

MICROFINANCE AND WOMEN MICROENTREPRENEURS: KEY VARIABLES INFLUENCING SOCIO-ECONOMIC AND FINANCIAL SUCCESS



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ABSTRACT

Given that Bangladesh has a male to female ratio of almost 49.5:50.5, the contribution of women's workforce to GDP is significant, and microfinance has been instrumental in enabling women to initiate microenterprises since 1974. Proper investigation of how microfinance can contribute to women's socio-economic and entrepreneurial financial success is required. This study examines whether microfinance impacts the socio-economic development of women microentrepreneurs and whether microfinance impacts the financial performance of women-led microenterprises. This primary and secondary database-driven mixed-methods study surveyed 273 women-led microentrepreneurs and their enterprises across Bangladesh using a homogenous survey questionnaire. To meet the first research objective, the study employs primary responses from women microentrepreneurs and uses Ordinary Least Squares (OLS) and Ordered Logit (Ologit) regression to analyze the mutual relationship between women microentrepreneurs' socio-economic development and the six explanatory variables, including four relevant control variables. The study has also used a paired t-test methodology to meet the second research objective, comparing the microenterprises' three years' average net income before and after taking microfinance. The results indicate a significant impact of microfinance on the socio-economic development of women microentrepreneurs, with all independent variables except Q4IV and the control variable Q8CV demonstrating a significant relationship with the dependent variable. Additionally, the study confirms a statistically significant relationship between microfinance and the financial performance of those microenterprises. The study contributes to the field of research with a mixed-methods statistical facility to analyze microfinance's impact on both socio-economic and financial performance dimensions of women microentrepreneurs using both primary and secondary data.

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INTRODUCTION

In 1974, a project named Rural Social Services (RSS) launched the first interest-free and collateral-free microcredit. In the late 1970s and early 1980s, certain non-governmental organizations (NGOs) and Grameen Bank initiated microfinance services as a demand-driven operation, with the backing of the Government. These services were provided in conjunction with their social development initiatives. Microfinance allows opportunities for women to take micro loans for enabling access to finance in a socially inclusive way for raising contribution to national income and gross domestic product (GDP). In 2023, a total of BDT 2857.57 billion of microcredit has been disbursed which is 5.67% of the GDP (in current amount). As 90% of the clients of microfinance institutions (MFIs), registered under Microcredit Regulatory Authority (MRA), are women, thus the disbursement of microfinance to women is nearly 5.09% of the total GDP.

A study on the perspective of Pakistan was conducted with a data set from 2006 to 2018 where the study found that women borrowers' percentage in microfinance significantly contribute to the financial sustainability of women (Maenuddin et al., 2024). A study at Uganda suggests that enhancing and broadening micro-finance assistance to economically disadvantaged and susceptible women in different regions of the country by means of entrepreneurial education and training, facilitating access to credit and financial services, and creating market opportunities (Robert, 2024). The implementation of microfinance in Bangladesh has resulted in an increase in individuals' incomes, enhanced housing and food security, and provided economic empowerment to women, thus promoting entrepreneurship and decision-making. Additionally, it has bolstered social solidarity and the growth of communities by promoting economic involvement.

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Although facing difficulties, microfinance continues to be essential for alleviating poverty in Bangladesh (Shah, 2024). In Afghanistan, the effect of microfinance on women's empowerment is less than projected; yet, there is evidence of a favorable benefit for some women (Hemat & Rahman, 2023). A study in the context of Bihar, India also established that microfinance significantly contributes to achieve financial inclusion (Fatima, 2024).

The scope of the study is centered on primary data collected from a sample of women microentrepreneurs around Bangladesh. As the bigger part of microfinance (90%) is drawn by the women, the study only focuses on the women clients of microfinance. It includes those women clients who have utilized the microfinance in establishing an enterprise. Microfinance has two dimensions; one is socio-economic development and the other is financial performance of enterprises. Thus, the study scopes both of the dimensions by blending primary and secondary data from the same respondents.

The study aims to find out whether microfinance is significantly impacting the socio-economic development of the women microentrepreneurs. Additionally, using the net income information of their enterprises, the study aims to find out whether microfinance significantly impacts the financial performance of those enterprises.

The novelty of the study consists in utilizing a mixed method analytical research blending primary and secondary data where both the socio-economic performance and financial performance of microfinance are evaluated focusing only on the women microentrepreneurs. This study contributes the existing field of research by understanding the gender dynamics of microfinance, providing policy implications for optimizing microfinance programs for women, offering a robust mixed-methodological framework, and implementing a localized, contextual, and evidence-based study.

The study approaches by reviewing exiting literatures in the given field. Review of literature involves studying the theories relevant to microfinance, findings of other studies, determining research gaps, and development of hypothesis. After that, the methodology of the study provides roadmaps to conduct the study. After that, results and discussion provide the statistical outputs and discussions based on the outputs. A brief finding is provided for summarizing the outputs and implications for microfinance society based on research aims. Finally, the study concludes by summarizing the outputs and providing shades of possible avenues of further studies.

LITERATURE REVIEW

Microfinance, a powerful tool for fighting against some major problems, including poverty (Kalla, 2021) and vulnerability (Bassem, 2012), in developing countries like Bangladesh, boosts socio-economic development (Al-Amin & Mamun, 2022), which is a multidimensional process through which an individual can take control over the matters concerning them for the socio-economic betterment of women (Sethy & Jana, 2020). Thus, it amplifies the capability of poor and marginalized people to improve their standards of living (Banerjee & Jackson, 2017).

In the early 1970s, the concept of microfinance was introduced by the economist Muhammad Yunus in Bangladesh to encourage women involved in start-ups and entrepreneurship. The famous economist Dr. Mohammad Yunus also developed Grameen Bank, which is most probably the largest microcredit organization in the world (Islam et al., 2012), to execute his microfinance concept, especially focusing on the poor rural women who are interested in improving their living standards and engaging in and expanding their entrepreneurial activities. The study conducted by Akter and Jilu (2020) has assessed the success of the microfinance concept through Grameen Bank in Bangladesh. The strategy of self-empowerment through micro-finance is successfully being operated in more than 60 countries in the world and it is being observed that women's participation in entrepreneurial activities has increased to a greater extent all over the world.

To make Bangladesh smart, fostering women's entrepreneurship is needed to contribute to national economic development. By 2041, Bangladesh is going to transition from a developing country to a middle-income country with the joint efforts of men and women who have worked together to implement Vision 2021 and are still working to attain the SDGs by 2030. It's a good point for Bangladesh that women entrepreneurs hold large portions and are actively exploring new opportunities in economic participation. Not only in Bangladesh but also in the whole world, microfinance contributes to the economy of the country by reducing poverty, creating self-employment, and fostering women's entrepreneurship. In both developed and developing countries around the world, microfinance is treated as a viable and best alternative to conventional financial and non-financial services. During the global financial crisis of 2008, microfinance gained trust and reliability with profound shock-resistant roots (Alimukhamedova, 2014).

The concept of microfinance, also called microcredit, provides women, especially those from rural areas, with affordable financial and non-financial services and opportunities to utilize their own skills, knowledge, and abilities to startup businesses, which causes women's empowerment (Nimmi & Ramachandran, 2021). Moreover, it is considered a world where all the people, especially marginalized and poor individuals and households, get wide access to affordable quality financial services and products, which do not only act as credit but also act as savings, payment services for the clients, leasing and micro-insurance (Khavul et al., 2013), and transfer of funds. It performs the function of banking for unbanked consumers and entrepreneurs who have little access to regular banks and are not able to provide proper collateral to take advantage of financial services (Bassem, 2012). In addition to that, microfinance provides women entrepreneurs with proper support and funding to financially contribute to their families (Tandon, 2016), especially in developing countries like Bangladesh. Nimmi and Ramachandran (2021) explained that women empowerment through small businesses is particularly a specific economic concept that helps women go forward and contribute to their families as well as the economy of Bangladesh.

Microfinance plays a crucial role in women's empowerment through entrepreneurship. Through this, women entrepreneurs get financial, social, health, and educational development that ultimately develops their family empowerment. A study by Gupta and Meher (2016) explained that microfinance is an effective way to boost women's entrepreneurship by providing financial and non-financial services such as small and emergency loan facilities, scholarships, educational and

training programs, medical facilities, etc. to women who are interested in entrepreneurship and small businesses. With financial independence through microfinance, women can grow their entrepreneurship and thus gain self-confidence and utilize their skills. Thus, the economic empowerment of women through microfinance makes a positive impact on their self-esteem (Sethy & Jana, 2020) and gains respect for them.

On the other hand, microfinance evolved as a procedure of financial inclusion for women entrepreneurs (Okesina, 2021) who are not able to get access to conventional financial services (Chowdhury et al., 2021) such as credit facilities, insurance, and some other non-financial services due to perceived gaps in ownership of land and religiosity (Olohunlana et al., 2024), gender discrimination, lack of proper collateral, and level of informality (Banerjee et al., 2015) for fostering more involvement of women in entrepreneurship (Okesina, 2021). Women's participation in entrepreneurship boosts their financial independence, earnings, family income, savings, and also some other household resources (Rehman et al., 2015), and microfinance paves the way for a for a smooth and affordable future. According to a study by Bassem (2012), a large portion of beneficiaries of microfinance are women who are interested in involving themselves in entrepreneurship and other self-employed activities. This gives women self-confidence, social status, and active participation in family decision-making, the ability to contribute to family and the economy (Degago & Aschale, 2018), and gender equality. Studies show that microfinance exerts a deep influence on the socio-economic status, knowledge, skill and ability (KSA) improvement, decision-making power, and self-dignity of women involved in self-employment. Addai (2017) shows the notable positive relationship between microfinance and the socio-economic development of the self-employed women group (Dame & Adisa, 2020), though marital status may affect the mentioned relationship, whereas age and educational level of women have no controlling effect.

In Bangladesh, microfinance is provided by Grameen Bank, which is the largest microfinance bank in Bangladesh and is acting as a revolutionary method to eradicate poverty and foster women's entrepreneurship (Islam et al., 2012). The microfinance concept and Grameen Bank have contributed so much to rural development, especially women's entrepreneurship and empowerment, that in 2006, the Nobel Prize Committee jointly awarded Dr. Muhammad Yunus and Grameen Bank for their earnest efforts to reduce poverty in Bangladesh (Islam et al., 2012). Despite all the positive outcomes of microfinance, there are some negative outcomes of microfinance on women entrepreneurs' ability to run their entrepreneurial activities. This is supported by (Dumbuya & Munu, 2024; Okesina, 2021). Such as the findings of the study conducted by Okesina (2021), it is a small statement that women's engagement with microfinance also has some negative outcomes, including increased debt, loan diversion, financial burden, less financial literacy, unjustified deductions, short repayment periods, etc. (Dumbuya & Munu, 2024) for women entrepreneurs. Islam et al. (2012) indicate that the high interest rate of microcredit sometimes becomes a huge burden for women entrepreneurs and suggest Grameen Bank rethink the interest rate and make a smooth way for women entrepreneurs to contribute to their families, society, and the economy of Bangladesh.

Up to the authors' latest knowledge, in Bangladesh, no research has been done on finding the impact of microfinance on women micro-entrepreneurs by conceptualizing a survey questionnaire and knowing directly from them about the effectiveness of microfinance in socio-economic development and financial performance of their microenterprises simultaneously. In addition to that, up to the authors' latest knowledge, no research has been done using a mixed method set up in this field with updated information till June 2023. These issues have lured the researchers to conduct a study in this domain.

Conceptual Framework

The book, "Banker to the Poor" specifically enlightening microfinance in Bangladesh context (Yunus & Porter, 2008), a study by Jayasinghe and Herath (2013) formulated few variables based on what the proxies for variables can be shaped. Again, a Women Empowerment Index (WEI) developed in the context of India by Roy et al. (2018) influenced the inclusion of variables. Also, studies by Asadullah et al. (2021) and Hashemi et al. (1996) provided different angles of judgments regarding microcredit program's relation to women empowerment. All these have been adjusted and conceptualized in Bangladesh by the authors of this study.

Referring to Figure 1, where a theoretical framework has been generated from theories and relevant studies. Women's microcredit utilization success is reflected in the entrepreneurial success of women taking microcredit. Entrepreneurial success is a factor of different types of capital, including financial capital (Elsafty et al., 2020). Access to credit encourages entrepreneurial success (Abebe & Kegne, 2023). It's seen in the study that when financial capital is ample, there is a chance of entrepreneurial success. Entrepreneurial success is remarkable when such a microbusiness initiative employs other women (Badal, 2010). A study published in Springer focusing on the European Union showed that there existed a significant correlation between employment rate and entrepreneurship (Anastasiou et al., 2021). Employment leads to higher income and business expansion, which finally provides a better network with stakeholders and MFIs. The MFIs consider these successful women micro-entrepreneurs as role models, and finally, the social status of the women micro-entrepreneurs develops. It is notably true that there should be a positive relationship between good corporate financial performance and entrepreneurship that is efficient and successful (Chitimiea et al., 2021). Thus, a better social status is blessed to these women micro-entrepreneurs, which consequentially leads to the empowerment of women. As microcredit allows opportunities for easy access to capital and all these direct and indirect opportunities that finally link women's microcredit entrepreneurship to success, the framework hints at a positive correlation between these variables and women's micro-entrepreneurial success.

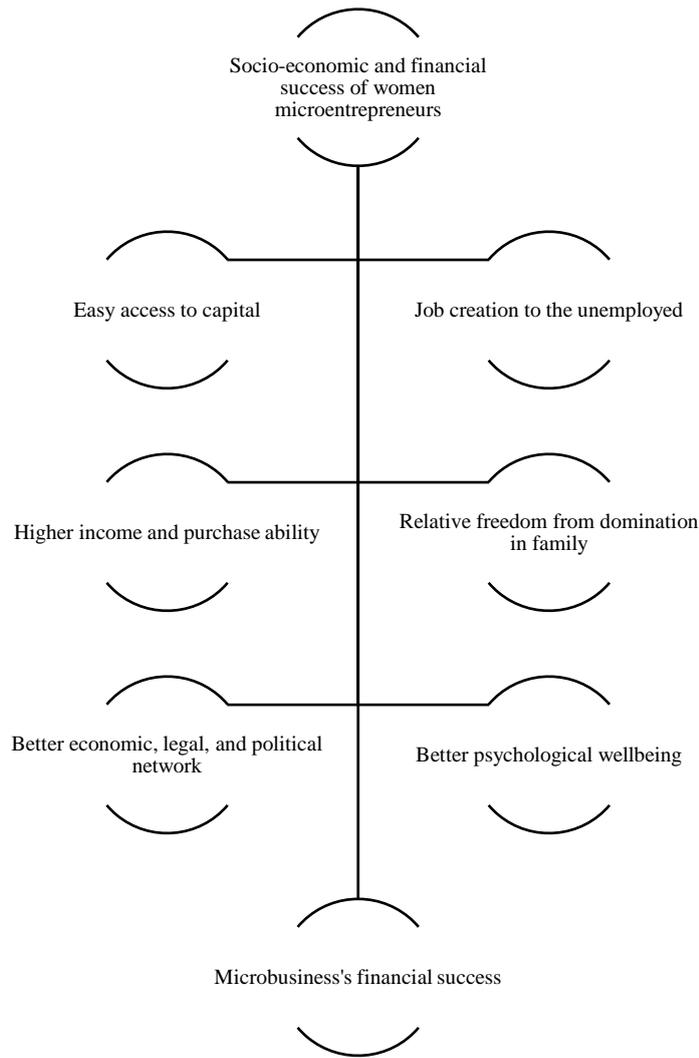


Figure 1. Conceptual Framework on How Microfinance Impacts Socio-economic Development and Financial Performance of Women Microentrepreneurs

Hypotheses of the Research

The study, as of its research objectives, wants to examine various segments of microfinance’s impacts and wants to test two hypotheses. Referring to table 1, the alternative hypotheses are denoted in the list with respective test strategies.

Table 1. Hypotheses of the Research

Alternative Hypotheses	Description of Hypotheses	Test Strategies
H ₁	There exists a significant relationship between microfinance and the socio-economic development of women microentrepreneurs.	Ordinary Least Squares (OLS), and Ordered Logit Regression Model.
H ₂	There exists a significant relationship between microfinance and women-led microenterprises' financial performance.	Paired t-test

MATERIALS AND METHODS

Data and Sample Distribution

The data is the women clients’ information found from the Grameen Bank, Society for Social Service (SSS), and other few microfinance institutions (MFIs), and Microcredit Regulatory Authority (MRA). Using sample size estimation formula from (1), the sample size has been estimated 273. Cochran (1977) advised the sample size formula.

$$\text{Sample Size } n = N * [Z^2 * p * (1-p)/e^2] / [N - 1 + (Z^2 * p * (1-p)/e^2)] \quad (1)$$

Where, N = population size, e = margin of error (percentage in decimal form), z = Critical value of the normal distribution at the required confidence level, and p = sample proportion. Here, 1,33,64,000 is the number of women clients of microfinance in Bangladesh till the fiscal year 2022-23. Using z value for 90% confidence interval with 5% margin of error, the number of samples is found.

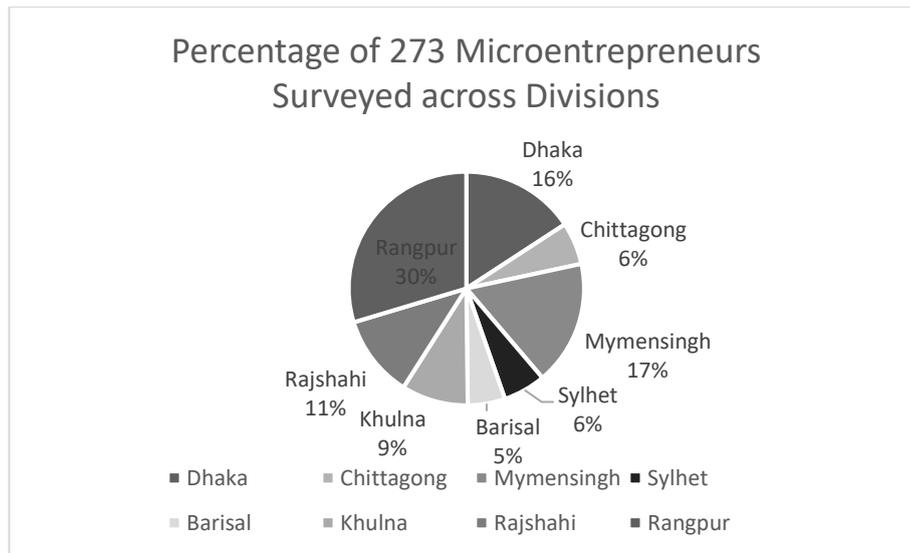


Figure 2. Samples Distribution across Bangladesh (As of Divisions of Bangladesh)

Referring to Figure 2, where the sample distribution across the locations has been provided. Figure 2 represents stratified sampling procedure across the country considering eight divisions of Bangladesh. Basing on MFI’s presence and the quantity of women clients, the density of survey has been shaped.

Data Collection

Data has been collected using survey questionnaire with the women microentrepreneurs. The data questionnaire is enclosed in the Appendix-A, where the data has been ordinal data in nature, in a Likert scale of 0 to 4. Also, information on net income before taking microfinance loans and net income after taking microfinance loans has been collected for meeting the second aim of the research.

Variables Identification, Labels and Justification

Table 2. Variables Identification, Labels and Justification

Variables’ Labels and Types	Name of the Variables	Justification
Q1DV: Dependent Variable	Economic security and Improvement of capital	From a study of Hashemi et al. (1996), this has been considered proxy for socio-economic development of women microentrepreneurs. This variable represents that woman have security against economic vulnerability and capital enhancement history from microfinance.
Q1IV: Independent Variable 1	Easy access to capital	A study of Roy et al. (2018) considered access to resources as a key indicator of women’s socio-economic empowerment.
Q2IV: Independent Variable 2	Job creation	Women from their microenterprises can impact the job creations for others which impact the socio-economic development (Sohail, 2014).
Q3IV: Independent Variable 3	Economic, legal, and political network	A study showed that women’s socio-economic empowerment is impacted positively by networking (Mayoux, 1970). Microfinance enables this option highly to the women microentrepreneurs.
Q4IV: Independent Variable 4	Higher income and purchase ability	The ability of women in income and purchase comparing to the past represents benefits which impacts socio-economic development (Hashemi et al., 1996).
Q5IV: Independent Variable 5	Better psychological wellbeing	Asadullah et al. (2021) found that better psychological wellbeing is a fundamental effect of microfinance that is a social outcome of microfinance.
Q6IV: Independent Variable 6	Relative freedom from domination in family	The access to microfinance has a significant relationship with relative freedom from domination in family (Hashemi et al., 1996).
Q7CV: Control Variable 7	Asset Size	The size of the asset can have an impact on the business’s growth (Kendo & Tchakounte, 2021). The model controls this accordingly.
Q8CV: Control Variable 8	Location	The location of the women-led enterprises may have an impact on what is controlled in the model (Kakooza et al., 2023).
Q9CV: Control Variable 9	Age of the Business	The age of the business represents its experience, which might have an impact on its growth. That’s why it’s controlled in the model (Gupta et al., 2013).
Q10CV: Control Variable 10	Amount of Loan Taken	The amount of loan taken from the MFIs or any other government organization or bank may have an impact on business growth for what’s controlled in the model (Al-Azzam & Parmeter, 2019).

Referring to Table 2, the definition of the variables is provided with proper background or insights with citations. As no specific theories are tested in this study, thus, variables are chosen with sincere blend of relevant literatures.

Regression Model

$$Q_{1DV} = \alpha + \beta_1 Q_{1IV} + \beta_2 Q_{2IV} + \beta_3 Q_{3IV} + \beta_4 Q_{4IV} + \beta_5 Q_{5IV} + \beta_6 Q_{6IV} + \beta_7 Q_{7CV} + \beta_8 Q_{8CV} + \beta_9 Q_{9CV} + \beta_{10} Q_{10CV} + \varepsilon \tag{2}$$

where,

- $\alpha \rightarrow$ The constant
- $\beta_i \rightarrow$ Slope for all the independent variables
- $\varepsilon \rightarrow$ Error Terms

Data Analysis Framework

The study has used STATA (version 18) to analyze the ordinal data series, where the data analysis has been formed in the Figure 3.

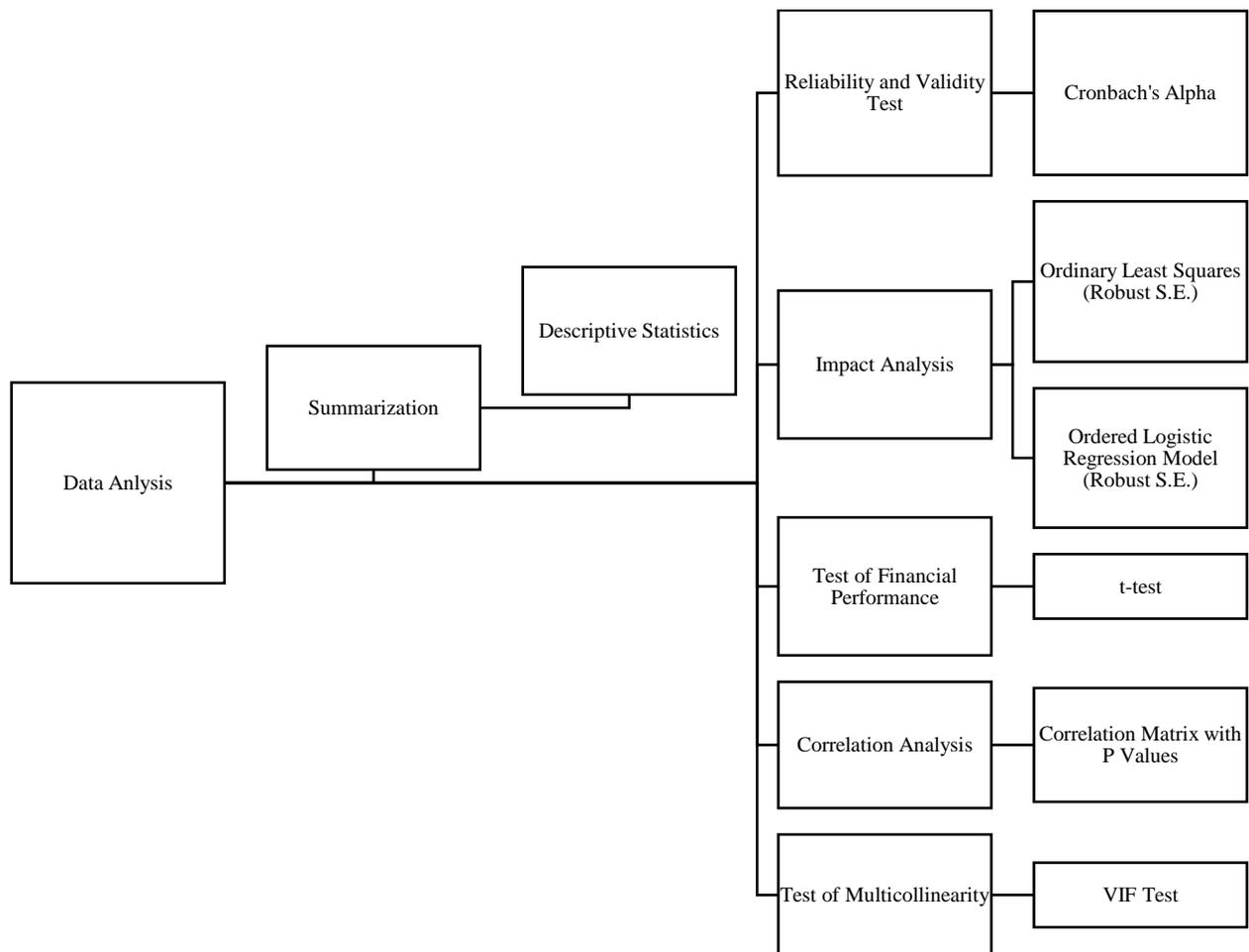


Figure 3. Data Analysis Framework

The research has undergone data analysis using this methodology. The steps are described briefly below:

Step 1: The Ordinal level data collected from the respondents is coded in a Likert scale of 0 to 4 (Appendix-A for more details).

Step 2: Using STATA, a statistical analysis tool, Cronbach’s Alpha is calculated, which represents the level of reliability and validity of the data set. In this stage, all the independent variables and dependent variable are tested by numerous questions (Appendix-B) for checking individual Cronbach’s Alpha and basing on omission process, the reliability and validity of individual variables is determined, and finally overall Cronbach’s Alpha is found out.

Step 3: Descriptive statistics is calculated to find out the minimum, maximum, mean, and standard deviation of the data set for understanding the basic depth and variability of the data dimension.

Step 4: Ordinary Least Squares (OLS) with robust standard errors is used to regress the Q1DV against all six independent variables and four control variables.

Step 5: The Ordered Logistic Regression Model (Ologit) with robust standard errors is used to regress the Q1DV against all the independent and control variables.

Step 6: The correlation matrix with p values is calculated to understand the variables' interrelationship to find out the chances of multicollinearity.

Step 7: The average net incomes of the women microentrepreneurs' particular enterprises are calculated in two series. One is "average net income before getting microfinance," and the other is "average net income after getting microfinance." The average of net income includes three consecutive years' average. After that, the average before and after series are used to generate the Ln (Before) and Ln (After) series using the lognormal function in STATA. After that, a paired two-tailed t-test is conducted on the Ln (before) and Ln (After) series to find whether there are any significant differences between the means of the data sets.

Step 8: The Variable Inflation Factor (VIF) Test is done to check multicollinearity.

RESULTS

Reliability and Validity Test (Cronbach's Alpha)

In order to find out individual Cronbach's Alpha, several consistent questions have been designed in the survey questionnaire for each variable. In the test, omission methodology has been used to maximize the scale reliability. Appendix-B shows the final list of questions used for reaching determining every variable's reliability and validity.

Table 3. Cronbach's Alpha Summary for Individual Variables

Variables	Overall Individual Cronbach's Alpha
Q1DV	0.881
Q1IV	0.896
Q2IV	0.903
Q3IV	0.891
Q4IV	0.930
Q5IV	0.892
Q6IV	0.888
Q7CV	0.889
Q8CV	0.886
Q9CV	0.887
Q10CV	0.887
Overall Cronbach's Alpha of Data Set	0.903

In Table 3, the Cronbach's Alpha is shown. Typically, a good Cronbach's Alpha value falls within the range of 0.70 to 0.99, although this can vary depending on the research context and the specific measurement instrument used. The scale reliability coefficient value 0.903 presented in Table 3 indicates the high reliability and validity of the data set used in this study for further analysis.

Descriptive Statistics

Table 4. Summary Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Q1DV	273	2.655	1.392	0	4
Q1IV	273	2.267	1.501	0	4
Q2IV	273	2.666	1.402	0	4
Q3IV	272	2.172	1.249	0	4
Q4IV	273	1.908	1.517	0	4
Q5IV	273	2.373	1.358	0	4
Q6IV	273	2.435	1.386	0	4
Q7CV	273	2.421	1.386	0	4
Q8CV	273	2.487	1.393	0	4
Q9CV	273	2.490	1.364	0	4
Q10CV	273	2.501	1.409	0	4

In Table 4, the descriptive statistics for the observation set for first research aim is shown. The table summarizes that there are 273 observations and the means and standard deviations are homoscedastic having no heterogenous outliers. The minimum and maximum in all cases are 0 and 4 respectively.

Correlation Matrix with P Values

Table 5. Correlation Matrix with P Values

	Q1DV	Q1IV	Q2IV	Q3IV	Q4IV	Q5IV	Q6IV	Q7CV	Q8CV	Q9CV	Q10CV
Q1DV	1.0										
Q1IV	0.6*	1.0									
	0.0										
Q2IV	0.5*	0.3*	1.0								
	0.0	0.0									
Q3IV	0.7*	0.5*	0.3*	1.0							

	0.0	0.0	0.0								
Q4IV	0.0	0.0	0.1	0.0	1.0						
	0.9	0.8	0.2	0.7							
Q5IV	0.6*	0.5*	0.3*	0.5*	0.1	1.0					
	0.0	0.0	0.0	0.0	0.2						
Q6IV	0.7*	0.4*	0.4*	0.5	0.0	0.6*	1.0				
	0.0	0.0	0.0	0.0	0.8	0.0					
Q7CV	0.7*	0.5*	0.3*	0.6*	0.0	0.5*	0.6*	1.0			
	0.0	0.0	0.0	0.0	0.5	0.0	0.0				
Q8CV	0.7*	0.5*	0.4*	0.5*	0.0	0.5*	0.6*	0.7*	1.0		
	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0			
Q9CV	0.7*	0.4*	0.3*	0.6*	-0.1	0.5*	0.5*	0.6*	0.7*	1.0	
	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0		
Q10CV	0.7*	0.4*	0.4*	0.5*	0.0	0.5*	0.6*	0.6*	0.6*	0.7*	1.0
	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	

Here, * denotes significance at 95% confidence interval.

In Table 5, the correlation matrix with p values states that there exists a good and positive correlation between the independent variables and the dependent variable. Almost every independent variable provides strong explanatory evidence of a representing the changes in the dependent variable.

Linear Probability Model (with Robust Standard Errors)

Table 6. Summary of OLS (with Robust Standard Errors)

Number of Observations	P Value	R-Squared
273	0.000***	0.819

Here, *** Stands for 99% Confidence interval

In Table 6, using OLS with robust standard errors, the p value is significant at a 99% confidence interval. The OLS model rejects the null hypothesis by establishing a significant relationship between microfinance and the socioeconomic development of women microentrepreneurs. The R-Squared of 81.93% indicates that the explanatory variables can accurately predict changes in the dependent variables by 81.93%, providing strong evidence of the model's fitness.

Table 7. Summary of Multivariate OLS Outcomes (with Robust Standard Errors)

Variables	Coefficients	Robust Standard Errors	t Values	P Values
Q1IV	0.085	0.034	2.43	0.016**
Q2IV	0.079	0.032	2.41	0.017**
Q3IV	0.202	0.049	4.08	0.000***
Q4IV	0.023	0.022	1.02	0.311
Q5IV	0.070	0.042	1.66	0.098*
Q6IV	0.193	0.048	3.99	0.000***
Q7CV	0.197	0.047	4.16	0.000***
Q8CV	0.012	0.049	0.25	0.804
Q9CV	0.103	0.053	1.95	0.052*
Q10CV	0.221	0.048	4.52	0.000***
constant	-0.191	0.113	-1.68	0.093

Here, *** Stands for 99% Confidence interval ** Stands for 95% Confidence interval * Stands for 90% Confidence interval

In Table 7, the detailed outputs as per variables are listed. The results show that except for Q4IV and Q8CV, all the variables are significantly impacting the dependent variable. The coefficients represent a positive slope in predicting the dependent variable.

Ordered Logistic Regression Model (with Robust Standard Errors)

Table 8. Summary of Ologit (with Robust Standard Errors)

Number of Observations	P Value	Pseudo R-Squared
273	0.000***	0.465

Here, *** Stands for 99% Confidence interval

In Table 8, the Ologit model, featuring robust standard errors, demonstrates a significant p value within a 99% confidence interval. This rejects the null hypothesis using the Ologit model by stating that there exists a significant relationship between microfinance and the socioeconomic development of women microentrepreneurs. The pseudo-R-squared shows that the explanatory variables have strong confidence in predicting the dependent variable.

Table 9. Summary of Multivariate Ologit Outcomes (with Robust Standard Errors)

Variables	Coefficients	Robust Standard Errors	z Values	P Values
Q1IV	0.252	0.114	2.2	0.028**

Q2IV	0.186	0.106	1.75	0.081*
Q3IV	0.573	0.158	3.62	0.000***
Q4IV	0.108	0.082	1.32	0.187
Q5IV	0.254	0.151	1.68	0.094*
Q6IV	0.608	0.170	3.56	0.000***
Q7CV	0.641	0.179	3.58	0.000***
Q8CV	0.022	0.175	0.13	0.896
Q9CV	0.367	0.182	2.02	0.044**
Q10CV	0.643	0.177	3.64	0.000***

Here,*** Stands for 99% Confidence interval ** Stands for 95% Confidence interval * Stands for 90% Confidence interval

In Table 9, the results completely affirm with the outcomes of OLS in Table 7. Except for the Q4IV and Q8CV, all the independent and control variables are significantly impacting the dependent variable.

Test of Multicollinearity (VIF Test)

Table 10. VIF Results

Variable	VIF	1/VIF
Q8CV	2.87	0.35
Q9CV	2.87	0.35
Q10CV	2.86	0.35
Q6IV	2.53	0.40
Q7CV	2.52	0.40
Q5IV	2.13	0.47
Q3IV	2.1	0.48
Q1IV	1.75	0.57
Q2IV	1.37	0.73
Q4IV	1.05	0.95
Mean VIF	2.2	

Referring to Table 10, where the test of multicollinearity using Variable Inflation Factor (VIF) is tested. The results show that mean VIF is 2.2 which explains that the models don't have substantial amount of multicollinearity.

The Paired t-test on Microenterprises' Financial Performance (Net Income)

Table 11. Paired t-test Summary Result

Paired t-test {Ln (After) – Ln (Before)}	
P Values	0.0021***
t Values	3.2307

Here, *** Stands for 99% Confidence interval

With reference to Table 11, using the 3-year average net income before taking the microfinance and the 3-year average net income after taking the microfinance, the sets are converted into lognormal values. At a 95% confidence interval, the paired t-test values reject the null hypothesis, indicating a significant difference between the means of the data sets before and after the microfinance loans received by the women microentrepreneurs. The t values for the difference between the Ln (after) and Ln (before) datasets are 3.2307, indicating that microfinance had a positive impact on microenterprises' financial performance.

DISCUSSIONS

The study's results align with the findings of relevant studies conducted in various geospatial contexts around the world. Shah's (2024) study revealed that microfinance significantly reduces poverty in Bangladesh, a finding further validated by the study's focus on women microentrepreneurs. Robert (2024) discovered in Uganda that microfinance enables access to credit and financial services and creates market opportunities, which aligns with this study's findings. However, a study by Hemat and Rahman (2023) in Afghanistan revealed that while microfinance positively benefited women, the impact was not significant. Our study ensures that, from a Bangladeshi perspective, the positive impact of microfinance on women microentrepreneurs is significant. Gupta and Meher (2016) concluded in their study that microfinance plays a critical role in empowering women entrepreneurs. The study validates the findings of previous studies conducted in diverse global contexts. The study's analysis confirms acceptance of the first alternative hypothesis, which asserts a significant relationship between microfinance and the socioeconomic development of women microentrepreneurs. The study also accepts the second alternative hypothesis, which asserts a significant relationship between microfinance and the financial performance of women-led microenterprises. The study identifies five independent variables that significantly impact the dependent variable: easy access to capital, job creation, economic, legal, and political networks, better psychological wellbeing, and relative freedom from family dominance. Meanwhile, the control variables, asset size, age of business, and amount of loan taken, also significantly impact the dependent variable. The R-squared from OLS with robust standard errors is 81.9%, and the pseudo-R-squared from the Ologit regression model with robust standard errors is 46.5%. The R-squared represents strong explanatory confidence among the independent variables to predict the dependent variable. Once again, a paired t-

test comparing the three-year average net income of women-led microenterprises before and after microfinance reveals that microfinance has a significant impact on their financial performance. Based on the alignment of findings from prior studies and this study, the study concludes that microfinance significantly impacts the socio-economic development of women microentrepreneurs in Bangladesh while also significantly enhancing their financial performance. With assurance to reject the null hypotheses, the study affirms that microfinance significantly and positively impacts the socio-economic development of women microentrepreneurs and financial performance of women-led microenterprises in Bangladesh.

CONCLUSIONS

Previous research on a similar segment of microfinance also revealed the importance of microfinance in a country's GDP and economic development. The study's uniqueness relied on direct responses from women microentrepreneurs and their enterprises' financial information to meet the research objectives. The study concentrated on root-level responses and secondary data-driven outcomes to explain whether microfinance in Bangladesh significantly improves the socio-economic development of women microentrepreneurs and the financial performance of their enterprises. The findings show a significant relationship between microfinance and the socioeconomic development of female microentrepreneurs. The study also discovered that microfinance significantly enhances the financial performance of women-led microenterprises. This study contributes significantly to developing ideas about the current contribution of microfinance to women's empowerment in an emerging economy like Bangladesh. The study suggests significant policy implications for expanding the reach of microfinance throughout the country and providing technical education to clients on how to effectively use microfinance to establish and operate businesses. The study provides an avenue for much deeper studies involving more respondents countrywide and comparing microfinance's contributions with those of other emerging economies using similar mixed-method pathways.

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APPENDICES

Appendix-A: Survey Questionnaire

Name	-
Age of the enterprise	-
Size of the Total Assets	-
Number of Employees Working	-
Amount of loan taken	-
Location	-
Age of the owner/s	-
Types of Business	-
Net Income for three years before and after microfinance received	-

Survey Questionnaire (Part A)

Numbers	Questions	Strongly Agree ^{*****}	Agree ^{****}	Neutral ^{***}	Disagree ^{**}	Strongly Disagree [*]
1	Have you gained more economic security and become able to appreciate your capital after taking microfinance?	-	-	-	-	-
2	Do you have easy access to capital now after taking microfinance, comparing to when you didn't have microfinance?	-	-	-	-	-
3	Could your microenterprise create job for your community?	-	-	-	-	-
4	Could you get better access to economic, legal, and political network after taking microfinance?	-	-	-	-	-
5	Utilizing the loan, could generate higher income and get ability to more purchase?	-	-	-	-	-
6	Are you now at a better psychological wellbeing after taking microfinance?	-	-	-	-	-
7	Do you think that you can manage a relative better freedom from domination your family now after taking microfinance?	-	-	-	-	-

Here, ***** represents 4, **** represents 3, *** represents 2, ** represents 1, * represents 0

Survey Questionnaire (Part-B)

Numbers	Control Variables	Codes				
		4	3	2	1	0
8	Size of Total Assets	7 lacs to 10 lacs	5 lacs to below 7 lacs	3 lacs to below 5 lacs	1 lac to below 3 lacs	Less than 1 lacs
9	Location of the enterprise	Metropolitan	City	Upazilla	Thana	Village
10	Age of the enterprise	Above 10 years	5 years to below 10 years	3 years to below 5 years	6 months to 3 years	1 month to below 6 months
11	Amount of Loan Taken	5 lacs to 10 lacs	3 lacs to below 5 lacs	1 lac to below 3 lacs	50 thousand 1 lac	Below 50 thousand

Appendix-B (Likert Scale 0 to 4) Supporting Questions after Omission Methodology

Main Questions	Sl. No.	Supporting Questions/Statements
Have you gained more economic security and become able to appreciate your capital after taking microfinance?	1	Has your income achieved greater stability since you obtained microfinance?
	2	Have you experienced any growth in your savings or assets since engaging in microfinance?
	3	Your enterprise experienced an increase in size, revenue, or customer base as a result of obtaining microfinance.
	4	You obtained additional assets (such as equipment, inventory, or property) for your business or personal use subsequent to receiving microfinance.
	5	Your ability to handle your finances and make financial choices improved as a result of obtaining microfinance.

Do you have easy access to capital now after taking microfinance, comparing to when you didn't have microfinance?	1	You can obtain further financing or loans, in comparison to the period prior to your acquisition of microfinance.
	2	You received offers or successfully acquired fresh credit or loans from other financial institutions subsequent to obtaining microfinance.
	3	Has the capital for your business activities increased since obtaining microfinance, in comparison to when you did not have microfinance?
Could your microenterprise create job for your community?	1	You strongly advocate for the necessity of recruiting extra personnel for your microenterprise following the acquisition of microfinance.
	2	You are convinced that your microenterprise has made a significant contribution to the creation of job possibilities within your local community.
	3	As your microenterprise expands, you intend to recruit additional employees or workers.
	4	You had difficulties in recruiting personnel or expanding your labor force.
Could you get better access to economic, legal, and political network after taking microfinance?	1	Since obtaining microfinance, your access to economic networks and commercial options has significantly improved.
	2	Since obtaining microfinance, you now have enhanced access to legal support and information.
	3	Since receiving microfinance, you have gained enhanced access to political networks and community power.
Utilizing the loan, could generate higher income and get ability to more purchase?	1	By utilizing the loan, you have been able to create a greater revenue than previously.
	2	Since obtaining the loan, I have been able to acquire a greater quantity of goods or services to meet the demands of my business or personal requirements.
	3	The financing has facilitated your investment in my firm, resulting in expansion and increased profitability.
Are you now at a better psychological wellbeing after taking microfinance?	1	Acquiring microfinance has alleviated your financial distress and concerns.
	2	Accessing microfinance has bolstered your confidence and elevated your self-esteem.
	3	The microfinance you received has significantly enhanced your overall quality of life.
	4	Microfinance has enhanced your sense of financial security and stability.
Do you think that you can manage a relative better freedom from domination your family now after taking microfinance?	1	Acquiring microfinance has enhanced your autonomy in managing your finances, reducing your reliance on my family.
	2	You now possess greater autonomy to make independent decisions without any interference from your family.
	3	Microfinance has resulted in a reduction of familial control or intervention in your financial and economic affairs.
	4	Since undertaking microfinance, your capacity to negotiate and assert my preferences within my family has significantly enhanced.

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