Research Pitch

The Effect of Digital Financial Literacy on Usage of Mobile Payment Apps in Bangladesh and its Variation across Age and Gender

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Abstract

The digital economy emerged two decades ago in Bangladesh and have been developing in a high speed. Despite the central bank's efforts of encouraging financial inclusion and mobile financial services, among 76 millions of Bangladeshi who have registered mobile payment accounts, less than half of them are active users on these apps. The disparity between installation and usage of mobile payment apps seems to be connected to financial literacy or digital financial literacy. This study examines the effects of financial literacy and digital financial literacy on usage of mobile payment apps. Additionally, this article aims to reveal the moderator effect of age and gender on the relationship between digital financial literacy and usage of mobile payment apps. The data was gathered from a questionnaire survey with a sample of 1000 responders through stratified random sampling method. Hypothetical relationship between dependent and independent variables and the significance of the moderating effect on the relationship are examined by multiple linear regression model in SPSS. In support of the current literature, this study has confirmed the positive effects of financial literacy and digital financial literacy on usage of mobile payment apps. Furthermore, the later one has a more significant effect on usage of mobile payment apps, which is an extending finding. In addition, my study demonstrated this relationship varying across age scale and gender category.

Word Count: 2637

1. Introduction

Bangladesh is emerging as a promising digital market in the global economy with an unprecedented GDP growth rate of 7.1% in 2022.[1] The nation has a large population of 170 million citizens, including 46 million youths.[2] The World Bank Global Findex Database 2021 reports a 53% penetration of financial services accounts.[3] Though there hasn't any national policy on financial literacy, Bangladesh Bank (the central bank of Bangladesh) introduced the Regulatory FinTech Facilitation Office (RFFO) early in 2019 to encourage more financial sector innovators to provide mobile financial services (MFS) to the public. The central bank also formulated the "Financial Literacy Guidelines"[4] in 2021 to increase public awareness of financial literacy, striving to make sure that people can access all financial products and information on banks and nonbank financial institutions.

Currently, there are approximately 76 millions registered mobile financial service accounts in Bangladesh. However, only 34 millions of them are active users.[5] This disparity represents the country's existing resistance towards usage of mobile payment apps. Why people having installed mobile payment apps are reluctant to make transactions through mobile phone? Does high financial literacy directly lead to frequent use of mobile payment apps? With the rapid expansion of digital devices, how can the digital financial literacy be evaluated? Can the new concept replace the role of purely financial literacy (without technology) played in customers' activities on mobile payment apps? If it is true, what kind of factors should the Bangladesh government rely on to promote digital financial literacy and thus encourage transactions on mobile payment apps?

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[1] World Bank, 2023. GDP growth (annual %) – Bangladesh.

[2] Bangladesh Economic Relations Division Ministry of Finance, Advancing Human Development in Bangladesh: National Human Development Report 2021, https://erd.portal.gov.bd/sites/default/files/files/erd.portal.gov.bd/page/83abb6f9_b264_45f9_92c0_2596b2421dc9/National_Human_Development%20(1).pdf, Dec 2021.

[3] World Bank, The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19, https://www.worldbank.org/en/publication/globalfindex, June 2022.

[4] Financial Inclusion Department of Bangladesh Bank, Financial Literacy Guidelines (Striving for a Financially Literate Society), https://www.bb.org.bd/aboutus/draftguinotification/guideline/financial_literacy_guidelines_draft.pdf, February 2021.

[5] Ehsan, Zaeem-Al and Musleh, Naomi and Gomes, Veronica and Ahmed, Wasiq and Ferdous, Md Dinash, The usage of mobile financial services in Bangladesh, Munich Personal RePEc Archive, Aug 2019.

In addition, there has been growing concern that digital solutions may create new problems such as exacerbating gender inequality or deteriorating debt burden among the youth in developing countries like Bangladesh. Therefore, I am trying to identify effective approaches to bridging the digital divide and ensure technology has a positive impact on the lives of Bangladeshi.

2. Research Question and the Hypotheses Formulated

2.1 Research questions:

Does digital financial literacy affect the usage of mobile payment apps much more than financial literacy?

Does the effect of digital financial literacy on usage of mobile payment apps vary by the responders' age and gender?

2.2 Hypotheses

Based on the research questions, five hypotheses thus are formulated as follows. The first three hypothesis aims to answer the first research question, while the remaining two hypothesis are designed to answer the second research question.

H1: There is a positive association between financial literacy score and usage of mobile apps.

H2: There is a positive association between digital financial literacy score and usage of mobile apps.

H3: The impact of digital financial literacy on usage of mobile payment apps are more significant than that of financial literacy.

H4: Among young and middle-aged people, there is a significant positive association between digital financial literacy score and usage of mobile payment apps while among elderly people, such positive association should be less significant

H5: Compared to males, females with high score of digital financial literacy are less likely to make transactions through mobile payment apps.

3. Model Flowchart

Figure 1 model

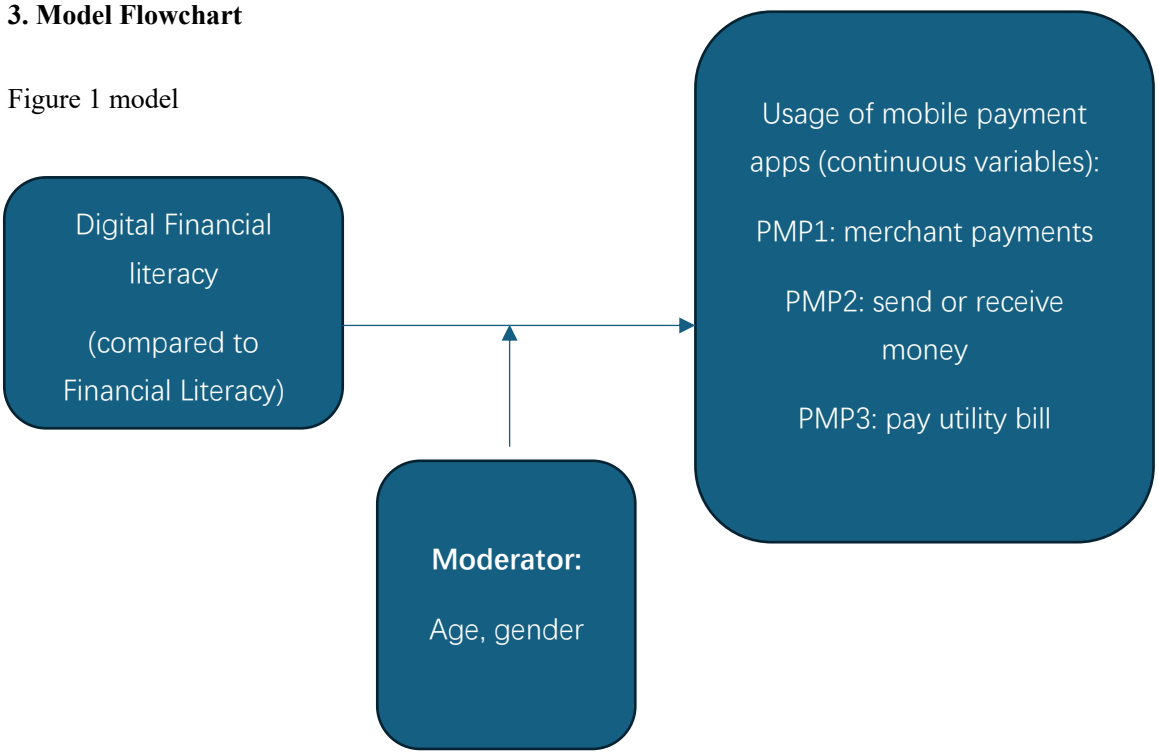

Table 1 definitions of dependent variables

Dependent Variables	Definitions
PMP1	Every month how much do you send/receive money to/from friends and family through mobile phone
PMP2	Every month how much do you pay for your utility bills through mobile phone
PMP3	Every month how much do you pay through mobile phone when shopping (including online shopping, purchasing in physical groceries, buying movie tickets, and so on so forth)
PMP4	Last year how much do you spend on investment products that mobile payment apps promote

4. Measurements of financial literacy and digital financial literacy scores

4.1 Financial literacy

The most widely used and well recognized knowledge-based measure of FL asks survey respondents 3–5 questions related to four core concepts—numeracy (interest), compound interest, inflation, and risk diversification.[6] These questions were first used by Lusardi and Mitchell (2008[7], 2011[8]) and have since been used by many others. The following are versions of the questions that I will raise to respondents.

A) [Interest] Suppose you put 100,000 taka into a no-fee, tax-free savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made? [1,02,000 taka, more than 1,02,000 taka, less than 1,02,000 taka, don't know]

B) [Risk diversification] I would like to know whether you think the following statements are true or false: when you have some money, it is safe to put into multiple investment rather than one business. [True, False]

C) [Inflation] I would like to know whether you think the following statements are true or false: High inflation means that the cost of living is increasing rapidly. [True, False]

4.2 Digital financial literacy

According to Lyons, and Kass-Hanna[9], digital financial literacy requires not only the above capabilities for financial literacy but also basic knowledge of hardware (mobile phone, computer, tablet) including turning on/off, charging, and locking devices and basic knowledge of software (e.g., creating user account, managing passwords, logging into account, using privacy settings). Here come the questions I plan to add:

D) Have you ever used the Internet on mobile phone? [Yes, No]

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[6] Angela C. Lyons, and Josephine Kass-Hanna, A methodological overview to defining and measuring digital financial literacy, Financial Planning Review, June 2021.

[7] Annamaria Lusardi and Olivia S. Mitchell, Planning and Financial Literacy: How Do Women Fare? American Economic Review: Papers & Proceedings Jan 2008.

[8] Annamaria Lusardi and Olivia S. Mitchell, Financial Literacy around the World: An Overview, Journal of Pension Economics & Finance, Oct 2011.

[9] The same with 6.

E) do you know how to turn on/off, charge, and lock your mobile phone? [Yes, No]

F) do you know how to create a user account, manage passwords, log into the account you created before on your mobile phone? [Yes, No]

5. Proposed Method and Proposed Analysis

5.1 Survey conduct and data collection

Given support from Bangladesh government, surveys will be delivered to 1,000 participants in eight divisions of Bangladesh (Barishal, Chattogram, Dhaka, Khulna, Rajshahi, Rangpur, Mymensingh and Sylhet) which contain urban and rural areas. The survey is designed to collect diverse factors such as gender, age, geography (urban vs. rural), and smartphone ownership. It starts with four screening questions: A) Do you have a mobile phone or share one with your family members? B) Do you have a bank account? C) Are you beyond 18 years old? D) Have you installed any mobile payment apps or do you have access to a mobile phone equipped with these apps? If a responder says “yes” to all the four questions, then he or she will go to the formal survey.

5.2 Coding moderating variables and control variables

Age is an integer and thus I treat it as categorical variable starting from 18.

Gender is coded from 1 – 3, with 1 being male, 2 being female, and 3 being not clear or reluctant tell.

Household income an continuous variables, usually ranging from less than 10,000 taka to 100,000 taka.

Marital status will be coded from 1 – 5, with 1 being unmarried (never married), 2 being married, 3 being widow/widower, 4 being divorced, and 5 being separated/deserted.

Education level will be coded from 1 – 4, with 1 being never attended school, 2 being partly or fully attended primary school, 3 being completed secondary or higher secondary school, and 4 being Tertiary education (or higher education)

Geography has two types of variables – division and region. Division is coded from 1 to 8, respectively means Barishal, Chattogram, Dhaka, Khulna, Rajshahi, Rangpur, Mymensingh and Sylhet. Region is coded from 1

to 2, with 1 being urban and 2 being rural area.

Employment status is coded from 1 to 7, with 1 being full-time job, 2 being part-time job, 3 being internship, 4 being retired, 5 being self-employment, 6 being no jobs (including college students)

5.3 Software and methodology

Stratified Random Sampling will be adopted based on age and gender distribution in Bangladesh population. According to the Census, there are more females (50.43%) than males (49.51%) in the population of Bangladesh.[10] As for age scale, one-third of Bangladesh's population is under the age of 30[11], which means, for example, we will try to guarantee that 33% of responders are under 30. When we finish data collection, we will check the validity and reliability of survey results.

R Studio and SPSS Statistics will be used in the analysis of survey results. We will firstly preprocess the data in R. The missing values of the indicators of some variables will be filled in by calculating the relevant median values or directly deleted if there are only a small number of missing data.

Multiple linear regressions are applied to test the research hypotheses. We treat gender and age as moderating variables, and demographic characteristics like household income, marital status, education level, employment status, and geography as control variables included in regressions.

6. Contribution (Potential Outcomes)

Unlike previous research focusing on the relationship between financial literacy and usage of Mobile financial Services (or mobile payment apps), we construct a score of digital financial literacy which turns out to more significantly predict the usage of mobile payment apps.

[10] 2023 State of the World Population Report "The 8 Billion Question: Too Many or Too Few?", April 2023, https://bangladesh.unfpa.org/en/news/2023-state-world-population-report-8-billion-question-too-many-or-too-few%E2%80%9D.

[11] Md. Ibrahim Kholil1 & Rabiul Alam Lokman, Youth of Bangladesh: Readying them Demographic Dividend, Bangladesh Journal of Public Administration, Vol. 30 Issue 4 (Special Issue), 2022 (174-192), file:///Users/grassonlake/Downloads/Youth_of_Bangladesh.pdf.

We also evaluate the moderating effect of age and gender on usage of mobile payment apps. In general, men use mobile financial service more than women. The gap is more pronounced in two regressions where PMP3 and PMP4 are dependent variables since compared to sending money or paying off utility bills, shopping online and purchase of investment products through mobile phone require sophisticated financial and digital knowledge and skills.

We extend the existing research findings by analyzing differences associated with age in terms of effect of digital financial literacy on usage of mobile payment apps. Young people with relatively lower digital financial literacy score remain active on mobile payment apps, including sending or receiving money and online shopping. Middle-aged people are more active in paying off utility bills and purchasing mobile financial services, which might be because they usually serve as a breadwinner in a family which allow them to make an important financial decision. This suggests that elderly people may be less likely to involve in mobile financial services due to their lack of digital knowledge and regular income depending on pension.

Another contribution of our research is to assist in policy making. Government of Bangladesh should focus on digital financial literacy rather than purely financial knowledge. It would be better if the government take into account the age and gender factors when making policy of promoting digital financial literacy. Moreover, policies should be given priority to protect young people having credit cards from over-indebtedness.

7. Limitations & Future Research

Survey questions we formulate for calculation digital financial literacy score are very simple, rough and not from previous literature. That is because there hasn't been any consensus about what kind of questions should be asked for digital financial literacy. For instance, OECD released 13 digital financial knowledge questions that can be used to compute the digital financial knowledge score.[12] However, these questions don't include practical know-how of operating mobile payment apps.

As for gender inequality, we cannot ignore some traditional cultures where women are usually in charge of allocating living expense for the whole family. In other words, we need more details on ethnical group where

[12] OECD (2023), Digital Financial Literacy in Portugal: Relevance, Evidence and Provision, https://www.oecd.org/daf/fin/financial-education/Digital-financial-literacy-in-Portugal-relevance-evidence-and-provision.pdf.

women play a critical role in a family, especially in some rural areas. in addition, men may be overconfident about their capability of making favorable financial decisions. Thus, even if some of them don't get a high digital financial score, they maybe remain purchase more amount of investment products.

Age barrier for elderly people can be reduced by having access to children, relatives, and neighbors who know practical digital knowledge better. On the other hand, it is likely that elderly people are risk-averse investors. Go down this road, the effect of digital financial literacy on usage of mobile payment apps can be blended.

8. References

[1] Angela C. Lyons, and Josephine Kass-Hanna, A methodological overview to defining and measuring digital financial literacy, Financial Planning Review, June 2021.

[2] Ehsan, Zaeem-Al and Musleh, Naomi and Gomes, Veronica and Ahmed, Wasiq and Ferdous, Md Dinash, The usage of mobile financial services in Bangladesh, Munich Personal RePEc Archive, Aug 2019.

[3] Jing Jian Xiao, Financial Literacy in Asia: A Scoping Review, Dec 2020, https://ssrn.com/abstract=3743345.

[4] Trisha Saha, Tonmoy Dey and Md. Rakibul Hoque, Initial Trust and Usage Intention: A Study on Mobile Payment Adoption in Bangladesh, Global Business Review, Sep 2022, https://doi.org/10.1177/09721509221120805.

[5] Annamaria Lusardi and Olivia S. Mitchell, Planning and Financial Literacy: How Do Women Fare? American Economic Review: Papers & Proceedings Jan 2008.

[6] Annamaria Lusardi and Olivia S. Mitchell, Financial Literacy around the World: An Overview, Journal of Pension Economics & Finance, Oct 2011.