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Nexus Between Financial Inclusion and Economic Growth in Bangladesh (2004-2021): ARDL Approach

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Abstract

The purpose of this paper is to assess the dynamic impact of financial inclusion on Bangladesh's economic growth, an emerging economy. In this study, Autoregressive Distributed Lag (ARDL) methods were used for analysis, focusing on the primary research question using time-series data spanning 2004 to 2021. The ARDL analysis indicates no significant relationship between financial inclusion and economic growth in Bangladesh in the short- or long-term. The study concludes that the development of financial institutions and improved use of banking services do not significantly contribute to the country's economic progress. Despite this, financial inclusion appears to drive economic expansion, but its effectiveness is hindered by factors such as the prevalence of the informal sector and the inadequate customization of financial services to meet the needs of lower-income groups. The assessment of financial inclusion's effectiveness may be incomplete if solely based on the expansion of financial institutions and banking services, as other factors, such as product diversity and utilization rates, could provide more accurate measures, while external shocks and economic cycles could significantly influence the relationship between financial inclusion and economic growth. The burgeoning position of Bangladesh's economy necessitates a thorough examination of initiatives for financial inclusion and their potential impact on GDP growth. Despite various obstacles and a noticeable lack of financial literacy among its citizens, there is a critical need to assess the effectiveness of these efforts. This research embarks on an innovative investigation into the causal link between indicators of financial inclusion and Bangladesh's economic progress. Significantly, this study represents a groundbreaking endeavor, supported by recent empirical evidence and collaborative efforts to promote financial inclusivity in Bangladesh's economic landscape. The implications of this study are poised to provide substantial insights beneficial to both financial institutions and policymakers.

Keywords: *Financial inclusion · financial institution · Economic growth · Developing country · emerging economy · Bangladesh*

JEL Classification: *G2 · G21 · G28*

1. Introduction

Financial inclusion, as defined by the World Bank, is the accessibility of affordable, easily attainable financial services and products that meet the

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needs of individuals and enterprises. This encompassing framework includes transactions, payments, savings, credit, and insurance, all provided ethically and sustainably. Access to transaction accounts serves as a fundamental gateway to a wide range of global financial services and is therefore crucial to achieving greater financial inclusion. Recognizing the pivotal role of financial institutions in fostering economic growth, elevating living standards, and bolstering the performance of small and medium-sized enterprises (SMEs), initiatives to enhance financial inclusion have garnered global attention. In Bangladesh, where financial inclusion remains a critical concern, initiatives such as agent banking, Corporate Social Responsibility (CSR) programs, and Mobile Financial Services (MFS) have been pivotal in extending the reach of formal financial services to previously underserved populations (Noor et al., 2022; Khanam, 2022; Ibne Afzal et al., 2023). Despite these efforts, significant segments of the population remain excluded from the formal financial system, presenting challenges to sustainable development (Islam, 2022).

Bangladesh stands as a compelling case study in the pursuit of financial inclusion, placing significant emphasis on integrating marginalized segments of society into the formal financial ecosystem. Notably, microfinance initiatives led by organizations like Grameen Bank have played a transformative role in extending financial services to historically underserved populations, particularly in rural areas. The overarching objective of these initiatives is to empower individuals and catalyze economic progress, thereby advancing broader socio-economic development. The correlation between financial inclusion strategies and economic growth is well-documented, with inclusive lending practices identified as catalysts for entrepreneurial endeavors and facilitators of overall prosperity. Moreover, the infusion of technology into financial services has emerged as a potent driver of transformation in Bangladesh, enhancing efficiency, accessibility, and inclusivity. The deployment of digital solutions not only enhances institutions' financial performance but also contributes to the broader financial inclusion agenda. Central to the discourse on financial inclusion is the regulatory framework, which shapes the dynamic between inclusive approaches in the financial sector and broader economic growth objectives. It is imperative to formulate and enforce regulations that champion inclusive practices while safeguarding the integrity and stability of the financial system. Such measures are essential for nurturing a resilient and harmonious financial environment conducive to sustainable economic growth. The adoption of mobile banking and inclusive financing practices has yielded promising outcomes, enhancing financial inclusion and catalyzing economic growth in Bangladesh (Uddin & Begum, 2023). Studies have indicated positive correlations between financial inclusion, poverty alleviation, and women's empowerment, underscoring the multifaceted benefits of inclusive financial services (Chakraborty & Abraham, 2023; Islam, 2023). However, the literature lacks a comprehensive exploration of the causal relationship between financial inclusion indicators and economic growth in Bangladesh. In this context, this paper explores the relationship between financial inclusion and economic growth in Bangladesh, considering two key dimensions: the penetration of banking institutions and the availability and access to banking services, shedding light on the transformative impact of inclusive financial practices on socio-economic development. Through a comprehensive analysis of microfinance interventions, technological innovations, and regulatory frameworks, this research aims to provide valuable insights into the multifaceted dynamics of financial inclusion and its implications for economic prosperity in Bangladesh.

This study aims to address this gap by conducting an empirical analysis to elucidate the causal nexus between various indicators of financial inclusion and economic growth in Bangladesh. By leveraging existing literature and empirical data, this research aims to provide insights into the role of financial inclusion as a catalyst for economic development in an emerging economy such as Bangladesh. Through rigorous analysis, this study seeks to contribute to the growing body of knowledge on financial inclusion and its implications for sustainable economic growth, thereby informing policymakers, practitioners, and researchers alike.

2. Rationale of the Study

Financial inclusion has emerged as a critical aspect of economic development, particularly in developing countries like Bangladesh, where access to formal financial services remains limited for a significant portion of the population. This literature review synthesizes insights from a range of studies examining the relationship between financial inclusion and economic growth, with a particular focus on various empirical evidence and theoretical frameworks across different regions, especially Bangladesh, India, Nigeria, and African countries.

Financial inclusion aims to provide accessible financial services to all members of society, playing a crucial role in driving Bangladesh's economic development by expanding access and encouraging economic participation across different sections of society. Empirical evidence suggests a significant relationship between financial innovation and economic growth, with the circulation of credit to the private sector and effective monetary management identified as key factors (Qamruzzaman et al., 2017). Access to credit facilities is pivotal for individuals and businesses, particularly those in rural and underserved areas, to achieve financial inclusion and drive economic growth. Financial services that are easily accessible have been shown to facilitate the growth of new firms and foster innovation (Levine, 1997).

Theoretical frameworks, such as T. Hall's three-dimensional model of financial inclusion, which emphasizes financial participation, capability, and well-being, provide a comprehensive lens for understanding the multifaceted nature of financial inclusion and its potential impact on economic development

(Joshua et al., 2020; Noor et al., 2020). Financial inclusion has been found to have a significant positive impact on both economic growth and human well-being in Asian countries, with bank branches and loans to rural areas identified as key factors (Audi et al., 2019). Microfinance and microcredit initiatives have revolutionized rural areas of Bangladesh, empowering low-income households and small-scale entrepreneurs to enhance their livelihoods and contribute to economic development. Increased participation in financial services has been highlighted as crucial for driving GDP growth, particularly in low-income countries, with financial inclusion positively affecting financial efficiency and stability (Pal & Bandyopadhyay, 2022; Ahamed and Mallick, 2019). The stability of banks prioritizing financial inclusion is notably higher, benefiting small businesses and sectors and fostering economic growth (Ahamed and Mallick, 2019). Proactive regulatory policies and expanded financial literacy play significant roles in shaping outcomes related to financial inclusion in Bangladesh, with financial literacy contributing to inclusive finance and supporting the stability of the financial system (Khalily, 2016; Nawaz, 2010). Despite progress, challenges persist, including limited access, inadequate financial literacy, and high informal lending rates, hindering the effectiveness of financial inclusion initiatives, particularly among vulnerable populations (Amit et al., 2022). Addressing these challenges requires concerted efforts from policymakers to promote financial literacy, enhance regulatory frameworks, and leverage digital innovations to ensure inclusive growth.

Bangladesh has made notable progress in financial inclusion, particularly through microfinance initiatives like Grameen Bank. However, the literature reviewed underscores the importance of inclusive finance in promoting business growth and overall economic progress. Comprehensive strategies tailored to regional and population-specific needs are crucial for harnessing the potential of financial inclusion as a driver of sustainable economic development. The relationship between financial education, financial inclusion, and financial stability is intricate and crucial. Financial education plays a significant role in enhancing financial literacy and inclusion, potentially enabling individuals to benefit from the opportunities presented by big tech firms entering the financial sector (Jonker & Kosse, 2022; Saydaliev et al., 2022). Empirical studies suggest that financial literacy positively influences financial inclusion, with education status, age, and gender also being key determinants of inclusion (Jonker & Kosse, 2022). Therefore, a well-designed financial education program, coupled with appropriate regulatory frameworks, is essential to mitigate risks and ensure that financial inclusion contributes positively to overall financial stability. Financial education and financial inclusion, operating in tandem, contribute to greater financial stability by addressing both the supply side through increased access to financial services and the demand side through heightened awareness of the benefits and necessities of utilizing such services offered by banks and other financial institutions (Bhaskar, 2013).

Table 1: Literature review on existing work of Bangladesh

Author	Topic	Methodology	Variables	Findings	Gap
Noor & Shirazi (2022)	Effects of Financial Inclusion on the Economic Growth of Developing Countries: An Empirical Analysis of the Bangladesh Economy from 2011 to 2020	Multiple regression analysis was used	Financial inclusion is assessed by the number of Automated Teller Machines (ATMs) and the credit-deposit ratio (CDR)	Financial inclusion plays a crucial role in economic development, with ATMs positively affecting GDP, whereas the CDR has a limited impact on GDP.	The study used only two determinants of financial inclusion, while the current study uses a financial index with the ARDL model
Audi et al. (2019)	Financial Inclusion, Economic Growth, and Human Well-Being Nexus: Empirics from Pakistan, India, China, Sri-Lanka, Bangladesh, and Malaysia	Panel pooled regression was used	Use GDP as a dependent variable and other independent variables, but do not use any financial inclusion index	The results show that financial development has a negative, insignificant impact on economic growth, but a negative, significant impact on human well-being.	The study was based on cross-country evidence, not specifically on Bangladesh, and they did not use the same variable as ours.
Saha et al. (2023)	The impact of financial inclusion on economic growth in developing countries	The two-stage system generalized method of moments (GMM) method was applied for the analysis	Used GDP per capita as the dependent variable and the financial inclusion index as an independent variable	Financial inclusion positively impacts economic growth in Bangladesh by expanding opportunities for lower-income individuals	This study is also a cross-sectional country study and our recent study found new insights and different results
Islam (2023)	Financial Inclusion as the Driver of Poverty Alleviation in Developing Economies: Evidence from Bangladesh	Ordinary Least Squares (OLS)	Income per capita is used as a dependent variable, and financial inclusion indicators are an independent variable	The study's empirical evidence suggests no statistically significant relationship between inclusive financing and poverty reduction in Bangladesh.	Though their finding was insignificant, it was not the study of the relationship between financial inclusion and economic growth
Amit et al. (2022)	Systemic Barriers to Financial Inclusion in the Banking Sector of Bangladesh	The study applied a qualitative approach, a focus group discussion. and key informants' interviews on identifying the existing number of challenges		RMG workers encounter barriers like insufficient documentation, financial illiteracy, and high fees from informal lenders, impeding access to financial services and exacerbating exploitation and debt.	This study identifies common barriers marginalized individuals face in accessing inclusive finance and thereby addresses a gap in understanding whether these barriers also impede economic growth.

There are numerous cross-country and country-specific empirical studies that examine the causal relationship between financial inclusion and economic growth. These studies vary across countries, with most revealing a significant relationship. In the context of an emerging economy like Bangladesh, introducing financial inclusion through various channels faces numerous barriers, including a lack of financial education and a critical gap in research on the impact of financial inclusion on GDP growth. Given the limited existing research in this area, the present study aims to explore the causal relationship between various financial inclusion indicators and economic growth in Bangladesh, an emerging economy.

H01: There is no significant relationship between GDP Per Capita and financial inclusion.

3. Theoretical Framework and Data Source

This study's thorough quantitative analysis is supported by data from reliable sources, including the Global Financial Development Database (GFDD) and the International Monetary Fund's (IMF) Financial Access Survey, covering the years 2004 to 2021. This ensures a high degree of reliability, credibility, and consistency in their quantitative analyses by using data from these well-established and internationally recognized repositories. In this study, we investigated the contextual relationship between different financial inclusion measures and Bangladesh's economic growth to answer the research question. Indicators of banking institutions have been employed in numerous studies to measure financial inclusion (Dahiya & Kumar, 2020; Raza et al., 2019; Yakubu & Musah, 2022; Khalily, 2016; Saha et al., 2023; Sharma, 2016). Various banking indicators have been used in studies to gauge the extent of financial inclusion. Drawing on prior research and the critical role of banking institutions in promoting financial inclusion in Bangladesh, which relies heavily on banks, this study centers on three essential aspects of financial inclusion. The following measurements are:

(1) penetration of banking institutions

(2) availability or access to banking services, and

(3) usage of banking services by the general public (Sarma, 2008).

The following criteria have been used to determine banking institution penetration:

- number of deposit accounts held by commercial banks per 1,000 adults (DAC); and

- number of loan accounts held by commercial banks per 1,000 adults (LAC).

Access to banking services has been indicated in terms of the following:

- bank branches per 1,000 km. (BRK)
- bank branches per 0.1 million adults. (BAC)
- ATMs per 1,000 km; and (ATMK)
- ATMs per 0.1 m adults. (ATMP)

The following are included in the use of banking services:

• Outstanding deposit (% of GDP)

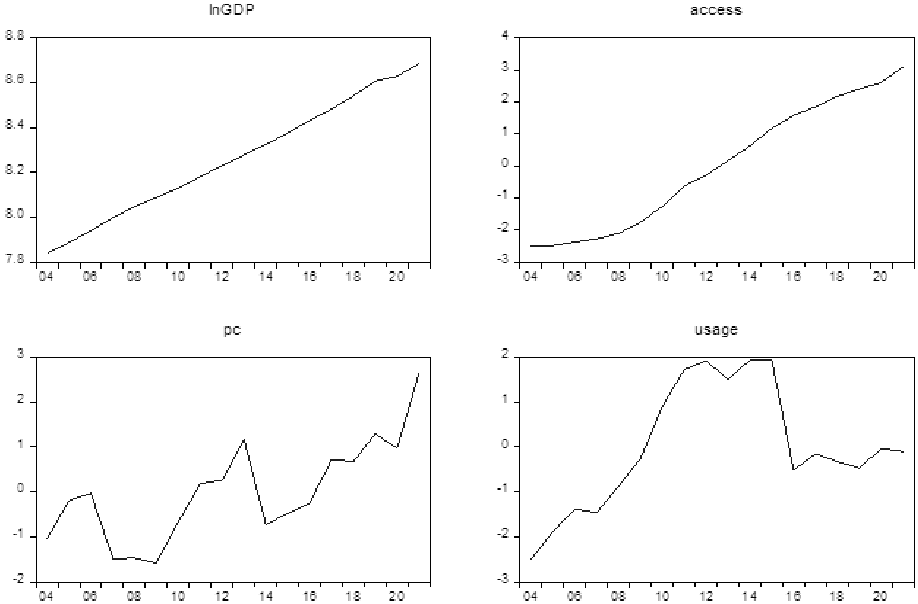
• Outstanding credit (% of GDP).

To investigate the short- and long-term relationships between composite dimensions of penetration, access, and usage with GDP, we developed an ARDL model for this study. We employed Principal Component Analysis to account for the composite dimension of penetration and access.

$$Penetration = f\ (DAC, LAC)$$

$$Access = f\ (BRK, BAC, ATMK, ATMP)$$

$$Usage = f\ (OD, OC)$$



Source: Global Financial Development Database (GFDD) & the International Monetary Fund's (IMF) Financial Access Survey

The linear functional association between the Dependent variables and independent variables stands:

GDP = f (Penetration, Access)

The empirical model stands as follows,

$$GDP_t = \beta_0 + \beta_1\, Penetrationt + \beta_2\, Accesst + \beta_3 Usage + \varepsilon_t \qquad (1)$$

Here,

$GDP_t = GDP$ per Capita at time t

Taking the natural log of the dependent variable, we get

$$ln\, GDPt = \beta_0 + \beta_1\, Penetrationt + \beta_2\, Accesst + \beta_3 Usage + \varepsilon_t \qquad (2)$$

4. Econometric Model

In this study, we will examine the effect of financial inclusion on Bangladesh's economic growth using time-series data from 2010 to 2021. We would apply the Autoregressive Distributed Lag (ARDL) methodology, which is the primary method recommended by Pesaran and Shin (1998). We believe this model is appropriate for representing the goal of our research because we intend to apply the Auto Regressive Distributed Lag (ARDL) approach in our investigation. Below is the description of the ARDL approach in an unrestricted error correction model (UCEM):

$$\begin{aligned} lnGDP_t = \alpha_0 &+ \sum_{i=1}^{p} \beta_i + ln\, GDP_{t-1} + \sum_{j=1}^{q} \beta_j\, Penetration_{t-1} \\ &+ \sum_{k=1}^{m} \beta_k\, Accesst_{t-1} + \sum_{l=1}^{n} \beta_l\, Usage_{t-1} + \lambda_1 lnGDP_{t-1} \\ &+ \lambda_2\, Penetration_{t-1} + \lambda_3\, Access_{t-1} + \lambda_4 Usage_{t-1} + \varepsilon_t \end{aligned}$$

Based on the derived model and data-set, we next explore the empirical association between per capita GDP and the financial inclusion dimension in Bangladesh. The error term is represented by ε, the exogenous variable subscripts, $t-1$ are the first difference operator and represent lags in the logarithm Δ. The short-run relationship is measured by the coefficients βs, and the long-run relationship is measured by the coefficientsλs. The model has intercept terms denoted by α0 and error terms denoted by $¶_t$.We then investigate the relationship between Bangladesh's financial inclusion dimension and per capita GDP in a developing nation, using the model and dataset generated.

5. Empirical Results and Discussion

The empirical findings and the relationships between the different aspects of financial inclusion and economic growth will be further discussed in this section. The descriptive statistics for the variables are shown in Table 2.

Table 2. Descriptive Statistics

Variables	Mean	Median	Std.	Jarque-Bera	Probability
lnGDP per Capita	8.26	8.25	0.26	1.0694	0.586
Penetration	1.67E-09	-0.112	1.24	0.76	0.68
Access	-5.00E-08	-0.06	1.99	1.68	0.43
Usage	1.67E-08	-0.203	1.38	0.77	0.67

Source: Author's own calculation.

The stationarity of the data series was verified using unit root test results (Table 3). The findings support stable data series, as each series rejects the null hypothesis of a unit root. With the exception of the access series, the series are stationary in levels and first differences. Our goal is to build a model using ln (GDP), PC, and usage. The variables at the second difference are not integrated. Therefore, the ARDL model makes sense.

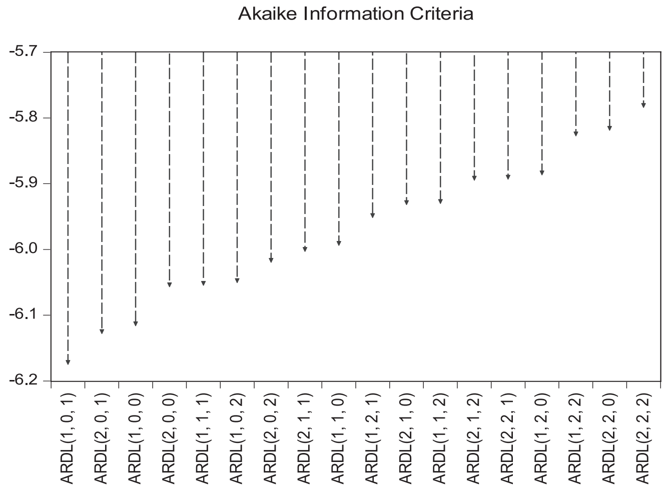
Table. 3. ADF Unit Root Test

	ADF (Level)		
Variables	Intercept	Trend & Intercept	Without Trend & Intercept
Ln GDP per Capita	0.0398 0.9501	-2.3546 0.3865	21.8054 0.9999
Penetration	-0.9267 0.7537	-3.8203** 0.0453	-1.0954 0.2364
Access	-0.1439 0.9282	-2.8203 0.2107	-0.7184 0.3894
Usage	-2.0023 0.2830	-1.4057 0.8208	-2.0196 0.0445
ADF (First Difference)			
Ln GDP per Capita	-4.6808*** 0.0023	-3.2437 0.1194	-0.2900 0.5629
Penetration	-4.3527*** 0.0044	-4.4797*** 0.0139	-4.2895*** 0.0003
Access	-2.2711 0.1918	-2.1232 0.4957	-0.2211 0.5908
Usage	-3.4455** 0.0247	-3.7308 0.0502	-3.5138* 0.0016

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. Source: Author's own calculation.

ARDL Estimation

We find the optimal lag for the suggested model once the dependent variable ln(GDP) passes the strict first-difference stationarity criterion in the ADF test above. Based on the minimum values of the selection-order criteria, the lag length is chosen to minimize the Akaike information criterion (AIC). Consequently, utilizing the AIC, we choose lag 1.



The results of the F-bounds statistic test are shown in Table 4. During the specified period, there was a discernible correlation among economic growth, the penetration of banking institutions, and the use of financial services. There exists a long-run relationship among variables, because the computed F-statistic is greater than the lower bound at all significant levels.

Table 4. Bound Test for Cointegration

F- Statistics	Level of Significance	Low Bound, I(0)	Upper Bound, I (1)	Long-run relationship
	10%	2.63	3.35	
115.9231	5%	3.1	3.87	Exist
	1%	4.13	5	

Source: Author's own calculation.

The ARDL model's short- and long-term coefficient estimations are displayed in Table 5. The model's variables appear to have a long-term, statistically significant relationship, as indicated by the bounds test. In the long-run equation, the individual coefficients for variables such as Usage and Penetration do not appear statistically significant on their own. This disparity could mean that although these variables work together to support a long-term equilibrium relationship, each variable's individual effect may not be as strong or may depend on other variables that this basic model does not account for. The impacts of other variables (such as Penetration and Usage) are less evident and statistically insignificant, but the short-run coefficients indicate that past GDP values have a considerable and immediate impact on the dependent variable.

Table 5. Short-run and Long-run Estimates for the Dependent Variable, in GDP

Long-run coefficients				
Variable	Coefficient	Std. Error	t-statistics	Prob
Penetration	0.192087	0.188875	1.017004	0.3292
Usage	-0.053200	0.197308	-0.269627	0.7920
Short-run coefficients				
Variable	Coefficient	Std. Error	t-statistics	Prob
LNGDP (-1)	0.987905	0.015180	65.08030	0.0000
Penetration	0.002323	0.003064	0.758143	0.4630
Usage	-0.005906	0.003493	-1.690704	0.1167
Usage (-1)	0.005262	0.003365	1.563997	0.1438

Source: Author’s own calculation.

In Bangladesh, the financial inclusion-growth relationship is not supported by data in either the short or long term, according to the ARDL model’s overall analysis. So, our null hypothesis can’t be rejected. Hence, the development of financial institutions and the usage of banking services have no bearing on Bangladesh’s economic progress. These results run counter to those of Saha et al. (2023), who demonstrated that financial inclusion increases opportunities for lower-income individuals, thereby benefiting Bangladesh’s economic growth. A nation’s ultimate economic prosperity, therefore, does not result from the integration of the entire society into the financial system through efficient banking penetration and usage of financial services.

Table 6. Diagnostic Test

Test	Test statistics	P-value
Breusch-Godfrey serial correlation LM test	5.28	0.0272

Notes: At 1% significant level, no autocorrelation exists.

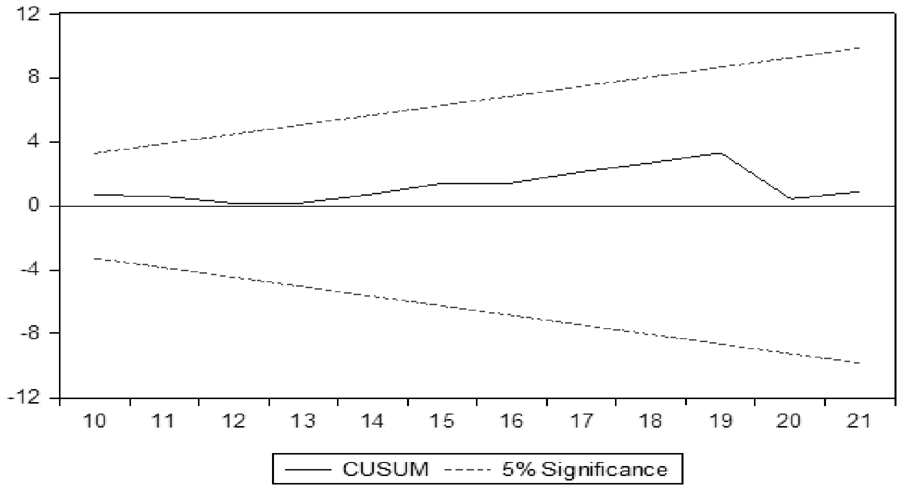


Figure 1. The CUSUM test as a stability test for Bangladesh from 2010 to 2021
Source: Author's own calculation.

The CUSUM (cumulative sum) was used to confirm the model's stability (Figure 1). The regression model parameters for Bangladesh exhibit a breakpoint. The CUSUM test reveals how the parameters move throughout the corridor.

6. Concluding Remarks and Policy Implications

This study aims to validate the relationship between finance and growth in the context of financial inclusion and economic growth in Bangladesh's rising economy between 2004 and 2021.

It is possible that the available financial services are not sufficiently customized to meet the demands of the most economically active parts of the population or the general public. Financial products that do not meet the needs of small enterprises or lower-income consumers may not be effective tools for promoting economic expansion. Bangladesh has a sizable informal sector that may not fully utilize official financial services due to various obstacles, including a lack of knowledge, trust, or context. The possible effect of financial inclusion programs on overall economic growth is lessened by this disparity. Significant economic consequences might not materialize below certain thresholds of financial inclusion. To maximize the impact of financial inclusion on economic growth in Bangladesh, authorities should focus on tailoring financial products for key sectors such as SMEs and agriculture, while improving financial literacy across all segments of society. To ensure that financial services are widely accessible, efforts should be made to strengthen both the physical and digital infrastructure. Regulatory reforms should also aim to protect consumer interests while fostering innovation.

7. Limitations

The standards by which financial inclusion is evaluated may not entirely capture the quality and efficacy of financial inclusion initiatives, as reflected in the growth of financial institutions and the use of banking services. The variety of financial products offered or the rates at which financial services are used may offer better indicators. The relationship between financial inclusion and economic growth may be significantly altered by exogenous shocks and larger economic cycles, which it may fail to account for.

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