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## **Access to microfinance and female labour force participation**

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**Abstract:** Although microfinance started as a movement to improve women’s economic well-being through increased female entrepreneurship in particular, its impact on women’s attitudes toward and participation in the labour market is not fully understood. We fill this gap by combining data on branch locations of the major microfinance institutions in Bangladesh with household survey data and implement a spatial regression discontinuity design. Our estimates suggest significant effects of access to credit on women’s work; attitudes towards gender, social and employment norms; and psychosocial well-being. Access to credit increases labour force participation in terms of paid employment and traditional economic participation. Relatedly, respondents are more likely to be prevented from working by their husbands or other household members. They are also more likely to express traditional beliefs in relation to gender, social, and employment norms. Finally, access to credit leads to a loss in life satisfaction, financial satisfaction, health satisfaction, and overall happiness.

**Key words:** microfinance, female entrepreneurship, psychosocial well-being, gender norms, regression discontinuity design, Bangladesh

**JEL classification:** G21, I31, J22

**Tables and figures:** at the end of the paper

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## 1 Introduction

Increasing women's economic participation is an important target in the UN Sustainable Development Goals. Although there has been a steady increase in female schooling and labour force participation in the developing world (Heath and Jayachandran 2018), there is also evidence of declines in female labour force participation in China and India, countries that have experienced sustained economic growth and falls in poverty in recent decades (Afridi et al. 2018; Chi and Li 2014; Klasen and Pieters 2015; Mehrotra and Parida 2017). One possible explanation for this phenomenon is the widely observed U-shaped relationship between economic development and female labour force participation (Goldin 1995; Mammen and Paxson 2000; Sinha 1967), with decreasing participation at the early stages of development followed by rising participation at later stages. Relatedly, there is potentially social stigma associated with female work outside of the home, and rising household incomes increase the reservation wage above which women would be willing to work outside of the home (Boserup 1970; Goldin 1995). Recent evidence also indicates that female seclusion norms can act as a barrier to female paid work participation (Asadullah and Wahhaj 2019a).

In the context of this literature and given the high concentration of women in home-based businesses, an important question is how access to microfinance loans affects female labour force participation. These loans are typically targeted at women in developing countries to encourage their engagement in economic activities and entrepreneurship (Armendáriz and Morduch, 2010). Access to credit can allow households to acquire capital that can be used for home production. Loans, in particular, can enable women to engage in economic activities within the home without incurring the social cost associated with outside work or without having to give up family responsibilities (Yunus 2007). This potential mechanism is particularly important given that, in contrast with the large gender gap in labour force and paid work participation, the majority of microenterprises in developing countries are run by women (Klapper and Parker 2011).

On the other hand, given the widespread patriarchal hold on valuable household assets, the exact use of the borrowed funds or control of them may not be limited to the participating women. There is important evidence indicating that other household members seize control of microfinance loans that are given to women (Garikipati 2008; Goetz and Gupta 1996; Kabeer 2001; Rahman 1999). Models of intra-household decision-making indicate that access to microfinance would lead to increased female entrepreneurship only under certain initial conditions (Ngo and Wahhaj 2012). Therefore, the effect of microfinance loans on female work is theoretically ambiguous.

Observational research on the determinants of women's labour market outcomes are limited in terms of causal inference, given the importance of many unobserved factors that simultaneously affect labour market outcomes and participation in schemes facilitating market participation. Recent experimental studies questioning the transformative effect of microcredit programmes on women's economic lives lack consensus on the impact on labour supply or employment. Although all studies report a substantial increase in service uptake (i.e. more borrowing and higher loan size), evidence on the overall labour supply is mixed. In their review of six studies conducted in six different countries, Banerjee et al. (2015) noted that, in three countries (Bosnia and Herzegovina, India, and Mongolia), the studies showed some positive effects on business start-ups, while there were no effects in the three other countries (Ethiopia, Mexico, and Morocco). Among more recent studies, Blattman et al. (2016) showed that microcredit recipients had 60 per cent higher labour supply and nearly twice as many hours in non-agriculture relative to the control group. Banerjee et

al. (2019) reported a 20 per cent increase in self-employment hours among borrowers whose target business size was large relative to existing entrepreneurs whose target business size was small.

In sum, the existing literature provides limited insight on how access to microfinance affects women's overall engagement in economic activities, including work within the home and paid work participation. Understanding how access to microfinance affects social attitudes towards female work outside the home is crucial for formulating effective policy design. While randomized experiments offer internally valid estimates, they mostly focus on short-term outcomes. Moreover, some experimental studies are underpowered to examine the full range of employment effects. There is also no comparable evidence for countries such as Bangladesh where the access to microfinance has, arguably, reached a saturation point making the randomized control trial approach adopted in this literature unfeasible.

In view of the existing literature, in this paper we address the following questions. In a social setting where prevailing norms discourage female work outside the home, how does access to microfinance affect:

- 1) women's economic participation, including entrepreneurship, paid work participation, and unpaid work for other family members;
- 2) attitudes towards traditional norms that discourage female work outside of the home;
- 3) female autonomy in decisions relating to labour force participation, in particular work outside of the home; and
- 4) women's psychosocial well-being (i.e. satisfaction related to work, finance, and life in general)?

We make use of the 2014 Women's Life Choices and Attitudes Survey (WiLCAS), a nationally representative survey of women in Bangladesh between the ages of 20 and 39 (Asadullah and Wahhaj 2021). The survey includes detailed information on microfinance loans and major microfinance institution (MFI) membership of female respondents, as well as first-hand information on their employment status, income-generating activities, and their ability to make labour choices autonomously. The survey data also includes geo-coded information on the location of households and villages, which is crucial for implementing the study design described below. The survey data is combined with branch locations of the MFIs in Bangladesh.

To identify the impact of microfinance access, we adopt a quasi-experimental design using a spatial regression discontinuity (RD) design, based on the fact that MFIs require their loan officers to offer loans to potential clients only within the specific distance of the branch office. As a result of this rule, some rural households located within the designated radius of a branch office have access while others that fall outside of the radius do not have access. Formal tests indicate no discontinuity in other household characteristics at the boundary of the serving areas of branches (implying that households do not make location choices taking branch locations into consideration). Using the spatial RD, we investigate how access to an MFI branch affects outcomes related to female labour force participation and attitudes towards female work within the home.

Overall, we find effects of access to credit on female labour force participation; attitudes towards gender, social, and employment norms; and the psychosocial well-being of respondents. Access to credit increases labour force participation in terms of paid employment and traditional economic participation. Relatedly, respondents are more likely to be prevented from working by their husbands or other household members. They are also more likely to express traditional beliefs in

relation to gender, social, and employment norms. Finally, access to credit leads to a loss in life satisfaction, financial satisfaction, health satisfaction, and overall happiness.

The rest of the paper is organized as follows. In Section 2, we provide an overview of the study context, clarifying recent trends in female labour force participation in Bangladesh and access to microfinance. The econometric model and identification strategy are presented in Section 3 alongside a brief description of the survey design and summary statistics. The main results are reported in Section 4, while the discussion and conclusions are provided in Section 5.

## **2 Study background**

### **2.1 Female labour force participation in Bangladesh**

In the past few decades, women’s economic participation in Bangladesh has benefitted from a number of shifts in the country’s economy and society. An industrial boom that followed trade liberalization during the 1990s led to rapid expansion of the export-oriented ready-made garments sector. Between 2000 and 2010, female employment in the export sector doubled (ADB and ILO 2016). This period was preceded by two sets of social transformation. First, non-governmental organizations (NGOs) employed women as frontline health workers, community leaders, and teachers throughout the country for social service delivery (Asadullah et al. 2014; Drèze and Sen 2013). This increased outside visibility of women and social acceptability for independent movement in the community. Second, the government invested heavily in female education and nationwide family planning campaigns targeting women.

In spite of the rise in schooling, and a reduced burden of child-rearing and maternal mortality rates, women’s overall labour force participation rate in Bangladesh, at 36 per cent, remains low by international standards (BBS 2018). A significant portion of working-age women do not engage in paid work either because of stigma or purdah restrictions (Asadullah and Wahhaj 2019). Those engaged in paid work usually belong to economically poor (e.g. landless) households and are often widowed or separated from their spouses. The majority of women in the labour force choose subsistence self-employment as it offers flexibility and autonomy or simply allows economic engagement without violating traditional gender norms (Heintz et al. 2018). Many working women quit low wage work for self-employment as access to credit or financial assets becomes available.<sup>1</sup>

### **2.2 Access to microfinance**

Another important social change is the increased availability of credit among women. Grameen Bank, often referred to as the ‘bank to the poor’, introduced collateral-free small loans to women in self-selected groups. It was not until the 1990s that other institutions banked on the microfinance model to start their own credit programmes in Bangladesh. Today, three NGOs—Association of Social Advancement (ASA), Bangladesh Rural Advancement Committee (BRAC), and Grameen Bank—account for about 62 per cent of all microfinance borrower accounts and approximately 69 per cent of the sector’s gross loan portfolio (Khalily, Khaleque and Badruddroza

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<sup>1</sup> Long-term evaluation of BRAC’s ultrapoor programme confirms a positive effect on transition into entrepreneurship among beneficiary women who have been previously in low-pay distress occupations such as day labourer and house maids, at least in the short term (Asadullah and Ara 2016).

2014). These three MFIs gradually expanded their outreach over the next decades and currently have a total of about 9,000 branches across Bangladesh.

Reflecting on the existing socio-economic scenario of women at the time, microcredit was specifically designed for women in Bangladesh to empower them and enhance their bargaining power within the household through economic security (Yunus 1998).

Grameen Bank and BRAC have nearly identical credit models. Both MFIs follow a geographical rule of operation for each branch. The MFI branches of BRAC and Grameen Bank cover a radius of 4 kilometres of geographic distance to lend to borrowers; ASA branches each cover a radius of 5 kilometres. Therefore, women have access to credit when they are located within the distance of the servicing area of the MFIs.

### 3 Methodology

#### 3.1 Empirical strategy: RD design and econometric specification

Although access to credit has been widely studied in the literature, it is not commonly measured in terms of access to bank branches because of endogeneity issues (Burgess and Pande 2005). This identification concern is also valid for estimating the impact of access to microfinance branches. This is because MFIs, similar to commercial banks, select their operational regions after considering the population density, geographical feasibility, demand for microfinance products, and other operational factors. This makes it difficult to determine suitable control and treatment groups for estimating effects of access to microfinance. In this paper, we address the endogeneity concern by using RD design based on an exogenous operational rule of MFIs in Bangladesh.

In Bangladesh, MFIs work within a certain radius to seek and serve borrowers. Grameen Bank and BRAC branches cover a radius of 4 kilometres while ASA branches cover a radius of 5 kilometres. We define thresholds using these operational distances to classify potential borrowers into treatment and control groups.

In order to measure access to credit, the control group is taken to be the households of respondents which do not have access to any MFI branch, i.e. the respondents are not located within the operational area of any MFI branch, and the treatment group is taken to be the households which have access to at least one branch of an MFI. We construct the running variable of access to credit by mapping the geo-referenced locations of all the operating branches of the three MFIs across Bangladesh and the location of the respondents to calculate the minimum distance of each respondent to each of the branches of the MFIs. Following this, we derive the number of MFI branches each respondent has access to and construct the control and treatment groups accordingly. The respondents who are located beyond the operational area of any MFI branch form our control group and the respondents who are located within the operational area of at least one MFI branch form our treatment group.

Mathematically, the running variable is given by the following formula:

$$R_i = \min_b(C_{o(b)} - d_{ib}) \quad (1)$$

$$b_i = \operatorname{argmin}_b(C_{o(b)} - d_{ib}) \quad (2)$$

where  $R_i$  = running variable for respondent's,  $i$ , access to microfinance;  $b$  = MFI branch;  $o(b) \in$  indicates the organization to which branch  $o$  belongs, ASA, BRAC, or Grameen Bank;  $d_{ib}$  = distance of respondent's household  $i$  from branch  $b$ ; and  $C_o(b)$  = distance threshold of the respective MFI.

As demonstrated by the formula, the running variable is centred at the threshold. Households located beyond the cut-off do not have to access to credit as the minimum distance is beyond the operational distance and those within the cut-off have access to one or more MFI branches. A negative value means that the respondents would have to travel some distance to be within the servicing area of an MFI branch. A positive value means that the respondents are already within the servicing area of at least one MFI branch. The control group, with the negative distance, has access to no MFI branch, and the treatment group, with the positive distance, has access to at least one MFI branch.

To estimate the impact of access to credit on female labour force participation, we employ a nonparametric local polynomial method using a sharp RD design.<sup>2</sup> Empirically we estimate the following equation:

$$Y_i = a + \tau D_i + \beta R_i + \delta X_i + u_i \quad (3)$$

where  $Y_i$  denotes the outcome of interest for respondent  $i$ ;  $D_i \in \{0, 1\}$  indicates access to credit such that  $D_i = 1$  if  $R_i > 0$  and  $D_i = 0$  if  $R_i < 0$ ;  $\tau$  is the coefficient of interest measuring the local average treatment effect;  $R_i$  is the centred running variable representing access to credit of respondents;  $X_i$  is a set of pre-determined covariates of respondents including respondents' age, age-squared, religion, parental education, and parental landholdings; and  $u_i$  is the error term.

Local linear regression is the most common form of nonparametric method in the RD design literature. This is because the nonparametric estimation is based on the observations closer to the cut-off, making it intuitively appealing as the observations are valid counterfactuals of each other. This reduces some of the bias that can result from using data farther away from the cut-off to estimate the discontinuity at the cut-off. The continuity around the threshold provides evidence of internal validity of the set-up. Therefore, as a robustness check, we estimate equation (1) using a simple ordinary least squares (OLS) estimation for the full sample on each side of the cut-off. In addition to the RD estimates, we provide OLS estimates for the full sample for the purpose of comparison of the two techniques.

## 4 Description of the data and descriptive statistics

### 4.1 Description of survey data

For our analysis, we use a nationally representative survey of women in Bangladesh, the 2014 Women's Life Choice and Attitudes Survey (WiLCAS), which has detailed information on the employment and economic activities of the primary respondent and other household members, attitudes towards female work and mobility, and borrowing by the respondent from microfinance institutions and other sources. The survey covers all rural households in the 2010 Bangladesh Household Income and Expenditures Survey (HIES) (Bangladesh Bureau of Statistics 2011) that included at least one woman aged between 16 and 35 in 2010, and a random 50 per cent of

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<sup>2</sup> In this study, we use the RD estimation package 'rdrobust' following Cattaneo et al. (2017), which gives us bias corrected RD estimates using data-driven optimal bandwidth.

households in the HIES rural sample without any women in this age group. In addition, the sample includes 87 urban primary sampling units (PSUs) randomly selected from those included in the 2010 HIES urban sample, with at least one sampling unit from each district; in each PSU, 20 households were randomly chosen for inclusion in the survey. This procedure yielded a sample of 7,974 households (1,436 in urban areas) and 6,293 individual interviews with women in the age group 20–39 years (1,557 in urban areas).<sup>3</sup>

## 4.2 Description of microcredit branch data

In order to determine each respondent's access to credit, we collected the geo-referenced branch location data at the union level of all operating branches of each of the three largest MFIs across Bangladesh: ASA, BRAC, and Grameen Bank.<sup>4</sup> We retrieved 2,886 branch locations of ASA, 2,364 branch locations of BRAC, and 2,555 branch locations of Grameen Bank operating across Bangladesh. To identify the respondent's location, we used the geo-referenced location of residence at the village level of each respondent of the survey. We spatially mapped the geo-referenced location of the MFIs at the union level with the geo-referenced location of the respondents at the village level to calculate the distance of each branch of the MFIs from the respective villages of women. We calculated the number of MFI branches each respondent has access to in order to study the impact of access to credit.

From the survey, we observe the sources women borrow from. Table 1 reports their borrowing composition. Of the loans taken by the women, 28.42 per cent were from Grameen Bank, 27.10 per cent from ASA, and 13.51 per cent from BRAC. Only 4.06 per cent of loans taken by the women were from other MFIs. Commercial bank loans accounted for only 0.75 per cent of the loans. The remaining 26.18 per cent of the loans were borrowed from informal sources such as family, friends, local usurers, and mutual funds. Therefore, for our analysis we focus on these three MFIs, which account for approximately 94 per cent of MFI loans. Henceforth, we use the phrase 'access to microfinance' to mean access to loans from any of these three MFIs.

## 4.3 Descriptive statistics

Tables 2 and 3 provide the descriptive statistics for the survey respondents. The age of the respondents had a mean of 29 years and a standard deviation of around 6 years. Average parental landholdings was 1.40 acres of land. The average monthly income of the sample was BDT 12,328, which is roughly around US\$159.<sup>5</sup> The respondents' fathers had, on average, 3 years of schooling, while the respondents' mothers had, on average, 1.62 years of schooling. Respondents, on average, had 5 years of schooling. Approximately, 88 per cent of the respondents were Muslim and about 20 per cent of the respondents had mothers who were members of the MFIs considered in this study.

About 41.4 per cent of respondents were in paid employment, and 10.4 per cent of them were self-employed. About 36 per cent were involved in traditional occupations and around 16 per cent in non-traditional occupations. In addition to the respondents, we examine labour force participation of the heads of the households where the respondents reside. Among the heads of

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<sup>3</sup> See Amirapu et al. (2020) and Asadullah and Wahhaj (2019b) for further information regarding the 2014 WiLCAS.

<sup>4</sup> A union is the smallest rural administrative and local government unit in Bangladesh.

<sup>5</sup> The exchange rate is taken for 2014 at US\$1 = BDT 77.55.

the households where the respondents reside, approximately 10 per cent were involved in paid employment and 28 per cent were self-employed.<sup>6</sup>

In terms of the ability of respondents to make employment decisions, about 43 per cent had freedom to choose to work and about 45 per cent had, at some point, been prevented by their husbands or other household members from working.

We also look at the psychosocial well-being indicators of the respondents. The survey follows ‘Cantril’s Ladder of Life Scale’, as proposed by George (1981), for the happiness and satisfaction questions, where the respondents are shown a ladder with steps numbered from 1 to 10 to demonstrate their satisfaction level. In the scale, 1 represents ‘not happy at all’ and 10 represents ‘extremely happy’. The mean for each of the four psychosocial well-being questions is approximately 5 with a standard deviation of around 2.

Table 3 describes the respondents’ reported attitudes towards traditional gender, social, and employment norms and the traditional norm index based on their responses. The gender and social norms attitudes are binary variables that take the value of 1 if the answers of respondents align with traditional norms (such as if the respondent agrees with the statement ‘a wife ought to be less educated than her husband’) and 0 otherwise. We combine these binary variables to construct a traditional norms index using principal components analysis following the procedure developed by Filmer and Pritchett. The index has a mean of 0 (by construction) and a standard deviation of 0.246.

## 5 Tests of identifying assumptions

Before presenting our main estimation results, we check for manipulation of the treatment status in our running variable, i.e. self-selection into the treatment, to see if the women chose to live in the areas where they would have access to credit.

### 5.1 Manipulation of treatment status (McCrary test)

We check the validity of our treatment status by testing the density of households of respondents around the threshold. A discontinuity at the threshold of the running variable (such as a sharp increase in density of households at the cut-off in the treatment group) would indicate that the respondents self-selected themselves into the treatment group. Figure 1 shows the plot for the McCrary density test of manipulation of the running variable for access to credit of respondents (McCrary 2008). The plot is continuous around the threshold considering the distribution of the confidence intervals at the threshold. In addition, formal estimation demonstrates that the sample passes the McCrary test at the threshold. This provides strong evidence of the internal validity of the empirical strategy, showing that there was no sorting around the threshold of access to credit. Therefore, we can conclude that respondents did not self-select themselves in the treatment and that the control and treatment groups are unbiased.

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<sup>6</sup> In our data, the labour force participation of the heads of the households was 38 per cent, but the labour force participation rate of husbands of the respondents was 88 per cent.

## 5.2 Discontinuity in socio-economic variables

In addition, as robustness checks, we estimate equation (3) with seven pre-determined characteristics of respondents to test for discontinuity, as proposed by Lee (2008) and Lee and Lemieux (2010), to disentangle the effect of access to credit. The pre-determined characteristics of the respondents that we test for discontinuity are age, education, mother’s membership of MFIs, mother’s education, father’s education, parental landholdings, and religion. We use a binary indicator for religion where the variable takes the value of 1 if the respondents are Muslim and 0 otherwise. We check age and education for a discontinuity at the threshold as other studies have shown that these characteristics are correlated with borrowing (Boiwa and Bwisa 2014). In addition, we test parental landholdings for a discontinuity as landholdings (half an acre of land) are typically included in the eligibility criteria of microfinance programmes. We also test parental characteristics for discontinuities as there is extensive evidence of parental education influencing the social outcomes of children (Chevalier 2004; Ermisch and Pronzato 2010).

Table 4 shows the OLS and RD estimation results for pre-determined characteristics. We see significant estimates for religion and mother’s membership of MFIs in column (1) for the OLS estimates. However, we observe no discontinuity for any characteristics for the RD estimates demonstrated by the statistical insignificance of all characteristics in column (2). Nonetheless, we use the pre-determined characteristics as controls in our regressions.

Next, we show the RD plots for visual depiction of the estimates. As proposed by Calonico et al. (2014), we use a data-driven sequence to select the number of bins for all plots. This method ensures that the plots represent the discontinuity taking into consideration the variability of data. The dots in the plots represent binned sample means of the outcomes of interest using the fourth polynomial and uniform kernel. The x-axis represents the running variable of access to credit for a range of 8 kilometres with 4 kilometres on each side of the threshold. A negative value indicates that the household is located outside of the catchment area of the second closest branch, while a positive value indicates that the household is located within the catchment area. In both areas, the magnitude of the variable represents the distance to the boundary of the catchment area. Figure 2 shows the series of plots of the pre-determined characteristics for a graphical analysis of the estimation. Although the plots for age, education, mother’s membership of MFIs, and father’s education show large discontinuities at the threshold, we do not find evidence of discontinuity at the threshold for any of the pre-determined characteristics in formal estimation.

## 6 Empirical results

The results are divided into three parts. The first part shows the effect of access to microfinance on female work, the second shows the effect on gender and social norms related to employment, and the third shows the effect on the psychosocial well-being of respondents. We present the graphical plots of the outcomes of interest in Figures 3–8. We report the OLS and the RD estimates of access to credit on the outcomes of interest in Tables 4–9. In the even-numbered columns, we report the estimates from regressions where we control for the pre-determined characteristics of the respondents including age, age-squared, education, religion, and parental characteristics.

### 6.1 Effect of microcredit access on female work

Our outcomes of interest for female work are: (i) overall labour force participation; (ii) paid employment; and (iii) self-employment. Overall labour force participation is a binary indicator

which takes the value of 1 if the respondent is a part of the labour force (whether involved in daily waged employment, self-employment, salaried employment, or is an employer herself) and 0 otherwise. Paid employment is a binary indicator which takes the value of 1 if the respondent is involved in waged and salaried employment and 0 otherwise. Self-employment is a binary indicator which takes a value of 1 if the respondent is an employer or is involved in a self-employment service or activity and 0 otherwise. We further classify labour force participation as follows: traditional occupations is a binary indicator taking the value of 1 if the respondents are involved in traditional employment such as homestead farming and raising livestock and 0 otherwise; and non-traditional occupations is the binary indicator taking the value of 1 if the respondents are not involved in traditional occupations and 0 otherwise. In addition, we look at the monthly income of women to investigate whether access to credit has an effect on women's income.

Figure 3 shows the RD plots for the women's labour force participation. Figures 3(a) for labour force participation and 3(c) for self-employment show large positive discontinuities at the threshold, suggesting that labour force participation and self-employment increase when women have access to credit. On the other hand, Figures 3(d) and 3(e) show small negative discontinuities, suggesting that both traditional and non-traditional occupations decrease when women have access to credit. Figures 3(b) and 3(f) show no discontinuity at the threshold, suggesting that access to credit has no effect on the paid employment and monthly income of women.

Next, we look at the formal estimation results. Table 5 reports the OLS regression estimates and the RD estimates for the outcomes mentioned above. Labour force participation increases for the full sample OLS estimation by 8.76 percentage points in column (1) and by 15.75 percentage points at the threshold according to the RD estimates in column (3) (both significant at the 5 per cent level). When the specification includes controls for pre-determined characteristics (respondents' age, age-squared, education, religion and parental landholdings, education, and occupation), we obtain statistically significant effects only in the case of the OLS estimator (column 2). Paid employment increases for all the specifications in columns 1–4. However, we obtain statistically significant effects only for the RD estimator with controls for the pre-determined characteristics: a 2 percentage points increase, significant at the 10 per cent level. Self-employment increases for all four specifications—by approximately 6 percentage points for the full sample OLS regression (significant at the 10 per cent level both with and without controls respectively). We obtain positive estimates for the RD estimation as well. However, they are statistically insignificant in both columns (3) and (4).

For the further classifications of labour force participation, we obtain positive effects on access to credit for all four specifications of traditional occupations. Traditional occupations increase by 8.70 percentage points in the case of the OLS estimate (column 1) and by 25.58 percentage points in the case of the RD estimates (column 3) (both significant at the 5 per cent level). When the specifications include controls for the pre-determined characteristics, we obtain an increase in traditional occupations by 8.84 percentage points (OLS estimate, significant at the 1 per cent level) and by 22.86 percentage points (RD estimate, significant at the 10 per cent level) respectively. We do not observe any effect of access to credit on non-traditional occupations of women. Neither do we see any effect on the monthly income of women.

Next, we investigate the effect of access to credit on the labour force participation outcomes for male household heads including labour force participation, paid employment, and self-employment. Figure 4 shows the corresponding RD plots. We observe large positive discontinuities for labour force participation (Figure 4(a)) and self-employment (Figure 4(c)) but a negative discontinuity for paid employment (Figure 4(b)).

Table 6 reports the formal OLS and the RD estimates of the average treatment effects of labour force participation outcomes of household heads. We do not observe any statistically significant effect on any outcome across columns 1–4, implying that access to credit by the female respondents has no impact on the labour force participation of the household heads.

## 6.2 Effect of microcredit access on norms related to employment

For the second part, we investigate the impact of access to credit on gender and social norms related to employment. Our outcomes include the ability of respondents to make employment decision, attitudes of respondents towards gender and social norms, and attitudes of respondents towards employment norms. We define the ability of respondents to make employment decisions in terms of two variables: (i) ‘had freedom to choose to work’—a binary indicator taking the value of 1 if the respondent reported having the freedom to choose to work and 0 otherwise; and (ii) ‘husband or household members prevented from working’—a binary indicator taking the value of 1 if the respondent has never been prevented from working by the husband or other household members and 0 if she had been.

Attitudes towards gender and social norms are defined by six categories: (i) ‘wife ought to be less educated than her husband’; (ii) ‘children suffer, when mothers engage in work outside of their home’; (iii) ‘women should not earn more than their husbands’; (iv) ‘husbands should have final say in all family matters’; (v) ‘husbands can use physical violence against wives in certain circumstances’; and (vi) ‘women can ask for divorce from their husbands in certain circumstances’. The corresponding variables are binary, taking the value of 1 if the respondents’ reported beliefs are traditional (such as ‘yes’ to (i) or ‘no’ to (vi)) and 0 otherwise.

Attitudes towards employment norms are defined by four categories: (i) ‘women can take up employment outside of home before marriage’; (ii) ‘women can take up employment outside of home before giving birth to children’; (iii) ‘women can take up employment outside of home while having young children’; and (iv) ‘husbands should help wives to make bed in the morning’. Similar to the gender and social norms, attitudes towards employment norms are binary indicators taking the values of 1 if the respondents’ beliefs are traditional (such as ‘no’ to (iv)) and 0 otherwise. We construct a traditional norm index taking account of the attitudes towards gender, social, and employment norms.

Figure 5 shows the RD plots for the two categories of respondents’ ability to make employment decisions. Both Figures 5(a) (‘had freedom to choose to work’) and 5(b) (‘husband or household members prevented from working’) show negative discontinuities at the threshold, suggesting that women were less able to make employment decisions when they had access to microfinance.

Table 7 reports the formal estimates for the OLS estimation for the full sample and the RD estimation at the threshold. The formal estimation shows no effect on freedom of respondents to choose to work across the specifications in columns 1–4. On the other hand, respondents were 8.99 percentage points more likely to be prevented from working when they had access to microfinance according to the OLS estimates in column (1) (significant at the 5 per cent level), and 38.52 percentage points more likely to be so according to the RD estimates in column (3) (significant at the 1 per cent level). The estimates remain statistically significant in columns (2) and (4) when the specifications include the pre-determined characteristics as controls: 9.07 percentage points more likely to be prevented from working in column (2) and 34.91 percentage points more likely in column (4) (both significant at the 1 per cent level).

Figure 6 shows the RD plots for the six reported attitudes towards gender and social norms. Figures 6(a), 6(c), and 6(d) show positive discontinuities, suggesting that women have more

traditional beliefs towards gender and social norms when they have access to credit. Figures 6(b) and 6(d) show negative discontinuities at the threshold, suggesting that women believe that children do not suffer when women work outside their homes and that husbands should not have the final say in all important family matters when they have access to credit.

Table 8 provides the estimates corresponding to these reported attitudes. We observe statistically significant estimates for three of the reported attitudes. When respondents have access to credit, they are more likely to believe, by around 18 percentage points, that women should not earn more than husbands according to the RD estimates without controls (column 3), and by about 20 percentage points according to the RD estimates with controls (column 4) (the estimates are significant at the 10 per cent level and 5 per cent level respectively). In addition, respondents are 22.58 percentage points more likely to believe that women do not have the right to ask for a divorce from their husbands in column (3) when they have access to credit and 22.33 percentage points more likely to believe so in column (4) when the specification includes the controls (both estimates significant at the 1 per cent level). On the other hand, there is suggestive evidence that respondents are less likely to believe that husbands should have the final say in all family matters when they have access to credit (both the OLS and RD estimates are negative but only the OLS estimates are statistically significant).

Figure 7 shows the RD plots for the four attitudes towards employment norms and the traditional norm index that we constructed. We observe small negative discontinuities in Figures 7(a) and 7(e), large positive discontinuities for Figures 7(c) and 7(d), and no discontinuity in Figure 7(b).

Table 8 also reports the formal estimation results for the attitudes towards employment norms and the traditional norm index. We observe statistically significant estimates for two out of the four attitudes. Respondents are around 6 percentage points more likely according to OLS estimates in column (1) and 13.93 percentage points more likely according to RD estimates in column (3) to believe that women should not take up employment outside of the home while having young children (significant at the 5 per cent and 10 per cent levels respectively). The estimates remain statistically significant, at the 10 per cent level, when the specifications include the pre-determined characteristics as controls (columns 2 and 4). In addition, respondents are more likely to believe that husbands should not help wives make the beds in the morning when they have access to credit (12.56 percentage points in column 3, and 22.41 percentage points in column 4, significant at the 5 per cent and 1 per cent levels respectively). However, we see no statistically significant effect of access to credit on the traditional norm index across the four specifications in columns 1–4.

### **6.3 Effect of microcredit access on psychosocial well-being**

Lastly, we investigate whether access to credit has an impact on the psychosocial well-being of respondents in terms of their overall happiness, life satisfaction, financial satisfaction, and health satisfaction. The four psychosocial well-being indicators follow ‘Cantril’s Ladder Scale’, where respondents have to choose their well-being at a level between 1 and 10 at the time of the survey (1 is the lowest point of well-being and 10 is the highest). Figure 8 shows the RD plots for the four psychosocial well-being indicators. We observe negative discontinuities at the threshold for all four of the indicators, suggesting that respondents experience a loss in their psychosocial well-being when they have access to credit.

Table 9 reports the formal estimation results for the four psychosocial well-being indicators. Respondents have a loss in their overall happiness when they have access to credit by around 0.307 in the scale, according to the OLS estimation in column (1), and by around 0.739 in the scale according to the RD estimation in column (3) (significant at the 5 per cent and 1 per cent levels respectively). The OLS and RD estimates both remain statistically significant (at the 10 per cent

level) when the specifications include the pre-determined characteristics as controls. The life satisfaction of respondents declines, according to RD estimates, when they have access to credit: by around 1.22 in column (3) (without controls) and by around 1.07 in column (4) (with controls), both significant at the 1 per cent level. Similarly, the financial satisfaction of respondents declines, according to RD estimates, when they have access to credit by around 0.847 in the scale in column (3) (without controls) and by around 0.682 in column (4) (with controls), both significant at the 10 per cent level. Respondents also show a loss of reported health satisfaction when they have access to credit by around 0.398 according to the OLS estimate in column (1) and by around 2.024 according to the RD estimate in column (3), both significant at the 1 per cent level. The estimates remain statistically significant in columns (2) and (4) when the specifications include the pre-determined characteristics as controls.

Overall, we find effects of access to credit on female labour force participation; attitudes towards gender, social, and employment norms; and the psychosocial well-being of respondents. The labour force participation of respondents increases in terms of paid employment (by around 2 percentage points) and traditional occupations (by around 22.86 percentage points) according to RD estimations when the specifications include pre-determined characteristics as controls (both significant at the 10 per cent level). Respondents are around 35 percentage points more likely to be prevented from working by their husbands or other household members when they have access to credit (RD estimate, significant at the 1 per cent level). They are also more likely to have traditional beliefs on attitudes towards gender, social, and employment norms regarding women earning more than husbands, women having the right to ask for divorce, women taking up employment outside the home when they have young children, and husbands helping wives to make beds in the morning. Additionally, the respondents are likely to experience a loss in overall happiness, life satisfaction, financial satisfaction, and health satisfaction when they have access to credit.

## 7 Discussion and conclusion

Since its introduction in rural Bangladesh nearly five decades ago, the microfinance movement has become global in coverage, affecting the lives of millions of women in a variety of ways. It is in this context that this study asked whether and how access to microfinance improves women's entrepreneurship and overall labour market participation. The causal effect remains contested while the evidence on the labour market effect is also limited. Irrespective of the employment and labour outcomes of interest, women's participation in credit schemes is an endogenous choice. To address these questions and issues, we implemented a quasi-experimental design combining data on the branch locations of the major microfinance institutions in Bangladesh with a nationally representative household survey dataset. This yielded RD estimates of the effect of access to microfinance on employment outcomes, attitudes, and subjective well-being scores. Although an OLS estimator is reported for comparison purposes, the RD estimator remains the preferred choice.

Our estimates suggest significant effects of access to credit on female labour force participation. However, when looking at occupation-wise indicators, we do not find any effect on the non-traditional economic participation of women. Neither do we see any effect on the monthly income of women. The significant employment effect seems to arise primarily through increased participation in traditional economic activities. This is consistent with the finding of a positive effect, albeit insignificant, on self-employment. In this context, the positive and significant effect on paid employment is puzzling. It is particularly so given the absence of a positive effect on mobility norms and social attitudes. Respondents are more likely to be prevented from working

by their husbands or other household members. They are also more likely to express traditional beliefs in relation to gender, social, and employment norms.

The results altogether suggest that greater work participation among women with access to credit is not necessarily associated with positive change in social norms. One reason could be the added responsibility of running businesses, associated distress, and the experience of domestic violence that loan recipients are subjected to. While we do not have data to formally test for these possibilities, we do find systematically negative and significant effects of access to credit on four dimensions of subjective well-being: life satisfaction, financial satisfaction, health satisfaction, and overall happiness. Nonetheless, the heterogeneous pattern of employment effects needs further research. The estimated labour impact of microfinance can be confounded because of measurement-related challenges. The perception of employment itself can be shaped by microfinance exposure leading to reporting differences between borrowers and non-borrowers. Self-employment can be informal (for instance, own-account workers rearing livestock) or formal (operated with hired workers). If the non-borrowers are concentrated in the former category and report as being out of the workforce because of the informal nature of their work, this may overstate the effect of microfinance on labour force participation through self-employment. In other words, the occupation-specific impact of microfinance can be ambiguous because of pre-existing heterogeneity among female borrowers. Some women are in entrepreneurship out of necessity while others with the highest growth potential started their business out of opportunity (Calderon et al. 2016). Microfinance is likely to impact on the intensive margin among ‘opportunity entrepreneurs’ while aiding transition to salaried employment among subsistence (i.e. low performing) necessity entrepreneurs, some of whom may have been reported as outside the labour force before receiving credit.

In addition, how these shifts across occupational categories will affect the overall labour force participation rate is unclear. Since female entrepreneurs face many other (non-credit) constraints, it is plausible that the first-time borrowers will be concentrated in low value-added activities. If so, labour force participation will increase primarily through a rise in first-time own-account work. However, if informal work is mis-measured, the gain in the labour force participation rate cannot be observed; we are likely to under-estimate the true effect of microfinance. Wage work is more common among the poor. However, microcredit also leaves out the poorest and economically vulnerable women (Amin et al. 2003). Therefore, it is unlikely that the main labour supply effect of microfinance will be on first-time female wage workers. Regardless, some past microfinance recipients may have moved to wage work and, therefore, the impact should be assessed across all categories of employment. Formal investigation of these issues is left to future research.

## References

- ADB and ILO (2016). *Bangladesh: Looking beyond Garments: Employment Diagnostic Study*. Manila: Asian Development Bank (ADB) and International Labour Organization.
- Afridi, F., T. Dinkelman, and K. Mahajan (2018). ‘Why Are Fewer Married Women Joining the Work Force in India? A Decomposition Analysis Over Two Decades’. *Journal of Population Economics*, 31(3): 783–818. <https://doi.org/10.1007/s00148-017-0671-y>
- Amin, S., A. Rai, and G. Topa (2003) ‘Does Microcredit Reach the Poor and Vulnerable? Evidence from Northern Bangladesh’. *Journal of Development Economics*, 70(1): 59–82. [https://doi.org/10.1016/S0304-3878\(02\)00087-1](https://doi.org/10.1016/S0304-3878(02)00087-1)
- Amirapu, A., M.N. Asadullah, and Z. Wahhaj (2020). ‘Social Barriers to Female Migration: Theory and Evidence from Bangladesh’. GLO Discussion Paper Series 692. Essen: Global Labor Organization (GLO).

- Armendáriz, B., and J. Morduch (2010). *The Economics of Microfinance*. London: The MIT Press.
- Asadullah, M.N., and J. Ara (2016) ‘Evaluating the Long-run Impact of an Innovative Anti-Poverty Programme: Evidence Using Household Panel Data’. *Applied Economics*, 48(2): 107–20. <https://doi.org/10.1080/00036846.2015.1073846>
- Asadullah, M.N., A. Savoia, and W. Mahmud (2014) ‘Paths to Development: Is There a Bangladesh Surprise?’. *World Development*, 62(C): 138–54. <https://doi.org/10.1016/j.worlddev.2014.05.013>
- Asadullah, M.N., and Z. Wahhaj (2019a). ‘Female Seclusion from Paid Work: A Social Norm or Cultural Preference?’. ECARES Working Paper 2019-10. Brussels: ECARES.
- Asadullah, M.N., and Z. Wahhaj (2019b). ‘Early Marriage, Social Networks and the Transmission of Norms’. *Economica*, 86(344). <https://doi.org/10.1111/ecca.12291>
- Asadullah, M.N., and Z. Wahhaj (2021). ‘Bangladesh Women’s Life Choices and Attitudes Survey’. Harvard Dataverse. <https://doi.org/10.7910/DVN/14CT0S>
- Banerjee, A., E. Breza, E Duflo, and C Kinnan (2019). ‘Can Microfinance Unlock a Poverty Trap for Some Entrepreneurs?’. NBER Working Paper 26346. Cambridge, MA: National Bureau of Economic Research. <https://doi.org/10.3386/w26346>
- Banerjee, A., D. Karlan, and J. Zinman (2015) ‘Six Randomized Evaluations of Microcredit: Introduction and Further Steps’. *American Economic Journal: Applied Economics*, 7(1): 1–21. <https://doi.org/10.1257/app.20140287>
- Blattman, C., E.P. Green, J. Jamison, M.C. Lehmann, and J. Annan (2016). ‘The Returns to Microenterprise Support among the Ultrapoor: A Field Experiment in Postwar Uganda’. *American Economic Journal: Applied Economics*, 8(2): 35–64. <https://doi.org/10.1257/app.20150023>
- Boiwa, W., and H. Bwisa (2014). ‘Effects of Multiple Borrowing on the Living Standards of Microfinance Clients at Kenya Women Finance Trust. Trans Nzoia Region’. *Developing Country Studies*, 4(9):77–85.
- Boserup, E. (1970). *Women’s Role in Economic Development*. London: George Allen and Unwin Ltd.
- Burgess, R., and R. Pande (2005). ‘Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment’. *American Economic Review*, 95(3): 780–95. <https://doi.org/10.1257/0002828054201242>
- Calderon G., L. Iacovone, and L. Juarez (2016). ‘Opportunity Versus Necessity: Understanding the Heterogeneity of Female Micro-entrepreneurs’. *World Bank Economic Review*, 30: S86–S96. <https://doi.org/10.1596/1813-9450-7636>
- Calonico, S., M. Cattaneo, and R. Titiunik (2014a). ‘Package “rdrubust”: Robust data- driven statistical inference in regression-discontinuity designs (version 0.70); 2014’. Software available at: <https://cran.r-project.org/web/packages/rdrubust/index.html> (accessed 11 November 2015).
- Chevalier, A. (2004). Parental education and child's education: A natural experiment.
- Chi, W., and B. Li (2014) ‘Trends in China’s Gender Employment and Pay Gap: Estimating Gender Pay Gaps with Employment Selection’. *Journal of Comparative Economics*, 42(3): 708–25. <https://doi.org/10.1016/j.jce.2013.06.008>
- Drèze, J., and A. Sen (2013). *An Uncertain Glory: India and Its Contradictions*. Princeton, NJ: Princeton University Press.
- Ermisch, J., and C. Pronzato (2010). ‘Causal Effects of Parents’ Education on Children’s Education’. ISER Working Paper 2010-16. Colchester: Institute for Social and Economic Research, University of Essex.
- Garikipati, S. (2008) ‘The Impact of Lending to Women on Household Vulnerability and Women’s Empowerment: Evidence from India’. *World Development*, 36(12): 2620–42. <https://doi.org/10.1016/j.worlddev.2007.11.008>
- George, L.K. (1981). ‘Subjective Well-being: Conceptual and Methodological Issues’. *Annual Review of Gerontology and Geriatrics*, 2(1): 345–82.

- Goetz, A.M., and R.S. Gupta (1996). 'Who Takes the Credit? Gender, Power, and Control Over Loan Use in Rural Credit Programs in Bangladesh'. *World Development*, 24(1): 45–63. [https://doi.org/10.1016/0305-750X\(95\)00124-U](https://doi.org/10.1016/0305-750X(95)00124-U)
- Goldin, C. (1995). 'The U-shaped Female Labor Force Function in Economic Development and Economic History'. In T. Paul Schultz (ed.), *Investment in Women's Human Capital and Economic Development*. Chicago, IL: University of Chicago Press.
- Heath, R., and S. Jayachandran (2018). 'The Causes and Consequences of Increased Female Education and Labor Force Participation in Developing Countries'. In S.L. Averett, L.M. Argys, and S.D. Hoffman (eds), *The Oxford Handbook on the Economics of Women*. New York, NY: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190628963.013.10>
- Heintz, J., N. Kabeer, and S. Mahmud (2018). 'Cultural Norms, Economic Incentives and Women's Labour Market Behaviour: Empirical Insights from Bangladesh', *Oxford Development Studies*, 46(2): 266–89. <https://doi.org/10.1080/13600818.2017.1382464>
- Bangladesh Bureau of Statistics (2011). *Report of the Bangladesh Household Income and Expenditures Survey 2010*. BBS Statistics Division, Ministry of Planning. Available at: <https://203.112.218.65:8008/WebTestApplication/userfiles/Image/LatestReports/HIES-10.pdf> (accessed 26 January 2021).
- Kabeer, N. (2001). 'Conflicts Over Credit: Re-evaluating the Empowerment Potential of Loans to Women in Rural Bangladesh'. *World Development*, 29(1): 63–84. [https://doi.org/10.1016/S0305-750X\(00\)00081-4](https://doi.org/10.1016/S0305-750X(00)00081-4)
- Khalily, M. B., Khaleque, M. A., & Badruddoza, S. (2014). Impact of regulation on the cost efficiency of microfinance institutions in Bangladesh. In *Microfinance Institutions* (pp. 139-161). Palgrave Macmillan, London.
- Klapper, L.F., and S.C. Parker (2011). 'Gender and the Business Environment for New Firm Creation'. *The World Bank Research Observer*, 26(2): 237–57. <https://doi.org/10.1093/wbro/lkp032>
- Klasen, S., and J. Pieters (2015). 'What Explains the Stagnation of Female Labor Force Participation in Urban India?'. *World Bank Economic Review*, 29(3): 449–78. <https://doi.org/10.1093/wber/lhv003>
- Lee, D.S. (2008). 'Randomized Experiments from Non-random Selection in US House Elections'. *Journal of Econometrics*, 142(2): 675–97. <https://doi.org/10.1016/j.jeconom.2007.05.004>
- Lee, D. S., & Lemieux, T. (2010). Regression discontinuity designs in economics. *Journal of economic literature*, 48(2), 281-355.
- Mammen, K., and C. Paxson (2000). 'Women's Work and Economic Development'. *Journal of Economic Perspectives*, 14(4): 141–64. <https://doi.org/10.1257/jep.14.4.141>
- McCrary, J. (2008). 'Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test'. *Journal of Econometrics*, 142(2): 698–714. <https://doi.org/10.1016/j.jeconom.2007.05.005>
- Mehrotra, S. and J. K. Parida (2017). 'Why is the Labour Force Participation of Women Declining in India?'. *World Development*, 98: 360–80. <https://doi.org/10.1016/j.worlddev.2017.05.003>
- Ngo, T.M.P., and A. Wahhaj (2012). 'Microfinance and Gender Empowerment'. *Journal of Development Economics*, 99(1): 1–12. <https://doi.org/10.1016/j.jdevec.2011.09.003>
- Rahman, A. (1999). *Women and Microcredit in Rural Bangladesh: Anthropological Study of the Rhetoric and Realities of Grameen Bank Lending*. Boulder, CO: Westview Press.
- Sinha, J.N. (1967). 'Dynamics of Female Participation in Economic Activity in a Developing Economy'. In *Proceedings of the World Population Conference*. Belgrade, 1965, Vol. IV, Migration, Urbanization, Economic Development. New York, NY: United Nations.
- Yunus, M. (1998). 'Poverty Alleviation: Is Economics Any Help? Lessons from the Grameen Bank Experience'. *Journal of International Affairs*, 52(1): 47–65.

Yunus, M. (2007) 'Credit for the Poor: Poverty as Distant History'. *Harvard International Review*, 29(3): 20–24.

## Tables and figures

Table 1: Sources of loan

Loan composition	%
Loan from ASA	27.10
Loan from BRAC	13.51
Loan from Grameen Bank	28.42
Loan from other MFIs	4.06
Loan from commercial bank	0.75
Loan from informal sources	26.18

Note: the table above shows the proportion of source of clients' loans. The three MFIs (ASA, BRAC, and Grameen Bank) account for approximately 70% of the loans taken. Informal sources include family, friends, moneylenders, employer, and shop owners.

Source: WiLCAS 2014 and authors' calculations.

Table 2: Descriptive statistics

	Mean	SD	Min	Max	N
Respondent features					
Age (in years)	29.102	5.673	19	39	6,184
Monthly income (in Bangladeshi Taka)	12,327.940	70412.69	0	5,000,000	6,181
Education (completed years of schooling)	5.236	3.808	0	13	6,184
Parental landholdings (in acres)	1.396	2.766	0	60	6,184
Father's education (in years)	2.949	3.883	0	13	6,184
Mother's education (in years)	1.618	2.778	0	13	6,184
Religion (muslim; non-muslim)	0.884	0.320	0	1	6,184
Mother's membership of MFI	0.197	0.398	0	1	6,184
Labour force participation					
A. Labour force participation (overall)	0.519	0.499	0	1	6,184
B. Labour force participation by employment type					
- Paid employment	0.104	0.306	0	1	6,184
- Self-employment	0.414	0.493	0	1	6,184
C. Labour force participation by occupation type					
- Traditional occupations	0.359	0.480	0	1	6,184
- Non-traditional occupations	0.159	0.366	0	1	6,184
Ability to make employment decision					
Had freedom to choose to work	0.425	0.494	0	1	6,184
Husband or household members prevented from working	0.548	0.498	0	1	6,184
Psychosocial well-being indicators					
Overall happiness	5.591	2.13	1	10	6,180
Financial satisfaction	5.185	2.12	1	10	6,180
Life satisfaction	5.492	2.02	1	10	6,180
Health satisfaction	5.424	2.08	1	10	6,180

Source: WiLCAS 2014 and authors' calculations.

Table 3: Descriptive statistics (continued)

	Mean	SD	Min	Max	N
Attitude towards gender and social norms					
A wife ought to be less educated than her husband (agree = 1, disagree = 0)	0.556	0.497	0	1	6,184
Children suffer when woman is engaged in work outside of the home (agree = 1, disagree = 0)	0.864	0.342	0	1	6,184
A woman should not earn more than her husband (agree = 1, disagree = 0)	0.661	0.473	0	1	6,184
A husband should have final say in all important family matters (agree = 1, disagree = 0)	0.434	0.496	0	1	6,184
There are some circumstances in which a husband is justified in using physical violence against his wife (agree = 1, disagree = 0)	0.294	0.456	0	1	6,184
There are some circumstances in which a woman is right to ask divorce from her husband (agree = 0, disagree = 1)	0.446	0.497	0	1	6,184
Should a woman a woman take up employment outside of the household before marriage? (agree = 0, disagree = 1)	0.303	0.460	0	1	6,184
Should a woman take up employment outside of the household after marriage, before giving birth to a child? (agree = 0, disagree = 1)	0.388	0.487	0	1	6,184
Should a woman take up employment outside of the household after marriage, when she has young children? (agree = 0, disagree = 1)	0.763	0.425	0	1	6,184
Should a husband help his wife make the bed in the morning? (agree = 0, disagree = 1)	0.234	0.424	0	1	6,184
Should a husband help his wife with cooking when she is sick? (agree = 0, disagree = 1)	0.089	0.284	0	1	6,184
Should a husband help look after children when his wife is busy collecting/harvesting/ threshing crops? (agree = 0, disagree = 1)	0.065	0.246	0	1	6,184
Traditional norm index					
Traditional norm index	0.000	1	-1.750	2.461	6,184

Source: WILCAS 2014 and authors' calculations.

Table 4: Pre-determined characteristics

	(OLS estimates)	(RD estimates)
	1	2
Age	0.3904 ( 0.404)	1.5310 ( 0.957)
<i>h</i>		0.852
Obs around cut-off		[276,5428]
Education	0.2604 ( 0.271)	0.8759 ( 0.715)
<i>h</i>		0.427
Obs around cut-off		[276,5428]
Mother's membership of MFIs	0.0737*** (0.028)	-0.0467 (0.083)
<i>h</i>		0.545
Obs around cut-off		[276,5428]
Mother's education	0.1501 (0.198)	-0.0062 (0.519)
<i>h</i>		0.517
Obs around cut-off		[276,5428]
Father's education	0.0283 ( 0.278)	-0.5528 ( 0.621)
<i>h</i>		0.830
Obs around cut-off		[276,5428]
Parental landholding	-0.2593 (0.190)	0.1338 0.1338
<i>h</i>		0.878
Obs around cut-off		[276,5428]
Religion	0.0493* (0.023)	0.0383 (0.050)
<i>h</i>		0.277
Obs around cut-off		[276,5428]
N	5,704	5,704

Note: the table presents the OLS estimates and the local linear RD estimates for the pre-determined characteristics of the respondents. Access to microfinance in this table above and all the following tables denote that respondents have access to at least one branch of a MFI. *h* is the data-driven optimal bandwidth taken around the threshold in kilometres for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

Table 5: Labour force participation and income

	(OLS estimates)		(RD estimates)	
	1	2	3	4
Labour force participation (overall)	0.0876**	0.0887**	0.1575**	0.1366
	(0.036)	(0.036)	(0.073)	(0.085)
<i>h</i>			0.880	0.649
Obs around cut-off			[276,5428]	[276,5428]
Paid employment	0.0282	0.0283	0.0110	0.0202*
	(0.021)	(0.017)	(0.017)	(0.016)
<i>h</i>			0.464	0.428
Obs around cut-off			[276,5428]	[276,5428]
Self-employment	0.0594*	0.0604*	0.1149	0.1116
	(0.035)	(0.036)	(0.091)	(0.101)
<i>h</i>			0.476	0.451
Obs around cut-off			[276,5428]	[276,5428]
Labour force participation by occupation type				
Traditional occupations	0.0870**	0.0884***	0.2558**	0.2286*
	(0.035)	(0.034)	(0.092)	(0.098)
<i>h</i>			0.443	0.447
Obs around cut-off			[276,5428]	[276,5428]
Non-traditional occupations	0.0006	0.0002	-0.1017	-0.0970
	(0.026)	(0.024)	(0.071)	(0.069)
<i>h</i>			0.478	0.511
Obs around cut-off			[276,5428]	[276,5428]
Income	6126	5902	10196	11488
	(5237)	(4196)	(6663)	(7333)
<i>h</i>			0.943	1.121
Obs around cut-off			[276,5428]	[276,5428]
N	5,704	5,704	5,704	5,704
Controls	No	Yes	No	Yes

Note: the table presents the OLS estimates for the full sample and local linear RD estimates for labour force participation outcomes of the respondents. Access to microfinance in the table denotes that clients have access to at least one branch of a MFI. Labour force participation is a binary variable which takes the value of 1 if the respondent is employed and 0 otherwise. Paid employment is a binary variable which takes the value of 1 if the respondent is involved in salaried employment and 0 otherwise. Self-employment is a binary variable if the respondent is self-employed (or an entrepreneur) and 0 otherwise. Labour force participation is further classified into traditional and non-traditional occupations binary outcomes where traditional occupation is classified as homestead farming. The estimates in column (2) and (4) include age, age-sq, education, religion, parental landholdings, and parental education of respondents as controls. *h* is the optimal data-driven bandwidth in kilometres taken around the threshold for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

Table 6: Household head's labour force participation

	(OLS estimates)		(RD estimates)	
	1	2	3	4
Labour force participation (overall)	-0.0010 (0.038)	-0.0004 (0.037)	0.0841 (0.096)	0.0745 (0.094)
<i>h</i>			0.545	0.548
Obs around cut-off			[233,4842]	[233,4842]
Paid employment	0.0013 (0.023)	0.0016 (0.023)	-0.374 (0.058)	-0.0291 (0.064)
<i>h</i>			1.053	0.619
Obs around cut-off			[233,4842]	[233,4842]
Self-employment	-0.0023 (0.034)	-0.0019 (0.034)	0.1547 (0.085)	0.1088 (0.075)
<i>h</i>			0.503	0.864
Obs around cut-off			[233,4842]	[233,4842]
N	5,075	5,075	5,075	5,075
Controls	No	Yes	No	Yes

Note: the table presents the OLS estimates for the full sample and the local linear RD estimates for labour force participation outcomes of the respondents. Access to microfinance in the table denotes that clients have access to at least one branch of a MFI. Labour force participation is a binary variable which takes the value of 1 if the household head is employed and 0 otherwise. Paid employment is a binary variable which takes the value of 1 if the household head is involved in salaried employment and 0 otherwise. Self-employment is a binary variable if the household head is self-employed (or an entrepreneur) and 0 otherwise. The estimates in columns (2) and (4) include age, age-sq, education, religion, parental landholdings, and parental education of respondents as controls. *h* is the optimal data-driven bandwidth in kilometres taken around the threshold for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

Table 7: Ability to make employment decision

	(OLS estimates)		(RD estimates)	
	1	2	3	4
Had freedom to choose to work	0.0106 (0.035)	0.0121 (0.035)	-0.1581 (0.096)	-0.1661 (0.095)
<i>h</i>			0.491	0.499
Obs around cut-off			[276,5428]	[276, 428]
Husband or household members prevented from working	-0.0899** (0.036)	-0.0907*** (0.035)	-0.3852*** (0.115)	-0.3491*** (0.120)
<i>h</i>			0.317	0.335
Obs around cut-off			[276,5428]	[276,5428]
N	5,704	5,704	5,704	5,704
Controls	No	Yes	No	Yes

Note: the table presents the OLS estimates for the full sample and the local linear RD estimates for ability of respondents to make employment decisions. Access to Microfinance in the table denotes that respondents have access to at least one branch of a MFI. 'Had freedom to choose to work' is a binary variable taking the value of 1 when the respondents had the freedom to choose to work and 0 otherwise. 'Husband or household members prevented from working' is a binary variable taking the value of 1 if the no one prevented the respondents from working and 0 otherwise. The estimates in columns (2) and (4) include age, age-sq, education, religion, parental landholdings, and parental education of respondents as controls. *h* is the optimal data-driven bandwidth in kilometres taken around the threshold for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

Table 8: Attitude towards gender and social norms

	(OLS estimates)		(RD estimates)	
	1	2	3	4
Attitude towards gender and social norm				
A wife ought to be less educated than her husband	-0.0015 (0.036)	-0.0027 (0.035)	0.0491 (0.077)	0.0777 (0.078)
<i>h</i>			0.923	0.854
Obs around cut-off			[348,5428]	[348,5428]
When a women is engaged in work outside of her home, her children suffer because they are deprived of mother's attention	-0.0311 (0.024)	-0.0313 (0.023)	-0.0686 (0.069)	-0.0708 (0.070)
<i>h</i>			1.026	0.991
Obs around cut-off			[348,5428]	[348,5428]
A woman should not earn more than her husband as this causes tensions within the household	-0.0185 (0.034)	-0.0185 (0.033)	0.1808* (0.083)	0.2031** (0.082)
<i>h</i>			0.543	0.530
Obs around cut-off			[348,5428]	[348,5428]
A husband should have final say in all important family matters	-0.0633* (0.035)	-0.0639* (0.036)	-0.0541 (0.070)	-0.0386 (0.070)
<i>h</i>			1.060	1.058
Obs around cut-off			[348,5428]	[348,5428]
There are some circumstances in which a husband is justified in using physical violence against his wife	-0.0261 (0.032)	-0.0273 (0.033)	-0.0162 (0.043)	-0.0856 (0.078)
<i>h</i>			0.989	0.931
Obs around cut-off			[348,5428]	[348,5428]
There are some circumstances in which a woman is right to ask for a divorce from her husband	0.0100 (0.036)	0.0093 (0.036)	0.2258*** (0.060)	0.2233*** (0.061)
<i>h</i>			0.902	0.847
Obs around cut-off			[348,5428]	[348,5428]
Attitude towards employment norm				
Is it appropriate for a woman to take up employment outside of the household before marriage?	0.0037 (0.032)	0.0003 (0.033)	-0.0309 (0.080)	-0.0121 (0.078)
<i>h</i>			0.949	0.958
Obs around cut-off			[348,5428]	[348,5428]
Is it appropriate for a woman to take up employment outside of the household after marriage, before giving birth to a child?	-0.0615 (0.035)	-0.0178 (0.035)	0.0615 (0.082)	0.0981 (0.082)
<i>h</i>			0.783	0.567
Obs around cut-off			[348,5428]	[348,5428]
Is it appropriate for a woman to take up employment outside of the household after marriage, when she has young children?	0.0601** (0.030)	0.0588* (0.032)	0.1393* (0.074)	0.1423* (0.074)
<i>h</i>			1.029	0.567
Obs around cut-off			[348,5428]	[348,5428]

Do you think a husband should help his wife make the bed in the morning?	0.0340	0.0340	0.1256**	0.2241***
	(0.030)	(0.028)	(0.074)	(0.078)
<i>h</i>			0.827	0.387
Obs around cut-off			[348,5428]	[348,5428]
Traditional norm index	-0.0296	-0.0349	-0.0345	0.0446
	(0.071)	(0.071)	(0.229)	(0.221)
<i>h</i>			0.540	0.552
Obs around cut-off			[348,5428]	[348,5428]
N	5,704	5,704	5,704	5,704
Controls	No	Yes	No	Yes

Note: the table presents the OLS estimates for the full sample and the local linear RD estimates for the 9 statements demonstrating attitude towards gender and social norms for respondents. The statements are binary indicators taking the value of 1 if the answers are traditional and 0 otherwise. Access to microfinance in the table denotes that respondents have access to at least one branch of a MFI. The estimates in columns (2) and (4) include age, age-sq, education, religion, parental landholdings, and parental education of respondents as controls. *h* is the data-driven bandwidth in kilometres taken around the threshold for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

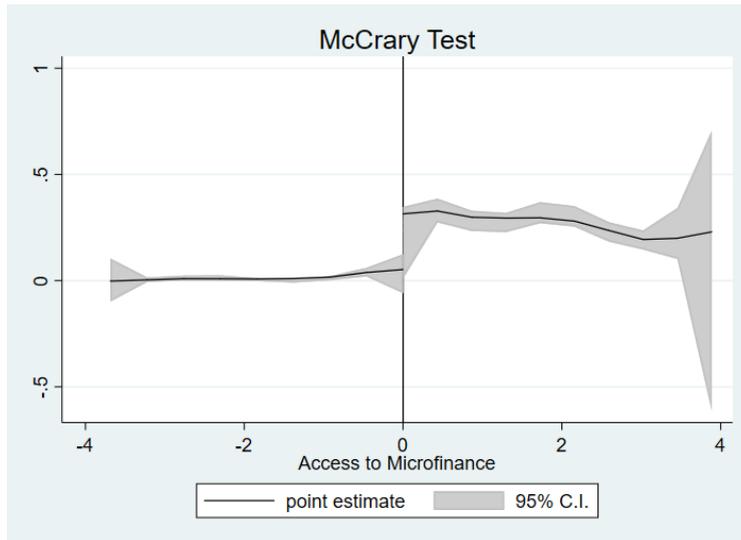
Table 9: Psychosocial well-being indicators

	(OLS estimates)		(RD estimates)	
	1	2	3	4
Overall happiness	-0.3072** (0.152)	-0.2869* (0.158)	-0.7394* (0.435)	-0.7941* (0.405)
<i>h</i>	0.411	0.406	0.411	0.406
Obs around cut-off	[275,5425]	[275,5425]	[275,5425]	[275,5425]
Life satisfaction	-0.1951 (0.149)	-0.1801 (0.150)	-1.2168*** (0.394)	-1.0739*** (0.329)
<i>h</i>	0.365	0.406	0.365	0.406
Obs around cut-off	[275,5425]	[275,5425]	[275,5425]	[275,5425]
Financial satisfaction	-0.1376 (0.151)	-0.1197 (0.156)	-0.8470* (0.494)	-0.6822* (0.409)
<i>h</i>	0.375	0.412	0.375	0.412
Obs around cut-off	[275,5425]	[275,5425]	[275,5425]	[275,5425]
Health satisfaction	-0.3976*** (0.152)	-0.3778** (0.157)	-2.0237*** (0.493)	-1.8906*** (0.449)
<i>h</i>	0.300	0.324	0.300	0.324
Obs around cut-off	[275,5425]	[275,5425]	[275,5425]	[275,5425]
N	5,700	5,700	5,700	5,700
Controls	No	Yes	No	Yes

Note: the table presents the OLS estimates for the full sample and the local linear RD estimates for the four psychosocial well-being indicators for respondents. The psychosocial well-being indicators include overall happiness, life satisfaction, financial satisfaction, and health satisfaction of the women. The estimates in columns (2) and (4) include age, age-sq, education, religion, parental landholdings, and parental education of the women as controls. *h* is the data-driven bandwidth in kilometres taken around the threshold for estimation. Standard errors are given in parentheses. Statistical significance is denoted by robust p-values \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: authors, based on WILCAS 2014.

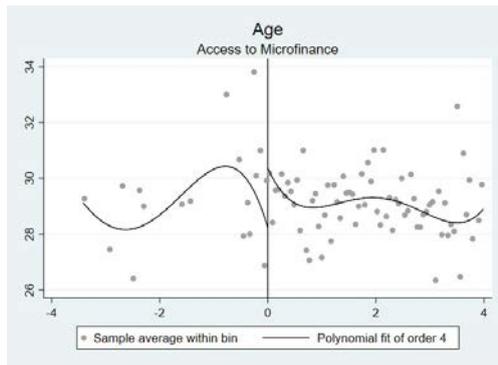
Figure 1: McCrary test of running variable: access to microfinance



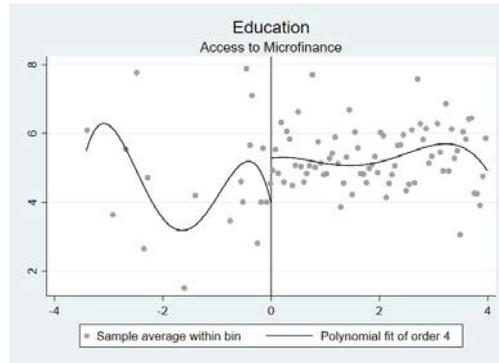
Note: the figure demonstrates the McCrary density test plot for the running variable to check for manipulation of access to microfinance. The plot shown here and in all the other figures has the running variable 'access to microfinance' centred to zero in the x-axis. The centre shows the cut-off of the operational rule of the MFIs. The negative distance shows that the households are beyond the operational area of the MFI branch and is taken as the 'control group'. The positive distance in the x-axis is the distance the households are within the given radius of the MFI operational area and is taken as the 'treatment' group. The control group does not have access to microfinance and the treatment group has access to at least one branch of MFI.

Source: authors, based on WILCAS 2014.

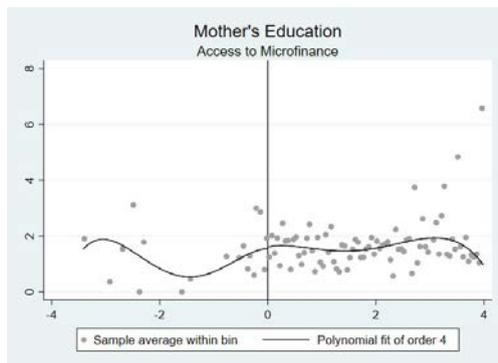
Figure 2: Pre-determined characteristics: RD plots



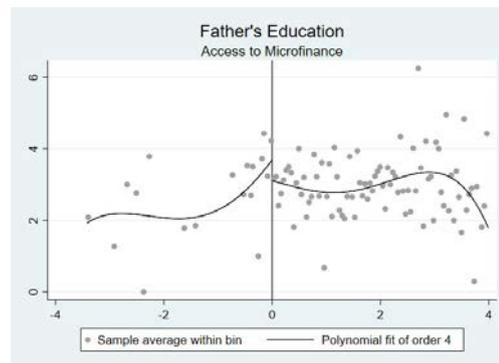
(a) Age



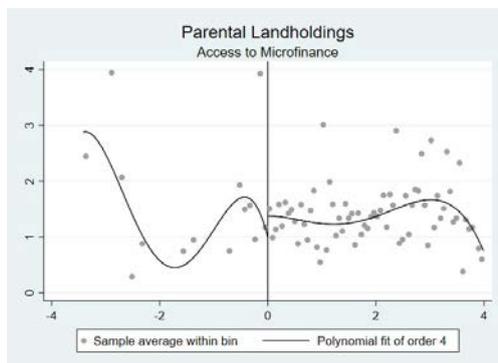
(b) Education



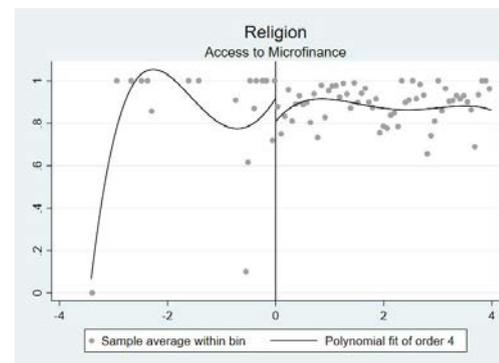
(c) Mother's education



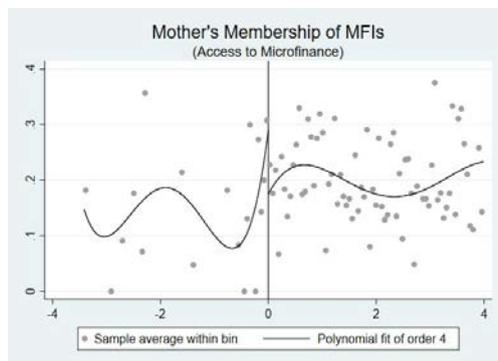
(d) Father's education



(e) Parental landholdings



(f) Religion

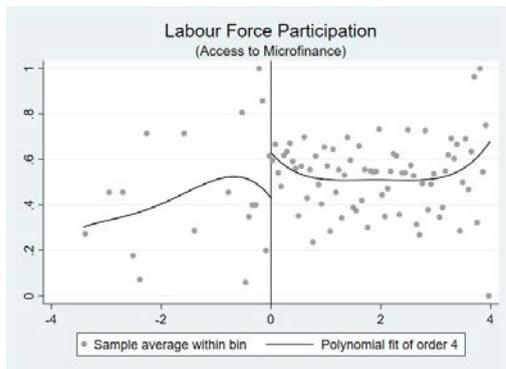


(g) Mother's membership of MFIs

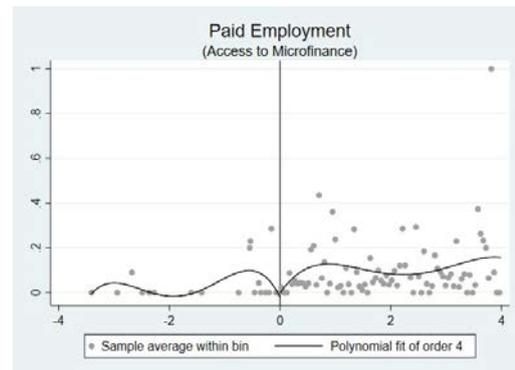
Note: these figures demonstrate the RD plots for pre-determined characteristics of respondents. The plots shown here and in all the other figures have the running variable 'access to microfinance' centred at zero in the x-axis and 4 kilometres of distance on each side of the cut-off. The centre shows the cut-off of the operational rule of MFIs with the negative being the distance the households are beyond the operational area of the MFIs, taken as the 'control group', and the positive being the distance the households are within the operational area of the MFIs, taken as the 'treatment' group. The plots use fourth polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

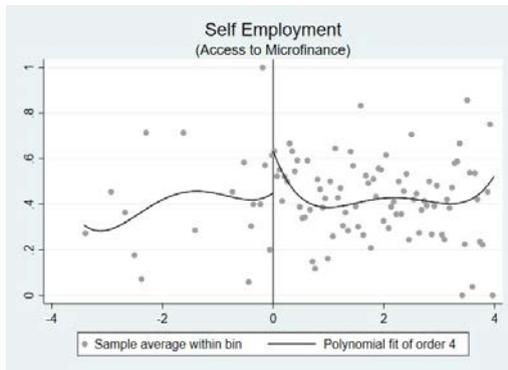
Figure 3: Labour force participation: RD plots



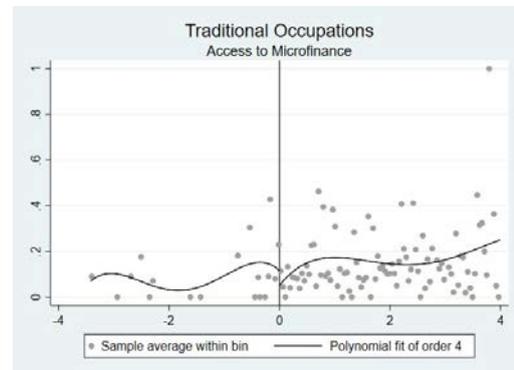
(a) Labour force participation



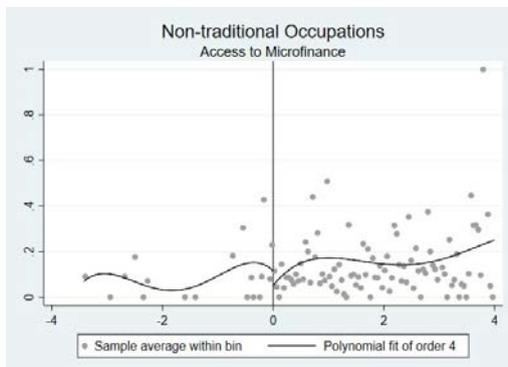
(b) Paid employment



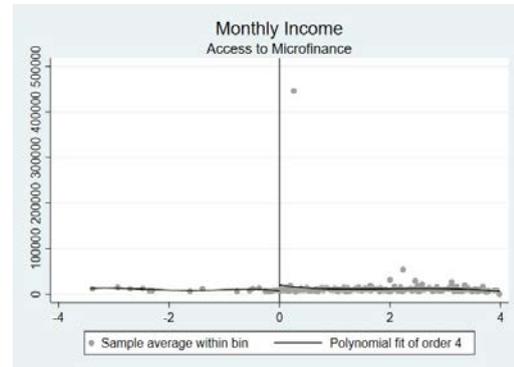
(c) Self-employment



(d) Traditional occupations



(e) Non-traditional occupations

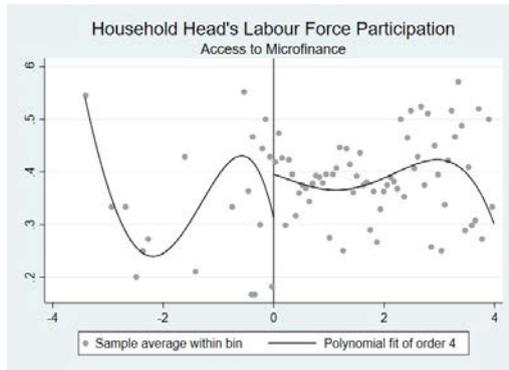


(f) Monthly income

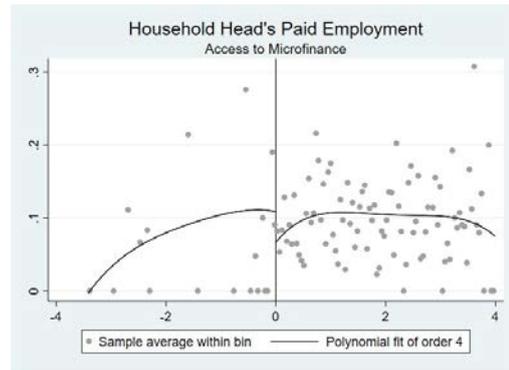
Note: these figures demonstrate the plots for labour force participation outcomes of respondents. Figure 3(a) demonstrates the plot for overall labour force participation of respondents, Figure 3(b) for paid employment, Figure 3(c) for self-employment, Figure 3(d) for traditional occupations, Figure 3(e) for non-traditional occupations, and Figure 3(f) for monthly income. The running variable on the x-axis is access to microfinance. The dots demonstrate the binned sample means of the respective labour force participation outcomes using fourth order polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

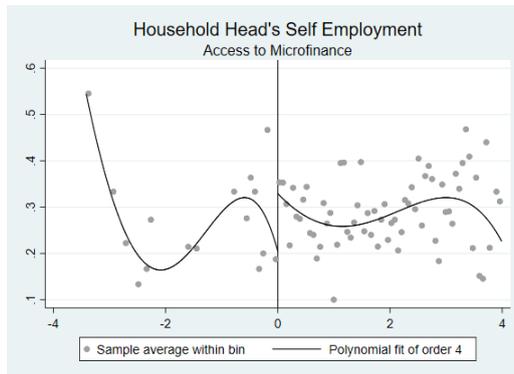
Figure 4: Household head's labour force participation: RD plots



(a) Labour force participation



(b) Paid employment

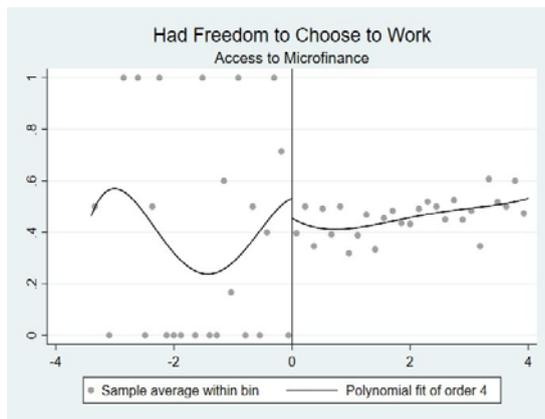


(c) Self-employment

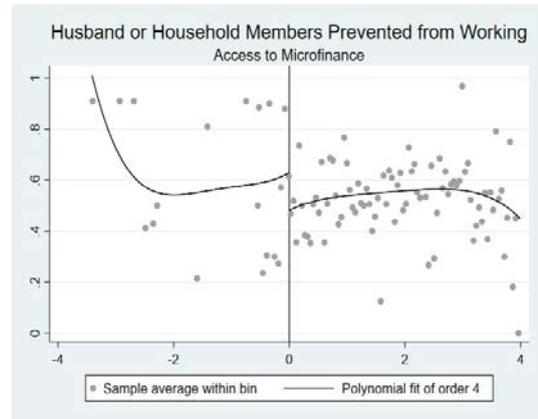
Note: these figures demonstrate the plots for labour force participation outcomes of household head of respondent's household. Figure 4(a) demonstrates the plot for overall labour force participation of household head, Figure 4(b) for paid employment, and Figure 4(c) for self-employment. The running variable on the x-axis is access to microfinance. The dots demonstrate the binned sample means of the respective labour force participation outcomes using fourth order polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

Figure 5: Ability to make employment decision: RD plots



(a) Freedom to choose to work

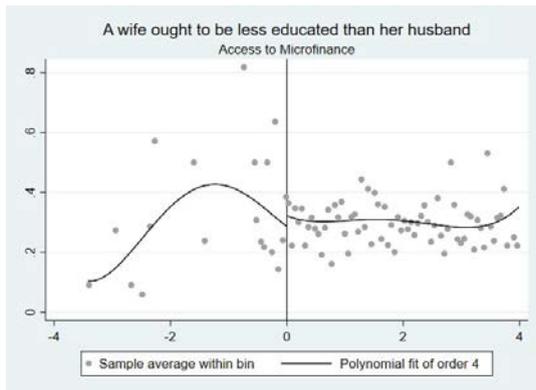


(b) Husband/household member prevented from working

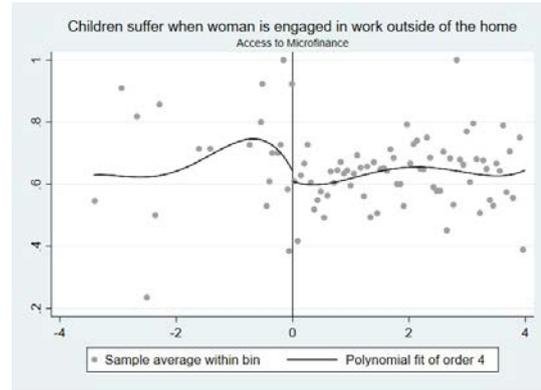
Note: these figures demonstrate the plots for ability of respondents to make employment decision. Figure 5(a) demonstrates the plot for freedom of respondents to choose to work and Figure 5(b) the plot for respondents being prevented from working by husband or household member. The running variable on the x-axis is access to microfinance. The dots demonstrate binned sample means of the outcomes using fourth order polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

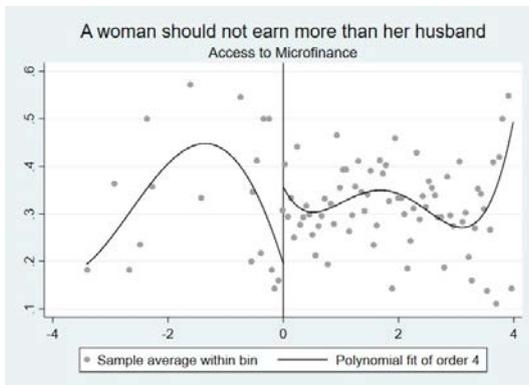
Figure 6: Attitude towards gender and social norms: RD plots



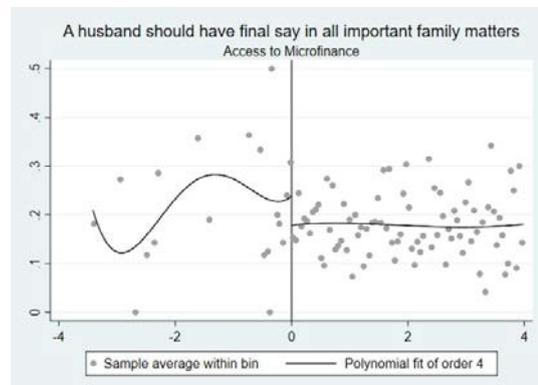
(a) A wife ought to be less educated than her husband



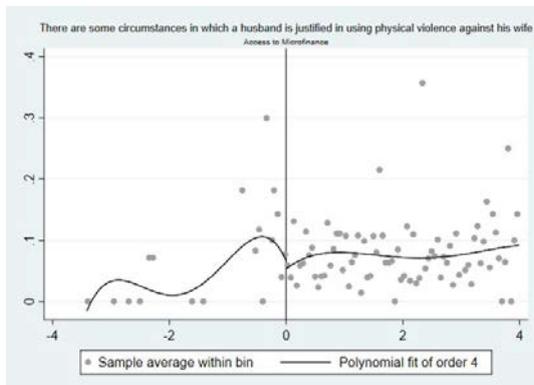
(b) Children suffer when a woman is engaged in work outside of the home



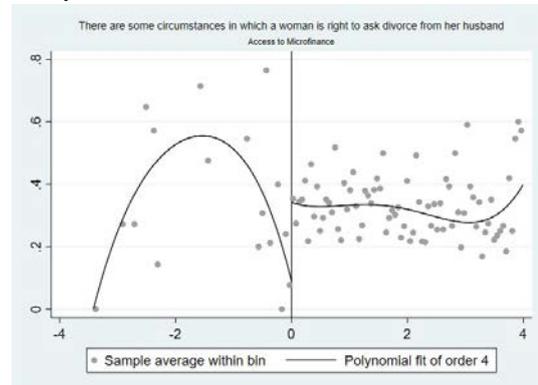
(c) A woman should not earn more than her husband



(d) A husband should have final say in all important family matters



(e) There are some circumstances in which a husband is justified in using physical violence against his wife

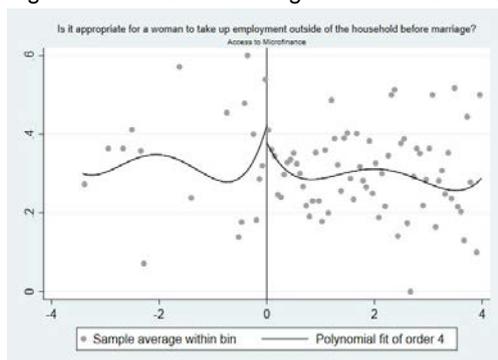


(f) There are some circumstances in which a woman is right to ask for a divorce from her husband

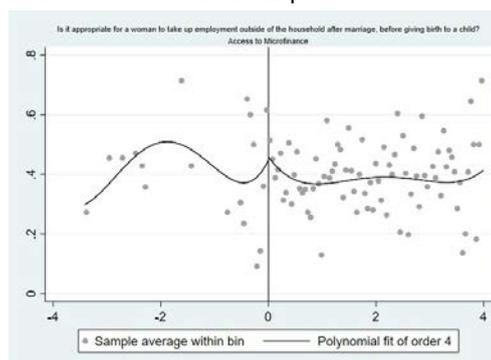
Note: these figures demonstrate the RD plots for the statements demonstrating the attitudes towards gender and social norms of respondents. The plots shown here and in all the other figures have the running variable 'access to microfinance' centred at zero in the x-axis and 4 kilometres of distance on each side of the cut-off. The centre shows the cut-off of the operational rule of MFIs with the negative being the distance the households are beyond the operational area of the MFIs taken as the 'control group' and the positive being the distance the households are within the operational area of the MFIs taken as the 'treatment' group. The plots use fourth polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

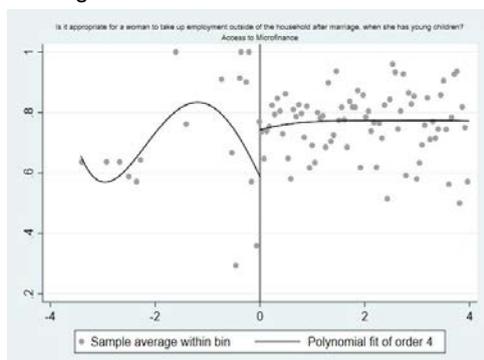
Figure 7: Attitude towards gender and social norms and traditional norm index: RD plots



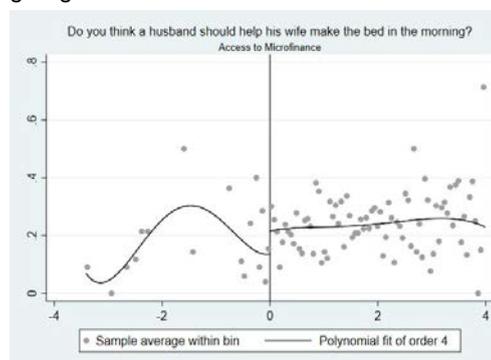
(a) Is it appropriate for a woman to take up employment outside of the household before marriage?



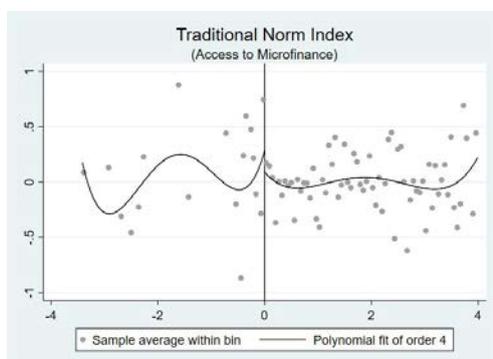
(b) Is it appropriate for a woman to take up employment outside of the household after marriage, before giving birth to a child?



(c) Is it appropriate for a woman to take up employment outside of the household after marriage when she has young children?



(d) Do you think a husband should help his wife make the bed in the morning?

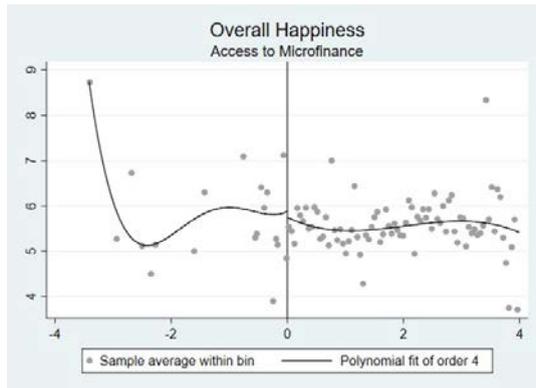


(d) Traditional norm index

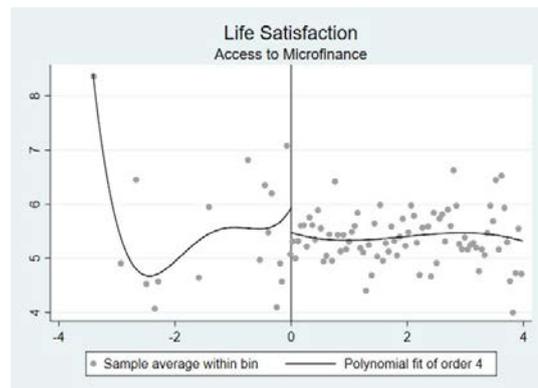
Note: these figures demonstrate the plots for attitudes towards gender and social norms and traditional norm index for respondents. The plots shown here and in all the other figures have the running variable 'access to microfinance'. The centre shows the cut-off of the operational rule of MFIs with the negative being the distance the households are beyond the operational area of the MFIs taken as the 'control group' and the positive being the distance the households are within the operational area of the MFIs taken as the 'treatment' group. The plots use fourth polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.

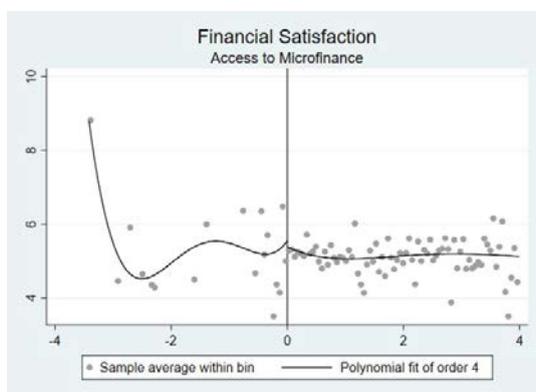
Figure 8: Psychosocial well-being indicators: RD plots



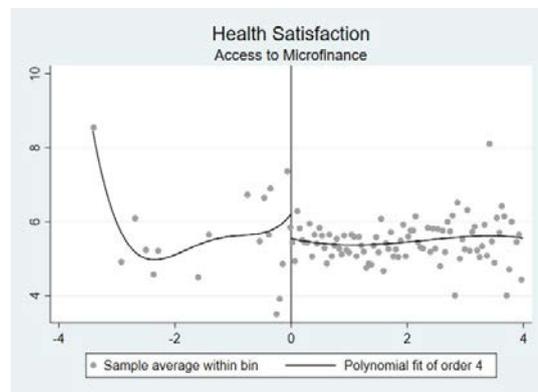
(a) Overall happiness



(b) Life satisfaction



(c) Financial satisfaction



(d) Health satisfaction

Note: these figures show the plots for psychosocial indicators for the respondents. The plots shown here and in all the other figures have the running variable 'access to microfinance'. The centre shows the cut-off of the operational rule of MFIs with the negative being the distance the households are beyond the operational area of the MFIs taken as the 'control group' and the positive being the distance the households are within the operational area of the MFIs taken as the 'treatment' group. The dots represent binned sample means of the respective psychosocial well-being indicators using a fourth order polynomial and uniform kernel.

Source: authors, based on WILCAS 2014.