

Does Microfinance Impact Sectoral Growth: A Case Study of Bangladesh

Abstract

Purpose: This research examines the impact of microfinance loans on sector-specific outputs—agriculture, services, and industry—and their contribution to Bangladesh's economic growth from 2008 to 2022.

Methodology: The study employs the Autoregressive Distributed Lag (ARDL) model to analyse the effects of microfinance loans on the selected sectors. Data was sourced from the Bangladesh National Portal, the Bangladesh Bureau of Statistics, the Bangladesh Economic Review, and the World Bank database.

Findings: The results show that microfinance loans positively affect the agriculture and service sectors, promoting growth and productivity. However, a negative impact was found in the industrial sector, suggesting inefficiencies in utilizing financial support. Regarding sector contributions to overall economic growth, the service and industrial sectors showed positive and statistically significant impacts, aligning with Bangladesh's economic objectives. Surprisingly, the agricultural sector did not significantly contribute to economic growth, indicating potential structural challenges.

Originality: This study provides a comprehensive sector-wise analysis of microfinance's influence on Bangladesh's economic growth, offering new insights into how different sectors respond to microfinance interventions. The findings contribute to understanding the disparities in the utilization and effectiveness of microfinance across sectors.

Keywords: Microfinance; Sectoral Growth; Economic growth and Bangladesh.

1. Introduction

The development of microfinance in Bangladesh is characterized by a succession of transformative moments that have impacted the country's economic environment. The initial development of microfinance dates back to the 1970s, when significant social and economic

instability occurred (Hollis & Sweetman, 2001). As a consequence of widespread impoverishment and the need for financial assistance for those who are underprivileged, novel concepts started popping up.

The concept gained popularity when Mr. Muhammad Yunus initiated the Grameen Bank in 1983 (Goldsworthy, 2010). The Grameen model was remarkable; it offered small loans without collateral to disadvantaged people, primarily focusing on women. This emphasis on female borrowers was based on the idea that empowering women could result in broader community advantages and poverty reduction (Nawaz, 2019a). The success of Grameen Bank not only affirmed the effectiveness of microfinance and acquired international recognition, placing Bangladesh as a global pioneer in this domain (Khandker et al., 1995). During the 1990s, the microfinance sector encountered extensive growth. Many non-governmental organizations (NGOs) have arisen, embracing microfinance as a mechanism for development. These organizations presented several financial services, including savings, insurance, training, and loans (Nawaz, 2019b). The Microcredit Regulatory Authority (MRA) was founded in 2006 to regulate the expanding sector, providing transparency and supporting best practices among microfinance institutions (MFIs). This framework of regulations was crucial in mitigating concerns such as high interest rates and the potential for borrower over-indebtedness (Ahmed, 2004). By the early 2000s, microfinance was a crucial financial instrument for stimulating economic development, especially in developing nations like Bangladesh. Microfinance facilitates access to credit for low-income individuals and unbanked communities, allowing these marginalized groups to participate in productive activities, enhance their lives, and disrupt the cycle of poverty (Hartarska, 2005; Karlan, 2006; Kyereboah-Coleman & Osei, 2008).

Despite the developments, concerns appeared regarding the efficacy of microfinance in attaining sustainable economic growth. Some studies argued that microfinance favorably impacts economic growth in developing nations by improving financial inclusion and alleviating poverty (Adhikary & Papachristou, 2014; Beck et al., 2009; Hamada, 2010). Nevertheless, other researchers noted that its effects may be less advantageous in more muscular banking systems, where microfinance may only sometimes contribute to significant expansion of the economy (Ahlin et al., 2011; Vanroose&Espallier, 2013). These disparities are frequently identified as insufficient access to financial services, especially in more developed nations, where specific

populations continue to be oppressed by formal financial systems (Sinclair, 2001; World Bank Group, 2015). Moreover, some studies have raised questions about its effectiveness in alleviating poverty and highlighted the necessity for more thorough evaluations of its sector-specific effects. Addressing these sectoral effects is crucial for formulating targeted policies that improve the efficacy of microfinance operations. Examining these associations may provide significant insights into the responses of several businesses to microcredit, highlighting opportunities for enhancement in financial services and economic development.

Table 1: Summary of Previous Studies

Author(s)	Study Area	Method	Findings
Kulinich et al. (2022)	Ukraine	Regression	Positive on ED
Banto& Monsia (2021)	76 Developing Countries	GMM Model	Positive with EG
Barguellil& Bettayeb (2020)	Tunisia	VAR	Positive on ED
Sultan & Masih (2016)	Bangladesh	ARDL	Positive on EG (Short run and Long run)
Adonsou& Sylwester (2016)	71 Developing Countries	Panel Model	Positive with FD
Khandker&Koolwal (2016)	Bangladesh	Panel Model	Positive with AG
Murad & Idewele (2017)	Nigeria	ARDL	Positive with EG (Short run), Negative with EG (Long run)
Miled &Rejeb (2018)	97 Developing Countries	OLS and 2SLS	Negative with Poverty Gap
Mohd. Sharif (2018)	India	Correlation	Positive with EG
Sulemana & Adjei (2015)	Ghana	Quantitative	Positive with AP
Ferdousi (2015)	Bangladesh	OLS	Positive with Income
Ochonogor (2020)	Nigeria	OLS	Positive on EG
Brune (2009)	African & Asian Countries	OLS & Panel	Positive with ED

Source: Author Preparation

Note: EG = Economic Growth, AG = Agriculture Growth, FD = Financial Development, ED = Economic Development, AP = Agriculture Production.

2. Research Methodology

This research paper investigates the impact of microfinance on sector-specific outputs—agriculture, services, and industry—and their contributions to Bangladesh's economic growth from 2008 to 2022. The study is divided into two parts: the first focuses on analyzing the effects of microfinance loan distributions on these three sectors. In contrast, the second assesses their role in driving overall economic growth during the specified period. Data on microfinance loan distributions (MLD) were gathered from the Bangladesh National Portal, Bangladesh Bureau of Statistics, and the Bangladesh Economic Review. In contrast, sector-specific economic growth and gross capital formation (GCF) data were sourced from the World Bank database.

Following data collection, the stationarity of the selected variables was tested using the Augmented Dickey-Fuller (1979) test. Based on these test results, both short-run and long-run analyses were conducted through the autoregressive distributed lag (ARDL) model, as proposed by Pesaran and Shin (1995), Pesaran (1997), and Pesaran et al. (2001), using gross capital formation as a control variable. The analysis followed the application of unrestricted long-run equations to examine the relationships. Equations 1 to 3 are expressed within the ARDL framework as an unrestricted error correction model (UECM) as follow:

Part-1

$$\begin{aligned} \Delta AGR_t = & \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta AGR_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \theta_1 AGR_{t-1} \\ & + \theta_2 MFL_{t-1} + \theta_3 GCF_{t-1} + \epsilon_t \end{aligned} \quad 1$$

$$\begin{aligned} \Delta SVR_t = & \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta SVR_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \theta_1 SVR_{t-1} \\ & + \theta_2 MFL_{t-1} + \theta_3 GCF_{t-1} \\ & + \epsilon_t \end{aligned} \quad 2$$

$$\Delta IND_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta IND_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \theta_1 IND_{t-1} + \theta_2 MFL_{t-1} + \theta_3 GCF_{t-1} + \epsilon_t \quad 3$$

Part-2

$$\Delta EG_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta EG_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta AGR_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta SVC_{t-1} + \sum_{i=0}^p \beta_{4i} \Delta IND_{t-1} + \theta_1 EG_{t-1} + \theta_2 AGR_{t-1} + \theta_3 SVC_{t-1} + \theta_4 IND_{t-1} + \epsilon_t \quad 4$$

We performed a bounds test to investigate the presence of co-integration among the variables. The null hypothesis in this test assumes that the long-run coefficients all equal zero, indicating no co-integration. If the null hypothesis is rejected, it suggests a long-run relationship exists between the variables. This analysis sheds light on the interdependencies and long-term dynamics among the variables over time.

Null hypothesis: $H_0: \delta_1 = \delta_2 = \delta_3 = \mathbf{0}$ and $H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \mathbf{0}$

Alternative hypothesis: $H_1: \delta_1 \neq \delta_2 \neq \delta_3 \neq \mathbf{0}$ and $H_1: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \mathbf{0}$

The presence of cointegration is determined by the joint significance of the F-statistics, which are compared against two sets of critical values at various significance levels. If the calculated F-statistic exceeds the upper bound of the critical values, it suggests the presence of cointegration among the variables. Conversely, if the F-statistic falls below the lower bound, it indicates no cointegration. The cointegration result is inconclusive when the F-statistic lies between the upper and lower bounds. To determine the appropriate lag length for our analysis, we used the Akaike Information Criterion (AIC). Once cointegration is confirmed, we apply the Error Correction Model (ECM), which captures short-run dynamics while accounting for long-run adjustments. The estimated model is as follow. For a detailed discussion on ARDL model read Adil et al. (2021).

$$\Delta AGR_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta AGR_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \lambda ECT_{t-1} + \varepsilon_t \quad 5$$

$$\Delta SRV_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta SRV_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \lambda ECT_{t-1} + \varepsilon_t \quad 6$$

$$\Delta IND_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta IND_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta MFL_{t-1} + \sum_{i=0}^p \beta_{3i} \Delta GCF_{t-1} + \lambda ECT_{t-1} + \varepsilon_t \quad 7$$

$$\begin{aligned} \Delta EG_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta EG_{t-1} + \sum_{i=0}^p \beta_{2i} \Delta AGR_{t-1} \\ + \sum_{i=0}^p \beta_{3i} \Delta SRV_{t-1} + \sum_{i=0}^p \beta_{4i} \Delta IND_{t-1} + \lambda ECT_{t-1} + \varepsilon_t \end{aligned} \quad 8$$

(Where Δ represents the first operator of differentiation, β_0 is intercept in respective equations, AGR= agriculture sector, SVR= service sector, IND= industry sector, MFL= microfinance loan, EG= economic growth and GCF= gross capital formation, $(\beta_{i1} - \beta_{i4})$ indicates the short-run coefficients, whereas $(\theta_1 - \theta_4)$ represent the long-run coefficients, ECT= error correction term, λ = speed of adjustment parameter with a negative sign and ε_t = error term).

3. Result and Discussion

Table 2 provides the descriptive and correlation analysis, offering a detailed examination of the data used for estimation purposes. The descriptive analysis highlights those variables such as SRV, MFL, and AGR exhibit low variability and normal distribution, with no significant outliers, while EG and IND show deviations, as indicated by their higher kurtosis values, suggesting potential outliers. Meanwhile, the correlation matrix reveal strong positive relationships between SRV and other variables like GCF, MFL, and AGR, emphasizing that these sectors are closely interconnected, with no negative correlations detected.

Table 2 Analysis of Data

Panel (A): Descriptive Analysis						
Statistics	SRV	MFL	IND	GCF	EG	AGR
Mean	25.38	6.48	8.79	29.32	6.31	24.08
Std. Dev.	0.26	0.72	2.03	2.19	1.07	0.15

Skewness	0.01	-0.02	-0.99	-0.14	-1.20	-0.14
Kurtosis	1.75	1.59	3.83	1.61	4.61	1.91

Panel (B): Correlation Matrix

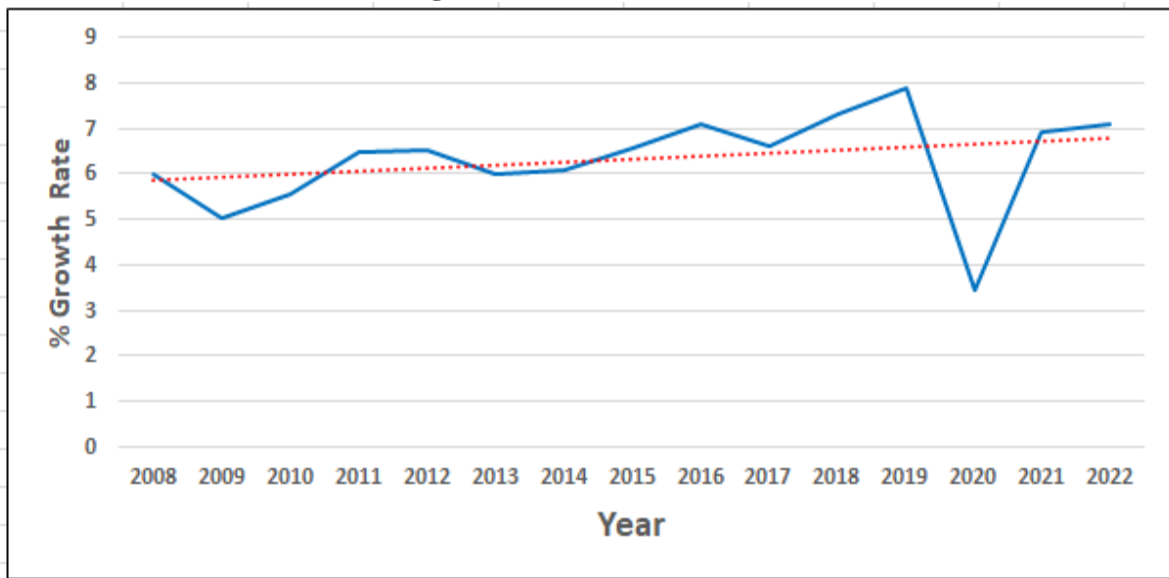
Variable	SRV	IND	AGR	EG	GCF	MFL
SRV	1.00	0.29	0.99	0.29	0.96	0.99
IND	0.29	1.00	0.30	0.94	0.37	0.31
AGR	0.99	0.30	1.00	0.29	0.96	0.99
EG	0.29	0.94	0.29	1.00	0.39	0.32
GCF	0.96	0.37	0.97	0.39	1.00	0.98
MFL	0.99	0.31	0.99	0.32	0.98	1.00

Source: Author Calculation based on data obtained from Bangladesh National Portal, Bangladesh Bureau of Statistics, and the Bangladesh Economic Review and World Bank

Figure 1 summarizes Bangladesh's economic growth from 2008 to 2022. The blue line shows the annual growth rate in percentage, but the red dotted line illustrates the overall trend over the period. Around 2008, the growth rate experienced a slight decrease in the initial years, succeeded by a consistently increasing trajectory. Beginning in 2010, there was a steady growth trend, but with some problems over this period. This phase of mild fluctuations persists until 2019, with the general trend indicating upped momentum. By 2019, Bangladesh experienced one of its peak growth rates in the entire historical period.

Nonetheless, 2020 signifies a significant reduction in the growth rate, characterized by a steep decrease presumably associated with the worldwide economic recession resulting from the COVID-19 pandemic. This significant decline illustrates the economic disturbances resulting from lockdowns, decreased global demand, and restrictions on business activities experienced worldwide. In 2021, the economy saw a significant revival, recovering much of the previous year's losses. This robust recovery underscores the tenacity of the Bangladeshi economy in rebounding from the pandemic-induced downturn. By 2022, the growth rate will stabilize, although slightly less than the pre-pandemic peak. The red dotted line illustrates the long-term trend of economic growth over 15 years. Despite the yearly variances, the overarching trend is ascending, indicating steady economic growth.

Figure-1 Economic Growth



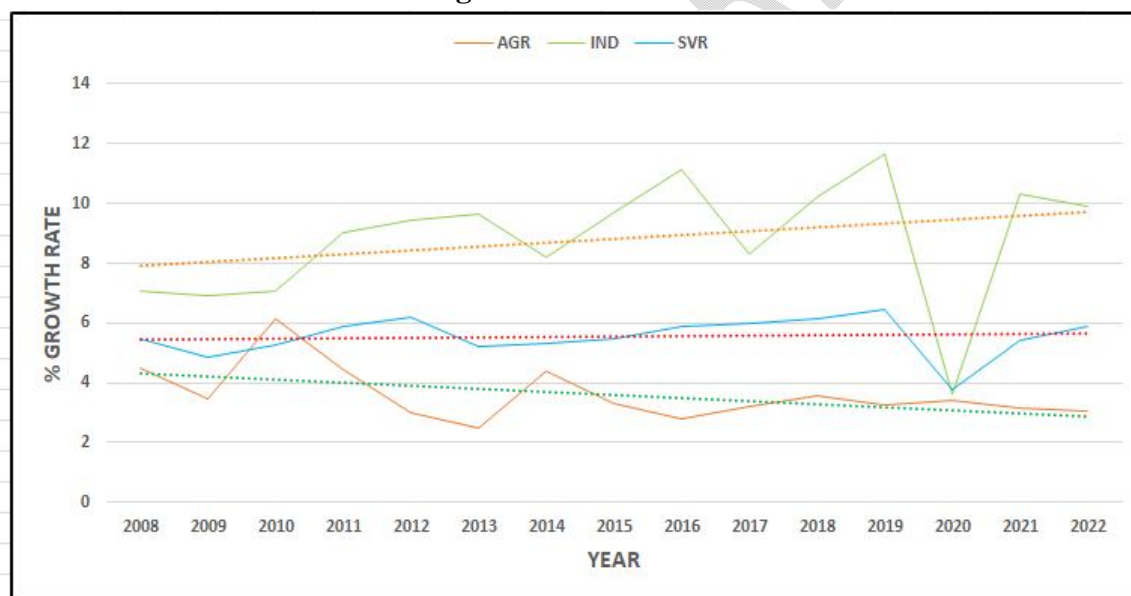
Source: Author Calculation based on data obtained from World Bank

Similarly, Figure 2 illustrates the growth rates of three critical sectors of the Bangladeshi economy from 2008 to 2022: Agriculture (AGR), Industry (IND), and Services (SVR). Each sector is represented by a distinctive line, accompanied by dotted trend lines that illustrate the general growth trend over time.

The orange line indicates that agriculture experienced mild and uneven growth. The growth rate of this industry ranges from 2% to 5% in most years, signifying a gradual expansion pace. The trend line for the agricultural sector indicates a mild downward path, implying a progressive drop in growth over time. This may be ascribed to climate variability, changing labor patterns, or structural economic transformations. The industry sector, denoted by the green line, exhibits a significantly more volatile pattern. This sector experiences substantial fluctuations in growth rate, with peaks above 12% in certain years, notably in 2017 and 2019. However, there was a significant decline, particularly in 2020, coinciding with the worldwide economic recession induced by the COVID-19 pandemic. The industrial sector is recovering significantly, achieving a high growth rate by 2021. The industrial trend line continues to grow higher, reflecting a generally good trajectory and signifying that the industry has been a vital contributor to economic growth in Bangladesh. The service sector, represented by the blue line, exhibits a comparatively stable growth rate with less volatility than the industrial sector. The growth rate

for services generally fluctuates between 5% and 7%, demonstrating a steady contribution to the economy. Nonetheless, similar to other sectors, services experienced a significant downturn in 2020 due to the pandemic, succeeded by an upsurge in the following year. The trend line for services demonstrates moderate and consistent growth over time, indicating that this sector has consistently contributed to Bangladesh's economy. Overall, the graphic illustrates the distinctive growth directions of the three sectors. Agriculture continues to experience slow and declining growth; industry exhibits greater dynamism with significant fluctuations, whereas services sustain a consistent but moderate growth rate. The pandemic's effects in 2020 are evident across all sectors; nevertheless, industry saw the most significant volatility, whereas services and agriculture exhibited a more moderated response. The trend lines indicate that although agriculture may encounter difficulties sustaining growth, the industrial and service sectors are expected to continue promoting Bangladesh's economic development.

Figure: 2Sector-wise Growth



Source: Author Calculation based on data obtained from World Bank

On the other hand, the agriculture sector experienced greater volatility, specifically post-2010. Growth exhibited a declining tendency after an initial increase, observing a significant decline around 2020, followed by a gradual regaining in the years following. The graph illustrates the significant effects of external shocks, like the pandemic, on all sectors, with the industrial sector exhibiting the most volatility, whereas the service and agriculture sectors saw more steady trends.

Table 3 Stationarity Results

Variables	ADF-Unit Root		PP- Unit Root		Order of Integration
	Level (with Constant) t- Statistics	First Difference (with Constant) t-statistics	Level (with Constant) t-statistics	First Difference (with Constant) t-statistics	
AGR	-6.034316**	-----	-4.784507***	-----	I (0)
SVR	-----	-3.585621**	-----	-5.439329***	I (1)
IND	-3.213209**	-----	-4.533528**	-----	I (0)
GCF	-----	-3.534066**	-3.446332**	-----	I (1)
MFL	-----	-4.496300**	-----	-5.680482***	I (1)
EGR	-3.961078***	-----	-3.961316***	-----	I (0)

Source: Author Calculation based on data obtained from Bangladesh National Portal, Bangladesh Bureau of Statistics, and the Bangladesh Economic Review and World Bank

Table 3 displays the results of the stationarity tests obtained from ADF and PP unit root methods. The ADF findings indicate that agriculture (AGR), industrial sector (IND) and economic growth rates (EGR) are stationary at levels whereas service sector (SVR), microfinance loans (MFL) and gross capital formation (GCF) exhibit stationarity at their first differences. Moreover, the ADF findings are further supported by PP test. Both tests indicate a mixed order of integration among variables at the 5% significance level. Thus the mixed order of integration provides the basis for using the ARDL approach to estimate both long-run and short-run coefficients (Pesaran et al., 2005), and the estimated results are reported in Table 4.

Table 4 ARDL Bound Result

Part-1				
Level of Significance	Lower Bound I(0)	Upper Bound I(1)	F-Statistics (Part-1)	
10%	3.17	4.14	Eq.1 (10.26) Eq. 2 (14.60) Eq. 3 (10.95)	
5%	3.79	4.85		
2.5%	4.41	5.52		
1%	5.15	6.36		
Part- 2				
10%	2.72	3.77		

5%	3.23	4.35	Eq. 4 (55.32)
2.5%	3.69	4.89	
1%	4.29	5.61	

Source: Author Calculation based on data obtained from Bangladesh National Portal, Bangladesh Bureau of Statistics, and the Bangladesh Economic Review and World Bank

We employed the bound test to assess the association's importance over a long period. Table 4 presents the outcomes for four distinct equations, with F-values of 10.26, 14.60, 10.95, and 55.32 for Equation 1, Equation 2, Equation 3, and Equation 4 of Part 2, respectively. The F-statistics exceed the lower and upper bounds at the 1% significance level, demonstrating a long-run connection among the variables.

Table 5 Empirical Estimation

Panel (A): Long-run & Short-run coefficients of Part- 1					
Long-Run Estimates			Short-Run Dynamic		
Summary Statistics For Equation 1			Summary Statistics For Equation 5		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
MFL	0.186702	0.0340	ECM	-0.359344	0.0012
GCF	-0.001669	0.9381	R-Squared		0.87
Summary Statistics For Equation 2			Summary Statistics For Equation 6		
MFL	0.161248	0.0405	ECM	-0.082176	0.0000
GCF	0.070642	0.0111	R-Squared		0.84
Summary Statistics For Equation 3			Summary Statistics For Equation 7		
MFL	-4.038714	0.0105	ECM	-2.196657	0.0003
GCF	1.533994	0.0005	R-Squared		0.89
Panel (B): Long-run & Short-run coefficients of Part- 2					
Summary Statistics For Equation 4			Summary Statistics For Equation 8		
AGR	-4.721761	0.0741	ECM	-0.976826	0.0000
SVR	4.092251	0.0145	R-Squared		0.94
IND	0.157914	0.0000			
Panel (C): Diagnostic Results					

Test	Test Name	Part-1		Part-2	
		Prob. Eq1	Prob. Eq2	Prob. Eq3	Prob. Eq4
Serial Correlation	Breusch-Godfrey	0.79	0.72	0.97	0.81
Heteroscedasticity	Breusch-Pagan	0.48	0.62	0.37	0.06
Normality Test	Jarque-Bera	0.59	0.88	0.81	0.59

Source: Author Calculation based on data obtained from Bangladesh National Portal, Bangladesh Bureau of Statistics, and the Bangladesh Economic Review and World Bank

Table 5 presents the long-term estimations and short-term dynamics for all specified equations. In Equation 1, with the agriculture sector as the dependent variable and microfinance loan distribution (MFL) and gross capital formation as independent variables, the findings demonstrate that a 1% increase in MFL results in a 0.19% rise in agricultural production. In Equation 2, with the service sector as the dependent variable, a 1% increase in MFL results in a 0.16% rise in the service sector. In Equation 3, using the industrial sector as the dependent variable, a 1% rise in MFL leads to a 4.038% reduction in industrial output in the long term. The significant adverse effect of microfinance lending on the industrial sector emphasizes the substantial disparity between microfinance programs and the industrial sector in Bangladesh (Alauddin & Chowdhury, 2015; Hasan & Islam, 2008). Furthermore, the positive and statistically significant outcomes for the agriculture and service sectors emphasize the significance of microfinance loan allocation in Bangladesh.

Following an analysis of the effects of load distribution on the agriculture, service, and industry sectors, a subsequent investigation was performed to assess the contributions of these sectors to Bangladesh's economic growth. The empirical findings in Table 5 of Part 2 reveal that the service and industry sectors positively influence economic growth, but the agriculture sector has a negative effect. The positive and statistically significant influence of the service and industrial sectors affirms the prior findings of Islam et al. (2020) and Yousuf et al. (2019). Nonetheless, the service sector proved to be the more significant determinant, as seen by its higher coefficient values relative to the industrial sector in the long term.

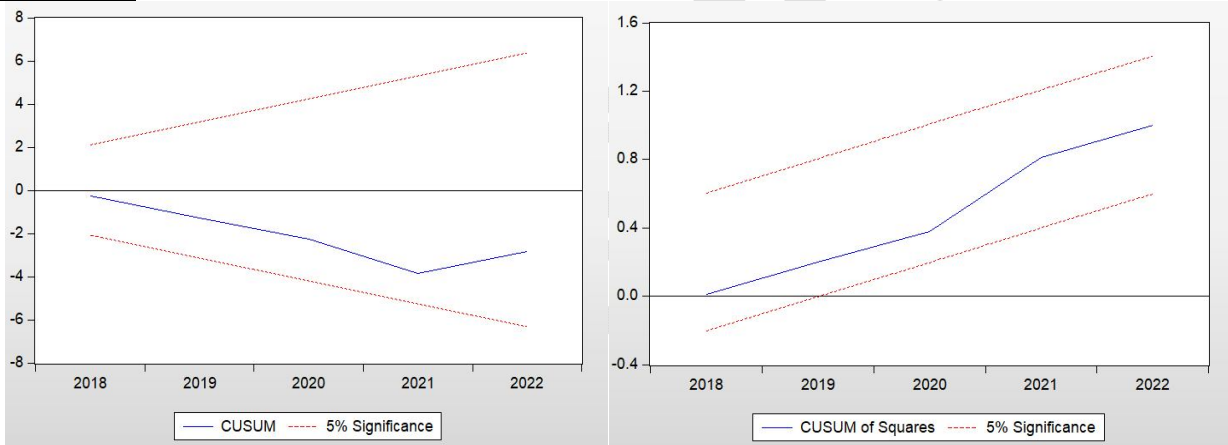
Furthermore, the model demonstrates significant explanatory power, as the corresponding R-squared values. The error correction model (ECM) for Equations 1, 2, and 3 in Part 1 and

Equation 4 in Part 2 exhibits negative and statistically significant coefficients. These suggest that any short-term disequilibrium can be rectified within a year at rates of 0.36, 0.08, 2.20, and 0.97, respectively.

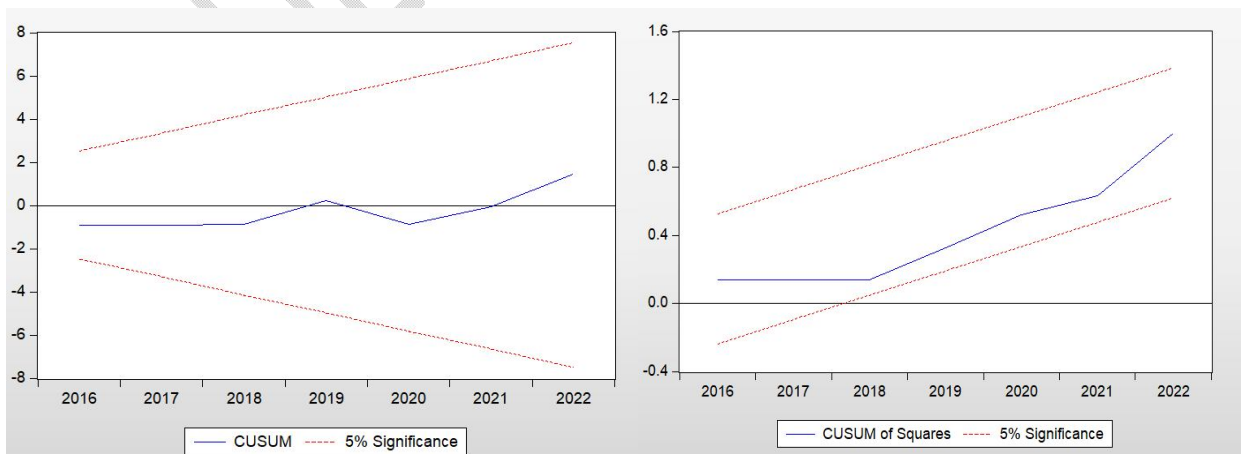
Moreover, the diagnostic tests have been conducted to validate the long-run and short-run ARDL model findings, with results displayed in Table 5 of panel C. The Breusch-Godfrey Lagrange Multiplier (LM) test validated the absence of serial correlation in the model, while the Breusch-Pagan test demonstrated a presence of homoscedasticity. The Jarque-Bera test further confirmed that the residuals follow a normal distribution, proven by their corresponding p-values.

Figure 3 Stability Results

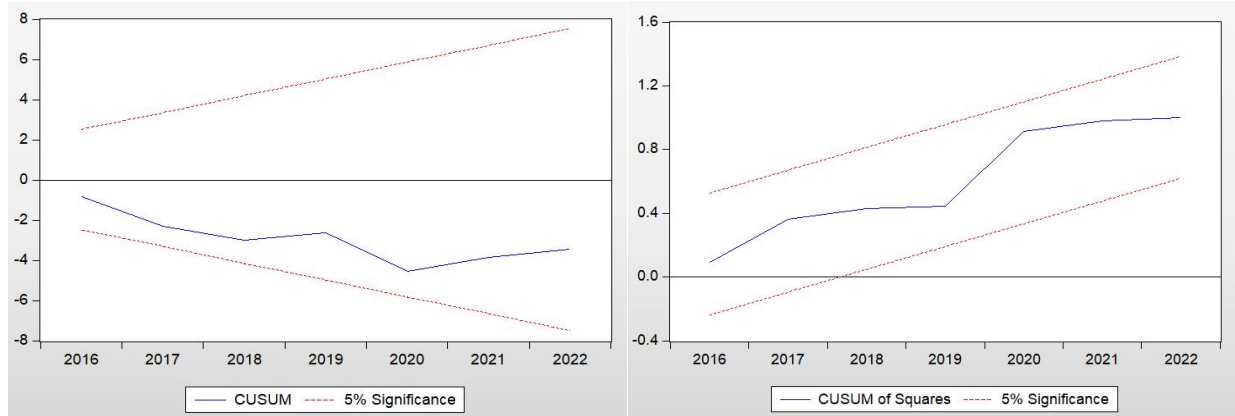
Equation 1



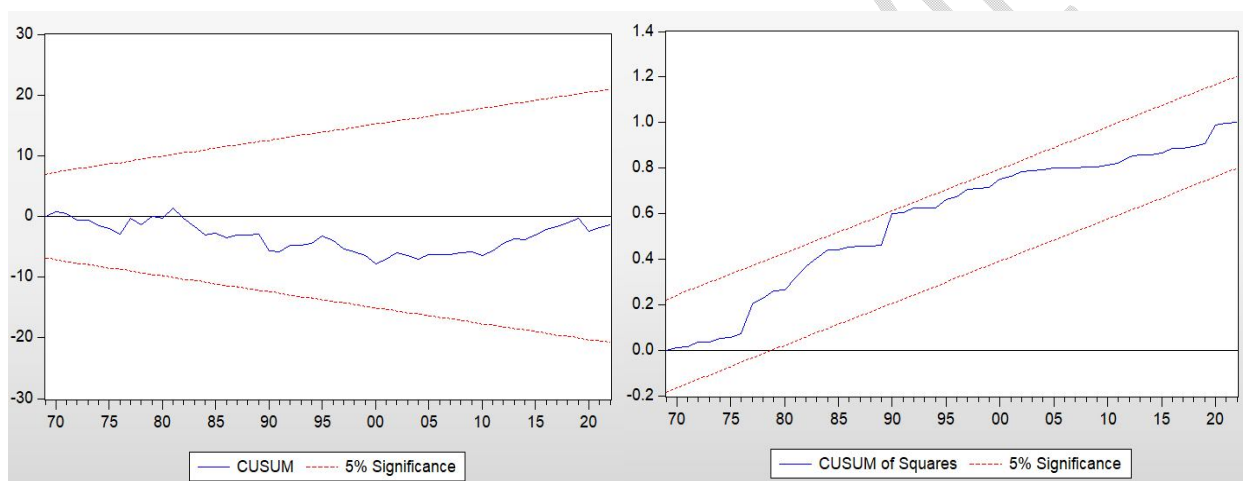
Equation 2



Equation 3



Equation 4



The CUSUM and CUSUMSQ plots in Figure 3 remain inside the 5% critical boundaries, signifying model stability (Brown et al., 1975). Consequently, all diagnostic and stability assessments validate that the model has favorable econometric characteristics, providing it appropriate for policy development.

4. Conclusion

The Autoregressive Distributed Lag model results demonstrate that microfinance loans positively impact both the agriculture and service sectors, enhancing growth and productivity in these domains. The results indicate the adverse impact of microfinance on the industrial sector, implying that the financial assistance intended to foster growth may not be efficiently employed in this area. The service and industrial sectors exhibit a favorable and statistically significant impact on total economic growth. This signifies that expansion in these sectors aligns with Bangladesh's broad economic goals. Contrary to predictions, the agricultural sector does not

significantly influence economic growth, emphasizing potential inefficiencies and problems within this vital sector. These findings illustrate the necessity for policymakers and government officials in Bangladesh to tackle the minimal impact of microfinance on the industrial sector and the agricultural sector's insufficient contribution to economic growth. Formulating suitable regulations that improve the efficacy of microfinance in these regions is crucial for optimizing its capacity as an instrument for economic development. By enhancing techniques that address the distinct requirements of each sector, the government can more effectively utilize microfinance's potential to promote sustainable growth and enhance overall economic performance. Extending the scope of the study would explain microfinance's function in sector-specific loan allocation and its influence on the economic growth of various sectors in Bangladesh.

Reference

1. Adhikary, S., & Papachristou, G. (2014). Is there a trade-off between financial performance and outreach in South Asian microfinance institutions?. *The Journal of Developing Areas*, 381-402.
2. Adil, M.H., Khan, M.A. and Rasool, H. (2021), "Determinants of inflation in India in a dynamic setup", *The Singapore Economic Review*, doi: 10.1142/S0217590821500739.
3. Ahlin, C., Lin, J., & Maio, M. (2011). Where does microfinance flourish? Microfinance institution performance in macroeconomic context. *Journal of Development economics*, 95(2), 105-120.
4. Ahmed, S. (2004). *Microcredit in Bangladesh: achievements and challenges*. Palli Karma-Sahayak Foundation (PKSF).
5. Alauddin, M. D., & Chowdhury, M. M. (2015). Small and medium enterprise in Bangladesh-Prospects and challenges. *Global Journal of Management and Business Research*, 15(7), 11.
6. Banto, J. M., & Monsia, A. F. (2021). Microfinance institutions, banking, growth and transmission channel: A GMM panel data analysis from developing countries. *The Quarterly Review of Economics and Finance*, 79, 126-150.
7. Beck, T., Demirgüç-Kunt, A., & Honohan, P. (2009). Access to Financial Services: Measurement, Impact, and Policies. *World Bank Research Observer*, 24(1).
8. Bel hadj Miled, K., & Ben Rejeb, J. E. (2018). Can microfinance help to reduce poverty? A review of evidence for developing countries. *Journal of the Knowledge Economy*, 9, 613-635.

9. Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society: Series B (Methodological)*, 37(2), 149-163.
10. Brune, A. (2009). An empirical study on the impact of microfinance institutions on development. An Unpublished Bachelor of Arts Thesis of the Institute for Empirical Research in Economics (IEW) at the University of Zurich.
11. Dickey, David A., and Wayne A. Fuller (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association* 74, no. 366: 427-431.
12. Donou-Adonsou, F., & Sylwester, K. (2017). Growth effect of banks and microfinance: Evidence from developing countries. *The Quarterly Review of Economics and Finance*, 64, 44-56.
13. Ferdousi, F. (2015). Impact of microfinance on sustainable entrepreneurship development. *Development Studies Research*, 2(1), 51-63.
14. Goldsworthy, H. (2010). Microfinance, Human Security, and Millennium Development Goal No. 7. <https://brill.com/view/journals/pgdt/9/3-4/article>.
15. Hamada, M. (2010). Commercialization of microfinance in Indonesia: The shortage of funds and the linkage program. *The Developing Economies*, 48(1), 156-176.
16. Hartarska, V. (2005). Governance and performance of microfinance institutions in Central and Eastern Europe and the newly independent states. *World development*, 33(10), 1627-1643.
17. Hasan, R. A., & Islam, K. Z. (2008). Bridging the Gap between Microfinance and SME Financing in Bangladesh: unlocking the potentials. *Daffodil International University Journal of Business and Economic*, 3(1), 41-57.
18. Hollis, A., & Sweetman, A. (2001). The life-cycle of a microfinance institution: The Irish loan funds. *Journal of economic behavior & organization*, 46(3), 291-311.
19. Islam, M. S., Hasif, M. A. M., Ema, N. S., & Jahan, H. (2020). Role of agriculture and manufacturing sectors in the economic growth of Bangladesh and India: An ARDL approach. *The Romanian Economic Journal*, 78, 89-92.
20. Karlan, D., & Goldberg, N. (2006). The impact of microfinance: A review of methodological issues. World Bank, *Doing Impact Evaluation Series*, 7.
21. Khandker, S. R., & Koolwal, G. B. (2016). How has microcredit supported agriculture? Evidence using panel data from Bangladesh. *Agricultural Economics*, 47(2), 157-168.

22. Khandker, S. R., Khalily, M. B., & Khan, Z. H. (1995). *Grameen Bank: performance and sustainability* (Vol. 306). World Bank Publications.
23. Kyereboah-Coleman, A., & Osei, K. A. (2008). Outreach and profitability of microfinance institutions: the role of governance. *Journal of Economic Studies*, 35(3), 236-248.
24. Mohd, S. (2018). A study on the performance of microfinance institutions in India. *International Academic Journal of Accounting and Financial Management*, 5(4), 116-128.
25. Murad, A. B., & Idewe, I. E. O. (2017). The impact of microfinance institution in economic growth of a country: Nigeria in focus. *International Journal of Development and Management Review*, 12(1), 1-17.
26. Nawaz, F. (2019a). *Microfinance and women's empowerment in Bangladesh*. Springer Nature, Switzerland AG.
27. Nawaz, F., & Nawaz, F. (2019b). Microfinance: it's globalization story. *Microfinance and Women's Empowerment in Bangladesh: Unpacking the Untold Narratives*, 23-35.
28. Pesaran, M. H. (1997). The role of economic theory in modelling the long run. *The economic journal*, 107(440), 178-191.
29. Pesaran, M. H., & Shin, Y. (1995). *An autoregressive distributed lag modelling approach to cointegration analysis* (Vol. 9514). Cambridge, UK: Department of Applied Economics, University of Cambridge.
30. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.
31. Pesaran, M. H., Shin, Y., & Smith, R. J. (2004). Bounds testing approaches to the analysis of long-run relationships.
32. Sinclair, S. P. (2001). *Financial exclusion: An introductory survey*. CRSIS, Edinburgh College of Art/Heriot Watt University.
33. Sulemana, A., & Adjei, S. A. (2015). Microfinance impact on agricultural production in developing countries: a study of the Pru District in Ghana. *International Journal of Academic Research and Reflection*, 3(3), 26-44.
34. Sultan, Y., & Masih, M. (2016). Does microfinance affect economic growth? Evidence from Bangladesh based on ARDL approach.
35. Vanroose, A., & D'Espallier, B. (2013). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development

and microfinance institutions' outreach and performance. *Applied Economics*, 45(15), 1965-1982.

36. World Bank group. (2015). *the Little Data Book on Financial Inclusion*. World Bank: Washington, DC, USA.
37. Yousuf, M., Ahmed, R., Akther, N., & Sumon, S. M. (2019). Estimating the services sector impact on economic growth of Bangladesh: An econometric investigation. *Asian Journal of Economic Modelling*, 7(2), 62-72.

UNDER PEER REVIEW