

THE EFFECT OF MICROCREDIT ON STANDARDS OF LIVING IN BANGLADESH

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ABSTRACT

This paper asks a simple question: do microcredit programs positively affect the standard of living of poor households with little or no land ownership? Access to credit at favorable terms is likely to increase the number of economic opportunities available to a rural household. I use a fixed effect regression model to explore panel data on 855 households from Bangladesh compiled from an extensive household survey conducted between 1991 and 1999. I explored seven representative measures for different aspects of standard of living: household per capita weekly non-food expenditure, household per capita weekly food expenditure, household non-land asset ownership, household female non-land asset ownership, household landholding, highest number of years of education of any household female, and highest number of years of education of any household male. The results suggest that microcredit program participation had positive impact on per capita food expenditure, landholding, and women's ownership of non-land assets. Microcredit seems to have had no significant, positive impact on overall household non-land asset accumulation and educational attainment.

I. INTRODUCTION

Microcredit, the act of giving very small, unsecured loans to poor households with very limited resources to promote an increase in income generating activities, has recently been championed as a tool for eliminating extreme poverty.¹ The concept, in its modern form, was first practiced in the 1970s in Bangladesh, then a very poor underdeveloped country. BRAC, currently the largest global non-governmental organization, and Grameen Bank, a pioneering Bangladeshi microcredit institution, both contributed to this early implementation of microcredit.² Since then, the concept has spread across the world to many developing and developed countries. Influential personalities from around the world, including former U.S. President Bill Clinton and former U.N. Secretary General Kofi Annan, have long promoted the work of microcredit institutions. Grameen Bank and its founder Muhammad Yunus went on to win the Nobel Peace Prize in 2006 for their efforts in fighting poverty in Bangladesh.³ Furthermore, the United Nations declared 2005 the International Year of Microcredit.⁴ Microcredit institutions have even gained popularity in the United States. Grameen America, one of the recent microcredit institutions founded by Muhammad Yunus, currently operates in six American cities

and has already disbursed over \$100 million worth of credit to approximately 18,000 borrowers from below the poverty line.⁵

Microcredit, as practiced in Bangladesh, provides small institutional credit with reasonable terms (i.e. interest rates lower than those charged by local informal moneylenders) and little or no collateral requirement to poor people who would normally not have access to conventional banking and financial institutions.⁶ In doing so, it allows the poor to expand the scale of their economic activities to lift themselves out of poverty. For example, it permits borrowers to start new businesses and to expand existing income generating activities, consumption of necessities, and ownership of capital goods.

The popularity of microcredit has encouraged some in-depth analysis of the extent to which microcredit improves the standard of living of the poor people. "Standard of living," in the context of this paper, refers to the level of wealth and material comfort available to households.⁷ This question is a timely one as more resources are channeled to microcredit every year, typically in developing countries like India and Bangladesh, where a significant proportion of the world's poorest people live.⁸ This paper will define "extremely poor households" as those with very little

or no land ownership prior to joining a microcredit program. I use this definition because ownership of land improves households' capacity to benefit from economic opportunities in a small, densely populated country like Bangladesh. As of June 2011, 576 microcredit institutions have gathered savings worth \$822.96 million from 26.08 million clients and had outstanding loans worth \$2,259.37 each from 20.65 million borrowers across Bangladesh.⁹ As the sector grows, it will draw in more funds. At the same time, it will incur a growing opportunity cost, as these funds will be diverted away from conventional poverty alleviation projects such as improving rural schools and developing village infrastructure.

In this paper, I consider whether microcredit improves the living standard of households in extreme poverty in Bangladesh. This paper focuses on Bangladesh because it has some of the largest and most established microcredit outreach programs in the world. Moreover, it is one of the few countries in which a large-scale, publicly available household survey measuring the impact of microcredit covered samples from all seven of the country's divisions and not from only a particular region.¹ The survey also covers a time period during which the majority of the population was still involved in farming activities.¹⁰ Microcredit programs today typically target this type of population in underdeveloped countries.

This paper will use a fixed effect regression model with time-invariant and village-time-invariant fixed effects to analyze representative measures of the seven different aspects of standard of living. The model will draw from panel data on rural households collected from four rounds of surveys conducted by Bangladesh Institute of Development Studies (BIDS) and World Bank between 1991 and 1999. In doing so, the paper will assess the impact of microcredit on poor households which had very little or no land ownership prior to joining a microcredit program to see whether there is empirical evidence to conclude that microcredit significantly improves the standard of living of extremely poor households in Bangladesh.

2. THEORY

Access to microcredit at a reasonable interest rate without any collateral requirement is likely to relax the borrowing constraint faced by poor households with little or no access to formal banking services. As a re-

sult, these households with little or no land ownership will be able to use the credit to expand their existing income generating activities or start new ventures. Hence, I expect to see a positive impact of microcredit program participation on consumption expenditure, asset accumulation, and education attainment of these households.

The loan repayment rates of these programs are high, 98% in case of Grameen Bank.¹¹ This indicates that the poor households experience enough increase in income to repay the principal with interest in Bangladesh. If they generate enough return from activities in which they primarily invest their microcredit, these households will see a positive impact on consumption, asset accumulation, and education attainment. However, it is also possible that households in extreme poverty do not necessarily benefit from microcredit program participation; the added burden of loan repayment may hinder them from sufficiently expanding their income-generating activities to escape from subsistence. In other words, the return generated from microcredit may not be large enough to accumulate significant amount of assets when loan repayment is taken into account. As a result, such poor households may not see a significant impact of microcredit program participation on land or non-land asset accumulation or on education attainment and at best see a positive impact on consumption expenditure alone.

The impact of microcredit program on the standard of living of poor households with little or no land ownership must consequently be determined by investigating whether microcredit program participation had a significant positive impact on variables pertaining to household consumption expenditure, landholding, non-land asset accumulation and education attainment over time. This will reveal which of the two possible natures of microcredit impact the data presents. If we do see any positive impact of microcredit on household wealth accumulation and consumption, we may infer from the data that microcredit improves the standard of living of extremely poor households. However, if we observe no such evidence, we may infer that returns from microcredit usage have not been large enough to significantly improve standard of living.

3. LITERATURE REVIEW

One of the most significant obstacles to analyzing the impact of microcredit in developing coun-

ⁱ Divisions are a form of administrative units in Bangladesh. They are analogous to states in the United States and other countries.

tries like Bangladesh has been the scarcity of publicly available data. Most empirical studies concerned with identifying the impact of microcredit in Bangladesh rely on data from BIDS-World Bank surveys from 1991 to 1999. Khandker and Pitt (1998) used this data to conduct one of the first influential studies on the impact of microcredit in Bangladesh. Using cross-sectional data from the 1991-1992 part of the survey, they showed that credit is an important factor in determining the level of several household variables like household food expenditure, education of children, labor supply and non-land assets owned by women.¹² Khandker and Pitt (1998) further demonstrated that microcredit had a larger positive impact on households when women were the principal borrowers in the families.¹³

Pitt, Khandker, and Cartwright (2006) next used cross-sectional data from the 1998-1999 segment of the survey to show that female participation in microcredit program promotes women's empowerment and influence in their respective households and societies. They used a large set of qualitative responses of women in the survey that indicated their level of influence in family matters to form proxy indicators. They subsequently tested the hypothesis that microcredit participation was "an empowering experience" for women.¹⁴ Their results showed that female participation in microcredit programs increased their decision-making roles in families, social networking, and access to resources and facilitated geographical mobility.¹⁵ The initial analysis of the BIDS-World Bank household survey was cross-sectional in nature and included all the households in the survey to see whether microcredit programs had a greater impact on women than men. These analyses also asked whether credit was important in determining the levels of different measures of household standard of living.

Further studies revealed negative effects of microcredit programs in Bangladesh. In a recent study, Islam and Choe (2013) used the data from the 1998-1999 part of the BIDS-World Bank household survey to explore the human capital formation of families borrowing from microcredit institutions. The study suggested that participation in microcredit decreases school enrollment and increases child labor as families often employ their children to expand their income-generating activities after borrowing.¹⁶ Moreover, Islam and Choe found this negative impact

on education and child labor more pronounced for girls than for boys in families participating in microcredit programs.¹⁷

Khandker (2005) was one of the first to utilize both the 1991-1992 and the 1998-1999 household survey as panel data to show that microcredit both reduces poverty among borrowers and benefits non-participants by raising local income in microcredit program villages.¹⁸ This study also suggested that credit again had a disproportionately positive impact on female borrowers over male borrowers. This was consistent with his past studies that utilized cross-sectional data from the 1991-1992 and 1998-1999 segments of the survey.¹⁹

Islam et al. (2013) drew a similar conclusion when they examined the performance of four of the biggest microcredit institutions in Bangladesh using a 2011 private survey of 200 households that are members of these institutions. The study argued that there has been continuous improvement in parameters like food consumption, health, standard of living and total household expenditure.²⁰ Although this new survey covered impacts of two of the programs included in the BIDS-World Bank survey, BRAC and Grameen Bank, it only focused on a small region in southern Bangladesh and so cannot be assumed to be representative of the entire population. Moreover, the study paid little attention to record the initial wealth of the households in the survey, such as land ownership, prior to joining a microcredit program. This makes it difficult to generalize the conclusions to all extremely poor households.

The research on microcredit programs in Bangladesh used different rounds of the BIDS-World Bank survey or other private surveys as cross-sectional data to focus on broadly answering how microcredit has influenced parameters like per capita consumption and women empowerment. This paper will seek to contribute to the existing literature by searching for the answer to one of the most important public policy questions: can microcredit help improve the standard of living of the extremely poor? To do so, I will use the BIDS-World Bank survey as a source of panel data in this paper to explore the impact of microcredit on a household over time.

The microcredit institutions investigated in this paper then used a loose criterion of land ownership (less than 0.5 acres or fifty decimals, roughly 21,775 square feet) to determine eligibility of households

to participate in microcredit. Even fifty decimals is a significant amount of land for cultivation, rearing livestock, and taking collateral-backed loans from local moneylenders in a densely populated, developing country like Bangladesh.²¹ It is very important to investigate how microcredit programs have benefitted the segments of the population with little or no land ownership prior to joining a microcredit program. An answer to this question will help policymakers decide how to better use funds when fighting extreme poverty in very poor rural communities in countries like Bangladesh.

Verdicts on the impact of microcredit on such poor populations in other countries have been mixed thus far. Banerjee et al. (2013) used a randomized evaluation to investigate borrowers from slums in Hyderabad, India. The results showed that there was no statistically significant effect of microcredit on average monthly per capita expenditure, consumption, health, or education within a treatment population fifteen to eighteen months after the introduction of a microcredit program.²² Crepon et al. (2014) also used a randomized evaluation to determine the impact of microcredit in remote areas of Morocco to observe that microcredit did not bring any net positive impact on labor income and consumption.²³ On the other hand, Noreen et al. (2011) observed a positive impact of microcredit program participation on household expenditure and children's education when investigating households from four prominent microcredit programs in Pakistan.²⁴ However, microcredit did not seem to have any positive impact on housing condition, food consumption and household asset ownership.²⁵

4. DATA

As stated before, there is little publicly available data on the impact of microcredit in Bangladesh and other developing countries. Since I require a data set from an extensive survey that includes households from across the country, I will use the BIDS-World Bank household survey conducted between 1991 and 1999. The panel-data nature of the survey will allow me to observe changes in the same sample units over time. At the same time, it will allow me to take time-invariant and village-time-invariant fixed effects to account for unobserved countrywide changes over time as well as unobserved differences across villages that remain more or less constant over time. More-

over, this particular survey was conducted at a time in rural Bangladesh when it was still a very underdeveloped economy with a small manufacturing sector. At that time, most of the population was involved in low-productive agricultural activities, exactly the type of population I am trying to investigate in this paper. I will first briefly describe the survey itself before explaining which subsample of the survey I will use in my research.

4.1 BIDS-World Bank Household Survey

The BIDS-World Bank extensive household survey, which measures the impact of microcredit in rural Bangladeshi households, was conducted between 1991 and 1999. The four-round survey focused on three of the major microcredit programs in Bangladesh: Grameen Bank, BRAC, and the Bangladesh Rural Development Board (BRDB). In the first round in 1991-1992, data was collected on 1,798 households from across the country. At first, 24 program and 5 non-program *thanas* were selected from 391 rural *thanas* in Bangladesh. A *thana* is an administrative unit under a division in Bangladesh that contains a number of villages. It should be noted that all twenty-four of the *thanas* had at least one microcredit program in place for at least three years prior to the first round of survey. Next, three villages were randomly selected in each *thana* and a total 1,798 households were randomly selected from these villages. Three rounds (waves) of extensive surveys were conducted on these households during 1991-1992. In these surveys, the households answered questions about expenditure, loans, landholdings, food consumption, and education, among other factors. Round 1 was conducted between November 1991 and February 1992 during the Aman Rice harvest season, the largest harvest season in Bangladesh. Round 2 was conducted between March and June of 1992 during the Boro Rice harvest season. Round 3 was conducted between July and October of 1992 during the Aus Rice harvest season. These households, identified by unique numbers, were revisited between 1998-1999, when only 1,638 households were available for re-survey. The 1,638 available units included in the survey could be roughly divided into five types in 1991-1992:

- i) Households in program villages that were eligible to borrow due to owning less than 0.5 acres of land and that borrowed at least once from a microcredit program.

ii) Households in program villages that were eligible to borrow but chose not to borrow.

iii) Households in program villages that were ineligible to borrow as they owned more than 0.5 acres of land.

iv) Households in non-program villages that owned more than 0.5 acres of land and so would be ineligible to borrow if a program existed in the village.

v) Households in non-program villages that owned less than 0.5 acres of land and would have been eligible to borrow if a program existed in the village.

It should be noted here that the program *thanas* were actively selected by the microcredit programs and were not randomly assigned. This is likely to give rise to village selection bias where the microcredit programs may have set up programs in *thanas* that had more probable and reliable borrowers. In addition, once they met the eligibility criterion, households self-selected into the program. As a result, there is also a possibility of self-selection bias in the data. I will discuss this further in sections 5 and 6.

4.2 Sampling Units to Be Used in This Paper

For the purposes of this paper, I will focus exclusively on types i, ii, and v and further reduce the size of the sample units used by only choosing those households which had less than twenty decimals (0.2 acres) of land prior to joining a microcredit program. Because fifty decimals of land is still a significant amount of land for a household in Bangladesh, I use twenty

decimals as the cut-off target to ensure that there will be a sufficient number of observations in the study to perform statistical and econometric inference, as I will be using several control variables and time-invariant and village-time-invariant fixed effects.

Eight hundred fifty-five households from the 1,638 households surveyed in all four rounds fit the criteria specified above for the purpose of this study: seven hundred households from program *thanas* and one hundred fifty-five households from non-program *thanas*. A program *thana* had at least one microcredit program in place before the first round of survey in 1991 while a non-program *thana* had no microcredit program in place during the first three rounds of survey. However, each had at least one microcredit program in place by 1998-1999.

All five non-program *thanas* from 1991 to 1992 had a microcredit program in place by 1998-1999. However, I will still refer to them as non-program *thanas* throughout this paper for convenience. As a result, the households involved in my research can be split into the following five different categories as displayed in Table 1. Categories 2, 3 and 5 will be used as treatment groups as households in these categories received microcredit. Categories 1 and 4 will be used as control groups as households in these categories did not receive any form of microcredit.

4.3 Data Compilation from Survey

For the purpose of this paper, I will use a data set that includes one observation per household per survey round for convenience. Roodman and Mor-duch (2013) prepared this data set for one of their papers by condensing information from the BIDS-

Table 1: Number of Households in Different Categories

Categories	Category of Households	Number of Households
1	Number of households in program <i>thanas</i> that did not borrow from microcredit programs (<i>Thanas</i> 1-24)	162
2	Number of households in program <i>thanas</i> that started borrowing from microcredit programs before Round 1 (<i>Thanas</i> 1-24)	431
3	Number of households in program <i>thanas</i> that started borrowing from microcredit programs after Round 1 (<i>Thanas</i> 1-24)	107
4	Number of households in initially non-program <i>thanas</i> that never borrowed from microcredit programs (<i>Thanas</i> 25-29)	90
5	Number of households in initially non-program <i>thanas</i> that borrowed from microcredit programs after Round 3 (<i>Thanas</i> 25-29)	65
	Total number of households used in investigation	855

World Bank household survey.²⁶ Tables A1 and A2 in Appendix provide summary statistics of the sampling units (households) used in the survey for 1991-1992 and 1998-1999 respectively.

Since no single variable will provide a perfect measure of a household's standard of living, I will use proxy measures of standard of living available in the Roodman-Morduch data set. In this paper, I investigate the following seven variables: household per capita weekly food expenditure, household per capita weekly non-food consumption expenditure, household non-land asset ownership, household female non-land asset ownership, household landholding at the time of survey, highest number of years of education completed by any male member of household, and highest number of years of education completed by any female member of household. The first three variables will be good representative measures to investigate the material well-being of the households in question. Household female non-land asset ownership serves as a proxy measure to investigate the material well-being of female members of a household. I use household landholding at the time of the survey as a proxy for long-run wealth accumulation. Lastly, highest number of years of education of any male and female member of household will be used as a representative measure to analyze the impact of microcredit on education attainment of the family. As a result, we will be able to see how microcredit impacts both the short-run and the long-run standard of living of households in terms of consumption expenditure, wealth accumulation, and education attainment.

Tables A3 to A9 in the appendix show the progression of means of the different dependent variables of interest in this research for both the target and the control groups from 1991-1992 to 1998-1999. The data presented in these tables suggest that an average household with little or no land which took microcredit tended to see a smaller growth in most of the dependent variables of interest compared to those which did not participate in a microcredit program over time. However, we cannot readily conclude that microcredit does not have a positive impact on standard of living of these households without a thorough analysis of each of these variables over time while controlling for possible differences arising from household and village characteristics.

5. METHODOLOGY

Because the survey draws from panel data, a fixed effect regression model with time-invariant and village time-invariant fixed effects is suitable to analyze the data on 855 households that fit the criteria specified in this paper. In panel data, multiple measures pertaining to the same sample units, in this case the households, are recorded over multiple time periods. These fixed effect regression models will have seven parameters pertaining to household standard of living as their dependent variables. These variables are: household per capita weekly food expenditure, household per capita weekly non-food consumption expenditure, household non-land asset ownership, household female non-land asset ownership, household landholding at the time of survey, highest number of years of education completed by any male member of household, and highest number of years of education completed by any female member of household. As mentioned previously, these variables will allow me to investigate the impact of participation in microcredit programs on the standard of living of households with little or no land ownership in terms of consumption, wealth accumulation, and education attainment over time. For example, household per capita weekly food expenditure is a good proxy measure of the improvement in nutrition intake of rural families while household ownership of land and non-land assets at the time of survey will be good measures of wealth accumulation over time. These particular choices of dependent variables will be discussed in greater detail later. Before that, I will briefly outline the fixed effect regression model.

5.1 Fixed Effect Regression Model

An example of a typical fixed effect regression I use on the data takes the following form:

$$Y_{ijt} = \beta_0 + \beta_1 X_{ijt} + \Omega Z_{jt} + \mu_1 M_{jt} + \mu_2 N_{ijt} + B_j + \gamma_t + u_{ijt} \quad (1)$$

Here, Y_{ijt} is the dependent variable, representing a value such as household per capita weekly food consumption in i^{th} household of j^{th} village in t^{th} time period. X_{ijt} is a vector of individual household characteristics, such as number of household members or highest level of education attained by household head. Similarly, Z_{jt} is a vector of village-level characteristics for j^{th} village in t^{th} time period such as the presence of a primary school, and price of rice (a proxy measure of price level in village). β_1 and Ω are vectors of

unknown parameters that must be determined after running the regression. The variables included in vectors X_{ijt} and Z_{jt} will be discussed in greater depth later. M_{ij} is a binary variable that is one if the village has at least one microcredit program in place and zero otherwise. N_{ijt} will also be a binary variable, which takes a value of one if the household was a member of a microcredit program at any point in time, and takes a value of zero otherwise. B_j accounts for village-level time-invariant fixed effects while γ_t accounts for time-fixed effects. u_{ijt} will be assumed to be a non-systemic error with mean zero. B_0 acts as the regression constant.

μ_1 is a crude measure of the effect of the presence of a microcredit institution in a village on a household with very little or no landholding. μ_2 indicates whether a household's decision to participate in a microcredit program has an impact on the standard of living parameters used as dependent variables. Thus, a crude measure of the average impact of microcredit program for an extremely poor household can be determined from the sum of these coefficients, i.e., $\mu_1 + \mu_2$.

Use of control variables and fixed effects is crucial in this paper since I am examining the impact of microcredit on households, holding other important factors constant. Introducing control variables for individual household characteristics is very important as households vary in terms of level of human capital, number of members, and access to alternate borrowing sources such as relatives or other informal lenders, among other factors. Using control variables for villages is also important as each of the villages has different characteristics. The section on dependent and control variables discusses these control variables in greater detail. It should be noted here that I was limited in my choice and employment of control variables. The Roodman-Morduch data set does not record values of all variables for all four rounds of survey. Additionally, many of the control variables did not vary over time for individual villages; thus, they were already indirectly taken into account when using village time-invariant fixed effects. If at least some of these time-varying characteristics are not taken into account, the model might pick up impacts of these characteristics incorrectly as impact due to presence of microcredit programs. Time-fixed effect is also crucial as it partially captures unobserved changes over time that affected all households more or less equally

at any time period, such as changes in nationwide government policies or agricultural subsidies. Use of a binary variable to take into account whether a household has ever participated in a microcredit program is sufficient for the purposes of this paper as I am only investigating whether the data suggest that microcredit has a positive impact on household standard of living. The precise size of that impact is not important to measure for my purposes.

I assume that the standard errors are heteroskedastic and thus calculate robust standard errors corrected for heteroskedasticity. I use village-level clustered standard errors, as the OLS standard errors are inappropriate for statistical inference here due to the strong possibility of correlation of the errors across observations over time in the same villages. Since the sampling units for the BIDS-World Bank household survey were not chosen by simple random sampling, sample weight for each household as specified by the BIDS-World Bank household survey is used to appropriately weigh the data when the fixed effect regression model is applied so that the regression results may provide a fairer representation of the rural population under investigation.

One of the biggest weaknesses of this fixed effect regression model is that microcredit programs are not randomly made available in a *thana* and households are not randomly assigned into the program. Instead, microcredit institutions actively select *thanas*; households self-select into the program once they meet the crude eligibility criterion of owning less than 0.5 acres of land. Hence, there are likely to be unobserved differences both between program and non-program villages, and between participant and non-participant households in the data. As a result, any suggestive impact of microcredit program participation picked up by our fixed effect regression model could partially be due to unobserved differences between participant and non-participant households and unobserved differences between program and non-program *thanas*.

The binary variable M_{jt} may not be well defined in the data. This concern exists because the variation in M_{jt} arises from changes in availability of microcredit programs between rounds three and four in only fifteen of the eighty-seven villages under investigation in the survey. As a result, there may not be sufficient variation in data to properly define M_{jt} and subsequently isolate the impact of household location in a village with microcredit program. Hence, more

emphasis will be put on the coefficient of N_{ijt} during statistical and econometric inference of impact of microcredit.

As a result of these weaknesses, the fully identified model will be first used on all 855 households from all twenty-nine *thanas* to investigate the seven representative measures of different aspects of standard of living. I will assume that there is no unobserved difference between our control and treatment groups once household and village level controls are added to the model. However, this is certainly a weak assumption. Hence, I will next exclude the five non-program *thanas* lacking microcredit programs in 1991-1992, and investigate 700 households from twenty-four program *thanas* using the same fixed effect regression model. I will exclude only variable M_{jt} as it is always 1 across all 700 households for all four survey rounds. This restriction will at least remove the possibility of systemic unobserved differences between program and non-program *thanas* that affect my inference. However, it will still not solve the problem of unobserved differences between participant and non-participant households in the program *thanas* affecting my inference. Hence, I will have to rely on the weak assumption that there are no differences between program participants and non-participants beyond those factors controlled for in this analysis that may partially account for positive impacts of microcredit program participation picked up by the fixed effect regression model.

The regression model as specified in this section also treats all households equally regardless of the amount of microcredit borrowed. To tackle this problem and to better understand how positive impacts of microcredit are related to the amount of credit borrowed by households, I will next slightly modify the model applied on households from program villages to include three binary variables instead of N_{ijt} as shown below:

$$Y_{ijt} = \beta_0 + \beta_1 X_{ijt} + \Omega Z_{jt} + \alpha_1 N_{1ijt} + \alpha_2 N_{2ijt} + \alpha_3 N_{3ijt} + B_j + \gamma_t + u_{ijt} \quad (2)$$

Here, N_{1ijt} is a binary variable that is 1 if household had cumulative borrowing between Tk zero and Tk 10,000 up until the time of the survey round and 0 otherwise. Tk (Taka) is the currency of Bangladesh. N_{2ijt} is a binary variable that is 1 if the household had cumulative borrowing between Tk 10,000 and Tk 20,000 until the time of the survey round and 0 otherwise. N_{3ijt} is a binary variable that is 1 if the house-

hold had cumulative borrowing above Tk 20,000 until the time of the survey. The resulting coefficients α_1 , α_2 , and α_3 will help us understand how borrowing different amounts of microcredit affected the dependent variables. We should expect α_1 to have the smallest value and α_3 to have the largest value among the three coefficients because the probable positive impact of microcredit on the dependent variables likely increases with the cumulative amount of microcredit borrowed until that point in time. The three binary variables pertaining to different levels of cumulative lifetime microcredit borrowing suffice for the purpose of this paper since I am only analyzing the possible impact of a rise in cumulative microcredit borrowing on the different dependent variables pertaining to household consumption, wealth accumulation, and education attainment. As seen before, X_{ijt} is a vector of individual household characteristics while Z_{jt} is a vector of village-level characteristics. B_j accounts for village time-invariant fixed effects while γ_t accounts for time fixed effects. u_{ijt} is assumed to be a non-systemic error with mean zero. Here, I will again assume that there is no systemic, unobserved difference between program participant and non-participant households.

5.2 Dependent and Control Variables

As stated before, the seven dependent variables to be investigated in this paper are representative measures of different aspects of standard of living of a rural household. I use consumption, asset accumulation, and education attainment, as I do not have access to any one variable or index that can capture all aspects of a household's living standard. Household per capita weekly food consumption will be a good representative measure of improvement in diet of a rural household whereas household per capita weekly non-food consumption expenditure tends to capture material well-being of a household in terms of consumption of durable and non-durable goods.

Household ownership of non-land assets and landholding at the time of survey are important measures of asset accumulation. Household ownership of non-land assets includes ownership of consumer durables like furniture, capital goods like farming and fishing tools and equipment, and precious goods like jewelry. One expects to see a positive impact of microcredit on these variables. Microcredit can be used to increase the scale of an existing income generating activity or start a new one by buying capital goods like

tools and equipment unless the household decides to only use labor and land to scale up their income generating activities.

Household female ownership of non-land asset will be used as a crude proxy measure to investigate the economic well-being of women in these extremely poor rural households. At the same time, I will also use the highest number of years of education of a female member of household as a crude measure of education attainment of household female children in these poor households. This, together with highest number of years of education of a male member of household, will give us a better picture of education attainment in these households as one expects to see rise in education attainment with improving living standard.

As stated before, controlling for differences across household is essential for inference in this paper. To this end, control variables were added to the model to account for differences across households that includes age, gender, number of years of education of household head, number of household members, and cumulative amount borrowed from other sources since 1986. The last variable is very important as it controls for differences in access to resources across households.

For village-level control variables, I used the price of rice as a crude control for cost of living across villages. This is because households in rural Bangladesh spend about 50 percent of their expenditure in food and rice is the staple food of Bangladesh. As a result, the price of rice substantially influences a household's perception of prevailing price level.²⁷ I also included a binary variable of whether the village had a primary, co-ed public school as a very crude control for infrastructure in a village. At the same time, many of the variables remained constant in all four survey rounds and thus were indirectly taken into account by village-time-invariant fixed effects used in the model. All these control variables are assumed to be exogenous in this model; I expect none of the variables to be correlated with the error term used in the regression model. More details about these control variables can be found under summary statistics presented in Tables A1 and A2 in the appendix section.

6. RESULTS

This paper examines the possible impact of microcredit program participation on different dependent variables of interest pertaining to consumption,

asset accumulation and education attainment of an extremely poor household with very little landholding. First, the fixed effect regression model was applied to the full sample of 855 households from both program and non-program villages. Next, the model was applied to a sub-sample of 700 households from program villages. Lastly, a modified fixed effect regression model was applied to this same sub-sample of households from program villages to examine how different amounts of cumulative microcredit borrowing possibly influenced the different dependent variables of interest pertaining to consumption, asset accumulation, and education attainment.

6.1 Full Household Sample from Both Program and Non-Program Villages

In examining the full sample of households from both program and non-program villages, households which participated in a microcredit program at least once were used as a treatment group and were compared to a control group of those households that never participated in a microcredit program. The results of these regressions are displayed in Table 2. The possible impact of microcredit on each of the dependent variables is captured by the coefficients of variables M, a binary variable that is 1 and 0 otherwise had a microcredit program, and N, a binary variable that is 1 if the household participated in a microcredit program at least once and 0 otherwise. In other words, the average impact of microcredit on each of the dependent variables can be crudely measured by the sum of the coefficients of variables M and N. T-tests were performed on coefficients of M and N separately to see whether each of the coefficients is different from zero at various significance levels. An F-test was also performed with the null hypothesis that the summation of the coefficients of M and N, $\mu_1 + \mu_2$, are zero for each regression. Results of these tests are listed at the bottom of Table 2.

Household Per Capita Weekly non-Food Consumption Expenditure

Participating households in program villages did not seem to see any significant positive rise in weekly per capita non-food expenditure when compared to non-participating households from program villages. The coefficient of N was not different from zero at ten percent significance level once household and village-level variations in characteristics were taken into account. When compared to non-participating house-

Table 2: Fixed Effect Regression Results (Full Sample)

	(1)	(2)	(3)	(4)
	Household weekly per-capita non-food expenditure (1992 Tk)	Household weekly per-capita food expenditure (1992 Tk)	Household non-land asset ownership (1992 Tk)	Household female non-land asset ownership (1992 Tk)
Program availability	-8.035** (3.596)	-7.756** (3.031)	2,893 (4,927)	1,867 (1,713)
Household participation	1.995 (1.537)	2.581** (1.222)	-2,171 (2,087)	462.5 (344.8)
Years of education of household head	1.369*** (0.277)	1.033*** (0.242)	2,525*** (589.6)	336.7*** (118.7)
Age of household head	0.035 (0.047)	0.082* (0.045)	9.008 (38.96)	-6.048 (9.051)
Household head male	-5.946 (3.935)	1.667 (2.568)	783.1 (1,949)	-6.077*** (1,135)
Number of members in household	-1.665*** (0.485)	-4.391*** (0.423)	1,928*** (728.7)	118.9* (60.52)
Borrowing from other sources	0.000542*** (0.000165)	0.000357*** (0.000098)	0.345*** (0.128)	-0.019 (0.022)
Time Fixed Effects	YES	YES	YES	YES
Village Fixed Effects	YES	YES	YES	YES
Village Level Cluster	YES	YES	YES	YES
Observations	3,420	3,420	3,420	3,420
R-squared	0.176	0.333	0.320	0.162
F-test p-value	0.106	0.109	0.899	0.183

Note: * $p < .1$, ** $p < 0.05$, *** $p < 0.01$. Not all control variables used in the regression are listed above.

holds from villages without a microcredit program, participating households still did not see any significant positive impact of microcredit on per capita non-food expenditure. One could barely reject the null hypothesis that the summation of the coefficients of M and N are zero at a ten percent significance level using an F-test. So, based on this regression model, microcredit program participation does not seem to have any significant positive impact on per capita non-food consumption expenditure.

Household per Capita Weekly Food Expenditure

Participating households in program villages see a positive rise in per capita food expenditure at the

five percent significance level when compared to non-participating households from program villages when household and village-level controls are accounted for in the model. However, when compared to non-participating households from villages without a microcredit program, null hypothesis that the summation of the coefficients of M and N are zero could barely be rejected at the ten percent significance level using an F-test; participating households did not see any statistically significant positive effect of microcredit on per capita food expenditure. As stated before in the methodology section, M is unlikely to be well defined due to a lack of sufficient variation. As a result, more emphasis should be put on variable N instead. This

suggests that microcredit program participation positively impacts food consumption for these extremely poor households.

Household Non-Land Asset Ownership

When compared to households from control groups, there was no significant positive rise in non-land asset ownership at the ten percent significance level for households that borrowed at least once from microcredit institutions after village and household level controls were taken into account.

Household Female Non-Land Asset Ownership

Again, there was no significant positive rise in this variable due to microcredit program participation at the ten percent significance level once the full model with controls was applied to the data.

Household Landholding

When compared to non-participating households from program villages, participating households experienced a positive rise in household landholding at a five percent significance level. However, when compared to non-participating households from villages without a microcredit program, participating households could possibly have not seen any significant positive rise in landholding due to effects of microcredit as one could again reject the null hypothesis that the summation of the coefficients of M and N are zero at the ten percent significance level using an F-Test. As stated before, M is unlikely to be a well-defined variable due to lack of sufficient variation. As a result, more emphasis should be placed on variable N, as it indicates that microcredit program participation seems to have had a positive impact on landholding of these extremely poor households.

Highest Number of Years of Schooling Completed by Any Female Member of Household

Highest number of years of schooling completed by any female member of household is usually a crude proxy measure to see the level of education attained by female children in these poor households. We don't see any statistically significant positive rise in this variable for program participating households when compared to non-program participating households from program villages. However, when compared to non-participating households from villages without a microcredit program, participating households saw a

fall in the highest number of years of schooling for a female member; the null hypothesis that the summation of the coefficients of M and N are zero or positive was rejected at the five percent significance level. Even though there is reservation in drawing inference from the variable M, the results indicate that microcredit either does not have any positive impacts or actually has negative impacts on participating household in terms of years of education completed by a female member of the household.

Highest Number of Years of Schooling Completed by Any Male Member of Household

No significant positive rise in this variable is noted for household participation microcredit programs when comparing program households with non-participating households from program villages and with households from villages without a microcredit programs. The coefficient of N is not different from zero at the ten percent significance level and the null hypothesis of the F-test, i.e., the summation of the coefficients of M and N is zero, cannot be rejected at the ten percent significance level, respectively.

As stated before, the binary variable M, which indicates whether a village has a microcredit program, is unlikely to be well-defined. This is because the variation in M came only from change in the status of fifteen of the eighty-seven villages between survey rounds three and four. Moreover, unobserved systemic differences likely exist between program and non-program villages that may not be completely taken into account with village-level control variables and village-time-invariant fixed effect. This is because microcredit programs tended to choose which villages they wanted to operate since the program was still not widespread from 1991-1992. This village selection bias problem is also likely to affect econometric inference of the results from the fixed effect regression model applied on the whole sample. As a result, I will next restrict our attention to the sub-sample of only those households from program villages, i.e., those seventy-five villages which had microcredit programs in place for at least three years before the first survey round.

6.2 Subsample of Only Households from Program Villages

Here, the same fixed effect regression model (without the variable M) as before was applied to only those households from the seventy-five program vil-

lages. The control group was restricted to those households in program villages that never borrowed from a microcredit institution. Results from these regressions on each of the seven dependent variables of interest are presented in Table 3. Variable N, a binary variable indicating whether a household participated in a program at least once, is only emphasized to investigate whether microcredit program participation led to any observed positive rise in the different representative measures of the standard of living of these poor households while controlling for different household and village level variations in characteristics. A t-test was performed on N in each regression to see whether its coefficient was different from zero at different significance levels.

The results suggest that microcredit program participation most probably had a significant positive impact on household weekly per capita food expenditure and household landholding at the five percent significance level. At the same time, it seemed to have had a positive impact on household female ownership of non-land asset at the ten percent significance level.

All the other variables of interest seemed not to have had any significant impact from microcredit program participation.

However, the binary variable N (whether household participated in a microcredit program at least once or not) only crudely captures the possible estimated average impact of microcredit program participation. It does not take into account the level of cumulative microcredit borrowing over time. It is very likely that the impact of microcredit on the dependent variables pertaining to consumption, asset accumulation and education attainment might become positively significant once the households attain a certain level of cumulative microcredit borrowing. To this end, the modified fixed effect regression model (2) will be applied to this subsample of households. In this model, three binary variables replace the binary variable N: N1, N2, and N3. N1 only takes the value 1 if the cumulative lifetime borrowing from the microcredit institutions is less than Tk 10,000 (\$250) and is 0 otherwise. N2 takes the value 1 if the cumulative lifetime borrowing from microcredit programs was between

Table 3: Fixed Effect Regression Results (only program villages)

	(1)	(2)	(3)	(4)
	Household weekly per-capita non-food expenditure (1992 Tk)	Household weekly per-capita food expenditure (1992 Tk)	Household non-land asset ownership (1992 Tk)	Household female non-land asset ownership (1992 Tk)
Household participation	1.924 (1.584)	2.737*** (1.270)	-2,012 (2,192)	586.5* (351.5)
Years of education of household head	1.394** (0.312)	1.117*** (0.268)	2,634*** (671.5)	316.0** (127.3)
Age of household head	0.017 (0.052)	0.082 (0.052)	-6.046 (41.51)	-6.030 (9.178)
Household head male	-6.991 (4.333)	0.639 (2.796)	959.6 (2,206)	-6,046*** (1,147)
Number of members in household	-1.592*** (0.568)	-4.386*** (0.462)	1,872** (851.8)	131.0* (71.67)
Borrowing from other sources	0.000528*** (0.000168)	0.000328*** (0.000086)	0.400*** (0.108)	-0.013 (0.025)
Time Fixed Effects	YES	YES	YES	YES
Village Fixed Effects	YES	YES	YES	YES
Village Level Cluster	YES	YES	YES	YES
Observations	2,800	2,800	2,800	2,800
R-squared	0.185	0.346	0.317	0.174

Note: *p<.1, **p<0.05, ***p<0.01. Not all control variables used in the regression are listed above.

Tk 10,000-20,000 (\$250-\$500). N3 takes the value 1 if the cumulative lifetime borrowing exceeds Tk 20,000 (\$500). Results from applying this modified fixed effect regression model are presented in Table 4 for all seven dependent variables. Separate t-tests were run on each of these three variables, N1, N2 and N3, to determine whether the coefficients were each significantly different from zero.

The results in Table 4 suggest that household per capita food expenditure, per capita non-food expenditure and female ownership of non-land asset seem to experience significant positive increase as cumulative microcredit borrowed increases above Tk 10,000. However, there is a fall in the highest number of years of schooling completed by any female member of household among microcredit borrowers with less than Tk 10,000 worth of cumulative microcredit borrowing. All other dependent variables do not seem to experience any significant positive impact of increase in cumulative microcredit borrowing at the ten percent significance level.

7. DISCUSSION

Microcredit participation certainly seems to be positively correlated with household per capita food expenditure, female ownership of non-land asset,

and household landholding. It also seems to have a strong positive correlation with per capita non-food consumption expenditure at higher levels of cumulative microcredit borrowing. This positive correlation with microcredit persists across these dependent variables after controlling for household and village-level characteristics and seem to be in line with the theory presented at the onset of this paper, i.e., microcredit relaxes the borrowing constraints of rural households and provide funds for income generating activities which can positively affect household standard of living in terms of consumption and wealth accumulation. Hence, one can reasonably conclude that this positive correlation is one of causality, i.e., microcredit actually improves consumption and wealth accumulation of these extremely poor households. Based on the analyses presented in this paper, the following conclusions can be reached in terms of microcredit's impact on the living standard of extremely poor households:

Consumption Expenditure

The results suggest that microcredit has a positive impact on household per capita food expenditure. A very crude approximation of the magnitude of this impact is a rise in weekly food consumption by an average Tk 2.74 (measured in 1992 Tk). Since, I

Table 4: Fixed Effect Regression Results (only program villages)

	(1)	(2)	(3)	(4)
	Household weekly per-capita non-food expenditure (1992 Tk)	Household weekly per-capita food expenditure (1992 Tk)	Household non-land asset ownership (1992 Tk)	Household female non-land asset ownership (1992 Tk)
Borrowing Level 1 (N1)	0.161 (1.783)	1.289 (1.495)	-2,634 (1,898)	164.9 (338.3)
Borrowing Level 2 (N2)	4.059* (2.201)	4.210*** (1.532)	-2,126 (2,277)	846.2* (486.7)
Borrowing Level 3 (N3)	10.81** (4.239)	6.077*** (1.905)	3,335 (3,112)	2,298*** (849.6)
Time Fixed Effects	YES	YES	YES	YES
Village Fixed Effects	YES	YES	YES	YES
Village Level Cluster	YES	YES	YES	YES
Observations	2,800	2,800	2,800	2,800
R-squared	0.190	0.344	0.317	0.180

Note: *p<.1, **p<0.05, ***p<0.01. Not all control variables used in the regression are listed above.

an investigating extremely poor households with little or no land-ownership, this result is significant as such poor households usually see a positive impact on food consumption as part taking part in programs, like microcredit, geared toward improving their living standard through increasing income generation.

The estimated average impact of microcredit on per capita non-food consumption expenditure does not seem to be significantly positive at low levels of cumulative microcredit borrowing. However, with continued participation in microcredit program that lead to a large increase and utilization of cumulative lifetime microcredit borrowing, a significant positive increase in per capita non-food consumption expenditure is observed as seen in Table 4. These results pertaining to household food and non-food consumption increase is in line with most findings in the literature related to impacts of microcredit in Bangladesh.

Asset Accumulation

There does not seem to be any significant positive impact of microcredit on non-land asset accumulation of households. However, the results suggest that microcredit program participation does have a significant positive impact on landholding. The average increase in landholding, possibly arising from the effect of microcredit program participation is about 2.8 decimals or 0.028 acres. Even though the size of this impact seems to be small, it is significant since this paper is primarily investigating a sample of extremely poor households with very little landholding. Hence, the results suggest that microcredit program participation is likely to contribute to a rise in household wealth and asset accumulation mainly through increase in land ownership. This may be occurring because households are scaling up income generating activities primarily through an increase in labor input and not through increase in capital input like purchasing more agricultural and fishing tools, equipment, etc., which are common form of non-land assets owned by rural households. In that regard, increase in landholding also seems reasonable as most landless agrarian workers will seek to first increase landholding so that they can work in their own fields before investing in agricultural tools and equipment.

Microcredit programs also seem to increase household female ownership of non-land assets even though overall household ownership of non-land asset does not appear to increase as a result of microcredit

program participation. This suggests that microcredit is most likely gradually increasing women's control of resources in these extremely poor rural households. This is expected as many established microcredit programs, such as Grameen Bank, are exclusively geared toward female borrowers. Rural women possibly disproportionately experience the positive impact of such programs in terms of asset accumulation. This is likely to gradually increase influence of women in poor rural households. This increase in female non-land asset ownership due to microcredit is in line with similar findings of Pitt and Khandker (1998).²⁸

Education

As measured by the two education dependent variables used in this paper, microcredit does not seem to have any positive significant impact in terms of increasing years of education of male members of a household. However, it does seem to reduce average years of schooling of female members of a household by at least a quarter of a year among households that had cumulative borrowing of less than Tk 10,000 over lifetime. This is most probably because households primarily rely on labor to scale up income generating activities and primarily resort to employing the labor of their children, typically their female children. This tends to support the findings of Choe and Islam (2013) who claimed that microcredit has a negative impact on education because increases in child labor affect girls more than boys in families.²⁹

8. CONCLUSIONS

The results in this paper suggest that microcredit has improved certain aspects of standard of living of extremely poor households with little or no land ownership like consumption expenditure and asset accumulation as this paper has recorded rise in per capita food and non-food expenditure, landholding and female ownership of non-land asset for microcredit borrowers. However, microcredit seems to have little effect on education attainment of these households and has in fact appeared to have had a negative impact on female education attainment in these households at low levels of cumulative microcredit borrowing.

As stated before, one of the primary weaknesses of this paper has been the fact the treatment, that is, microcredit program participation, was not randomly assigned to the households in the sample like a randomized experiment. Households self-selected them-

selves into the program and in doing so may have induced self-selection bias in the data. For example, more entrepreneurial households may have taken out microcredit while less entrepreneurial households may have avoided such programs. Hence, households that participated in a microcredit program at least once may differ from households that never participated in a microcredit program in terms of unobserved characteristics not accounted for by household level control variables. As a result, differences in standard of living between control and treatment groups found in this paper may partially arise due to these differences in unobserved characteristics. Hence, the actual effects of microcredit are likely to be weaker than those observed in the models used in this paper. It is very difficult to isolate the effect of abilities in this kind of studies. Unfortunately, a randomized experiment to isolate the effect of microcredit program participation is not feasible in Bangladesh where such programs have virtually spread to all corners of the country.

Another weakness of this paper was that there was not enough access to village-level control variables which varied over time. Hence, the simple fixed effect regression model used in this paper can be further improved in explaining the variation across program and non-program households in different villages by including more village level controls which vary over time, such as the presence of government food programs and subsidy initiatives, as well as control variables that would help one to differentiate villages based on state and development of village infrastructure like connectivity to urban centers, presence of electricity, and gas supply from national grid and pipeline respectively. This will allow the models to better measure the average impact of microcredit on very poor households over time.

The seven dependent variables pertaining to consumption, wealth accumulation and education attainment certainly do not cover all aspects of standard of living of a household. As a result, other possible variables of interest such as household medical expenditure, household use of child labor, household access to sanitary latrine, occurrences of child marriage and under-age pregnancy, and women's role in family decision making could also be investigated which will provide a much better and detailed picture of the impact of microcredit on the standard of living of these poor households.

There are also drawbacks to this study in terms

of external validity of the results. The data from the households explored in this paper are over fifteen years old. The economy of Bangladesh has changed significantly since then as it moved toward allocating resources to more productive economic activities, such as low-end manufacturing and more productive agricultural activities like hybrid crop harvesting. In addition, local infrastructure improved considerably. Such developments in the national economy have probably increased the number of income generating opportunities in rural areas where microcredit can be utilized to better improve standard of living. As a result, we may expect to see a greater positive impact of microcredit than that documented in this paper. Hence, an ideal step forward would be to collect data on more recent program participants and non-participants to analyze representative measures of their standard of living to see whether the inferences drawn in this paper on the impact of microcredit program participation on extremely poor households with little or no land ownership are still valid in the changed economic scenario of the country.

The socioeconomic and political conditions of Bangladesh in the 1990s were likely to be different from those of other developing and developed countries where microcredit is increasingly used today. For example, democratic political reforms were just starting in Bangladesh following the end of dictatorship in 1991. Much of the rural areas of the country was, and still is, conservative. Hence, the conclusions reached in this paper about the impact of microcredit on extremely poor households may not necessarily hold in other countries with very different socioeconomic and political conditions. Microcredit is often used as an umbrella term to refer to a wide variety of microfinance initiatives across the globe. Microcredit programs in other countries have different models in terms of target population, criteria of membership, and loan repayment options. As a result, a very similar microcredit impact study on microcredit borrowers or a randomized experiment on households in other countries could be performed to see whether similar conclusions about the impact of microcredit on extremely poor households can be reached. At the same time, the models could be refined further to measure the estimated impact of microcredit on different household-level variables of interest to a reasonable degree of precision.

Based on the analyses presented in this paper,

the results conclude microcredit does have a positive impact on extremely poor households with very low landholding in terms of consumption, land ownership and female ownership of non-land assets. However, it also seems to have certain negative effects, such as possibly reducing the years of schooling of female children in households. At the same time, the paper also produced interesting findings indicating little or no significant positive impact of microcredit on non-land asset accumulation of households. Hence, even though the results indicate that microcredit can potentially increase consumption expenditure and wealth accumulation of extremely poor households and hence possibly lift these poor households from extreme poverty, there are new questions that need to be explored and answered in light of this study. In particular, the lack of significant impact of microcredit on household accumulation of non-land asset, such as consumer durables and capital goods needs to be investigated. At the same time, why microcredit did not have any positive impact on household education attainment needs to be explored in greater depth. Because increases in human capital through education has the potential to lift households from extreme poverty by making more productive income generating activities accessible to households, lack of education attainment is certainly a constraint on poor households in terms of improving living standards.

Works Cited

1. Becky Hsu, "Microcredit," forthcoming in George Ritzer, ed., *The Encyclopedia of Sociology*, (Oxford: Blackwell Publishing), forthcoming, p.1.
2. MicroWorld.org, "About Microcredit," <http://www.microworld.org/en/about-microworld/about-microcredit>.
3. Nobelprize.org, "The Nobel Peace Prize 2006," http://www.nobelprize.org/nobel_prizes/peace/laureates/2006/grameen-facts.html,
4. United Nations, "International Year of Microcredit 2005," http://www.un.org/en/events/pastevents/microcredit_2005/index.htm.
5. Shaila Dewan, "Microcredit for America," *New York Times*, October 28, 2013. <http://www.nytimes.com/2013/10/29/business/microcredit-for-americans.html>.
6. Grameen Bank, "Introduction," http://www.grameen-info.org/index.php?option=com_content&task=view&id=16&Itemid=112.
7. Investopedia, "Standard of Living," <http://www.investopedia.com/terms/s/standard-of-living.asp>.
8. Eleanor Goldberg, "The World's Poorest People live in these 5 Countries," *The Huffington Post*, April 17, 2014, http://www.huffingtonpost.com/2014/04/17/where-poorest-people-live_n_5168499.html.
9. Microcredit Regulatory Authority, "Microcredit in Bangladesh," http://www.mra.gov.bd/images/mra_files/Publications/microcredit%20in%20bd14072014.pdf.
10. Food and Agricultural Organization of United Nations, "The State of Food and Agriculture 1993," p.108. <http://www.fao.org/docrep/003/t0800e/t0800e.pdf>.
11. Grameen Bank, "Monthly Update, November 2014," http://www.grameen.com/index.php?option=com_content&task=view&id=453&Itemid=527.
12. Mark M. Pitt and Shahidur R. Khandker, "The Impact of Group-Based Credit Program on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political Economy* 106:5 (October 1998): 958. <http://www.jstor.org/stable/10.1086/250037>.
13. Ibid, p. 987.
14. Mark M. Pitt, Shahidur R. Khandker, and Jennifer Cartwright, "Empowering Women with Microfinance: Evidence from Bangladesh," *Economic Development and Cultural Change* 54:5 (July 2006): 793. <http://www.jstor.org/stable/10.1086/503580>.
15. Ibid, p. 817.
16. Asadul Islam and Chongwoo Choe, "Child Labor and Schooling Responses to Access to Microcredit in Rural Bangladesh," *Economic Inquiry* 51:1 (2013): 46.
17. Ibid, p. 46.
18. Shahidur R. Khandker, "Microfinance and Poverty: Evidence using Panel Data from Bangladesh," *The World Bank Economic Review* 19:2 (2005): 26.
19. Ibid, p. 285.
20. Md. N. Islam, K.H. Robel, Ashique M. Adnan and Chowdhury S. Ekram, "Do Microcredit Programs ameliorate Standard of Living? Spotlight on Microcredit Organizations in Bangladesh," *International Journal of Economics and Finance* 5:4 (2013): 114.
21. Asian NGO Coalition for Agrarian Reform and Rural Development, "Bangladesh," <http://www.angoc.org/where-we-work/south-asia/bangladesh/>.
22. Abhijit Banerjee, Esther Duflo, Rachel Glennerster, and Cynthia G. Kinnan, "The Miracle of Microfinance? Evidence from a Randomized Evaluation," *NBER Working Paper No. 18950*, (2003): 1.
23. Bruno Crépon, Florencia Devoto, Esther Duflo, and William Pariente, "Estimating the impact of microcredit on those who take it up: Evidence from a randomized experiment in Morocco," working paper (March 2014): 24. <http://economics.mit.edu/files/6659>.
24. Umara Noreen, Rabia Imran, Arshad Zaheer and M. Iqbal Saif, "Impact of Microfinance on Poverty: A Case of Pakistan," *World Applied Sciences Journal* 12:6 (2011): 877.
25. Ibid, p.1.
26. David Roodman and Jonathan Morduch "The Impact of Microcredit on the Poor in Bangladesh: Revisiting Evidence," *Center for Development Studies Working Paper 174*, (June 2013). <http://www.cgdev.org/publication/impact-microcredit-poor-bangladesh-revisiting-evidence-working-paper-174-june-2013>.
27. Tango International, "Rural Bangladesh Socio-Economic Profiles of WFP Operational Areas & Beneficiaries," (October, 2006) p.28. http://www.preventionweb.net/files/2806_wfp152436.pdf.
28. Mark M. Pitt and Shahidur R. Khandker, "The Impact of Group-Based Credit Program on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political Economy* 106:5 (October 1998): 958.
29. Asadul Islam and Chongwoo Choe, "Child Labor and Schooling Responses to Access to Microcredit in Rural Bangladesh," *Economic*

Bibliography

- Asian NGO Coalition for Agrarian Reform and Rural Development. "Bangladesh," <http://www.angoc.org/where-we-work/south-asia/bangladesh/>.
- Banerjee, Abhijit, Esther Duflo, Rachel Glennerster and Cynthia G. Kinnan. "The Miracle of Microfinance? Evidence from a Randomized Evaluation," *NBER Working Paper No. 18950* (2013): 1-37.
- Crépon, Bruno, Florencia Devoto, Esther Duflo and William Pariente, "Estimating the impact of microcredit on those who take it up: Evidence from a randomized experiment in Morocco," working paper (March, 2014): 1-53. <http://economics.mit.edu/files/6659>.
- Dewan, Shaila. "Microcredit for America," *New York Times*, October 28, 2013. <http://www.nytimes.com/2013/10/29/business/microcredit-for-americans.html>.
- Food and Agricultural Organization of the United Nations. "The State of Food and Agriculture 1993," <http://www.fao.org/docrep/003/t0800e/t0800e.pdf>.
- Goldberg, Eleanor. "The World's Poorest People live in these 5 Countries," *The Huffington Post*, April 17, 2014. http://www.huffingtonpost.com/2014/04/17/where-poorest-people-live_n_5168499.html.
- Grameen Bank. "Monthly Update November 2014," http://www.grameen.com/index.php?option=com_content&task=view&id=453&Itemid=527.
- Grameen Bank. "Introduction," http://www.grameen-info.org/index.php?option=com_content&task=view&id=16&Itemid=112.
- Hsu, Becky. "Microcredit," forthcoming in George Ritzer, ed., *The Encyclopedia of Sociology*, (Oxford: Blackwell Publishing). Forthcoming.
- United Nations. "International Year of Microcredit 2005," http://www.un.org/en/events/pastevents/microcredit_2005/index.htm.
- Islam, Asadul, and Chongwoo Choe. "Child Labor and Schooling Responses to Access to Microcredit in Rural Bangladesh," *Economic Inquiry* 51:1 (2013): 46-61.
- Islam, Md. N., K.H. Robel, Ashique M. Adnan and Chowdhury S. Ekram. "Do Microcredit Programs Ameliorate Standard of Living? Spotlight on Microcredit Organizations in Bangladesh," *International Journal of Economics and Finance* 5:4 (2013): 109-115.
- Khandker, Shahidur R. "Microfinance and Poverty: Evidence using Panel Data from Bangladesh," *The World Bank Economic Review* 19:2 (2005): 263-286.
- Khandker, Shahidur R. "Household Survey to Conduct Microcredit Impact Studies: Bangladesh," *Research at the World Bank*, World Bank (accessed October 03, 2013). http://siteresources.worldbank.org/INTRES/Resources/survey_desc.pdf.
- MicroWorld.org. "About Microcredit," <http://www.microworld.org/en/about-microworld/about-microcredit>.
- Microcredit Regulatory Authority. "Microcredit in Bangladesh," 2013. http://www.mra.gov.bd/index.php?option=com_content&view=category&layout=blog&id=29&Itemid=80.
- Nobelprize.org. "The Nobel Peace Prize 2006," http://www.nobelprize.org/nobel_prizes/peace/laureates/2006/grameen-facts.html.
- Noreen, Umara, Rabia Imran, Arshad Zaheer, and M. Iqbal Saif. "Impact of Microfinance on Poverty: A Case of Pakistan," *World Applied Sciences Journal* 12:6 (2011): 877-883.
- Pitt, Mark M., and Shahidur R Khandker. "The Impact of Group-Based Credit Program on Poor Households in Bangladesh: Does the Gender of Participants Matter?" *Journal of Political Economy* 106:5 (October 1998): 958-996.
- Pitt, Mark M., Shahidur R. Khandker, and Jennifer Cartwright. "Empowering Women with Micro Finance: Evidence from Bangladesh," *Economic Development and Cultural Change* 54:5 (July 2006): 791-831.
- Roodman, David, and Jonathan Morduch. "The Impact of Microcredit on the Poor in Bangladesh: Revisiting Evidence," *Center for Development Studies Working Paper 174* (June 2013): 1-45. <http://www.cgdev.org/publication/impact-microcredit-poor-bangladesh-revisiting-evidence-working-paper-174-june-2013>.