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## Article

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ISRA International Journal of Islamic Finance

## Provided in Cooperation with:

International Shari'ah Research Academy for Islamic Finance (ISRA), Kuala Lumpur

*Suggested Citation:* Islam, Md. Saiful (2021) : Role of Islamic microfinance in women's empowerment: Evidence from Rural Development Scheme of Islami Bank Bangladesh Limited, ISRA International Journal of Islamic Finance, ISSN 2289-4365, Emerald, Bingley, Vol. 13, Iss. 1, pp. 26-45, <https://doi.org/10.1108/IJIF-11-2019-0174>

This Version is available at:

<https://hdl.handle.net/10419/301998>

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Received 20 November 2019  
Revised 4 February 2020  
12 May 2020  
24 July 2020  
27 September 2020  
28 November 2020  
Accepted 1 December 2020

# Role of Islamic microfinance in women's empowerment: evidence from Rural Development Scheme of Islami Bank Bangladesh Limited

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## Abstract

**Purpose** – The purpose of this study is to investigate the impact of Islamic microfinance services (IMFS) on women's empowerment in rural Bangladesh.

**Design/methodology/approach** – The study is based on a multi-stage sampling technique. The primary data are collected through a face-to-face survey of 389 women respondents who have received IMFS from the Islami Bank Bangladesh Limited. Cronbach's alpha test is conducted to test the reliability and internal consistency of collected data. Paired-sample tests, logit regression and proportion hypothesis tests are conducted to measure the impact of IMFS on women's empowerment. Descriptive and inferential statistics are used to interpret the data.

**Findings** – The study reveals that IMFS have led to structural transformation in the occupation dynamics of the respondents' families from agriculture to retail businesses. IMFS have had a significant positive impact on household income, savings and expenditure; have improved standard of living and human capital formation; and have enhanced all three dimensions of empowerment, namely, economic empowerment (ECEM), socio-cultural empowerment (SCEM) and familial empowerment (FLEM). Of them, ECEM and SCEM have positively contributed toward overall women's empowerment, while FLEM has a negative but insignificant impact on overall empowerment. The respondents' perception also supports the finding that IMFS have benefited rural women and empowered them.

**Originality/value** – The study is based on primary data. It leads to an inquiry as to whether women are dominant in familial affairs. If so, it may reduce the state of happiness and overall women's empowerment. There is a clear gap in the existing literature about this inquiry.

**Keywords** Economic empowerment, Familial empowerment, Islamic microfinance, Rural Bangladesh, Socio-cultural empowerment, Women's empowerment

**Paper type** Research paper



## Introduction

Islamic microfinance is the supply of financial services consistent with Islamic finance principles to low-income people. Islam sets out some principles, which govern business transactions in general and financial transactions in particular. In financial transactions, an important principle is that money is not an income-generating asset, and thus, the notion of cost of capital – that is, interest – is completely prohibited in Islam. Therefore, God-fearing Muslims refrain from accepting interest-based microfinance. Thus, Islamic microfinance programs cannot imitate conventional microfinance programs, which are based on interest. Although interest is prohibited in Islam, trade is allowed, “Allah has permitted trade and prohibited interest” (Qur’ān, 2:275).

Generally, microfinance institutions (MFIs) operate on the conventional mode of interest. Moreover, they charge high interest rates, ranging between 22%–30% because of higher administrative, processing and operational costs (InM, 2016). However, under the Islamic microfinance program, no interest is charged; rather, it is based on the Sharī’ah principle. Thus, Islamic microfinance programs operate on different Islamic modes of finance such as *muḍārabah* (profit sharing), *mushārakah* (profit-and-loss sharing), *murābahah* (mark-up sale) and *ijārah* (lease).

Islamic microfinance has been flourishing around the world, albeit at a slow pace. Countries, where MFIs based on Islamic principles operate, include Benin, Pakistan, Cambodia, Ecuador, Zambia, Philippines and Togo, etc. (Ahmed *et al.*, 2015). While hundreds of MFIs have been operating in Bangladesh, with Grameen Bank being the first and the largest one, unfortunately, none of them follows Islamic finance principles. There is, thus, no MFI based on Sharī’ah principles in Bangladesh. The only Sharī’ah-based microfinance program in Bangladesh is the Rural Development Scheme (RDS) of Islami Bank Bangladesh Limited (IBBL), which is the first private sector Islamic bank in the country, having started operations on March 13, 1983.

The IBBL under its RDS program has been providing Islamic microfinance services (IMFS) without the requirement for any traditional collateral, following instead the group lending approach. It has proved remarkably successful with very high loan repayment rates. The IBBL finances largely women because they are among the most vulnerable and disadvantaged in society. In many cases, female-headed families are the poorest of the poor. The hard-core poor are mostly women because they encounter social barriers to acquire economic assets such as skill and property. It is, thus, much tougher for them to get out of poverty and they are more vulnerable to becoming poorer, especially when they miss the male earner of the family owing to divorce or death. Another reason to finance women is because they are more reliable as borrowers and more likely than men to repay promptly. That is, they are more cooperative and their repayment records are high (Cheston and Khan, 2002). Moreover, women spend more of their earnings on their families, and therefore, helping women to increase their income is more effective in improving the welfare of the family (Deshpanda, 2001). Thus, the RDS program accommodates the financing needs of women in the rural segment of the economy to generate income and employment to reduce poverty, attain rural development and empower the poor. With IMFS, women are engaged in several income-generating activities, such as agriculture, raising poultry and livestock, family gardening and handicrafts, to become economically solvent.

Women’s empowerment in this study refers to the empowerment of disadvantaged rural women who have little or no income and assets and little or no control over family wealth and decision-making. Financial inclusion through IMFS is likely to enable rural women’s access to income and wealth, and it may empower them economically and raise their status in the family and society. Hence, this study looks into the socio-demographic dimensions of

the respondents, their occupation dynamics and the extent of IMFS, and assesses their impact on income, savings, expenditure and other empowerment dimensions such as economic, social and familial empowerment (FLEM) and overall empowerment.

Therefore, based on a survey of respondents conducted during January and February 2019 in selected branches of IBBL in the southwest part of Bangladesh, this study aims to investigate the extent and impact of IMFS of IBBL. In particular, it evaluates their impact on income generation, savings mobilization, standard of living, human capital formation, women's participation in the decision-making process and particularly, their impact on women's empowerment in Bangladesh.

The remaining part of the study is structured as follows: the next section reviews the literature, followed by an explanation of the data and methodology. The results are then analyzed, and the final section concludes the study.

### Literature review

MFS have been extensively discussed in economic literature, while discussions of IMFS are relatively scant. The author has attempted a survey of representative studies and has reviewed the available records on microfinance and women's empowerment.

#### *Past studies on microfinance and women's empowerment*

[Haider \(1991\)](#) and [Kuddus \(2000\)](#) described the survival strategies of poor women in Bangladesh. They reviewed several governmental (GO) and non-governmental organization (NGO) projects to design an action research project for mainstreaming rural women and described the disproportionate and oppressive social burden that women bear in the society.

[Hamid \(1995\)](#) examined the gender dimensions and rural poverty in Bangladesh and documented the socio-economic profile of female-headed households to highlight the disparities between male- and female-headed households. [Berger \(1995\)](#) studied women's access to and use of microcredits and found that an increase in women's access to MFS would lead to their economic empowerment (ECEM) by enabling them to make decisions on savings and credit use, and allowing them to set up micro-enterprises to increase income under their control. He further concluded that increased ECEM would lead to their augmented well-being and socio-political empowerment.

[Salahuddin and Shamim \(1996\)](#) studied the poverty of rural women in Bangladesh and identified the impact of poverty-focused NGO programs on rural women beneficiaries in a poverty situation in terms of employment and income. The overall picture showed a wide gender gap in spheres including employment and earnings, literacy and education, dietary intake and provision of health facilities. [MacIsaac \(1997\)](#) in a discussion paper prepared for the Canadian International Development Agency examined the role of microcredit in lessening poverty and promoting gender equity. He concluded that maximization of the impact of microcredit requires an understanding of its limitations, efforts to improve the credit programs and offering alternate credit programs for excluded women, especially for the poorest.

[Cheston et al. \(1999\)](#) documented that many MFIs sought to empower women as either an implicit or explicit objective, while others believed that they could not afford to emphasize empowerment as it was incompatible with financial sustainability or because it detracted from the core business of delivering financial services. [Latifee \(2003\)](#), in a study of Grameen Trust, found that access to microcredit brought about a social change in the conditions of women in terms of various social indicators. These included self-respect, self-assurance, self-expression, the capacity to protest against social unfairness and the capacity to solve social problems and earn respect from fellow citizens and spouses.

Slee (2004) studied the development context of Bangladesh and found that women, particularly from disadvantaged families, cannot participate in or benefit from development efforts. In response to climatic and economic vulnerabilities, men tend to migrate, leaving their families behind, whereby women bear the burden of poverty in a discriminatory situation. Hasan (2005) studied various skill development programs for women in Bangladesh and documented that poor women are engaged in various income-creating activities to improve their financial well-being. These included agriculture, raising poultry and livestock, household horticulture, aquaculture, handicrafts and providing services. In this way, women could establish their opinion in household activities, as well as in the society, and the development process may accordingly improve.

UNFPA (2007) conducted a survey in 14 countries in collaboration with 32 MFIs and documented the association between microfinance and women's empowerment and enhancement of their health. The study supported the link between microfinance and social activities, exemplified by the strong positive impact of microfinance on women's empowerment and a less provable influence on reproductive health. As microfinance was offered in combination with health education services, this link was reinforced with a positive effect on both empowerment, as well as sexual and reproductive health.

Haugen (2008) examined the effect of microfinance on women's empowerment in Bangladesh. He showed that when women started saving money and working with small businesses, their practical needs were fulfilled. The strategic needs of women were, however, not fully met through microfinance, particularly within the range of domestic work, where customary gender roles seem to prevail. Thus, the study concluded that women were not fully empowered through microfinance but still underwent incredible progress, both individually and in the community. Hossain (2008) examined and analyzed the role of MFIs in promoting rural livelihoods in Bangladesh. The study highlighted recent arguments against microcredit and showed that, despite several criticisms, microfinance was making a substantial contribution to uplifting the livelihoods of disadvantaged rural communities.

Mayoux and Hartl (2009) found that microfinance has been positively contributing to poverty reduction and financial sustainability. It has been promoting a series of "virtuous spirals" of ECEM, leading to augmented well-being, socio-political empowerment for women and thereby contributing to the goal of gender equality. Rahman and Ahmad (2010) explored the RDS finance of IBBL and reported that investment facilitated by microfinance has a significant impact on family income, crop productivity, livestock possession, household expenditure and employment. The clients' socio-economic aspects, such as age, the number of family members involved in farming and total land size, as well as their ethics and morals had a significant positive impact on household income.

Noreen (2011), in a study of Bahawalpur District of Pakistan, found that the utilization of loans by women has better results than utilization by male family members. Therefore, many MFIs target only women. Another motive of targeting women is to empower them. Another study in the context of Pakistan is by Khan *et al.* (2011), who investigated the impact of the microcredit program of the Punjab Rural Support Program on the empowerment of women. The study compared women's status before and after receiving microcredit and reported that microcredit amplified their awareness and empowerment. It raised their participation in children's education and the family budget, self-identity and visits to shops. Another study by Shah and Butt (2011) examined the income-generating activities and women's empowerment through microcredit in the Kasur district of Pakistan and found that microcredit had a significant impact on raising the socio-economic empowerment of credit borrowers. The study documented that most of the women who availed the microcredit facilities finally benefited from socio-economic empowerment.

Islam and Reza (2012) explored a sustainable way to alleviate poverty through microcredit operations coordinated with social overhead capital (SOC) in the rural areas of Bangladesh. They tested the practicability of SOC as a contributing factor to the efficiency of microcredit programs and recommended for a government and NGO partnership. Ali and Hatta (2012) in a concept paper tried to highlight the success rate of microfinance in Bangladesh. They contested the popular view on microfinance that it has a significant positive influence on livelihood and standard of living of poor women through poverty reduction. They instead concluded that microfinance should build capacity for poor women through skills training and access to education to succeed.

Islam (2014) and Islam and Islam (2018) examined the role of microcredit in women's empowerment through financial inclusion in the southwestern part of Bangladesh. They found that microcredit promoted financial inclusion and played a significant role in empowering low profile rural women in terms of income creation, savings mobilization, household assets creation and overall poverty reduction. The study suggested microcredit as a useful means for women's empowerment and economic progress. Islam and Islam (2018) further found that women's empowerment score continued to be higher in urban areas than in rural areas. Jahan and Rashid (2015) investigated the socio-economic impact of RDS microfinance on women beneficiaries in the Barisal district of Bangladesh and found that Islamic microfinance brought about a positive change in social capital and the income of beneficiaries.

Debnath *et al.* (2019) investigated the factors affecting rural women's access to microcredit and its influence on women's empowerment in Bangladesh. They used primary data, descriptive statistical analysis and econometric modeling and found an inverse relationship between income and loan accessibility, while family size had a positive relationship with loan accessibility. They further reported a positive influence of microcredit on household decision-making and women's awareness. They suggested that MFIs extend their financial services to higher-income rural women to expedite women's empowerment. Rahayu (2020) in a qualitative case study explored the relation between Islamic microfinance and women's empowerment by Baitul Maal Wat Tamwil (BMT) in the Yogyakarta province of Indonesia. The study investigated only four selected BMTs and reported that none of them targeted women's empowerment. Women were selected as main clients not on the basis of gender inequality, rather because of business considerations.

Most of the above-cited literature examined the impact of microcredit and microfinance on women's empowerment mainly based on a small sample and documented how microcredit and microfinance benefited poor women economically and socially. A few of them, particularly Rahman and Ahmad (2010), Jahan and Rashid (2015) and Rahayu (2020), investigated the impact of Islamic microfinance on women's empowerment. The present study is original, based on primary data and is more comprehensive covering a larger sample considering the nature, extent, utilization, payment and profits in Islamic microfinance transactions, and their social and economic impact on occupation, income, savings and expenditure, with special reference to human capital formation. Thus, this study has been minute and has captured details of women's empowerment based on reliability test, multivariate analysis and logit regression along with hypothesis testing of the respondent women's perception. As there is limited literature on Islamic microfinance in Bangladesh, this study tries to fill in this gap to some extent and produce new literature on Islamic microfinance in Bangladesh.

#### *Rural Development Scheme of Islami Bank of Bangladesh Ltd*

IBBL launched its RDS program in 1995. It serves the community with a large network of 341 branches throughout the country, out of which 79.72% offer the RDS program. The



bank has distributed a cumulative sum of Bangladesh Taka (BDT) 815 billion (US \$11.4721bn) [1] under the RDS program with a record recovery rate of 99.56%, which is much higher than that of any conventional MFI. A total of 814,915 members have been involved with IBBL's RDS program, of which 83% are women (IBBL, 2019).

The bank extends its IMFS without any traditional collateral following the group lending approach. The bank extends finance to rural women mainly for farm and non-farm activities in rural areas following an integrated rural development approach based on Islamic principles. The target groups are small farmers, destitute women, sharecroppers and persons engaged in non-farming activities such as aquaculture, cattle rearing and dairy and poultry production. This study focuses on the financial inclusion of disadvantaged women through IMFS and assesses their impact on women's empowerment through employment creation, income generation, savings mobilization and participation in the decision-making process, etc.

### Data and methodology of the study

This study is based on a primary survey that has followed a multistage sampling technique. To begin with, all 16 zones of IBBL [2] were selected at the first stage and then for convenience, only 20% of the zones – namely, Barisal, Khulna and Jessore in the southwestern part of Bangladesh – were selected for survey purposes. From each of these three zones, four branches [3] were conveniently selected for impact evaluation. The sample size is determined using the following formula based on Kothary (2004):

$$N = \frac{z^2 \cdot p \cdot q}{e^2} \quad (1)$$

where

$N$  = sample size;

$p$  = assumed target population proportion;  $q = 1 - p$ ;

$z$  = standard normal variate; and

$e$  = margin of error.

To determine the value of “ $p$ ,” it is assumed that 50% of the women may feel that they are empowered and have benefited from RDS finance. Hence, it is assumed that  $p = 0.5$ , which determines the maximum possible size of the sample. On the other hand, at 5% significance level, the value of  $z = 1.96$  and at 5% expected error, the sample size is:

$$N = \frac{(1.96)^2 (0.5) (0.5)}{(0.05) (0.05)} = 384, \text{ being the minimum desired sample size.}$$

The total number of respondents is divided among 12 branches and a random sampling technique is adopted to select the sample of target respondents. Thus, the clients of the RDS program under the selected 12 branches are treated as the active population of the study. From the beneficiaries of 12 branches, a sample of 389 clients, 32 from each branch, receiving IMFS under the RDS program were surveyed randomly using a structured questionnaire.

In addition, several direct personal interviews were conducted with different key individuals as a research tool. The survey was conducted during January and February 2019 and collected data were compiled and processed through E-views 9. Both descriptive and inferential statistics are used to interpret the data.

Cronbach's alpha test, based on Cronbach (1951), is conducted to test the reliability and internal consistency of collected data. The formula to calculate Cronbach's alpha value is given in equation (2).

$$\alpha = \frac{N \cdot -c}{-v + (N - 1) \cdot -c} \quad (2)$$

where

$N$  = sample size;

$-c$  = average covariance between item pairs; and

$-v$  = average variance.

The impact of Islamic microfinance on household income, consumption, savings and investment is measured in terms of paired sample test: before and after receiving IMFS. Women's empowerment is measured in terms of three different dimensions, namely, ECEM, socio-cultural empowerment (SCEM) and FLEM. Each of these dimensions is further defined in terms of 5 separate indicators (total 15 indicators) on a Likert scale extending from strongly agree to strongly disagree, coded 5 to 1, respectively, and data on those indicators are collected from the respondents. Data are also collected on overall empowerment in a binary (0, 1) form from the respondents.

A multiple regression based on the logit model is conducted to identify the relationship among three empowerment factors and the overall empowerment of rural women arising from IMFS. The following regression model is used to measure overall women's empowerment:

$$P_i = E(WE = 1|X_i) = \beta_0 + \beta_i X_i \quad (3)$$

where  $X_i$  are the different empowerment dimensions,  $WE = 1$  means women are empowered,  $\beta_0$  is the intercept and  $\beta_i$  are the coefficients of  $X_i$ . However, the following representation of women's empowerment is considered:

$$P_i = E(WE = 1|X_i) = \frac{1}{1 + e^{-(\beta_0 + \beta_i X_i)}} \quad (4)$$

where  $P_i$  ranges between 0 and 1 and  $P_i$  is non-linearly related to  $X_i$ .

Finally, to ascertain the respondents' perceptions about their empowerment resulting from IMFS, the proportion hypothesis test is implemented. Women's responses to the question "have you benefited from and been empowered by IMFS?" in binary form are collected. As the sample size is much greater than 30 (i.e. 389), Z-test is used and the following hypotheses are formulated:

*H0.*  $p = 0.5$ , i.e. 50 % of the respondents believe that IMFS have empowered them.

*HA.*  $p > 0.5$ , i.e. more than 50 % of the respondents believe that IMFS have empowered them [4]

The following formula is used to test the proportion hypothesis test based on Kothary (2004):

$$Z = \frac{\hat{P} - p}{\sqrt{\frac{pq}{n}}} \quad (5)$$

where  $p$  = assumed target population proportion,  $q = 1-p$  and  $\hat{P}$  = the estimated target population parameter [5].



## Result and discussion

### *Socio-demographic dimensions of the respondents*

The socio-demographic features greatly shape the working and economic behavior of any populace. Therefore, this study has investigated the socio-demographic dimensions of the respondents. The following sections describe the different socio-demographic magnitudes of the respondents, which include family size, marital status, number of earning members, education, occupation and landholdings.

The data presented in [Table 1](#) is self-explanatory. The mean family size of the respondents is 4.6 persons. Out of 389 families, 381 are male-headed, 348 families have single earning members, 38 families have 2 earning members and 3 families have 3 earning members. The average number of years of schooling is seven years, 95% of the respondents are literate and having primary to a higher level of education and only 5% of respondents are illiterate. The mean age of the respondents is 35 years, which implies that young women are more interested in IMFS. This further implies that IMFS may be a significant source of financing for rural women of the country and provides financial inclusion of rural communities, which would not otherwise have any access to formal finance. In total, 98.71% of the respondents are married, while only 1.29% are unmarried, widowers or divorcees. This leads to the understanding that the respondents are well aware of their empowerment because marital status plays a vital role in empowering women. Married women tend to be more aware of empowerment than unmarried women, who generally depend on their fathers' income and get little chance to involve in economic activities.

Landholding is an important determinant of production for any economy, especially for the rural agriculture-based economy because land is an indispensable factor of production. The majority of the respondents have less than 50 decimals of land and the mean landholding is only 71.5 decimals, which indicates that most of the respondents are marginal farmers with small landholdings. Thus, financial services extended to them have been a worthy exercise in bringing about positive economic change in the rural community and reducing rural poverty.

Occupation is an important determinant of empowerment. [Table 2](#) captures the occupation dynamics of the respondents and shows that the majority (60.16%) of the respondents' families had an occupation in agriculture, followed by retail business (19.02%); labor (16.71%) and service (4.11%). The IBBL under the IMFS finances various investments in sectors such as agriculture, retail business and other non-agricultural income-generating activities. As a result, respondents having occupations in agriculture, including fisheries

| Item                                  | Count                                                 |
|---------------------------------------|-------------------------------------------------------|
| Mean family size                      | 4.6 persons                                           |
| Family head (male)                    | 381 families (97.94%)                                 |
| Number of earning members in a family | 1 (348 families)<br>2 (38 families)<br>3 (3 families) |
| Average year of schooling             | 7 years                                               |
| Mean age                              | 35 years                                              |
| Marital status                        | 384 families (98.7%)                                  |
| Average land holdings                 | 71.5 decimals                                         |

**Note:** decimal = 436 sq. feet = 40.5 sq. meter

**Source:** Field survey, January-February 2019

**Table 1.**  
Respondents' socio-  
demographic  
features

and labor, have shown a downward revision, while business occupation has shown a significant upward revision. This shows a structural transformation in the rural economy.

*Extent of Islamic microfinance services*

IBBL provides IMFS to clients who are short of finance to meet their financial needs. Whenever a client needs to buy a product, but is out of cash, he approaches the IBBL for financial access. The bank under the RDS program comes forward with the financial service to help the respondent. For example, a respondent wants to buy a van (transport vehicle) for generating income but he has no purchasing power, so he approaches the IBBL, who agrees to pay for the van, and he gets the product of his choice. The bank allows the respondent to repay the paid amount with an agreed mark-up over an agreed period with an equal number of installments.

The IMFS facilitated investment in various sectors, including agriculture that consists of livestock and poultry, crops, vegetables, nursery, flower and fruit cultivation; retail business in clothes, restaurant and tea stall, buying and selling of fish, fruits and sweets; and non-agriculture such as rural transportation, biogas, solar plant, rural housebuilding, agricultural tools and irrigation. Thus, the agricultural sector attracted the highest percentage of investment, followed by retail businesses and the non-agricultural sector received the least number of investments.

Of the surveyed investment financed by IMFS, the broad agricultural sector attracted the largest number of investments (39.84%) with a mean of BDT42,981 (US\$511.55), a maximum of BDT400,000 (US\$4,760.71) and a minimum of BDT2,000 (US\$23.80). The retail business attracted the second-highest (38.3%) number of investments with a mean of BDT42,409 (US\$504.74), a maximum of BDT150,000 (US\$1,785.27) and a minimum of BDT2,000 (US\$23.80). The non-agricultural sector attracted the third largest and least number of investments (21.85%) with a mean of BDT44,447 (US\$529.00), a maximum of BDT600,000 (US\$7,141.07) and a minimum of BDT5,000 (US\$59.51) (Table 3). Thus, it is evident that the loan size offered by the IMFS has been small. The noteworthy point is that out of 389 respondents surveyed, all reported zero collateral and no bothersome documentation against financial services they have received from the IBBL under the RDS program.

Data in Table 4 show that in 86.12% of investment cases, husband and wife mutually took the loan utilization decision, which shows strong family bondage among them. In 12.6% cases, the respondents' husbands have taken the loan utilization decisions alone, while in 1.29% cases the respondents themselves have taken the loan utilization decision (Table 5).

**Table 2.**  
Occupation  
dynamics of the  
respondents' families

| Occupation                         | Occupation before receiving IMFS |        | Occupation after receiving IMFS |        |
|------------------------------------|----------------------------------|--------|---------------------------------|--------|
|                                    | Count                            | (%)    | Count                           | (%)    |
| Agriculture, including aquaculture | 189                              | 60.16  | 166                             | 55.78  |
| Retail business                    | 74                               | 19.02  | 118                             | 30.33  |
| Labor                              | 65                               | 16.71  | 36                              | 9.25   |
| Service                            | 16                               | 4.11   | 18                              | 4.63   |
| Total                              | 389                              | 100.00 | 389                             | 100.00 |

**Source:** Field survey, January-February 2019

The amount of repayment per installment ranges from BDT50 to 15,000 (US\$0.60–US\$178.53) with an average of BDT1,094 (US\$13.02) and a standard deviation of BDT1,148 (US\$13.66). Among the repayment installments for 389 respondents, almost half (49.87%) of the installment amounts are less than BDT1,000 (US\$11.90), while 40.36% of the installment amounts are within the range of BDT1,001–BDT2,000 (US\$11.91–US\$23.80), followed by 5.40% in the range of BDT2,000–BDT3,000 (US\$23.81–US\$35.71), 2.57% in the range of BDT3,000–BDT4,000 (US\$25.72–US\$47.61), etc. The number of installments in 98.46% of cases is 44 in a year, while in 1.54% of cases of IMFS the number of installments is 12 only (Table 6).

Out of 389 microfinance investment cases, only one respondent has reported economic loss, while the rest have reported some accounting profit. The magnitude of profit ranges between a maximum of BDT136,000 (US\$1,618.64) and a minimum of BDT200 (US\$2.38) with an average of BDT4,781 (US\$56.9) and standard deviation of BDT8,438 (US\$100.43). In total, 75.87% of respondents have reported annual profit less than BDT6,000 (US\$71.41), which is quite meager indeed, while 18.76% of respondents have reported an annual profit range of BDT6,001–BDT10,000 (US\$71.42–US\$119.02), which is also a small amount.

### *Impact of Islamic microfinance*

*Impact of Islamic microfinance services on earnings of the respondents.* The 389 households surveyed have at least one earning member, out of which 38 families have 2 earning members and three families have 3 earning members. The monthly income statistics of the respondents are analyzed and presented in Table 7.

| Sector          | Sector of investment |            | Amount of investment (BDT) |                       |                  |
|-----------------|----------------------|------------|----------------------------|-----------------------|------------------|
|                 | Count                | Percentage | Mean                       | Max                   | Min              |
| Agriculture     | 155                  | 39.84      | 42,981<br>(511.55)         | 400,000<br>(4,760.71) | 2,000<br>(23.80) |
| Retail business | 149                  | 38.30      | 42,409<br>(504.74)         | 150,000<br>(1,785.27) | 2,000<br>(23.80) |
| Non-agriculture | 85                   | 21.85      | 44,447<br>(529.00)         | 600,000<br>(7,141.07) | 5,000<br>(59.51) |
| Total           | 389                  | 100.00     | 88,672<br>(1,055.36)       | 600,000<br>(7,141.07) | 2,000<br>(23.80) |

**Note:** Figures in parentheses indicate the amount in US\$

**Source:** Field survey, January-February 2019. The available weighted average exchange rate prevailing in 2018, US\$1 = BDT84.021, is used in conversion throughout the study

**Table 3.**  
Extent and sectors of  
RDS finance

| Value                        | Count | (%)    |
|------------------------------|-------|--------|
| Mutually by husband and wife | 335   | 86.12  |
| Loan by husband              | 49    | 12.60  |
| Loan by wife                 | 5     | 1.29   |
| Total                        | 389   | 100.00 |

**Source:** Field survey, January-February 2019

**Table 4.**  
Dynamics of loan  
utilization

The average monthly income of respondents’ families’ first and second earning members has increased significantly, which is evident from the test statistics, analysis of variance (ANOVA) *F*-test statistics and their corresponding probabilities. Because of access to IMFS, the respondents’ family members have become more able to involve in income-generating activities that have enabled them to raise their monthly income. Although the average income of the third earning member increased a little as a result of IMFS, it is not statistically significant. Thus, this study evidences a significant effect of microfinance on the income of respondents’ first and second earning members. IMFS have a significant impact on the monthly income of the respondents because the bank extends practical training on business, marketing and customer care to the beneficiaries.

*Impact of Islamic microfinance services on expenditure.* Consumption expenditure on necessities of life such as food, clothes and shelter reflects the standard of living because consumption largely depends on the level of income; the more one can earn, the more he can consume. In the short run, according to the consumption function, a community generally spends a fixed ratio of their income on consumption.

*Impact of Islamic microfinance services on consumption expenditure.* In this study, the major consumption expenditures are on food and clothes. We present the respondents’ monthly family expenditure statistics under two items in [Table 8](#).

**Table 5.**  
Repayment and  
installment dynamics  
(BDT)

| Value                         | Repayment dynamics |        |                     | No. of installments |       |        |
|-------------------------------|--------------------|--------|---------------------|---------------------|-------|--------|
|                               | Count              | (%)    |                     | Value               | Count | (%)    |
| 50–1,000 (0.60–11.90)         | 194                | 49.87  | Mean 1,094 (13.02)  | 12                  | 6     | 1.54   |
| 1,001–2,000 (11.91–23.80)     | 157                | 40.36  | Max 15,000 (178.53) | 44                  | 383   | 98.46  |
| 2,001–3,000 (23.81–35.71)     | 21                 | 5.40   | Min 50 (0.60)       | Total               | 389   | 100.00 |
| 3,001–4,000 (25.72–47.61)     | 10                 | 2.57   | SD 1,148 (13.66)    |                     |       |        |
| 4,001–6,000 (47.62–71.41)     | 5                  | 1.28   |                     |                     |       |        |
| 10,000–15,000 (119.02–178.53) | 2                  | 0.52   |                     |                     |       |        |
| Total                         | 389                | 100.00 |                     |                     |       |        |

**Note:** Figures in parentheses indicate the amount in US\$  
**Source:** Field survey, January-February 2019

**Table 6.**  
Profits in RDS  
financed investments  
(BDT)

| Value                         | Count | (%)   |                        |
|-------------------------------|-------|-------|------------------------|
| –11,600 (–138.06)             | 1     | 0.26  | Mean 4,781 (56.90)     |
| 200–6,000 (2.38–71.41)        | 295   | 75.87 | Max 136,000 (1,618.64) |
| 6,001–10,000 (71.42–119.02)   | 73    | 18.76 | Minimum 200 (2.38)     |
| 10,001–20,000 (119.03–238.04) | 15    | 3.86  | SD 8,438 (100.43)      |
| 20,000 (238.04)               | 2     | 0.51  |                        |
| 40,000 (476.07)               | 1     | 0.26  |                        |
| 75,000 (892.63)               | 1     | 0.26  |                        |
| 136,000 (1,618.64)            | 1     | 0.26  |                        |
| Total                         | 389   | 100   |                        |

**Note:** Figures in parentheses indicate the amount in US\$.  
**Source:** Field survey, January-February 2019.

|                                                                                                       | Income before borrowing | Income after borrowing | Test for equality of mean income            |         |       |
|-------------------------------------------------------------------------------------------------------|-------------------------|------------------------|---------------------------------------------|---------|-------|
| <i>First earning member</i>                                                                           |                         |                        |                                             |         |       |
| Mean                                                                                                  | 12,075.84 (143.72)      | 14,832.39 (176.53)     | Method                                      | df      | Value |
| Maximum                                                                                               | 30,000.00 (357.05)      | 40,000.00 (476.07)     | T-test                                      | 776     | 7.63  |
| Minimum                                                                                               | 2,500.00 (29.75)        | 5,000.00 (59.51)       | ANOVA F-test                                | (1,776) | 58.19 |
| SD                                                                                                    | 4,913.69 (58.48)        | 5,162.47 (61.44)       | Included observations: 389                  |         |       |
| Observations                                                                                          | 389                     | 389                    | * indicate significance at 1% level         |         |       |
| <i>Second earning member</i>                                                                          |                         |                        |                                             |         |       |
| Mean                                                                                                  | 6,402.63 (76.20)        | 9,578.95 (114.01)      | Method                                      | df      | Value |
| Maximum                                                                                               | 21,000.00 (249.94)      | 21,000.00 (249.94)     | T-test                                      | 74      | 2.87  |
| Minimum                                                                                               | 0.00                    | 3,000.00 (35.71)       | ANOVA F-test                                | (1,74)  | 8.21  |
| SD                                                                                                    | 5,059.46 (60.22)        | 4,593.66 (54.67)       | Included observations: 38 after adjustments |         |       |
| Observations                                                                                          | 38                      | 38                     | *indicate significance at 1% level          |         |       |
| <i>Third earning member</i>                                                                           |                         |                        |                                             |         |       |
| Mean                                                                                                  | 8,333.33 (99.18)        | 11,666.67 (138.85)     | Method                                      | df      | Value |
| Maximum                                                                                               | 15,000.00 (178.53)      | 15,000.00 (178.53)     | T-test                                      | 4       | 0.707 |
| Minimum                                                                                               | 0.00                    | 10,000.00 (119.02)     | ANOVA F-test                                | (1,4)   | 0.50  |
| SD                                                                                                    | 7,637.63 (90.90)        | 2,886.751 (34.26)      | Included observations: 3 after adjustments  |         |       |
| Observations                                                                                          | 3                       | 3                      |                                             |         |       |
| <b>Notes:</b> Figures in parentheses indicate the amount in US\$; *indicates significance at 1% level |                         |                        |                                             |         |       |
| <b>Source:</b> Author's calculation                                                                   |                         |                        |                                             |         |       |

**Notes:** Figures in parentheses indicate the amount in US\$, \*indicates significance at 1 % level

**Source:** Author's calculation

**Table 7.**  
Monthly income  
statistics of earning  
members (BDT)

**Table 8.**  
Respondents’  
monthly family  
consumption  
expenditure (BDT)

|                               | Expenditure before borrowing | Expenditure after borrowing | Test for equality of mean expenditures       |         |       |             |
|-------------------------------|------------------------------|-----------------------------|----------------------------------------------|---------|-------|-------------|
| <i>Expenditure on food</i>    |                              |                             |                                              |         |       |             |
| Mean                          | 5,679.92 (67.60)             | 6,362.47 (75.72)            | Method                                       | df      | Value | Probability |
| Maximum                       | 17,000.00 (202.33)           | 17,000.00 (202.33)          | <i>T</i> -test                               | 776     | -4.75 | 0.0000*     |
| Minimum                       | 1,500.00 (17.85)             | 3,000.00 (35.71)            | ANOVA <i>F</i> -test                         | (1,776) | 22.57 | 0.0000*     |
| Std. dev.                     | 1,892.22 (22.52)             | 2,109.18 (25.10)            | Included observations: 389 after adjustments |         |       |             |
| Observations                  | 389                          | 389                         |                                              |         |       |             |
| <i>Expenditure on clothes</i> |                              |                             |                                              |         |       |             |
| Mean                          | 1,113.5 (13.25)              | 1,301.16 (17.49)            | Method                                       | df      | Value | Probability |
| Maximum                       | 10,000 (119.02)              | 12,000 (142.82)             | <i>T</i> -test                               | 776     | 1.94  | 0.053**     |
| Minimum                       | 0.00                         | 0.00                        | ANOVA <i>F</i> -test                         | (1,776) | 3.75  | 0.053**     |
| Std. dev.                     | 1,242.6 (14.79)              | 1,451.81 (17.28)            | Included observations: 389 after adjustments |         |       |             |
| Observations                  | 389                          | 389                         |                                              |         |       |             |

**Note:** Figures in parentheses indicate the amount in US\$; \* indicates significance at 1 % level \*\* indicates significance at 10 % level  
**Source:** Field survey, January-February 2019.



As IMFS have led to an increased monthly income of the respondents, their monthly family consumption expenditures on food and clothes have also increased significantly as captured by data presented in Table 8. This is documented by the test for equality of mean expenditures, test statistics, ANOVA *F*-test statistics and their corresponding probabilities. Hence, it validates that IMFS have a significant effect on the improvement of consumption behavior of the respondents and have led to an enhanced standard of living. As in the rural areas, the majority of the respondents live in their own houses, they do not generally need to spend on housing on a monthly basis.

*Impact of Islamic microfinance services on investment expenditure.* Apart from the consumption expenditure, community people invest mainly in human capital because investment in human capital formation particularly in education and health is crucial for any developing country such as Bangladesh. Education directly increases the productivity of the workforce, and thus, it has a direct influence on future income. Therefore, education among the population is a crucial factor in economic development and long-term income growth (Islam, 2020). Studies indicate that education significantly raises a person's income; it is higher even after netting-out the explicit and implicit costs of education. The income of educated people is always above average, and the income gains are generally bigger in less-developed countries (Mincer, 1974; Becker, 1975).

Similarly, "health and longevity" of the workforce is another vital determinant of the economic development of a nation, where a healthy populace is essential for the productive labor force and economic prosperity. Thus, there is a two-way relationship between health and economic growth. Lack of health restricts economic development, and poor health causes a potential decline in lifetime incomes for an individual. Therefore, this study investigates respondents' monthly expenditures on education and health.

The average monthly family investment expenditure on education and health has increased significantly, which is documented and evidenced by the test statistics and their corresponding probabilities presented in Table 9. Thus, this study concludes that IMFS have a significant positive effect on human capital formation, with an increase in expenditure on education and health being recorded at the level of the respondents.

*Impact of Islamic microfinance services on savings.* Savings is a precondition for any developing country to progress. It enables an economy to spend on various types of investment such as human capital formation, purchase of physical capital and construction of residential buildings. Therefore, this study analyzes the savings behavior of the respondents and examines the impact of IMFS on their savings behavior.

The average monthly family savings of the respondents increased significantly as a result of the availability of IMFS. IMFS have led to an increase in their income, which has enabled them to save more. This is documented and confirmed by the test statistics, and their respective probabilities are presented in Table 10. Thus, this study concludes that IMFS have a significant positive impact on the savings behavior of the respondents.

#### *Women's empowerment: multivariate analysis*

Women's empowerment is measured in terms of three different dimensions, namely, ECEM, SCEM and FLEM.

The descriptive statistics presented in Table 11 document the mean, standard deviation and size of the sample, etc. for each variable incorporated in the analysis. The mean values of the variables are more than three except "access to higher education," which imply that access to IMFS has raised the status of women in terms of various aspects of ECEM, SCEM and FLEM. Thus, it is evident that IMFS have facilitated the overall empowerment of rural women.

**Table 9.**  
Respondents'  
monthly family  
expenditure on  
human Capital  
formation (BDT)

|                                                                                                       | Expenditure<br>before<br>borrowing | Expenditure<br>after borrowing | Test for equality of mean expenditures       |         |         |             |
|-------------------------------------------------------------------------------------------------------|------------------------------------|--------------------------------|----------------------------------------------|---------|---------|-------------|
| <i>Expenditure on education</i>                                                                       |                                    |                                |                                              |         |         |             |
| Mean                                                                                                  | 1,633.68 (19.44)                   | 2,074.04 (24.68)               | Method                                       | df      | Value   | Probability |
| Maximum                                                                                               | 6,000.00 (71.41)                   | 15,000.00 (178.53)             | <i>T</i> -test                               | 776     | 4.615   | 0.0000*     |
| Minimum                                                                                               | 0.00                               | 0.00                           | ANOVA <i>F</i> -test                         | (1,776) | 21.2997 | 0.0000*     |
| Std. dev.                                                                                             | 1,157.749 (13.78)                  | 1,483.629 (17.66)              | Included observations: 389 after adjustments |         |         |             |
| Observations                                                                                          | 389                                | 389                            |                                              |         |         |             |
| <i>Expenditure on health</i>                                                                          |                                    |                                |                                              |         |         |             |
| Mean                                                                                                  | 721.72 (8.59)                      | 843.83 (10.04)                 | Method                                       | df      | Value   | Probability |
| Maximum                                                                                               | 3,000.00 (35.71)                   | 3,000.00 (35.71)               | <i>T</i> -test                               | 776     | 3.089   | 0.0021*     |
| Minimum                                                                                               | 0.00                               | 0.00                           | ANOVA <i>F</i> -test                         | (1,776) | 9.543   | 0.0021*     |
| Std. dev.                                                                                             | 517.745 (6.16)                     | 582.86 (6.94)                  | Included observations: 389 after adjustments |         |         |             |
| Observations                                                                                          | 389                                | 389                            |                                              |         |         |             |
| <b>Note:</b> Figures in parentheses indicate the amount in US\$; * indicates significance at 1% level |                                    |                                |                                              |         |         |             |
| Source: Field survey, January-February 2019                                                           |                                    |                                |                                              |         |         |             |

**Table 10.**  
Respondents'  
monthly family  
savings (BDT)

|                                                                                                       | Savings before<br>borrowing | Savings after<br>borrowing | Test for equality of mean savings            |         |       |             |
|-------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------|----------------------------------------------|---------|-------|-------------|
| Mean                                                                                                  | 2,531.75 (30.13)            | 4,065.06 (48.38)           | Method                                       | df      | Value | Probability |
| Maximum                                                                                               | 17,500.00 (208.28)          | 60,008.00 (714.20)         | <i>t</i> -test                               | 776     | 6.25  | 0.0000*     |
| Minimum                                                                                               | 0.00                        | 0.00                       | ANOVA <i>F</i> -test                         | (1,776) | 39.01 | 0.0000*     |
| Std. dev.                                                                                             | 2,418.48 (28.78)            | 4,194.80 (49.97)           | Included observations: 389 after adjustments |         |       |             |
| Observations                                                                                          | 389                         | 389                        |                                              |         |       |             |
| <b>Note:</b> Figures in parentheses indicate the amount in US\$; * indicates significance at 1% level |                             |                            |                                              |         |       |             |
| <b>Source:</b> Field survey, January-February 2019.                                                   |                             |                            |                                              |         |       |             |

The result of Cronbach's alpha[6] ( $\alpha = 0.916$ ) indicates that the sample data is internally consistent and highly reliable (Table 12). The result of the logit model is presented in Table 13, which evidences that two dimensions out of three have a positive and significant impact on overall women's empowerment. ECEM has the most significant contribution to women's empowerment, followed by SCEM, while FLEM has no significant effect on the overall empowerment of rural women. However, the negative sign of the coefficient of FLEM may imply that a stronger score on the factors underlying FLEM, such as reproductive health services and ability to make childbearing decisions, can negatively affect overall women's empowerment in the family. This leads to the possibility that if women are dominant in familial affairs, it may reduce their happiness and overall empowerment. The literature also has a gap; it does not provide any research on women's empowerment and happiness in the long term from an Islamic perspective.

The result of the hypothesis for the proportion test as per equation (3) is presented in Table 14. It shows that the respondents' response "1" is much stronger than "0." Accordingly, the calculated value of *Z* (20.93) is much greater than the table value at a 5% level of significance (in the case of a one-tailed test, the value of *Z* = 1.64). Therefore, based

|                                             |                        |                |     |     |     | Women's empowerment              |
|---------------------------------------------|------------------------|----------------|-----|-----|-----|----------------------------------|
| Factor                                      | Mean empowerment score | Std. deviation | N   | Max | Min |                                  |
|                                             |                        |                |     |     |     |                                  |
| <i>Economic empowerment score</i>           |                        |                |     |     |     |                                  |
| Access to family resources                  | 3.69                   | 0.778          | 389 | 5   | 1   |                                  |
| Access to purchasing power                  | 3.61                   | 0.781          | 389 | 5   | 1   |                                  |
| Ownership of assets and land                | 3.57                   | 1.021          | 389 | 5   | 1   |                                  |
| Women's control over income                 | 3.31                   | 0.812          | 388 | 5   | 1   |                                  |
| Women's access to employment                | 3.40                   | 1.088          | 388 | 5   | 1   |                                  |
|                                             |                        |                |     |     |     | 41                               |
| <i>Socio-cultural empowerment score</i>     |                        |                |     |     |     |                                  |
| Access to mobile phone                      | 3.98                   | 0.652          | 388 | 5   | 1   |                                  |
| Access to newspaper and television          | 3.80                   | 0.779          | 389 | 5   | 1   |                                  |
| Access to modern transportation             | 3.41                   | 0.806          | 389 | 5   | 1   |                                  |
| Social dignity/status                       | 3.31                   | 0.980          | 389 | 5   | 1   |                                  |
| Access to higher education                  | 2.46                   | 0.923          | 389 | 5   | 1   |                                  |
| <i>Familial empowerment score</i>           |                        |                |     |     |     |                                  |
| Ability to make childbearing decision       | 3.87                   | 0.716          | 389 | 5   | 1   |                                  |
| Freedom from violence                       | 3.86                   | 0.943          | 389 | 5   | 1   |                                  |
| Reproductive health service                 | 3.78                   | 0.916          | 388 | 5   | 1   |                                  |
| Participation in domestic decision-making   | 3.67                   | 0.809          | 389 | 5   | 1   |                                  |
| Self-confidence                             | 3.53                   | 0.872          | 389 | 5   | 1   |                                  |
|                                             |                        |                |     |     |     | Table 11.<br>Women's empowerment |
| Source: Field survey, January-February 2019 |                        |                |     |     |     |                                  |

**Source:** Field survey, January-February 2019

**Table 11.**  
Women's empowerment

| Reliability statistics | Value |  |
|------------------------|-------|--|
| Cronbach's alpha       | 0.916 |  |
| N of items             | 15    |  |

**Source:** Author's calculation

**Table 12.**  
Reliability test result

| Variable         | Coefficient | Std. error             | Z-statistic | Probability           |  |
|------------------|-------------|------------------------|-------------|-----------------------|--|
| <i>C</i>         | −2.145914   | 1.167330               | −1.838310   | 0.0660 <sup>***</sup> |  |
| <i>ECEM</i>      | 0.856176    | 0.348872               | 2.454125    | 0.0141 <sup>**</sup>  |  |
| <i>SCEM</i>      | 0.647986    | 0.330161               | 1.962636    | 0.0497 <sup>**</sup>  |  |
| <i>FLEM</i>      | −0.273026   | 0.332608               | −0.820864   | 0.4117                |  |
| Obs with Dep = 0 | 53          | Total observations 389 |             |                       |  |
| Obs with Dep = 1 | 336         |                        |             |                       |  |

**Note:** <sup>\*\*</sup> Shows significance at 5% and <sup>\*\*\*</sup> shows significance at 10% level

**Source:** Author's calculation

**Table 13.**  
Binary logit regression results

| Question                                      | "1" (%) | "0" (%) | Z-value | Mean | Std. deviation |  |
|-----------------------------------------------|---------|---------|---------|------|----------------|--|
| Has microfinance benefited and empowered you? | 86.38   | 13.62   | 20.93   | 336  | 6.77           |  |

**Notes:**  $\mu = np$ ;  $\sigma = \sqrt{(npq)}$  For reference, [Levin and Rubin \(2007\)](#)

**Source:** Author's calculation

**Table 14.**  
Women's perception of their empowerment

on the test statistic, the null hypothesis is rejected and the alternate hypothesis is accepted. Hence, it is concluded that IMFS have benefited rural women and empowered them.

Based on descriptive empowerment scores, logit regression results and proportion hypothesis test, it is evident that IMFS have significantly empowered the rural women of Bangladesh.

## Conclusion

The foregoing analyzes reveal that the loan size offered by IMFS has been small. The noteworthy point is that all 389 respondents have reported zero collateral and no bothersome documentation against IMFS they have received from the IBBL. The study reveals that because of IMFS, structural transformation is taking place in the rural economy. There is a shift in occupation of the respondents' families from agriculture to retail businesses. In most cases, the husband and wife have mutually taken the loan utilization decision, which shows strong family bonds among the respondents. The repayment and installment dynamics have shown that the amount of repayment per installment was also small and the number of installments in most cases is 44 in a year. In all investment cases (except one) they have reported operational profit; the magnitude has ranged from BDT200–BDT136,000 (US\$2.38–US\$1,618.64) with an average of BDT4,781 (US\$56.90), which is also a small amount.

With regard to the impact of IMFS on the respondents' income, the study reveals that earning members were involved in income-generating activities that have enabled them to raise their monthly income significantly. However, the only three families with three earning members could not reap the benefits of RDS finance and accordingly were not able to raise their income significantly. IMFS have a statistically significant impact on monthly family consumption expenditure that has led to a significant increase in the respondents' standard of living. Moreover, IMFS have a significant effect on human capital formation with an increase in health and education expenditures being recorded at the level of respondents. Besides, IMFS have a statistically significant effect on the savings behavior of the respondents. That is, the monthly family savings of the respondents increased significantly as a result of IMFS. Thus, the impact of IMFS on household income, consumption, savings and investment has been positive and statistically significant.

IMFS have raised the ECEM, SCEM and FLEM of rural women. ECEM and SCEM have subsequently contributed positively toward overall women's empowerment, while FLEM has had a negative but insignificant impact on overall empowerment. This may imply that a stronger score on the factors underlying FLEM can negatively affect overall women's empowerment. This raises the possibility that if women are dominant in familial affairs, it may reduce the happiness and overall empowerment of women in the family. Moreover, the respondents' perceptions of their benefits and overall empowerment also document that IMFS have benefited and empowered rural women.

Therefore, policymakers may pave the way to extend Islamic microfinance throughout the economy as that will ease the lives of millions of people. The IBBL may extend and replicate the RDS program to all its branches to reach out to poor people. The extension of the program's financial services across the country will enhance the quality and standard of living of the rural population in particular. It will help to gradually replace conventional interest-based IMFS by providing an Islamic alternate to the rural poor. The bank should find a way to enhance its financing amounts as the clients showed concern that the financing amounts are "too small." The bank may provide a diversified range of demand-driven training to its clients under its business, marketing and customer care services.

Further research in this area may be conducted to investigate whether women's dominance in familial affairs reduces the state of happiness and overall women's empowerment in the family.

## Notes

1. The weighted average exchange rate prevailing in 2007, US\$1 = BDT68.60, is used in conversion because 2007 lies in the middle of the period 1995–2018.
2. The administrative divisions of IBBL are divided into 16 zones across Bangladesh. They are Dhaka Central, Dhaka South, Dhaka North, Dhaka East, Chittagong North, Chittagong South, Bogra, Khulna, Comilla, Sylhet, Rajshahi, Barisal, Mymensingh, Noakhali, Rangpur and Jessore (IBBL, 2019).
3. The selected branches are Jhalakathi, Rajapur, Miarhat and Bandaria from Barisal zone; Kalaroa, Khulna Sadar, Daulatpur and Bagerhat from Khulna zone; Keshabpur, Jhikorgacha, Benapole and Cot Chandpur from Jessore zone.
4. Here, right-tailed (one-tailed) test is used because answers to the question (presented in Table 14); i.e. the value of estimated proportion is much greater than 0.5. The value remains in the right tail of the normal curve.
5. If the estimated value of Z in equation 5 is greater than the table value of Z, the null hypothesis is rejected; otherwise, it is accepted.
6. The reference value of  $\alpha$  (alpha) is  $0.5 > \alpha$  is unacceptable;  $0.6 > \alpha \geq 0.5$  poor;  $0.7 > \alpha \geq 0.6$  questionable;  $0.8 > \alpha \geq 0.7$  acceptable;  $0.9 > \alpha \geq 0.8$  good;  $\alpha \geq 0.9$  excellent.

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