, (t-1)	0.1120	0.0978*
	(0.0703)	(0.0554)

Source: Author's estimations

Note: Robust standard errors are in parentheses.

TABLE 6
MARGINAL EFFECT OF GRAMEEN BANKCREDIT AND MARKETING TRAINING ON
HOUSEHOLD INCOME

Variable	(M) Credit	(M*Z) Interaction Term
Log of women's loans from Grameen, (t)	0.0621* (0.0343)	0.136** (0.0546)
Log of women's loans from Grameen, (t-1)	-0.0204 (0.0460)	-0.0262 (0.0549)
Log of men's loans from Grameen, (t)	0.0803** (0.0395)	0.0599 (0.0626)
Log of men's loans from Grameen, (t-1)	0.0990* (0.0564)	0.101* (0.0575)

Source: Author's estimations

Note: Robust standard errors are in parentheses.

TABLE 7
MARGINAL EFFECT OF GRAMEEN BANK CREDIT AND OTHER
SERVICES ON HOUSEHOLD INCOME

Variable	(M) Credit	(M*Z) Interaction Term
Log of women's loans from Grameen, (t)	0.0581* (0.0350)	-0.0598 (0.0645)
Log of women's loans from Grameen, (t-1)	0.0294 (0.0484)	0.141** (0.0684)
Log of men's loans from Grameen, (t)	0.0974** (0.0407)	0.0000 (0.0000)
Log of men's loans from Grameen, (t-1)	0.0882 (0.0558)	0.0112 (0.0816)

Source: Author's estimations

Note: Robust standard errors are in parentheses.

TABLE 8
MARGINAL EFFECT OF BRAC CREDIT AND MARKETING TRAINING ON HOUSEHOLD INCOME

Variable	(M) Credit	(M*Z) Interaction Term
Log of women's loans from BRAC, (t)	-0.0122 (0.0405)	0.230** (0.0890)
Log of women's loans from BRAC, (t-1)	-0.0013 (0.0660)	-0.0291 (0.0946)
Log of men's loans from BRAC, (t)	0.173** (0.0693)	0.250*** (0.0941)
Log of men's loans from BRAC, (t-1)	0.191** (0.0758)	0.1410 (0.2350)

Source: Author's estimations

Note: Robust standard errors are in parentheses.

TABLE 9
MARGINAL EFFECT OF BRAC CREDIT AND OTHER SERVICES ON HOUSEHOLD INCOME

Variable	(M) Credit	(M*Z) Interaction Term
Log of women's loans from BRAC, (t)	-0.0197 (0.0414)	0.0143 (0.0701)
Log of women's loans from BRAC, (t-1)	-0.0185 (0.0694)	-0.0549 (0.0806)
Log of men's loans from BRAC, (t)	0.133* (0.0753)	0.146** (0.0655)
Log of men's loans from BRAC, (t-1)	0.0524 (0.1030)	-0.158* (0.0833)

Source: Author's estimations

Note: Robust standard errors are in parentheses.