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**MICROCREDIT AND WOMEN'S EMPOWERMENT
IN BANGLADESH: A STRUCTURAL EQUATION MODEL
FOR CATEGORICAL OBSERVED VARIABLES**

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Microcredit and women's empowerment in Bangladesh: a structural equation model for categorical observed variables.

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Abstract

This paper employs the Bangladesh Demographic and Health Survey (2004) to explore the relationship between participation in microcredit programs and women's empowerment using a structural equation model with categorical observed variables. A MCMC-based Bayesian approach is adopted for estimation. Along with participation in microcredit, we consider a variety of socio-cultural aspects as potential predictors of empowerment in the Bangladeshi context including men's perceptions about women's status. We conclude that gender community norms are strongly rooted in women's minds regardless of the partners' perceptions of women's status, and microcredit interventions may actually contribute to change gender beliefs and social attitudes.

Keywords: Microcredit programs, Women's empowerment, Gender relations, Asia, Bangladesh, Bayesian approach.

JEL Classification: : J10, O15, O19

1. INTRODUCTION

Women's empowerment is a multidimensional process which involves the woman's personal, family, social, cultural, economic and political space (Kabeer, 1999, Swain and Wallentin, 2012). Empowerment cannot be directly observed: following Kabeer's (1999) approach, the concept of empowerment concerns three closely interrelated dimensions: agency, resources and achievements.

In particular, agency represents a central issue. It is the ability to define one's goals and act upon them (Kabeer, 2005; Mosedale, 2005). Usually thought of as "decision-making", agency can

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also include “bargaining and negotiation, deception and manipulation, subversion and resistance” (Kabeer, 1999).

Resources are the medium through which agency is exercised (Kabeer, 2005). They are identified as not only material but also human, social and cultural and as involving future expectations as well as actual allocations (Mosedale, 2005). Following Kabeer (1999), the “resources” dimension has to be defined in a way that spells out its potential for human agency and valued achievements. In many empirical studies “resources” are treated as catalysts for empowerment or “pre-conditions” under which empowerment is likely to occur (Goetz and Gupta, 1996; Hashemi, Schuler and Riley, 1996; Steel, Amin and Naved, 2001; Malhotra, 2002). Nonetheless, variables like education, geographic region and socio-economic status should be better defined as “enabling factors” or “sources of empowerment” rather directly used as “proxies” for empowerment (see Malhotra, 2002; Kishor, 2000).

Finally, achievements refer to the outcomes of the agency process. In other words, they have been considered in terms of both the agency exercised and its consequences. Achievements concern the increase in women’s well-being, reflecting improvement in both women’s absolute well-being (the process of improving the position of women at the community and societal levels) and women’s relative well-being (the process of improving the position of women relative to men in intra-household relationships) (Mahmud, 2003).

In line with this conceptual framework, access to social networks outside the family can play a crucial role in the empowerment process. Women’s access to microcredit programs may increase their involvement in the public sphere and change normative structures that limit women’s strategic life choices. The actual access to credit can provide different potentials for the actualization of choice (i.e., greater economic independence and awareness of their rights). It is clear from the analysis of the literature on gender and empowerment that the role of gender in development cannot be understood without considering the socio-cultural contexts in which development takes place (Malhotra, 2002). Gender intra-household relations represent a “pre-condition” for the empowerment process: gender asymmetries regarding initial resources and opportunities make women less able to bargain for their own needs and priorities, highlighting potential conflicts within the household (Kabeer, 2001). Considering gender relationships at the intra-household level as pre-conditions allow us to investigate if partner’s perceptions about women’s role in both the household and the community effectively influence their choices and their ability to make decisions. (Kabeer, 2001; Mahmud, 2003).

Empowerment is context specific. This implies that behaviors and attributes that signify empowerment in one context often have different meanings elsewhere. For instance, a shift in women’s ability to visit a health center without the husband permission may be a sign of empowerment in rural Bangladesh but not in, for example, urban Peru. Context can also be relevant in determining the extent to which empowerment at the family and individual level is a determinant of development outcomes (Malhotra, 2002; Hashemi et al., 1996).

In our study, we consider women’s empowerment as a multidimensional process, and we selected two distinct sub-dimensions of agency as contextual sensitive measures of this process in Bangladesh: socio-economic participation and decision making power (Hashemi et al. 1996). The

first concerns freedom of mobility and women's employment, the second a set of strategic choices regarding health, purchases and mobility¹. These latent dimensions are measured by a set of observed ordinal variables. Given the nature of the observed variables, the methodology we use here takes the ordinality of the data into account. We examine whether microcredit and other relevant socio-cultural factors are effective in determining women's empowerment. The analysis is based on cross-section data on Bangladeshi couples from 361 Primary Sampling Units, 122 in urban area and 239 in rural area, for the year 2004.

The paper contributes to new research at three distinct levels. First, it involves as "pre-conditions" or "resources" men's attitudes about some crucial aspects of women's empowerment. A growing body of literature highlights the need to acknowledge the dynamics of couple relationships in the field of women's empowerment studies, especially concerning the male involvement in the promotion of reproductive and child health (Kumar et al., 2009; Karra et al., 1997; Barker and Schulte, 2010). But limited attention has been paid to men's perception of women's role in intra-household relationships and in the social context as factors that have a potential to influence women's behaviours and the agency process. Secondly, it provides further evidence of the positive correlation between microcredit participation and the multidimensional process of empowerment (Mahmud, 2003; Swain and Wallentin, 2009). Thirdly, it introduces a different statistical approach to the field of women's empowerment studies. We use a Bayesian Latent Variable Model for analysing ordinal manifest variables which allows for covariate effects on the latent factors. Due to the flexibility of the Bayesian approach, it is straightforward to apply the method in a complex modelling framework. There are several differences between the Bayesian and frequentist approaches. The Bayesian approach requires the specification of prior distributions for each of the model parameters, including the latent variables and the parameters from the measurement and structural models. For model fitting we rely on Markov Chain Monte Carlo (MCMC) integration, which involves generating samples from the joint posterior distribution of the model parameters and latent variables through a computationally intensive procedure. MCMC methods have become popular for estimating the parameters of Latent variable models mainly because they allow for the estimation of complex models (for detailed information about the Bayesian approach, see Lee, 2009, ch.6).

The remainder of this paper is organized as follows. The next section provides a brief overview of the literature concerning microcredit, gender roles and women's empowerment. Section 3 presents the theoretical framework. Section 4 describes the data and the variables used in the study. Section 5 explains the methodology and the estimation strategy. The last two sections present the results and conclusions.

2. ON EMPOWERMENT, GENDER CULTURAL DIFFERENCES, AND MICROCREDIT PROGRAMS.

The empowerment of women is an important purpose of microcredit programs. It is about a change in favor of those who previously exercised little control over their lives. This change is two-

sided. The first concerns control over resources (financial, physical, and human), and the second regards control over ideology (beliefs, values, and attitudes) (Afrin et al., 2008).

Microcredit can be viewed as an entry point for women's economic, social and political empowerment. A combination of women's improved economic activity and control over resources resulting from access to programs can enhance their status within the community, mobility and access to knowledge. These changes are reinforced by group formation, leading to strengthened social interactions (between women themselves, and between women and members of the microcredit organizations) that play an important role in sustaining or modifying the gender beliefs as a whole (Ridgeway et al., 1999; Mayoux, 2002).

There is an extensive literature debating the effectiveness of participation in microcredit programs in terms of empowering women (i.e. Pitt and Khandker, 1998; Hashemi, Schuler and Riley, 1996; Swain and Wallentin, 2012). Thinking of microcredit as a potential enabling factor (as a pre-condition or resource) in the empowerment process is a route followed by many (Swain and Wallentin, 2009, 2012; Pitt and Khandker, 1998; Pitt, Khandker and Cartwright, 2006; Aghion and Morduch, 2010; Anderson and Eswaran, 2005; Goetz and Gupta, 1996; Dijkstra, 2002; Beteta, 2006; Bardhan and Klasen, 2000). In their interesting study, Aghion and Morduch (2010) suggest that microfinance effectively empowers women especially in terms of bargaining power, by increasing access to and control over resources and influencing social and cultural norms (see also Swain and Wallentin, 2012). Browning and Chiappori (1998) find that increasing the relative value of a woman's time and her monetary income increases her power to allocate resources within the family, which empowers her. Mahmud (2003) analyzes the effect of microcredit participation on women's empowerment in the Bangladeshi context. Results from her study suggest that program participation effectively enables women to exercise agency in household processes, and this effect is greater in situations where women are traditionally most subordinate to men. Other research emphasizes the social impact of microcredit participation on the degree of autonomy (see Anderson and Eswaran, 2005; Goetz and Gupta, 1996) and political and social inclusion (Aghion and Morduch, 2010; Beteta, 2006; Bardhan and Klasen, 2000).

Improvements in access to and control over money are important benefits for women but evidence also shows that "female targeting without adequate support networks and empowerment strategies will merely shift the burden of household debt and household subsistence onto women" (Mayoux, 2002). Kabeer (2001) explores the reasons why several evaluations of the empowerment potential of credit programs for rural women in the Bangladeshi context have reached very conflicting conclusions. Although these evaluations use distinct methods and have been carried out at different points of time, Kabeer (2001) highlights that the primary source of the conflict lies in the very different understandings of intra-household relations which these studies draw on. Starting from Kabeer's framework (1999), Mahmud (2003) conceptualizes the pre-conditions for empowerment in terms of women's access to choice-enhancing resources. These are both material resources (such as education) and non-material resources (such as participation in the public sphere and a favorable household attitude). Concerning this last category, she includes a proxy for intra-household relations as a pre-condition for the empowerment process. A favorable household attitude towards women can expand women's choices and increase the likelihood that women's

welfare is incorporated into household livelihood strategies. Specifically, she uses “husband’s approval of family planning” as a favorable household attitude because this potentially increases the welfare of women and children by reducing the costs to women of using modern birth control methods.

One of the main problems in measuring empowerment and its interrelations with other factors is that behaviors and attributes take on different meanings in different contexts. Context changes not only across socio-cultural settings but also within settings over time (Malhotra et al., 2002). A relevant body of literature confirms the importance of context in defining and measuring the relationship between economic and human development outcomes and women’s empowerment (Mason and Smith, 2000; Jejeebhoy, 2000; Kritiz, Makinwa-Adebusoya, and Gurak, 2000; Hashemi, Schuler, and Riley, 1996).

Cultural and social constraints have a significant impact on the empowerment process (Beteta, 2006). Mayoux (1999), analyzing a survey of 15 distinct programs in Africa, points out that the degree of women’s empowerment strictly depends on the social norms and traditions. The key factor is that, as women, they are all constrained by “the norms, beliefs, customs and values through which societies differentiate between women and men” (Kabeer, 1999, p. 438). Clearly, the ways in which this operates vary over time and culturally. For instance, in a specific situation it may reveal itself in women’s lower incomes compared with men, in another it might be shown by the relative survival rates of girl and boy children and in a third by strong restrictions on women’s freedom of mobility. Focusing on the empowerment of women as a group implies taking into account gender relations, that is, the ways in which power relationships between the sexes are constructed and handled.

In the Bangladeshi context, cultural norms are based on asymmetrical assumptions regarding gender roles and prescribe seclusion of women (purdah) and promote the multi-generational, patrilineal extended household. Younger women are relatively powerless and live under the control of their husbands and mothers-in-law. Girls learn to accept dependence and deprivation, and education for them is often considered irrelevant. Because of the purdah, they are confined to the homestead and their contacts with the world outside the household are quite limited. Social and economic dependence on men is the normal situation for poor women in Bangladesh (Schuler and Hashemi, 1994; Goetz and Gupta, 1996; Mahmud et al., 2012).

3. THEORETICAL FRAMEWORK

To conceptualize empowerment, we start from the well known Kabeer’s (1999) definition. It defines women’s empowerment as “the expansion in people’s ability to make strategic life choices in a context where this ability was previously denied to them.”

This approach is very attractive because it contains two relevant elements: first, the idea of process, or change from a condition of disempowerment, and second, the concept of agency, that refers to the process of removing different types of “un-freedoms” that limit individual choices (Sen, 1999). Specifically, Kabeer (1999) identifies three key components of empowerment².

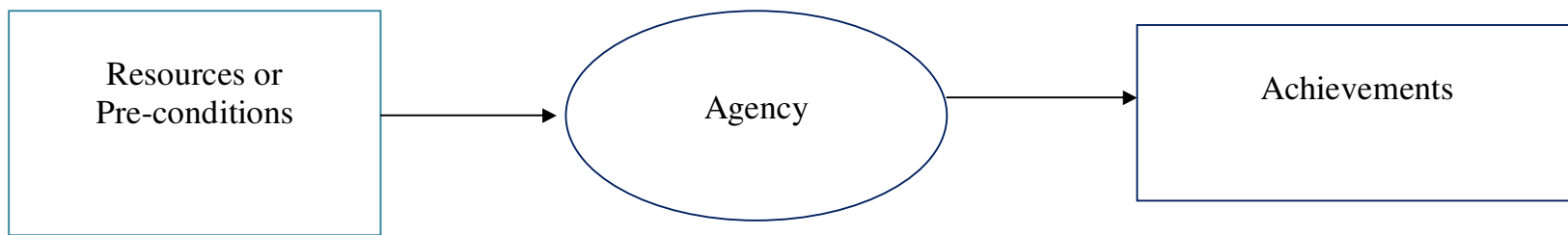


Figure 1: A conceptual framework for Empowerment (Personal elaboration from Kabeer, 1999)

Agency is a central concept in empowerment literature. It regards the ability to formulate strategic choices, and to control resources and decisions that influence important life outcomes (Sen, 1999; Malhotra et al., 2002). The effective exercise of choice (sense of agency) is the translation of pre-conditions into greater levels of women's well-being. In this dimension empowerment takes place in different forms. Traditionally, "agency" tends to be operationalized as "decision-making" power, but it can take the form of bargaining and negotiation, deception and manipulation, cognitive processes of reflection and analysis exercised by individuals as well as by collectivities (Kabeer, 1999). Indicators that have been commonly identified to measure the agency dimension are also financial independence, participation in public sphere and freedom of movement (Mahmud, 2012). In our study, we focus on "agency" as the essence of empowerment and select two distinct sub-dimensions as contextual sensitive measures of this process in Bangladesh: socio-economic participation and decision making (Hashemi et al. 1996; Goetz and Gupta, 1996; Steel, Amin and Naved, 2001; Mahmud, 2003).

The "pre-conditions" of empowerment (that is the conditions under which choices are made) involve economic, human and social resources. These are enabling factors, that is potential critical inputs into an empowerment process. Therefore, resources and agency together generate the potential for specific outcomes called "achievement" (Malhotra et al., 2002).

According to our framework, the process of women's empowerment is shaped by several "resources" or "pre-conditions": personal and social indicators (including participation in microcredit programs), men's perception about women's role at both household and community levels, exposure to media and economic and geographical characteristics.

Concerning microcredit interventions, we consider as a "pre-condition" the actual participation in the program, and not only its availability (Goetz and Gupta, 1996; Kabeer, 1999; Swain and Wallentin, 2012, 2009; Pitt and Khandker, 1998; Pitt, Khandker and Cartwright, 2006). We consider access to microcredit as a resource that can be translated into valuable achievements (Kabeer, 1999). This kind of approach is used in other studies (e.g., Mahmud, 2003; Malhotra et al., 2002).

The introduction of men's attitudes to women's role in social and intra-household contexts as a "pre-condition" of the empowerment process provides information about the intra-household gender attitudes and their effect in expanding choices (see Mahmud, 2003). For example, favorable male attitude towards women can actually expand choices since it increases the likelihood that women's well-being is incorporated into family livelihood strategies (Mahmud, 2003). On the other hand, gender normative structures can seriously limit women's strategic life choices, constraining women's freedom of movement, access to economic resources, and "voice" in the local community (Malhotra et al., 2002). As outlined by Mosedale (2005, p. 245): "Since gender relations vary both geographically and over time they always have to be investigated in the context. It also follows that they are not immutable. Nevertheless, particular manifestations of gender relations are often fiercely defended and regarded as "natural" or "God-given."

Following Kabeer's study (1999), the third component of empowerment concerns "achievements". In the evaluation context, "achievements" are usually treated as outcomes of empowerment. The selection of achievements is based on the conceptualization of women's

empowerment in terms of “decision-making power” and “socio-economic participation”. We hypothesize that their empowerment would be associated with positive achievements in health (of women and children), purchases, mobility and paid employment.

3. DATA AND VARIABLES

The model estimation is based on data from the Bangladesh Demographic & Health Survey (NIPORT, 2005). The objectives of the survey are to assess the overall demographic situation and to assist in the evaluation of the population and health programs in Bangladesh.

The 2004 Bangladesh Demographic and Health survey was conducted under the authority of the National Institute for Population Research and Training (NIPORT) of the Ministry of Health and Family Welfare. The survey was carried out by Mitra and Associates, a Bangladeshi research organization located in Dhaka.

The sample covers the entire population residing in private dwellings units in the country. Bangladesh is divided into six divisions. In turn, each division is divided into *zilas*, and in turn each *zila* into *upazilas*. Each urban area in the *upazila* is divided into wards and into *mahallas* within the ward; each rural area in the *upazila* is divided respectively into *union parishads* (UP) and, within them, into *mouzas*. These divisions allow the country as a whole to be separated into rural and urban areas.

For the 2001 census, subdivisions called enumeration areas (EAs) were created based on a convenient number of dwellings units. Enumeration areas were considered suitable to use as Primary Sampling Units (PSUs). Within each division, the list of enumeration areas constituted the sample frame for the 2004 Bangladesh Demographic and Health Survey. A target number of interviews with eligible women was set at 10,000, on the basis of information from the 1999-2000 Bangladesh Demographic and Health Survey. The sample is a stratified, multistage cluster sample including 361 Primary Sampling Units, 122 in urban areas and 239 in rural areas. Once the target sample was allocated to each group area (urban and rural), the number of Primary Sampling Units was computed in terms of an average of 28 completed interviews of eligible women per Primary Sampling Unit (or an average of 30 selected households per primary sampling unit) (NIPORT, 2005).

The survey uses a Household Questionnaire, Women’s Questionnaire, Men’s questionnaire, and a Community Questionnaire. The Household Questionnaire contains information about the characteristics of the usual members and visitors in the households, including age, sex, education, and relationship to the head of the household. The Women’s Questionnaire collects information on fertility and childhood mortality levels; nuptiality; fertility preferences; awareness, approval, and use of family planning methods; breastfeeding practices; nutrition levels; and maternal and child health. These women were asked questions on background characteristics, such as age, education, employment status, religion, etc.

The Men’s Questionnaire is used to collect information on the following topics: background characteristics (including respondent’s work), health and life style (illness, use of tobacco),

marriage and sexual activity, participation in reproductive health care, awareness of AIDS and attitudes on women's decision making roles, and domestic violence.

In addition, the survey collects information from women and men on other measures of women's autonomy and status. More specifically, questions were asked about women's role in household decision-making process. To assess it, the survey collects information on the women's participation in six different types of household decisions: on the respondents' own health care, on child health care, on making large household purchases, on making household purchase for daily needs, on visits to family or relatives, and on what food to cook each day. Another important dimension of women's autonomy measured in the survey is women's freedom of movement: currently married women were asked whether they go alone outside the village/town/city and to a health center or hospital. Concerning domestic violence, currently married men were asked whether they thought it was justified for a husband to beat his wife in different situations (if she goes out without permission, if she neglects children, if she argues with him, and if she fails to provide food in time).

The survey was conducted between the months of October 2003 and December 2003. Sampling was designed to select 10,811 households with at least one woman age 10-49 years and all ever married women in the selected households were eligible respondents for the women's questionnaire. As regard the men's survey, survey's officials interviewed one randomly selected man, regardless of marital status, in the age group 15-54, from each of the selected households.

Our study is focused on the sample of couples. After correcting for missing values, the analysis is based on 2428 couples.

Table 1: Description of observed indicators to measure latent variables (women)

Observed indicators	Questions asked to the DHS respondent	Coding	Percentages
<u>Socio-economic</u>			
- Goes to a health center or hospital alone	Do you go to a health center or hospital alone?	1 - No	1 = 0.09
		2 - Yes, with husband	2 = 0.38
		3 - Yes, with children	3 = 0.19
		4 - Other	4 = 0.05
		5 - Yes, alone	5 = 0.29
-Goes outside the village/town/city alone	Do you go outside the village/town/city alone?	1 - No	1 = 0.32
		2 - Yes, with children	2 = 0.46
		3 - Yes, alone	3 = 0.22
-Respondent currently working	Aside from your own housework, are you working?	1 - No	1 = 0.78
		2 - Yes	2 = 0.22
<u>Decision-making power</u>			
- Final say on making large household purchases	Who in your family usually has the final say on the following decisions: making large household purchases?	1 - Husband/partner alone	1 = 0.37
		2 - Someone else	2 = 0.06
		3 - Respondent & other person	3 = 0.05
		4 - Respondent & partner	4 = 0.46
		5 - Respondent alone	5 = 0.06
- Final say on making household purchases for daily needs	Who in your family usually has the final say on the following decisions: making household purchase for daily needs?	1 - Husband/partner alone	1 = 0.37
		2 - Someone else	2 = 0.06
		3 - Respondent & other person	3 = 0.04
		4 - Respondent & partner	4 = 0.38
		5 - Respondent alone	5 = 0.15
- Final say on visits to family, friends and relatives	Who in your family usually has the final say on the following decisions: visits to family, friends and relatives	1 - Husband/partner alone	1 = 0.39
		2 - Someone else	2 = 0.05
		3 - Respondent & other person	3 = 0.04
		4 - Respondent & partner	4 = 0.44
		5 - Respondent alone	5 = 0.08
- Final say on child health care	Who in your family usually has the final say on the following decisions: child health care?	1 - Husband/partner alone	1 = 0.35
		2 - Someone else	2 = 0.10
		3 - Respondent & other person	3 = 0.03
		4 - Respondent & partner	4 = 0.39
		5 - Respondent alone	5 = 0.13
- Final say on own health care	Who in your family usually has the final say on the following decisions: own health care?	1 - Husband/partner alone	1 = 0.53
		2 - Someone else	2 = 0.03
		3 - Respondent & other person	3 = 0.02
		4 - Respondent & partner	4 = 0.28
		5 - Respondent alone	5 = 0.14

(a) Indicators of Agency and Pre-conditions

In order to investigate the relationship between microcredit, men's attitudes and empowerment, the model is estimated using two latent sub-dimensions of agency: socio-economic participation and decision-making power.

The first column of Table 1 corresponds to the variable names and lists the observed indicators used to measure the two latent factors. The second column reports the exact question that was asked to the Demographic Health Survey respondent. Finally, column 3 contains the coding of the responses and column 4 the proportion of the responses to each of the coded categories.

As a first step, an Exploratory Factor Analysis was used to support the extraction of the two latent dimensions of empowerment considered in the study. Its goal is to identify the underlying relationships between observed variables and the latent constructs. Starting from the observed indicators shown in Table 1, we use this technique to see if there are really two latent factors, and if those factors represent the sub-dimensions indicated above. In order to extract the two latent factors, we use the Kaiser's criterion, suggested by Guttman (1954) and adapted by Kaiser, that considers factors with an eigenvalue greater than one as common factors (see Kaiser, 1958).

Table 2: Factor loadings in exploratory factor analysis

Variable	Factor1	Factor2
Working	0.185	0.199
Go to health center	0.240	0.464
Go outside village/city	0.243	0.487
Final say child health	0.767	-0.019
Final say visits family/friends	0.737	-0.089
Final say daily purchases	0.739	-0.099
Final say large purchases	0.827	-0.094
Final say own health	0.701	-0.051

Factor loadings allow the interpretation of factor 1 as a measure of decision-making power while factor 2 may be related to agency in the socio-economic environment.

In particular, from Table 2, we may note that the socio-economic factor is associated to working outside the household to two variables regarding the freedom of mobility. On this latter aspect, women were asked if they had gone to two places: (1) hospital/health center and, more generally, (2) outside the village. Only a relatively small percentage of women (22%) had been involved in working activities outside the home. The degree of freedom of mobility is represented by their independence in going to a hospital/health center and outside the village/town. About 29% of them reported that they go to an hospital/health center alone, and 38% with their husband, while only 20% of women reported that they go outside the village/town alone.

Decision-making power is associated to a set of observed variables describing the women's role in the household decision process. To assess women's decision-making autonomy, we selected five distinct kinds of decisions: large household purchases, household purchases for daily needs, visit to the woman's family or relatives, child health care and own health care (see Swain and Wallentin, 2009; Mahmud et al. 2012). The strength of women's role in decision-making varies with the kind

of decision. A 15% of women decides independently on daily household purchases, but only 6 to 14 percent make independent decision on other matters.

In line with the conceptual framework described in figure 1, there are different factors (pre-conditions) that affect the empowerment process. A concise description of the sample distribution of these variables may be found in Table 3.

First, we include a set of personal and social indicators such as woman's age, level of education, participation in microcredit programs, household composition and household wealth. Regarding education, the Bangladeshi system is comprised into three main levels: primary, secondary and higher secondary. Primary education is a 5-year cycle, while secondary education is a 7-year one with three sub-stages: three years of junior education, two years of secondary and two years of higher secondary.

For the present study, we classified education in different levels: none, incomplete primary, complete primary, incomplete secondary, secondary or higher (in line with the BDHS's classification).

Family patterns in Bangladesh remain traditional and patriarchal. Women, especially in rural communities, live in accordance with community norms and usually move to their husband's household at marriage. Recently married young women tend to be passive, obedient, and uninvolved in the decision making process. The major household decisions are controlled by the male members of the family (such as father, brother and son) and, often, by the mother-in-laws (Nosaka and Bairagi, 2008). By introducing in our analysis household composition (a dummy variable equal to one if there is another related adult person within the household), we attempt to take into account large family structures in the socio-cultural context of Bangladesh.

Following the Demographic Health Survey's approach, the household wealth variable is measured through the welfare index. It is an indicator of the level of wealth that is consistent with expenditure and income measures, and its estimate is directly available in the Bangladesh Demographic and Health Survey (Rutstein, 1999). The wealth index is constructed from data on household assets via a collection of indicators representing durable goods (such as television and bicycles) and dwelling characteristics (such as source of drinking water, sanitation facilities and construction materials). Each asset was assigned a weight (factor score) through a Principal Component Analysis, and the resulting asset scores are standardized in relation to a Normal distribution with mean 0 and standard deviation 1 (Gwatkin et al., 2000; NIPORT, 2005). Then, each household is assigned a score for each asset, and the scores were summed for each household. A single asset index is created for the whole sample (rural and urban populations).

Table 3: Summary Statistics “Pre-conditions”. Number of observations (couples) is 2428.

Variable	Mean	St. deviation	Min	Max
Microcredit	0.363	0.481	0	1
Household Size	5.213	2.111	2	16
Household Wealth:				
- Poorest	0.217	0.412	0	1
- Poor	0.212	0.409	0	1
- Middle	0.197	0.398	0	1
- Rich	0.178	0.383	0	1
Age	27.65	7.78	13	49
Education:				
- No education	0.390	0.488	0	1
- Incomplete primary	0.221	0.415	0	1
Complete Primary	0.091	0.288	0	1
- Incomplete Secondary	0.229	0.420	0	1
- Complete Secondary	0.020	0.139	0	1
Media Exposure:				
- Listen radio:				
- Never	0.563	0.496	0	1
- Rarely	0.116	0.320	0	1
- Once a week	0.167	0.373	0	1
- Often	0.155	0.362	0	1
- Watching TV:				
- Never	0.444	0.497	0	1
- Rarely	0.095	0.293	0	1
- Once a week	0.218	0.413	0	1
- Often	0.243	0.429	0	1
Men's opinions:				
- Decisions on large purchase	0.894	0.308	0	1
- Beating if visits friends/family	0.523	0.500	0	1
- Acceptable working (not spouse)	0.539	0.499	0	1
- Acceptable working	0.155	0.362	0	1
Rural	0.675	0.469	0	1
Main Economic Activity:				
- Agriculture	0.699	0.459	0	1
- Commerce	0.148	0.355	0	1
- Manufacturing	0.004	0.063	0	1
- Fishing	0.016	0.124	0	1
- Labor	0.096	0.294	0	1
- Other	0.037	0.189	0	1
Region:				
- Barisal	0.094	0.292	0	1
- Dhaka	0.245	0.430	0	1
- Chittagong	0.124	0.330	0	1
- Khulna	0.175	0.380	0	1
- Rajshahi	0.281	0.450	0	1
- Sylhet	0.081	0.273	0	1

Exposure to media can help to empower women by equipping themselves with information and new ideas. We select as indicators of media exposure whether the woman listens to the radio and watches television and with what frequency.

The men's attitudes about the role of women in specific contexts (decision-making for large purchases, beating justification if woman visits family or friends without permission, acceptable for a woman to work outside home to earn an income and acceptable for a woman to work outside home if spouse isn't) are indicators of the socio-cultural context and can provide a measure of the intra-household relationships, which are related to gender inequalities at the family level (Mahmud, 2003). On the men's attitudes about women's work outside home, 85% of respondents report that it is not acceptable, while 46% of the male sample reports that it is acceptable if the woman is not married. About 48% of men justify beating their wife if she visits family or friends without permission, while 11% of them does not involve women in important economic decisions (NIPORT, 2005).

We finally include variables such as type of place of residence (rural/urban) and region to capture dynamics at the geographic level.

5. METHODOLOGY

The model consists of two parts: the measurement and the structural parts. The measurement model (on the right of figure 2) relates the manifest ordinal variables to two latent factors: the socio-economic and decision-making facets of agency. In the structural part of the model, these two latent components are regressed on a set of observed variables (left-hand side of figure 2).

The relationships between the latent dimensions of women's empowerment and the observed variables are indicated by the arrows.

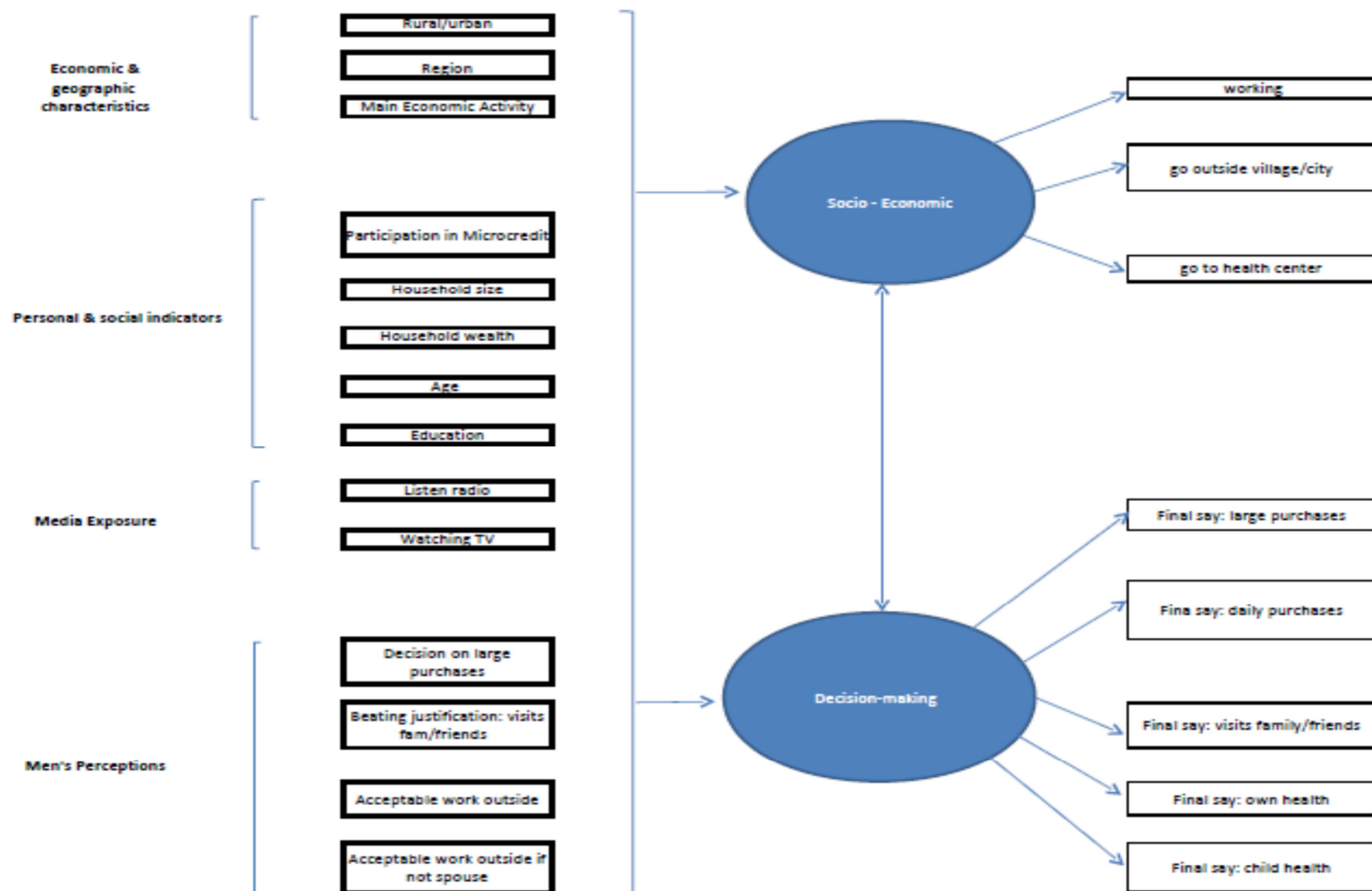


Figure 2: Path Diagram for the women's empowerment model

(a) Measurement model

Let Y_{hi} denote each of the 8 response variables that we consider ($h=1, \dots, H=8$). Each of these variables is categorical with K_h levels associated to sample unit i (i.e.), $i=1, \dots, 2428$ we assume

$$Y_{hi} \sim \text{cat}(\mathbf{p}_{hi}) \quad (1)$$

where \mathbf{p}_{hi} is a vector of probabilities $\mathbf{p}_{hi} = (p_{hki})_{1 \leq k \leq K_h}$ such that $\sum_k p_{hki} = 1$.

For the probabilities vectors \mathbf{p}_{hi} we specify a proportional odds model (McCullough, 1980 Agresti, 2002, chapter 7) which provides a useful extension of the binary logistic model to situations where the response variable takes on ordered categorical values:

$$\text{logit}\{\Pr(Y_{hi} \leq k)\} = \log \frac{\Pr(Y_{hi} \leq k)}{\Pr(Y_{hi} > k)} = \alpha_{kh} - \sum_{m=1}^M \lambda_{hm} \eta_{mi} \quad (2)$$

where m denotes the unobservable latent factors ($m=1, 2$) and η_{mi} their scores on unit i λ_{hm} are the factor loadings. Following the results of the exploratory factor analysis, some loadings are set 0.

Note that a different intercept is included for each level of the response variable. These intercepts increase with k , since $\Pr(Y_{hi} \leq k)$ increases in k for a fixed value of the covariates and the logit is an increasing function of this probability. These intercepts α are sometimes referred to as cut-points.

(b) Structural model

Let $\boldsymbol{\eta}_i = (\eta_{1i}, \eta_{2i})$ denote the vector of factors scores associated to sample unit i . The structural model specifies relations among latent variables and regressions of latent variables on observed variables. We suppose that the unobservable latent factors $\boldsymbol{\eta}_i$ are multi-normally distributed, as follows:

$$\boldsymbol{\eta}_i \sim MVN(\boldsymbol{\mu}_i, \Sigma) \quad (3)$$

where $\boldsymbol{\mu}_i = (\mu_{1i}, \mu_{2i})$ and $\boldsymbol{\mu}_{mi} = \mathbf{x}_i^t \boldsymbol{\beta}_m$ with \mathbf{x}_i^t a $1 \times p$ vector of pre-conditions and $\boldsymbol{\beta}_m$ are the $p \times 1$ factor specific vector of regression coefficients. The latent factors are assumed to have unit variance so that

$$\Sigma = \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}$$

is a correlation matrix and $\rho \in (-1, 1)$ describes the correlation between the two latent factors.

(c) Prior specification and Model checking

The Bayesian specification implies the selection of priors for all the parameters involved in the model.

For the intercepts we assume diffuse normal distributions

$$\alpha_{hk} \sim N(0, 100)$$

constrained in order to have $\alpha_{hk} < \alpha_{h,k+1}$. Similarly for the factor loading we assume $\eta_{mi} \sim N(0,100)$ and a priori independence.

Focusing on the parameters of the structural model, for the regression parameters β_m we assume independent normal priors with large variances for each component:

$$\beta_{mj} \sim N(0,100)$$

$j=1, \dots, p$. These priors are approximately non-informative and computationally more convenient than flat priors over the real line.

Regarding the parameter that describe the correlation between the two latent factors, we assume

$$\rho \sim Unif(-1,1)$$

A sensitivity analysis has been conducted to assess the impact of the selected prior distributions on the posterior distributions of the parameters we are mostly interested in, from which it emerges that the posterior distributions are largely unaffected by the choice of the prior among those we have considered. In particular the variance of the priors for $\alpha_{hk}, \beta_{mj}, \eta_{mi}$ has been set to different levels (10,50, 200) without any relevant effect on the posterior distributions.

To assess the adequacy of the model fit we adopt the approach of the Bayesian posterior predictive checks (Bayesian p-values). The idea is to generate samples from the posterior predictive distribution and compare these samples to the observed sample through a summary measure. If the measure calculated on the posterior predictive distribution is systematically different from that calculated on the observed sample this means that the model misfits the data, at least for the aspect considered in the definition of the summary measure (Gelman et al., 2004, ch. 6).

Specifically, for our model, we follow a procedure illustrated in Crespi and Boscardin (2009). If the model fits the h -th response variable of the i -th individual well, then $d(Y_{hi}, Y_{hi}^*) \cong d(Y_{hi}^*, Y_{hi}^{**})$ where Y_{hi}^*, Y_{hi}^{**} are two random vectors independently drawn from the posterior predictive distribution and $d(a, b)$ is some distance between K_h -vectors. If the fit is bad, we will have that, in most cases $d(Y_{hi}, Y_{hi}^*) > d(Y_{hi}^*, Y_{hi}^{**})$. This tendency may be summarized through the estimation of $\Pr\{d(Y_{hi}, Y_{hi}^*) > d(Y_{hi}^*, Y_{hi}^{**})\}$ We consider the Minkowsky distance $d(a, b) = \sum_{\gamma=1}^H |a_\gamma - b_\gamma|$ (see also Fabrizi et al., 2012). To evaluate the fit of the model at the level of individual respondents we may calculate

$$Bp_i = H^{-1} \sum_{h=1}^H \Pr\{d(Y_{hi}, Y_{hi}^*) > d(Y_{hi}^*, Y_{hi}^{**})\} \quad (4)$$

while a synthetic measure of model adequacy may be obtained averaging over sample units

$$Bp = (Hn)^{-1} \sum_{i=1}^n \sum_{h=1}^H \Pr\{d(Y_{hi}, Y_{hi}^*) > d(Y_{hi}^*, Y_{hi}^{**})\} \quad (5)$$

To generate samples from the posterior distribution we use the OpenBugs software (Thomas et al., 2006). The Openbugs code is available upon request from the authors. We generate 20,000

MCMC runs. The mixing of chains coefficients is very good in most cases, and adequate in others (namely the factor loadings). We assessed the convergence of the chains for all models by analysing generation paths, auto-correlograms and dynamic quantile plots. In all cases convergence was rather fast. Nonetheless, we exclude the first 5,000 MCMC samples as a conservative burn in.

6. RESULTS

Before presenting the results related to the measurement and structural parts of the models we note that the overall Bayesian posterior p -value calculated according to (5) equals 0.436. The goodness of fit is confirmed if we look at the Bayesian posterior p -values for individual observations calculated according to (4). Bp_i s range from 0.31 to 0.95; since the 0.975 percentile of the distribution of Bp_i s is 0.839 we have that only a small fraction of the observations in the sample may be judged to be misfit by the model, so the evaluation of the model adequacy may be considered, in summary, satisfactory.

Table 4 presents the posterior distributions of the measurement model parameters. As regards socio-economic participation, the observed indicators of freedom of mobility have the greatest weight in determining the latent construct. Economic and mobility decisions have a greater impact on decision-making power than having the final say with regard to own health care and child health care.

The parameter ρ measures the correlation between the two latent empowerment indicators. Socio-economic participation and decision-making power are positively correlated, and the size of the correlation is not negligible in the sense that the credibility intervals at 0.95 and 0.99 probability level based on quantiles of the posterior distribution do not include 0. This implies the greater is the level of empowerment in the socio-economic sub-dimension (which generally defines the role of women outside the home) the greater is the decision-making power within the household, and otherwise.

The results of the present analysis confirm the complexity of the process of women's empowerment

Table 4: Posteriors distributions of achievements- Measurement model

Variable	Mean	Standard deviation	low	upp
Socio-economic:				
Working	0.5175	0.05959	0.3979	0.6364
Go outside village/city	1.13	0.1131	0.9161	1.383
Go to health center	0.7277	0.06715	0.6066	0.8667
Decision-making power:				
Final say large purchases	3.345	0.1914	2.996	3.714
Final say daily purchases	2.082	0.08823	1.909	2.257
Final say visits family/friends	2.182	0.09758	1.996	2.378
Final say own health	1.645	0.07747	1.499	1.8
Final say child health	1.815	0.07743	1.67	1.972
Correlation between latent factors:				
ρ	0.2584	0.0396	0.1839	0.3388

In particular, the complexity of empowerment is evident when we examine the relationships between pre-conditions and achievements. From the regression results we find that the two distinct empowerment sub-dimensions (socio-economic participation and decision-making power) are not necessarily related to the pre-conditions in a consistent fashion.

The Results pertaining to the structural model parameters can be found in tables 5 and 6.

They confirm that participation in microcredit programs has a positive impact on empowering women. Its effect concerns both the latent sub-dimensions, but is more evident for the socio-economic indicator. The process of group formation, frequent group meetings and the involvement of members in local development activities increase confidence and lead to substantial changes in the attitude of the women (e.g., increase in self-esteem) and their household members. Participating in microcredit groups implies more freedom of mobility, and more opportunities to work outside the home. At the same time, it increases their bargaining and decision-making power within the household and leads to better performances in terms of women's empowerment. These results, however, may be attributable to selection bias as members might differ from non-members in ways that make them more autonomous, open-minded or enterprising (Armendàriz, Morduch, 2010). Specifically, as argued by Hashemi et al. (1996), women who are already more empowered for reasons not captured by the control variables might be more likely to participate in credit programs and, therefore, selection bias may overestimate the effect of microcredit on empowerment. Data limitations of the Bangladesh Demographic and Health Survey prevent us from doing a comparative analysis of change in empowerment levels before and after joining a microcredit program, since we cannot know when women joined the program, nor the duration of membership.

Table 5: Posterior distributions of regression parameters associated to “Pre-conditions”– Socio Economic Latent factor

Variable	Mean	Standard deviation	0.025 quantile	0.975 quantile
Microcredit*	0.4496	0.08175	0.2943	0.6176
Household Composition	-0.1399	0.07583	-0.2897	0.006899
Household Wealth:				
- Poorest	0.5053	0.1503	0.2157	0.8005
- Poor	0.4073	0.1465	0.1292	0.6984
- Middle	0.3446	0.1393	0.07582	0.6218
- Rich	0.1163	0.1245	-0.1268	0.3657
Age*	0.7232	0.05629	0.6164	0.8385
Age sq.*	-0.2241	0.03439	-0.294	-0.1581
Education:				
- No education*	-0.1756	0.142	-0.4582	0.09194
- Incomplete primary*	-0.2921	0.1477	-0.5863	-0.01032
Complete Primary	-0.051	0.1705	-0.3852	0.283
- Incomplete Secondary	-0.04869	0.1459	-0.3342	0.2307
Media Exposure:				
- Listen radio:				
- Never	-0.01213	0.09951	-0.2057	0.1885
- Rarely	0.1234	0.1401	-0.1522	0.4058
- Once a week	0.09207	0.1231	-0.146	0.3343
- Watching TV:				
- Never*	-0.2311	0.1189	-0.4731	-0.002191
- Rarely	-0.08765	0.1536	-0.3958	0.2117
- Once a week	0.01389	0.1167	-0.2226	0.2395
Men's opinions:				
- Decisions on large purchase	0.1456	0.1143	-0.07038	0.3629
- Beating if visits friends/family	0.0222	0.06828	-0.1104	0.1565
- Acceptable working (not spouse)	0.1388	0.07438	-0.006675	0.2877
- Acceptable working	0.1775	0.1067	-0.02989	0.3895
Rural*	-0.2924	0.09576	-0.4849	-0.1035
Main Economic Activity:				
- Agriculture	-0.3165	0.1256	-0.5735	-0.08361
- Commerce*	-0.1594	0.1406	-0.4388	0.1146
- Manufacturing	-0.1038	0.5629	-1.224	0.9977
- Fishing	-0.2382	0.3059	-0.8371	0.3667
- Other	0.19	0.2115	-0.2147	0.6065
Region:				
- Barisal	0.1008	0.138	-0.1697	0.3762
- Chittagong	0.09895	0.1209	-0.1387	0.3342
- Khulna*	0.3801	0.113	0.1636	0.6069
- Rajshahi	0.2038	0.09991	-0.01084	0.4038
- Sylhet	-0.06207	0.1442	-0.3409	0.2243

-The (*) indicates that posterior distributions are far away from the zero value in the sense that both the 0.025 and 0.975 quantiles share the same sign. Household Wealth, Education, Media Exposure and Region are measured by a set of dummies. Household composition is a dummy that gives information on the presence of another adult person in addition to the couple and children.

To address unobserved heterogeneity (due to the fact that endogenous decision to join the program may be correlated with the unobservable empowerment endowment) some cross-sectional studies opt for an instrumental variable approach. For instance, Pitt, Khandker, and Cartwright (2006) take advantage of the program design of some microfinance institutions in the rural Bangladeshi context to obtain unbiased estimates of microcredit effects. They exploit the eligibility rule used by the institutions to select their clients in designing the sample of eligible and ineligible household in the program villages. To focus attention on the poorest, this eligibility rule is defined in terms of land ownership: household having over half an acre of land are not allowed to borrow. But this exogeneity assumption has come under criticism (see, for instance, Morduch, 1998). With our data, it is difficult to identify a valid instrument for microcredit participation as we do not know the eligibility criteria used by microfinance institutions by the time of the survey we consider. Following the Pitt et al. (2006) approach, we attempt to address selection bias by introducing “land ownership” (a dummy variable that assumes value one if the respondent owns any land and zero otherwise) as an instrument for program participation in our model³. The new results (available upon request from the authors) confirm the positive association between microcredit and the two empowerment dimensions, even if the magnitude of its effect on the outcome variables is lower. No relevant changes in the posterior distributions of other regression parameters are detected.

Men’s attitudes (or better, partner’s attitudes) about the social and intra-household roles of women do not have a strong impact on the two sub-dimensions under consideration. As we can see from table 5, only men’s perceptions about the role of women in economic choices and working outside the home produce some positive effects on the socio-economic latent indicator.

It was in part surprising to find that this set of variables did not have an evident and strong effect on women’s empowerment sub-dimensions, since Bangladeshi society has been strongly patriarchal.

The reason could be that women’s attitudes about their position relative to partners are shaped more by general attitudes prevailing at the community level than by their own intra-household gender perceptions. For instance, as suggested by some interesting testimonies (see Kabeer, 2005, p. 69), conformity to purdah often featured in terms of a voluntary adherence to gender norms rather than as a direct manifestation of male control. Many of the social norms evolve over time and have been internalized by both men and women without ever questioning it, unless confronted by new nonconforming situations that lead to the questioning and challenging of those norms (see Rani, Bonu, 2008).

Table 6: Posterior distributions of regression parameters associated to “Pre-conditions”– Decision-making Latent factor

Variable	Mean	Standard deviation	0.025 quantile	0.975 quantile
Microcredit*	0.1711	0.04841	0.07558	0.2661
Household Composition	-0.03558	0.0465	-0.1271	0.0546
Household Wealth:				
- Poorest	0.07956	0.09778	-0.1108	0.2724
- Poor	0.08022	0.09325	-0.1014	0.2625
- Middle	-0.08478	0.08993	-0.259	0.0933
- Rich	0.0391	0.08122	-0.03888	0.1998
Age*	0.1692	0.02645	0.1173	0.2212
Age sq.*	-0.0482	0.01958	-0.08701	-0.009747
Education:				
- No education*	-0.1958	0.09234	-0.3807	-0.01835
- Incomplete primary*	-0.2008	0.09428	-0.3888	-0.01946
- Complete Primary	-0.02139	0.1104	-0.2371	0.1929
- Incomplete Secondary	-0.0345	0.0921	-0.2193	0.1457
Media Exposure:				
- Listen radio:				
- Never	-0.01292	0.06442	-0.1378	0.113
- Rarely	-0.1424	0.08859	-0.3148	0.03241
- Once a week	0.07395	0.07738	-0.07748	0.2266
- Watching TV:				
- Never*	-0.219	0.07422	-0.3655	-0.07629
- Rarely	-0.1261	0.0933	-0.3098	0.05614
- Once a week	-0.07737	0.07385	-0.2218	0.06578
Men's opinions:				
- Decisions on large purchase	-0.03883	0.06587	-0.1648	0.09153
- Beating if visits friends/family	0.04357	0.04433	-0.04323	0.1313
- Acceptable working (not spouse)	0.0546	0.0477	-0.03917	0.149
- Acceptable working	-0.0632	0.0662	-0.193	0.06668
Rural	-0.1082	0.06005	0.2217	0.01191
Main Economic Activity:				
- Agriculture	-0.07841	0.07675	-0.2293	0.07045
- Commerce*	0.2547	0.0853	0.09235	0.4264
- Manufacturing	0.1424	0.3609	-0.5604	0.8456
- Fishing	0.3243	0.1925	-0.04881	0.7014
- Other	-0.02048	0.1323	-0.2788	0.2424
Region:				
- Barisal	-0.02542	0.08743	-0.1957	0.1438
- Chittagong	0.008856	0.07648	-0.1589	0.1384
- Khulna*	0.17	0.06883	0.03413	0.3065
- Rajshahi	-0.008532	0.06142	-0.1279	0.1106
- Sylhet	-0.05211	0.09348	-0.2347	-0.1313

—The (*) indicates that posterior distributions are far away from the zero value in the sense that both the 0.025 and 0.975 quantiles share the same sign. Household Wealth, Education, Media Exposure and Region are measured by a set of dummies. Household composition is a dummy that gives information on the presence of another adult person in addition to the couple and children.

According to our results, the effect of wealth on decision-making power is negligible, but low and medium levels of the index positively affect the socio economic indicator.

This is not entirely surprising. For instance, Balk (1997) indicates that the poorest women have relatively greater mobility outside the home, likely related to their greater participation in the labor force. This could be a reflection of our factor construction, which involves working outside the home in addition to visiting a relative/friend outside the village/city and going to a health center. She also finds that wealth has a negligible effect on household decision making. Batliwala (1994) points out that empowerment is not a necessary result of economic strength (rich women suffer restrictions, domestic abuse and rape too). The reason why household wealth has no effect on the decision-making indicator could be that decision making is determined more by the socio-cultural attitudes prevailing at the community level than by own household circumstances.

Education doesn't influence in a clear way the two empowerment sub-dimensions.

The effects of education are greatly affected by the socio-cultural context in which women live. Stromquist (2002) points out that access to formal schooling does not necessary lead to a higher level of empowerment. He argues that women's empowerment is possible more through non-formal education programs. The spaces provided by women-led non-governmental organizations promote learning opportunities through workshops on topics such as gender subordination, reproductive health and domestic violence and give the opportunity for women to discuss problems with others (see also Swain, Wallentin, 2012). Kabeer (2005) points out that the changes associated with education are likely to be influenced by the context in which it is provided and the kind of social relationships that it embodies and supports. In other words, social and gender inequality is often reproduced through interactions within the education system. She reports the case of India, in which within the same school different groups of children are treated in different ways. Apart from the caste-differences, there is also evidence of gender bias: teachers show greater attention to boys and have a lower opinion of girl's abilities.

From the estimates of our model, incomplete primary education affects socio-economic participation. Its effect is negative, that is women that do not complete a primary cycle of study show a lower level of empowerment. Leaving school prematurely could be a further signal of the subordinate status assigned to women in the patriarchal context of Bangladesh. To equip girls and women with education has lower value in contexts in which they are seen only as wives and mothers, with limited power within and outside the household. No education and incomplete primary education negatively affect the decision-making sub-dimension. A plausible explanation is that less educated women have less skills and a reduced access to knowledge, information and new ideas that would help them to actively participate in the household decision-making process. There are some studies that suggest a positive association between education and power relationships within the household. For instance, Hashemi et al. (1996) find that educated women in the Bangladeshi context participate in a wider range of decisions than uneducated ones (see also Kabeer, 2005).

Age is a factor of the life cycle that influences women's role within the household. A traditional Bangladeshi concept is that a daughter in law may be responsible for the household work but the mother in law has the decisional power about family matters. In line with other studies

(e.g., Haque et al., 2011, Mahmud et al., 2012), we find that empowerment, in both sub-dimensions is higher for the older respondents. The effect is stronger for the socio-economic indicator, possibly because young women (newly married or young wives) have greater restrictions on movements outside the home and because they have less occasion to go to a health center, for many reasons (e.g., fewer children, better health, etc.) (see Mahmud et al., 2012). Concerning the working activity, as highlighted above, young women are more likely to be involved in household work.

Exposure to media (radio and television) is seen as a potential source of empowerment providing women with the knowledge and means to function effectively, particularly in modern society (Mahmud et al., 2012). La Ferrara and Chong (2009) have explored the effect of television expansion on the pattern of marital dissolutions in Brazil over the period 1970-1991. Interestingly, they find that exposure to modern lifestyles as portrayed on television can actually emancipate women's roles. These findings suggest that media programs have the potential of targeting specific groups at low cost and may be employed as a public policy tool. In our study, we find that not watching television has a negative and consistent relationship with the decision-making power. Women who do not watch television are least likely to be involved in household decisions. Not watching television negatively affects the socio-economic indicator of empowerment.

As expected, living in rural areas has a negative effect on both latent dimensions of empowerment, more consistently so for the socio-economic indicator.

Agriculture negatively affects socio economic participation. A plausible explanation of this is that cultural norms and traditions are probably more deeply rooted in the rural and agricultural areas of the country. In addition, the structure and characteristics of the agricultural system tend to limit the contacts with the world outside of the family, constraining the expansion of women's own income-generating activities (Kabeer, 2005).

Belonging to a primary sampling unit in which commerce is the main economic activity has a positive effect on household decision-making power. This finding is not totally unexpected. One explanation may be that commercial activities encourage the development of social networks and interactions, which can mitigate the effect of socio-cultural norms and shift the balance of power within the family.

If we look at the regional dynamics, belonging to Khulna positively affects both sub-dimensions of empowerment. On the basis of a World Bank Report on Bangladesh (2008), that analyzes poverty dynamics during the period 2000-2005, the region of Khulna has one of the highest poverty rates, but has among the best health outcomes. The mismatch between poverty and human development outcomes at the spatial level, especially with respect to health indicators, has been documented in other work (BIDS, 2001; Sen, Hulme, 2005). If we consider regional variations in educational attainment, Khulna division, in spite of being one of the poorest, has higher primary enrolment rates among boys and girls than Dhaka, Chittagong and Sylhet.

Balk (1997) highlights that regional differences have an important influence on women's mobility. She finds that women in the south-west have more freedom of mobility than the other ones. Khulna is a region situated in the South-West of Bangladesh, bordering the Indian state of West Bengal. It is one of the most vulnerable from a climate change perspective.

A rapid expansion of saline water shrimp farming, encouraged by government policies, has produced important changes. The transition from a subsistence agriculture to an export-oriented agro-based shrimp industry affects the gender relation system. Shrimp production has enabled women (in particular rural women) to earn more cash and to become more active income-earning members within the household. In addition, they work mostly outside the home, increasing the freedom of mobility. These factors could have important implications for the women's empowerment process (Guhathakurta, 2011).

7. CONCLUSIONS

In this paper, we consider women's empowerment as a latent, multidimensional variable and evaluate which factors are more effective at impacting the two selected sub-dimensions. An important consideration is that external community factors (such as participation in microcredit programs and watching TV) produce consistent effects on the empowerment indicators. Participating in microcredit programs may effectively equip women with the knowledge and means to function well in the modern society, and create conditions that go against socio-cultural norms.

The results of our model support other findings (i.e. Balk, 1997) suggesting that wealth and education may not necessarily improve women's empowerment in a patriarchal society. They could have a negative effect if socio-cultural factors remain unchanged.

The intra-household relations are dominated by gender inequality. But the structures of inequality start from the community, and reach all levels of socio-economic, political, cultural and familiar structures of the society. This is in line with the other crucial finding of our study regarding the absence of impact of men's attitudes on empowerment. Our results suggest that partners' attitudes do not influence women's choices. This confirms that microcredit interventions which focus not only on the income generation by women but also on changes in social attitudes have the advantage of leading to their empowerment. It is critical that these kinds of interventions be focused on changing female beliefs and attitudes toward women's status.

NOTES

1. The study does not provide an exhaustive measure of overall empowerment, which would require the inclusion of several distinct dimensions. Due to the unavailability of direct and complete data, we selected only two critical agency dimensions: the first gives a general description of the role of women in the community space, and the second within the family.
2. The practice of the purdah varies widely according to the social milieu. Full purdah (especially practiced in traditional circles) requires the complete seclusion of women

from the onset of puberty. Within the home, women inhabit private quarters that only male relatives or servants can enter.

Outside the home, a woman in purdah usually wears a veil or an enveloping. For most rural families the importance of women's labor made full seclusion not possible. In certain areas, for instance, women went unveiled within the village but donned the veil for trips farther from their community (Wikipedia, 2013).

3. Kabeer (2001) defines the three dimensions without indicating the direction of the interrelations.
4. Due to the structure of our data, we cannot perfectly respect the eligibility rule of 0.5 acres /a very small amount of land). Therefore, we have opted for including a land-possession dummy variable.

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