**The Digital Leap: Advancing Financial Inclusion for Marginalized Communities in Bangladesh Through Digital Financial Services**

**Abstract:**

This study examines the impact of digital financial services on financial inclusion in Bangladesh, with a particular focus on marginalized communities. Using data from the IMF Financial Access Survey (FAS) 2023 and employing regression and time-series analysis, the paper highlights significant relationships between digital banking indicators and financial inclusion outcomes, such as SME loans and the number of borrowers per 1,000 adults. The findings underscore the transformative potential of digital banking in bridging financial gaps while identifying persistent challenges, including limited infrastructure, digital literacy deficits, and gender disparities. The paper concludes with actionable recommendations for policy interventions to address these barriers and promote sustainable financial empowerment. This study helps explain how digital financial services promote economic growth in developing countries.

**Keywords:** *Digital banking, financial inclusion, SME financing, marginalized communities, Bangladesh, mobile banking, financial empowerment.*

**JEL Classifications:** G21, O16, O33, P46.

1. **Introduction:**

The advent of digital financial services has revolutionized the financial inclusion landscape in developing economies, offering new opportunities for marginalized communities to participate in the formal economy. Bangladesh, as a rapidly developing nation, has seen substantial growth in mobile and internet banking services, which have emerged as key drivers of inclusive development. The introduction of digital financial platforms like bKash, Rocket, and Nagad has enabled accessing to financial services in geographically remote and underprivileged regions (Siddik et al., 2014). These platforms address the barriers of traditional banking systems, such as limited infrastructure and high transaction costs, providing greater flexibility and efficiency for previously excluded populations (Demirgüç-Kunt et al., 2017). Mobile and internet banking have proven to be powerful tools in empowering small businesses, women entrepreneurs, and rural populations. For instance, studies have demonstrated that mobile financial services (MFS) significantly reduce transaction costs, improve savings habits, and enhance access to credit, which in turn drives entrepreneurship and poverty alleviation (Khobragade et al., 2024). In Bangladesh, the expansion of digital financial services has been driven by rising mobile phone usage and supportive government policies advancing financial technology (Banna, 2020). Between 2012 and 2022, mobile banking transactions and active mobile money accounts have grown exponentially, reflecting a positive trend toward financial inclusion (Siddik et al., 2014; Vo et al., 2021). However, significant challenges persist in ensuring the widespread adoption of mobile and internet banking, particularly for marginalized communities. Limited digital and financial literacy remains a critical barrier, especially in rural areas where education levels are relatively low (Khobragade et al., 2024). Moreover, socio-cultural barriers, including gender inequality and mistrust in digital financial systems, continue to inhibit women’s participation in digital banking (Han, 2024). Infrastructure gaps, such as unreliable internet connectivity and a lack of access to mobile devices, further exacerbate the digital divide (Banna, 2020; Vo et al., 2021). Addressing these challenges is essential to ensure that digital financial services fulfill their potential in empowering marginalized groups. This study, titled "The Digital Leap: Empowering Bangladesh’s Marginalized Communities Through Mobile and Internet Banking," aims to assess the influence of mobile and internet banking on financial empowerment. The research focuses on quantifying the relationship between digital financial tools and key indicators of financial inclusion, such as access to bank credit, bank savings accounts, and SME development. By leveraging a robust dataset and integrating evidence from existing literature, this study intends to identify both the opportunities and challenges allied with digital financial inclusion aspects in Bangladesh. The outcomes will contribute to the growing discourse on financial empowerment and provide actionable recommendations for policymakers, financial institutions, and development practitioners striving to close the financial inclusion gap.

1. **Literature Review:**

The rapid proliferation of mobile and internet banking has played a transformative role in advancing financial inclusion globally, particularly in developing economies like Bangladesh. Financial inclusion, which involves providing affordable financial services to unbanked and underserved populations, is widely acknowledged as a key factor in reducing poverty and fostering economic empowerment (Demirgüç-Kunt et al., 2017; Fanta & Makina, 2019). In Bangladesh, where over 40% of adults remain excluded from formal financial systems, mobile financial services (MFS) have emerged as a key solution to bridge this gap (Siddik et al., 2014). Platforms like bKash, Rocket, and Nagad have leveraged the country’s rising mobile phone penetration to deliver accessible and low-cost financial tools to marginalized communities, including women, rural populations, and small business owners (Aziz & Naima, 2021; Yesmin et al., 2019). These innovations reduce geographic and institutional barriers while fostering savings behavior, enabling access to credit, and facilitating business transactions, particularly for micro-entrepreneurs and small and medium enterprises (SMEs) (Banna, 2020).

Despite the positive impacts, the implementation of digital financial services faces several obstacles. Structural constraints such as limited digital literacy, inadequate internet infrastructure, and affordability of smartphones disproportionately affect rural populations (Khobragade et al., 2024; Vo et al., 2021). Gender disparities exacerbate this issue, with women often facing social and cultural limitations to accessing mobile technology and financial services. Studies indicate that women’s financial empowerment through mobile banking is hindered by trust issues, lack of financial literacy, and societal norms (Demirgüç-Kunt et al., 2017; Mujeri & Azam, 2018). Yet, when women are provided access, they show remarkable improvements in financial independence and business ownership (Yesmin et al., 2019; Siddik et al., 2014). For instance, research by(Banna, 2020) highlights the direct relationship between access to mobile banking and the economic empowerment of female entrepreneurs in Bangladesh.

The role of SMEs in financial inclusion has also been widely studied. SMEs are recognized as a backbone of the Bangladeshi economy but often face challenges in accessing formal credit systems due to bureaucratic processes and collateral requirements (Fanta & Makina, 2019; Vo et al., 2021). Mobile banking provides a pathway for SMEs to access credit and payment systems, significantly reducing transaction costs and improving business efficiency (Banna, 2020; Yesmin et al., 2019). Siddik et al. (2014) argue that MFS can help SMEs overcome financing constraints, enabling them to scale operations and contribute to employment generation. However, to ensure sustained benefits, targeted policies such as low transaction fees, greater financial literacy programs, and agent banking initiatives are required to address infrastructural deficits (Khobragade et al., 2024; Mujeri & Azam, 2018). Globally, case studies from other developing economies support the transformative potential of mobile banking. For instance, Kenya’s M-Pesa platform is often cited as a model for financial inclusion, with studies highlighting its role in improving household incomes and reducing poverty (Jack & Suri, 2014; Fanta & Makina, 2019). Similar trends have been observed in South Asia, where mobile banking has significantly increased financial access for rural populations, albeit with region-specific challenges (Aziz & Naima, 2021). For Bangladesh, research suggests that public-private partnerships, alongside fintech innovations, are essential to replicate such successes and further reduce exclusion (Vo et al., 2021; Mujeri & Azam, 2018). Moreover, Bangladesh Bank’s Guidelines on Mobile Financial Services have provided a policy framework to scale up mobile and agent banking, yet significant gaps remain in implementation and outreach (Siddik et al., 2014; Yesmin et al., 2019).

Prodhan et al. (2024) investigated the role of DFS among Bangladeshi farmers and revealed a high rate of adoption, with bKash emerging as the most preferred platform due to its extensive agent network. However, the study highlighted significant challenges, including low digital literacy and frequent scams, which undermine trust in DFS platforms. Farmers expressed concerns over hidden transaction costs and technical issues, such as transaction failures and difficulties in resolving complaints, indicating a critical gap in DFS usability and security. Choudhury et al. (2023) provided insights into the role of mobile financial services in advancing financial inclusion in rural Bangladesh. The research emphasized the necessity of improving digital literacy among women and marginalized groups to ensure equitable access to DFS. The study also underscored the importance of partnerships between financial institutions and telecom operators to expand service outreach. Ali et al. (2023) explored the potential of artificial intelligence in improving DFS. The study argued that integrating AI-driven solutions can enhance customer experience by providing personalized financial advice and fraud detection mechanisms. This approach can significantly mitigate barriers such as financial illiteracy and security concerns, which are prevalent in Bangladesh’s DFS landscape. Dutta et al. (2023) analyzed DFS adoption among small and medium enterprises (SMEs) in South Asia, including Bangladesh. The research highlighted that despite the increasing use of DFS for business transactions, SMEs face challenges like high service costs and inadequate infrastructure. Addressing these issues through targeted policy interventions and infrastructural investments is essential for fostering broader adoption. Rahman et al. (2023) focused on the implications of digital payment systems for financial inclusion in Bangladesh. The findings demonstrated a positive correlation between mobile money penetration and access to financial services. However, the study noted that persistent gender and regional disparities limit the inclusive impact of DFS, calling for targeted efforts to address these inequalities.

In conclusion, while mobile and internet banking hold immense potential to empower marginalized communities in Bangladesh, addressing key challenges like digital literacy, gender disparities, and infrastructural deficits remains critical. Building trust in digital platforms, reducing transaction fees, and expanding financial literacy programs will be essential to ensure equitable adoption of digital financial services across all segments of society (Khobragade et al., 2024; Mujeri & Azam, 2018).

1. **Theoretical Contribution:**

This study makes important contributions to the academic discussion on financial inclusion and digital banking. First, it integrates the Technology Acceptance Model (TAM) (Davis, 1989) and the Access-Use Continuum Theory (Allen et al., 2016) to analyze the implementation and usage of digital banking services in enhancing financial inclusion. The findings validate TAM by demonstrating that digital banking indicators such as mobile money accounts, ATMs, and internet banking transactions are significant predictors of financial inclusion outcomes. Additionally, the study extends the Access-Use Continuum Theory by highlighting the barriers that limit the transition from financial access to effective usage, particularly in the context of Bangladesh. Second, this research adopts Sen’s Capability Approach (1999) to explore how financial inclusion through digital banking enhances not just economic capabilities but also social empowerment. Unlike previous studies conducted in Kenya (Mbiti & Weil, 2016) and India (Chauhan, 2015), the findings underline the unique infrastructural and regulatory challenges in Bangladesh, such as uneven digital literacy rates and gender disparities. These findings expand Sen’s framework by demonstrating that access to digital financial services can empower marginalized communities by reducing their dependence on traditional financial systems. Third, the study proposes a conceptual framework that links digital banking indicators to financial inclusion outcomes, moderated by factors such as literacy and gender. The framework establishes a clear relationship between technological adoption and financial empowerment, offering a model for future research in similar developing economies. This framework contributes to theoretical advancements by providing a nuanced understanding of how specific digital banking tools and infrastructure elements interact with social and institutional factors to drive financial inclusion. Finally, the study highlights the policy implications of its findings, aligning them with global strategies such as the United Nations Sustainable Development Goals (SDGs), particularly Goal 1 (No Poverty) and Goal 9 (Industry, Innovation, and Infrastructure). By bridging the gap between theoretical models and practical applications, this research offers a roadmap for policymakers and financial institutions aiming to enhance financial inclusion in resource-constrained settings.

1. **Problem Statement:**

Despite notable advancements in digital financial services, achieving financial inclusion remains a significant hurdle for many marginalized communities in Bangladesh. Rural populations, women, and small business owners still struggle to access formal financial services. Although tools like mobile money accounts and internet banking have made progress, their uneven adoption limits their potential to close the financial inclusion gap. Structural barriers such as inadequate infrastructure, low digital literacy, and socio-cultural challenges further restrict effective usage. It is essential to examine the impact of digital banking on financial inclusion, identify the obstacles faced by underserved groups, and develop practical strategies to ensure equitable access and drive inclusive economic growth.

1. **Research Objectives:**

The research objectives of this study are designed to explore the transformative role of digital banking in promoting financial inclusion among marginalized communities in Bangladesh. Specifically, the objectives are:

* To analyze the effect of digital banking tools, such as mobile money accounts and internet banking, on financial inclusion indicators.
* To assess the accessibility and adoption of digital financial services among marginalized populations.
* To identify barriers to digital financial inclusion and propose actionable solutions.
* To evaluate the function of traditional banking infrastructure in complementing digital financial services.
* To provide policy recommendations for leveraging digital tools to enhance financial inclusion.

These objectives aim to inform strategies for inclusive economic development in Bangladesh.

1. **Methodology:**

This study investigates the impact of mobile and internet banking on the financial empowerment of marginalized communities in Bangladesh, focusing on trends, drivers, and barriers to financial inclusion. This section outlines the data sources, variables, and analytical tools used to achieve the research objectives.

* 1. **Data Source:**

The primary data for this study is sourced from the IMF Financial Access Survey (2023), a globally recognized dataset that provides comprehensive indicators of financial inclusion. The dataset contains country-level data on key financial inclusion variables such as mobile banking, digital transactions, and access to banking infrastructure. This study supplements the IMF data with relevant secondary data from the Bangladesh Bank and publicly available reports from mobile financial service providers like bKash, Rocket, and Nagad.

* 1. **Variables and Measurements:**

This study identifies key variables to measure the relationship between mobile and internet banking and financial inclusion, focusing on marginalized communities in Bangladesh. The variables are grouped into dependent and independent variables, supported by relevant literature.

**Dependent Variables (Y): Financial Inclusion Indicators:**

* **SME loans from commercial banks (% of GDP):** SME loans as a percentage of GDP serve as a key measure of financial inclusion, particularly for small and medium enterprises, which are crucial for economic growth and employment generation. However, SMEs often face challenges in accessing credit from formal financial institutions due to high collateral requirements and lack of financial history (Siddik et al., 2014). Improved access to loans through digital banking platforms enables SMEs to expand operations, contributing to poverty reduction and economic empowerment.
* **Number of borrowers from commercial banks (per 1,000 adults):** The number of borrowers per 1,000 adults reflects the accessibility of credit to individuals. Borrowing opportunities from formal institutions empower marginalized communities, allowing them to invest in small businesses, education, or healthcare. Digital financial tools, such as mobile and internet banking, have played a role in increasing access to credit by lowering transaction costs and reaching underserved populations (Demirgüç-Kunt et al., 2017).
* **Number of SME deposit accounts:** The number of SME deposit accounts measures financial engagement, particularly for businesses that were previously excluded from formal banking systems. Higher adoption of deposit accounts indicates improved savings behavior and greater participation in the financial system. Research indicates that mobile and internet banking enhance financial access for small businesses, particularly in rural areas with limited traditional banking services (Siddik et al., 2014; Mujeri & Azam, 2018).
* **Value of mobile money transactions (annual):** The total value of mobile money transactions is a key indicator of digital financial inclusion. Mobile financial platforms such as bKash and Nagad have revolutionized financial access in Bangladesh, enabling users to transfer money, pay bills, and access micro-loans. An increase in transaction values reflects higher adoption and trust in digital banking tools, particularly including low-income and rural populations (Jack & Suri, 2014; Aziz & Naima, 2021).

**Independent Variables (X): Digital Banking Indicators:**

* **Number of active mobile money accounts:** The number of active mobile money accounts measures the penetration of digital financial tools. Mobile banking platforms provide marginalized communities with affordable and secure financial services, bypassing the need for physical branches of commercial banks. The growing number of active accounts in Bangladesh reflects increasing engagement with mobile financial services, particularly among women and rural entrepreneurs (Siddik et al., 2014).
* **Number of mobile and internet banking transactions (per 1,000 adults):** This variable captures the usage intensity of digital banking services, including transactions for payments, savings, and credit. Higher transaction volumes reflect greater adoption of mobile and internet banking as a preferred financial tool, particularly in countries like Bangladesh where mobile penetration has grown rapidly in rural and underserved regions (Vo et al., 2021).
* **Number of ATMs per 1,000 km²:** ATM density serves as a proxy for access to banking infrastructure, enabling cash withdrawals and other basic banking services. While mobile banking has reduced the reliance on physical bank branches, ATMs remain an important touchpoint for financial services, especially in semi-urban and rural areas (Demirgüç-Kunt et al., 2017; Mujeri & Azam, 2018).
* **Number of commercial bank branches per 1,000 km²:** The presence of commercial bank branches per 1,000 km² measures the physical accessibility of traditional financial institutions. Despite the rise of digital banking, bank branches remain relevant for financial activities that require in-person services, such as loan applications or large transactions. Research shows that bank branch accessibility complements digital financial tools by building trust and enhancing service delivery (Siddik et al., 2014).
* **Outstanding SME loans (% of GDP):** Outstanding SME loans represent the total value of unpaid loans extended to small and medium enterprises as a percentage of GDP. This indicator reflects both the accessibility and usage of credit among SMEs. While a higher share of outstanding loans may indicate improved credit access, it also highlights repayment challenges that must be addressed through proper financial management training and supportive policies (Vo et al., 2021).
  1. **Analytical Framework:**

The analytical framework of this study employs a combination of descriptive statistics, correlation analysis, and regression modeling to examine the impact of mobile and internet banking on financial inclusion outcomes in Bangladesh. Descriptive statistics are used to analyze trends and patterns in key indicators, including the number of active mobile money accounts, the value of mobile money transactions, the density of ATMs and bank branches, and financial inclusion metrics such as SME loans and borrower numbers. Correlation analysis identifies the strength and direction of relationships between digital banking indicators and financial inclusion outcomes. For a more robust analysis, a linear regression model estimates the causal relationship between Digital banking indicators (e.g., Number of credit cards, mobile money agent outlets, Number of ATMs etc.) and financial inclusion outcomes (dependent variables), such as borrowers from commercial banks. The general form of the regression model is specified as:

**Y*it* ​= β0 ​+ β1​X*1it* ​+ β2​X*2it* ​+β3​X*3it* ​+ ϵit​**

Where:

**Y*it​*** = Financial inclusion outcomes (borrowers from commercial banks) in country i at time t.

**X*1it* – X*3it* ​** = Digital banking indicators (e.g., Number of credit cards, mobile money agent outlets, Number of ATMs etc).

**ϵit​​** = Error term.

Although here, regression model is not a strong predictor, I have used it to identify the possible trend in financial inclusion.

**6.4 Research Hypothesis:**

Based on the regression model, the study has the following hypothesis:

**H0 :** Digital banking indicators have no significant impact on financial inclusion outcomes.

**H1 :** Digital banking indicators have a significant impact on financial inclusion outcomes.

The regression analysis quantifies the extent to which digital banking contributes to financial empowerment by examining the significance and magnitude of the coefficients for digital banking indicators. This approach provides a comprehensive understanding of how mobile and internet banking influence financial inclusion, particularly for marginalized communities in Bangladesh.

* 1. **Limitations:**

While this study employs robust methods to analyze the impact of mobile and internet banking on financial inclusion, certain limitations exist. The reliance on country-level data may mask regional disparities and micro-level variations in financial inclusion. Data gaps in the IMF Financial Access Survey for specific years could affect continuity and completeness of analysis. Additionally, the absence of control variables in the regression model limits the ability to account for other socio-economic influences. Finally, while regression analysis identifies relationships, it does not establish definitive causality due to the observational nature of the data.

1. **Findings and Analysis:**

**7.1. Trends in Digital Banking:**

Fig 1-Number of ATMs per 1,000 km2

Fig 2-Number of mobile and internet banking transactions (per 1,000 adults)

Fig 3-Number of active mobile money accounts

The trends in digital banking (IMF FAS 2023) in Bangladesh above show notable growth, with some fluctuations over time. The number of ATMs per 1,000 (one thousand) km² experienced steady growth from 2004 to 2015, reflecting investments in physical banking infrastructure to improve access, particularly in semi-urban areas. However, the growth plateaued after 2015, with a slight decline post-2020, possibly due to a shift toward digital alternatives. Similarly, the number of mobile and internet banking transactions per 1,000 adults shows relatively stable trends, with minor dips between 2011 and 2015, followed by a gradual recovery post-2017, indicating a slow but steady adoption of digital banking tools. In contrast, the number of active mobile money accounts has grown exponentially, particularly after 2010, overlapping with the rapid expansion of platforms like bKash. The sharp spike around 2010 highlights the initial surge in mobile money adoption, while periodic declines suggest temporary disruptions or saturation in specific years. Overall, the data indicates a significant shift toward mobile financial services as a dominant mode of digital banking in Bangladesh.

**7.2. Impact on Financial Inclusion:**

Fig 4-Outstanding (SME) loans from commercial banks (% of GDP)

Fig 5-Number of borrowers from commercial banks per 1,000 adults

Fig 6-Number of SME deposit accounts with commercial banks

The three graphs (IMF FAS 2023) above highlight the overall positive impact of digital banking on financial inclusion in Bangladesh, with noticeable trends in SME loans, credit access, and deposit accounts. The outstanding SME loans as a percentage of GDP show modest growth until 2014, followed by a sharp decline, suggesting initial improvements in SME financing that could not be sustained. The number of borrowers from commercial banks per 1,000 adults demonstrates steady growth from 2004 to 2013, reflecting improved access to credit driven by digital financial tools, but the plateau afterward indicates a slowdown in expansion. Similarly, the number of SME deposit accounts increased sharply between 2004 and 2006, with periodic peaks in later years, reflecting greater financial participation among SMEs. Overall, while digital banking has facilitated credit and savings opportunities, the trends reveal challenges in sustaining consistent growth, signaling the need for continued efforts to enhance financial inclusion.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **p-Value** |
| Constant | 13980.5328 | 4886.3519 | 2.8611 | 0.0119 |
| Credit cards per 1,000 adults | 0.0022 | 0.0006 | 3.7182 | 0.0021 |
| Mobile money agent outlets | -404.7661 | 103.1348 | -3.9246 | 0.0014 |
| ATMs per 1,000 km2 | 504.0160 | 87.0978 | 5.7868 | 0.0000 |
| R-squared | 0.93584 | | | |
| Adjusted R-squared | 0.923016 | | | |
| F-statistic | 72.937802 | | | |
| Prob (F-statistic) | 0.000000 | | | |
| Log-Likelihood | -167.827846 | | | |
| Durbin-Watson | 1.291290 | | | |

Table 1: Regression output

The regression results in table 1 reveal a strong relationship between digital banking indicators and financial inclusion, as indicated by an R-squared value of 0.9358 and an adjusted R-squared of 0.9230. Among the independent variables, the number of credit cards per 1,000 adults has a positive and statistically significant effect (coefficient = 0.0022, p-value = 0.0021), emphasizing the role of formal financial tools in enhancing credit access (Sakanko, et al. 2023). Conversely, mobile money agent outlets show a significant negative impact (coefficient = -404.7661, p-value = 0.0014), suggesting challenges in their effectiveness, especially in rural areas (Bongomin et al., 2018). The number of ATMs per 1,000 km² demonstrates the highest positive effect (coefficient = 504.0160, p-value < 0.0000), highlighting the importance of physical infrastructure in driving financial inclusion (Beck et al., 2009). The F-statistic (72.9378, p-value < 0.0000) confirms the overall model's significance, while a Durbin-Watson statistic of 1.291 indicates moderate autocorrelation. These findings suggest that both digital and traditional banking infrastructure are crucial for broadening access to financial services (Dupas et al., 2018).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **p-Value** |
| Constant | 746.70070 | 484.10677 | 1.54243 | 0.14892 |
| Credit cards per 1,000 adults | 0.00068 | 0.00098 | 0.68931 | 0.50374 |
| Mobile money agent outlets | -7.32176 | 107.68638 | -0.06799 | 0.94691 |
| ATMs per 1,000 km2 | 170.39645 | 130.25090 | 1.30822 | 0.21530 |
| ECT | -0.37886 | 0.20707 | -1.82964 | 0.09224 |

Table 2: ECM result

The Error Correction Model (ECM) results on table 2 provide insights into both short-term and long-term dynamics. In the long term, the significant coefficient for the Lagged Residuals (ECT) (-0.379, p-value = 0.092) confirms the existence of a stable long-term relationship between the number of borrowers and financial access indicators. The negative sign of the ECT coefficient indicates that the system corrects 37.9% of any deviations from this equilibrium within one period, suggesting that borrowing behavior steadily adjusts toward long-term stability after disturbances. In the short term, none of the independent variables, including credit cards, mobile agents, and ATMs, show statistically significant impacts on borrowing behavior. This suggests that immediate changes in these indicators do not substantially influence borrowing in the short run. While these factors may play a vital role in driving long-term trends, their short-term effects are negligible or less pronounced.

**7.3 Outcome of Hypothesis:**

The hypothesis testing results indicate that digital banking indicators significantly influence financial inclusion outcomes. The null hypothesis (H₀), which states that digital banking indicators have no significant impact on financial inclusion outcomes, is rejected. Key variables such as the number of credit cards per 1,000 adults (p-value = 0.0021) and the number of ATMs per 1,000 km² (p-value < 0.0000) show statistically significant positive effects, while mobile money agent outlets (p-value = 0.0014) have a significant negative impact. These findings support the alternative hypothesis (H₁), demonstrating that digital banking plays a significant role in shaping financial inclusion outcomes.

1. **Challenges and Barriers:**

Despite significant advancements in mobile and internet banking, several challenges endure in achieving widespread financial inclusion in Bangladesh. These challenges are particularly prominent among marginalized communities.

**Digital Infrastructure Gaps:** The inadequacy of digital infrastructure, particularly in rural areas, is a critical barrier. A large segment of the population lacks stable internet access, hindering the adoption of mobile banking services. Poor infrastructure not only affects accessibility but also restricts the functionality of these platforms in remote regions (Aziz & Naima, 2021).

**Financial Literacy Deficits:** A low level of financial literacy continues to hinder the adoption of digital banking. Many users, especially in rural communities, lack the knowledge needed to understand and use mobile banking services effectively. Efforts to improve financial literacy are sporadic and fail to reach the intended audience, leaving a large segment of the population excluded (Chauhan, 2015).

**Gender Disparities:** Socio-cultural norms and gender inequality further exacerbate the exclusion of women from financial systems. Women, particularly in rural areas, face restrictions in accessing and using digital financial tools. Studies show that women are disproportionately affected by barriers such as limited ownership of mobile phones and lack of digital literacy (Dupas et al., 2018; Bongomin et al., 2018).

**Regulatory Bottlenecks:** Although regulatory frameworks have encouraged the growth of mobile financial services, certain aspects remain restrictive. For example, transaction caps on mobile money services can discourage users from conducting larger transactions, thereby limiting the utility of these services for small businesses (Demirgüç-Kunt et al., 2017).

**Trust and Security Concerns:** Trust in digital platforms is another major issue. Instances of fraud, lack of transparency, and inadequate customer support deter potential users. Security concerns, particularly regarding data breaches and financial fraud, have been frequently cited as reasons for reluctance to adopt mobile financial services (Beck et al., 2009; Mbiti & Weil, 2016).

**Product Suitability:** A lack of tailored financial products also hampers the growth of financial inclusion. Many digital banking platforms offer generic services that fail to address the specific needs of small farmers, women entrepreneurs, and other underserved groups. Customized financial solutions could play a transformative role in enhancing financial inclusion (Bansal, 2014).

**Vulnerability to Climate Change:** Bangladesh’s exposure to natural disasters, including floods and cyclones, disrupts mobile networks and financial systems, particularly in rural areas. Such disruptions reduce trust and reliability in digital financial services, further widening the inclusion gap (Jack & Suri, 2014; Dupas et al., 2018).

1. **Conclusion:**

This study highlights the transformative role of digital financial services in advancing financial inclusion in Bangladesh. By analyzing key metrics such as SME loans, borrower access, and digital transaction volumes, it is clear that digital banking has played a pivotal role in extending financial services to marginalized communities. However, persistent challenges such as gender inequality, infrastructural deficiencies, and gaps in digital literacy must be addressed to unlock the full potential of financial inclusion. Overcoming these barriers will require a multi-pronged approach involving targeted policy reforms, innovative technological solutions, and robust public-private collaborations. Looking ahead, tailored strategies that prioritize the unique needs of underserved populations will be vital for fostering sustainable, inclusive, and equitable economic development in Bangladesh.

**COMPETING INTERESTS DISCLAIMER:**

**Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.**

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