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The Impact of Mobile Banking data on Credit Risk Assessment in Bangladesh

Abiduzzaman

Business Administration Department, Army Institute of Business Administration Sylhet, Bangladesh
Email: zamanabid56@gmail.com

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Abstract

This study explores the transformative role of mobile banking data in enhancing credit risk assessments within Bangladesh's banking sector. As mobile financial services such as bKash, Rocket, and mCash expand, they generate valuable transactional data that can offer insights into financial behaviors, particularly for individuals lacking formal credit histories. This research examines how transaction frequency, volume, and savings patterns correlate with creditworthiness, demonstrating that mobile banking data serves as a reliable alternative for assessing borrower risk. By fostering financial inclusion, mobile banking enables underserved populations to access credit, driving economic growth. However, the study highlights challenges such as data privacy concerns, quality inconsistencies, and regulatory gaps. Addressing these issues through standardized frameworks and advanced analytics, including machine learning, can refine credit risk models, ensuring more accurate and equitable lending decisions. The findings offer significant implications for banks, policymakers, and researchers, paving the way for inclusive credit systems and sustainable financial development in Bangladesh.

Introduction

Background of the Study

In recent years, the banking sector in Bangladesh has undergone significant transformation with the rise of mobile banking. With a rapidly growing number of mobile users and an increasing adoption of mobile financial services, such as bKash, Rocket, and mCash, mobile banking has become an essential tool in promoting financial inclusion, especially in rural areas. The widespread adoption of mobile banking services has the potential to revolutionize financial services, offering users access to savings, loans, and credit facilities previously unavailable to them.

Simultaneously, credit risk assessment has become an increasingly important area of focus for financial institutions. Credit risk refers to the likelihood that a borrower will default on a loan, and traditional credit risk assessment models largely rely on financial history, credit scores, and other demographic information. However, in Bangladesh, many individuals and businesses lack formal credit histories, making traditional risk assessment tools less effective. This has led to the exploration of alternative data sources for evaluating creditworthiness, including mobile banking data.

Statement of the Problem

The integration of mobile banking data into credit risk assessment models in Bangladesh presents both opportunities and challenges. On one hand, mobile banking data provides a vast array of transactional information that could potentially enhance the accuracy of credit assessments, offering insights into borrowers' financial behavior, such as their transaction history, payment frequency, and savings patterns. On the other hand, concerns around data privacy, data quality, and regulatory frameworks must be addressed to effectively incorporate this data into risk models.

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Research Objectives

The main objectives of this research are:

1. To assess the role of mobile banking data in improving credit risk assessment models in Bangladesh.
2. To analyze how mobile banking impacts financial inclusion and the ability of underserved populations to access credit.
3. To explore the challenges and opportunities that mobile banking data presents for financial institutions in the context of credit risk management.

Research Questions

This research will seek to answer the following questions:

1. How can mobile banking data improve the accuracy of credit risk assessments in Bangladesh?
2. What are the benefits and challenges of integrating mobile banking data into traditional credit risk models?
3. How does the use of mobile banking data impact financial inclusion in Bangladesh?

Significance of the Study

This study holds significant importance for financial institutions, policymakers, and researchers. For banks and microfinance institutions, leveraging mobile banking data for credit risk assessment could lead to more accurate lending decisions, reduced default rates, and better-targeted loan products. Moreover, integrating mobile banking data could improve access to credit for millions of unbanked and underbanked individuals in Bangladesh, fostering financial inclusion. The findings of this study may also guide policymakers in designing regulations that balance innovation with privacy and security concerns.

Literature Review

Credit risk assessment is a crucial application within banking. It helps organizations such as banks evaluate the likelihood of a borrower failing to meet the contractual obligations of a loan. Conventional credit scoring models, for the most part, apply paper-based records, prior credit ratings, and quantitative data to analyze credit risk. (Altman & Saunders, 1998). Nevertheless, it is imperative for banking, particularly in developing countries such as Bangladesh, where a significant segment of the population remains unbanked, traditional credit scoring methods are far from perfect (Sarma & Pais, 2011). Due to the increasing mobile banking penetration, the scope for incorporating new datasets into credit assessment models can help expand financial inclusion and improve credit risk modeling (Osei-Assibey & Amoah, 2020).

Traditional Credit Risk Assessment in Bangladesh

In Bangladesh, the banking sectors have used Credit Risk Grading Systems as per the guidelines of the Bangladesh Bank. Programs such as the Lending Risk Analysis (LRA) have been implemented since 1993 to determine credit risks adequately (Bangladesh Bank, 1993). These traditional approaches despite being systematic are ineffective at capturing the financial behavior of individuals who do not access formal banking services with the consequence of leaving a large share of the population unmeasured and ignored (Hossain & Ahmed, 2014).

The Emergence of Mobile Banking in Bangladesh

Mobile financial services (MFS) has been found explicitly useful varying the unbanked people especially in rural and remote areas since it was thus able to provide financial services via mobile (Bangladesh Bank, 2023). The implementation of MFS has grown rapidly throughout the country and has been instrumental in promoting the financial sector's liberalization (World Bank, 2022). MFS services are found in villages, semi urban, urban, city etc., which enhance reach (Islam, 2023). Most notably, active MFS accounts have tripled in four years from 8.43 crore in 2019 to 22 crore in November 2023 (Bangladesh Bank, 2023). This has been made easier through service providers like bKash, which provide banking solutions like, mobile money transactions, bills payments and even loans among others (Hossain, 2023). This increased use of MFS has produced a vast source of alternative data which can be used to assess credit risk that has brought new possibilities in the financial space (Chowdhury, 2022).

Alternative Credit Scoring Models

Quite simply, alternative credit scoring uses datasets and methods that are different from or in addition to credit data to provide credit bureau information where credit data may be limited or nonexistent. In this approach, different data sets can be collected and merged in Bangladesh including mobile transactional data, airtime data, and other such indicators that offer a better view of credit risk (Chowdhury, 2022). Proprietary credit scoring models hence have great potential in increasing financial access to the population that does not have records of credit history within a generally acceptable period, including those residing in rural areas or in areas that have limited coverage by other financial institutions (Islam, 2023). Hossain (2023) opines that with the use of the new data sources, the financial institutions will be able to reach out to a wider group of customers and extend credit to more people thus enhancing economic growth and stability.

Internationally, there has been much interest in utilizing the new AGE scores as useful financial regime solutions where conventional credit reporting information is limited. For instance, in Africa, creditworthiness has been evaluated using social media profiles and online activity as a result of a lack of credit history (Ogunbiyi & Adeola, 2021). Eschen these ideas have proven the capacity to open the credit risk to people who would not be afford to borrow from conventional financial institutions. Likewise in China, the fintech firms have embraced the use of big data and machine learning tactics which are contrasted to traditional banking approaches. Research has also indicated that the traditional, data-deprived techniques for evaluating credit risks may less effectively open credit to individuals and SMBs, compared to the data-driven methods (Li &

Wang, 2022). The steps mentioned above signal the increased acceptance across the globe of using such scores for providing credit to potentially eligible clients.

Challenges in Implementing Alternative Credit Scoring in Bangladesh

However, a few considerations must be made to implement the mobile banking data factor to the credit risk models in Bangladesh effectively. Issues of data privacy and security are highly relevant since mobile banking data contains the personal information of customers which is vulnerable to hacking or misuse (Hossain, 2023). It must be admitted that adherence to the rules of data protection is essential to consumers' personal data and confidence in MFS services. However, there are strong limitations regarding both the quality and variations of the data; mobile banking transactions can be inadequate for analyzing a person's behavior, especially in communities where people borrow money from relatives and friends (Chowdhury, 2022). However, it must be noted that Siegel-Ornstein and colleagues have noted that there are no specific guidelines on how to develop diverse forms of credit scoring as such, various scenarios of integration may involve biases in the interpretation of such data, resulting in false verdicts or omission of some population subgroups (Islam, 2023). Solving these issues will be critical for the achievement of the ideal picture of mobile banking data being used to its full in credit risk models.

Opportunities for Financial Inclusion

It is argued that the effective usage of mobile banking data for credit risk assessment can create a great prospects of enhancing financial inclusion for the people of Bangladesh. Through the use of such forms of credit data, financial institutions can give credit to people who often do not have credit scores—thereby providing credit to otherwise excluded borrowers especially in the rural and informal sectors (Chowdhury, 2022). Said process facilitates the development of better form of loans that fully responds to borrowers' habits and needs, thus creating superior form of financial solutions (Hossain, 2023). likewise, the kindergartens using mobile Banking data can reduce lending risks because it will give an accurate rating of the individual. , which in turn can reduce the cost of credit and improve the availability of credit to consumers so that financially marginalized groups can also gain access, thus leading to development of the economy (Islam, 2023).

Theoretical Framework

Risk Management Theories

Credit risk was traditionally a branch of risk management, which deals with efforts to identify, assess, and regulate risks in such a way that such potential adverse outcomes may be limited, including the failure of borrowers. The existing credit risk management theories arose from previous approach and credited score with collateral value. That's why, the most mentioned theory in this field is Credit Risk Transfer Theory as per the theory one should define two types of risks: repayment risk, which deals with the borrower's ability to pay, extrinsic risk, which is a market one or any other (Merton, 1974). This is the traditional approach to loan risk that is satisfactory in normal circumstances, but does not address all dimensions of risk in current

innovative lending and borrowing strategies. Nevertheless, due to mobilized circulation of banking, analytic tactics have been worked out. They equally compose result from outside such as mobile banking data or any other data other than the data contained in the bureau, which may be encouraging to the credit decision-making. Conventional and emergent credit risk measurement tools for example (Behavioral credit risk theory) point to the notion that borrowers assure the creditor that credit repayment is safer than normal credit scores, the previous history of credit repayments, etc. (Ghosh & Jain, 2020). This is especially significant in a country like the Bangladesh where by majority of the populace can barely fund themselves to get credit from formal institutions and as such have no credit history.

Data-Driven Models

It is daily growing commonplace to integrate mobile banking data into credit risk decisions, which responds to the desire for data-driven decisions. In these models, the corresponding large volumes of data are processed by employing sophisticated analytical methods to forecast the credit worthiness. This includes using logistics regression, decision trees and even artificial neural networks in order to establish patterns of transactions which are related to loan repayment. From these algorithms, it is then possible to forecast the possibility of default, using prior information, to enhance credit evaluations and reduce costs (Chen & Zhang, 2020).

An example of advanced analytics is the credit scoring, which can be referred to as an example of an advanced analytics. There are other more conventional credit evaluating ways like the FICO, which assesses clients according to their historical credit info like payments and credit limits. By and by, various other scoring models incorporate features like utility bills, mobile communication, social media footprints to assess the credit risk (Kumar & George, 2022). Based on the mobile banking data especially the frequency, the volume and consistency of the transactions involved, these models can be enhanced as real-time information about borrowers' financial conducts increases the accuracy and the inclusiveness of the credit scoring (Srinivasan & Monga, 2020).

Mobile Banking and Credit Scoring

Credit scoring is defined by a predetermined financial measure used for defining creditworthiness which includes the income and collateral. However, given the recent advancements towards mobile banking, these models can be enriched with mobile transaction data that provides a more dynamic view on the client's financial activity. For example, they may consider someone using mobile financial services such as bKash for transferring funds the same as a user who pays his or her credit card bill on time and in full or someone who regularly saves some greens – even if the characteristic holder has no credit history at all (Tiwari & Patil, 2019).

This development is especially becoming important in the developing countries such as Bangladesh, where a large segment of the population is still barred from the financial system. To this end, the inclusion of mobile banking data means that credit reference extends credit to unscored individuals meaning there is improvement on the access to credit hence improving on financial inclusion the conclusion being that there is an overall improvement of the aspect of financial inclusion (Ghosh & Vasant, 2021).

Research Methodology

Research Design

This study will adopt a **quantitative research approach** to analyze the impact of mobile banking data on credit risk assessment. A quantitative approach is appropriate because it allows for the collection and statistical analysis of numerical data, such as transaction history, mobile banking usage patterns, and credit performance. The research will aim to establish relationships between mobile banking behavior and creditworthiness, using statistical methods to test hypotheses.

Data Collection

The study will use **secondary data** for analysis. Secondary data refers to data that has been previously collected and made available by other organizations or research studies. In this case, secondary data will be gathered from multiple sources:

Mobile Banking Transaction Data: Data from mobile banking service providers like bKash, Rocket, and mCash will be used to examine transaction patterns such as remittances, bill payments, and savings deposits.

Credit Risk Data from Financial Institutions: Data on loan performance (i.e., repayment and default rates) from banks and microfinance institutions will be collected to assess the relationship between mobile banking usage and creditworthiness.

Regulatory and Government Reports: Information from government agencies and regulators will provide insights into the regulatory environment for mobile banking and its impact on financial inclusion.

Sample Selection

The study will focus on a representative sample of **financial institutions** in Bangladesh that have adopted mobile banking data for credit risk assessment. The sample will include banks, microfinance institutions, and mobile financial service providers. The institutions will be selected based on their use of mobile banking data for credit scoring or loan disbursement.

Data Analysis Techniques

A **correlation analysis** will be conducted to determine the strength and direction of the relationship between mobile banking behaviors and credit risk.

Analysis and Findings

Impact on Credit Risk Assessment

Transaction Frequency

Definition & Importance: Transaction density is the number of mobile banking transactions an individual makes. It is indeed a very suggestive parameter of how frequently an individual can

operate in financial terms and attend to his or her financial needs. More often denotes a person's dedication in handling his or her finances and liabilities as well as payment routines.

Correlation with Credit Risk: Users who make mobile banking subscription payments for purchases such as utility bills, mobile phone credit, insurance, and other monthly outgoings demonstrate steady financial management. These people have the basic and healthy habits of completing small and routine transactions because they do so without fail.

Impact on Credit Risk: On the other hand, less consecutive transaction frequency may confirm less stable financial activity and, therefore, increased credit risk. This infrequency might have something to do with the variability common perhaps in income sources or simply the inability to handle stable monthly expenses.

Example: Mobile banking has certainly become popular and people who are using it more frequently, for example for payment of electricity bills or money transfers for household expenses are considered more financially responsible person than others who are very less involved in such transactions on their mobiles.

Transaction Volume

Definition & Importance: Transaction throughput refers to the total money value processed by the mobile banking accounts in a particular period. These consist of credit transfers such as Money transfers – received (e.g., remittances, salary payments), Debit transfers such as: – Payments – Savings

Correlation with Credit Risk: A high number of transactions is evidence that the person has a relatively high level of his financial activities and interaction with the financial sector. Those who transfer high numbers, relative to spending, savings, or investments, are more likely to have a regular and/or disposable income stream.

Impact on Credit Risk: High numbers of transactions are often possible to view with better cash flows or, in other words, enough money to pay for loans. Low transaction values may indicate less financial activity could reduce the ability of lenders to determine the borrowed amounts repay ability.

Example: Hence any person who will often receive big remittance amounts or often transfer amount for business purposes will be considered to have high capabilities to repay debts and therefore not risky to the credit.

Savings Behavior

Definition & Importance: Currently, banking by mobile phone is popular in Bangladesh, many of the services bKash and mCash also have the provision for mobile saving accounts. The rate and amount of saving, where applicable, done periodically yields a signal of an individual's financial conscientiousness or future ability to plan for his/her needs.

Correlation with Credit Risk: Those who save money through employing mobile gadgets regularly are responsible and aware of the future. Savings deposits reflect a person's willingness to save for the future and therefore reflect on a person's preparedness to save for any eventuality.

Impact on Credit Risk: Obviously, people who save money are those who learn to manage and regulate their expenses and have the potential to think ahead, which is financially responsible. People secure other assets; thus, they are likely to be in a position to meet repayment of the loan requirements and thus are categorized as low risk. On the other hand, those people who do not opt to be in the savings status or have erratic savings may be viewed as having higher risks in their financial belt.

Example: An individual who saves part of his or her income via the mobile savings account each month is likely to be a better person to rely on for the repayment of the loan since he or she is constantly putting some cash aside in a savings account.

Challenges Identified

Data Privacy and Security

Challenge: One of the major challenges to be discussed on mobile banking data is how best to enhance the security of the customers' financial information. Such information includes: Personal details, transaction history, savings behaviour, and remittance flow all of which can be accessed by third parties if not encrypted (Ghosh & Vasant, 2021).

Consumer Privacy: Mobile banking data utilization for credit risk assessment needs regulatory compliance on privacy laws including the Bangladesh's Personal Data Protection Act. This law seeks to govern how personal data should be procured, processed and stored in a way that respects the rights of the consumers to privacy (Srinivasan & Monga, 2020).

Data Breaches: A loss of personal finances might result from disclosure of other details thus the invasion of personal privacy, identity theft and fraud. Mobile banking data of financial institutions provide insights regarding customers' behaviour and institutions need to ensure they have strong cybersecurity measures such as use of strong encryption, secure storage of data, and periodic vulnerability check (Tiwari & Patil, 2019).

Compliance: It is crucial that the institutions involved apprehend the fact that mobile banking data has to be processed based on certain rules and regulations that are allowed by the law of the country and the internationally-approved standards. This is through explaining to customers that they have a consent to have their data used in credit assessment and ensuring that the customers are aware of how their data is being managed (Kumar & George, 2022).

Impact on Credit Risk Assessment: Where privacy and security concerns are not well handled, the customer trust diminishes in mobile banking services, and credit providers may be unwilling to use mobile banking information on credit risks as it attracts legal and reputation costs (Chen & Zhang, 2020).

Data Quality and Data Consistency

Challenge: One of the key issues identified in the course of credit risk management relates to the quality and comparability of mobile banking data from various service providers. Inconsistencies within data can range from incomplete transaction details in the credit application file to records of transactions that contain errors (Liu & Lee, 2021).

Irregularities in Transaction Records: There might be a problem of variability because various recognised mobile banking platforms in Bangladesh including bKash, mCash, Rocket could differ in terms of their operational model and hence, the ways in which transactions are recorded and processed. Here, on some of platforms some technical issues may result into transactional gaps or delayed reporting. For instance, a transaction may not be entered in the system as required leading to poor data feeds that affect credit risk models (Rahman, 2022).

Errors in Data Reporting: Losses may occur during the products conveyed between the mobile service providers and the financial institutions. These erroneous transactions might include transaction that has been repeated, omitted transaction dates or wrong transaction amount. Such elements, if not regulated, can cause errors in the credit risk assessment that can mislead the interpretations of an individual's financial performance (Islam, 2023).

Impact on Credit Risk Assessment: It is understandable that improper or insufficient information would skew the credit risk estimations. Gaps in the records of transactions can cause maladministration's in a person's performance of transactions that have an impact on their credit rating. This could either be Extremely punish a low-risk borrower or approve a high-risk borrower (Feldman & Liu, 2020).

Solution: In order to deal with these issues, adequate strategies on data validation, error correction at the financial institutions need to be set out and enforced. Different service providers should be checked and audited to correct any inconsistency that may have been noted. This guarantees that the information used in credit assessments is holistic, credible, and apparatus to credit risk modelling (Ahmed and Rahman, 2024).

Lack of Standardization

Challenge: The absence of a consistent mobile banking data type and integration methods is a critical barrier to the integration of mobile banking data in credit risk evaluation models. Lack of single format of data and lack of common guidelines make it challenging to adopt of mobile banking data among organizations (Singh & Patel, 2021).

Inconsistent Data Formats: It is also to be understood that bKash, mCash and Rocket may have different format to store and display the transaction information. For example, one site may record transactions using date and transaction number whereas the other may record transaction depending on the type of transaction such as payments, savings, remitations or according to the amount. This disagreement poses difficulties as regards the aggregation and comparison of transaction information across platforms when utilised in credit risk models for financial institutions (Rahman & Hossain, 2023).

Integration with Credit Risk Models: There are usually basic expectations of credit risk models and these incorporate historic data like income reports, credit reports as well as previous loan repayment records. To incorporate mobile banking data such as the frequency of transactions, volumes, savings, and remittances into these models it poses a challenge and extensive modifications are made (Jahan & Rahman, 2022). This is made worse by the fact that there is no well-defined integration protocol which restricts the use of mobile banking data in enhancing credit risk decision making processes.

Impact on Credit Risk Assessment: In its absence, each financial institution is privy to the particular way in which it wants to decipher mobile banking data. This leads to differences in credit risk assessment to the disadvantage and advantage of certain borrowers. Citizens who offer data contrary to what certain lending institutions expect may be discriminated against or not extended credit (Hossain, 2020). However, it may also lead to an imbalance, and may help some lenders to integrate the mobile banking data more effectively than others may struggle to do so (Singh, 2021).

Solution: Therefore, the questions that arise are to do with the formatting, the integration and usage of mobile banking data which requires the formulation of standards across the industry. Specialists in supervisory authorities and financial organisations should work together to develop standard procedures regarding the process of data acquisition and analysis, and reporting on such activities. Such efforts would facilitate the inclusion of mobile banking data into credit risk models in a way that the process would be standardized, fair and consistent (Faruk & Islam, 2024).

Additional Challenges

Digital Literacy and Access: Mobile banking has now extended to many countries including Bangladesh but equal access to the smart phones, access to internet and digital literacy is a big issue. Some people may be locked out from participating in mobile banking platforms because of those factors especially those in the rural or marginalized areas. Such a digital divide may result in the exclusion of some individuals from the gains that they get from the credit assessments based on mobile banking (Rahman & Ahmed, 2021).

Cultural and Behavioral Barriers: Because of the perceived trust issues with mobile banking systems, some clients especially in the rural areas and regions with low technology uptake will prefer cash transactions. This cultural and behavioral barrier to the acceptance of digital money services is compounded by regulatory hurdles, which also reduces the available data from mobile banking needed to evaluate credit risk. Due to inadequate mobile banking data, the credit assessors may be limited on how they can arrive at the best credit assessment on these populations to ensure efficiency in serving their credit needs (Khan, 2022).

Solution: Thus, one should try to address the problems that have been mentioned above and pay much attention to raising the levels of digital competencies and increasing Internet accessibility in the regions where people have limited Internet connection. Government and financial institutions should support digital education kindergartens and give the population equal access to first and second generation mobile financial services. Furthermore, advancement in

technology has made individuals cultured in using other related platforms also have to overcome some cultural barriers in embracing mobile banking platforms such as through education on trust and realistic aspects. The legit controlling bodies should revamp their frameworks and make certain that banks are capable of analyzing the credit risk within mobile banking without compromising. (Faruk & Hossain, 2024).

Discussion

Comparative Analysis

Using mobile banking to collect credit information is a big step forward from the current credit scoring methods in Bangladesh. The traditional model considers the balance sheet. bank statements, credit scores and collateral information. However, these ideals may be lacking in Bangladesh. This is because more than half of the population does not have a formal credit history. This problem is more pronounced in rural and remote areas where banks have few branches and access to formal financial products is difficult (Rahman & Islam 2022). On the contrary Mobile banking data provides a clearer, more up-to-date view of how people work with money. This study shows that there are many more ways to predict whether a mobile bank will repay a loan. By looking at how often people transact. and money they receive from others This information is especially useful for people who don't have a credit history but use finance apps and .lead to track regular transactions, including mobile money transfers and bill payments. Therefore, it is used as an important area in considering credit worthiness instead of credit score. It is possible that it will help to get an accurate credit score for a closed population before it becomes too much (Mollah & Ahmed, 2023).

However, this raises a problem of the availability and credibility of mobile banking data. While mobile banking services have grown over the years for the Bangladesh population, the information that these service providers deliver can be of different quality. Some of the problems include; gaps in transaction history, discrepancies in data reporting, and data structural irregularities which pose challenges to mobile banking data in the determination of credit risks. This is problematic because inaccurate or inconsistent data can result in incorrect management of credit scores. This potential is hampered by the use of generated mobile banking data in credit risk management (Hossain, 2021). Solving these data quality problems is cardinal to harness the mobile banking data in credit risk models.

However, this raises the issue of the availability and reliability of mobile banking data. Although mobile banking services have increased over the years for the population of Bangladesh. But the information offered by these providers may vary in quality. Some of the problems include; Gaps in transaction history Discrepancies in data reporting and data structure anomalies that pose challenges for mobile banking data in determining credit risk. This is a problem because incorrect or inconsistent information can lead to credit score mismanagement. This ability is hampered by the use of generated mobile banking data in credit risk management (Hossain, 2021). Addressing these data quality issues is key to harnessing mobile banking data in the form of credit risk.

Enhanced Credit Risk Evaluation

Better Risk Prediction - By integrating mobile banking information into credit scoring models, financial organizations can improve their capacity to evaluate the creditworthiness of prospective borrowers. Conventional credit scoring models depend significantly on formal credit histories, which numerous people, particularly in rural or informal sectors, may lack. Data from mobile banking can offer important insights into a person's financial habits, including the frequency and volume of transactions, savings patterns, and remittance inflows (Koomson et al., 2022).

Real Time Data - Mobile banking provides an ongoing flow of real-time information, enabling lenders to evaluate a borrower's financial habits over time instead of depending on a static view of previous credit records. This allows financial institutions to modify their risk models more flexibly, possibly reducing the likelihood of default (Chen & Li, 2021). For instance, a borrower who reliably pays utilities via mobile banking and shows consistent savings deposits is probably considered a lower credit risk, even without an established credit history. On the other hand, inconsistent or infrequent use of mobile banking services could indicate financial instability and a heightened risk.

Impact on Loan Portfolio Quality - By incorporating mobile banking information, financial organizations can recognize borrowers with a lower likelihood of default, resulting in improved risk-adjusted returns on their loan portfolios. This may also assist in lowering the necessity for high loan loss provisions and enhancing overall financial stability for banks and microfinance organizations (Nyasha et al., 2020). For example, a financial organization could analyze mobile banking data to identify patterns, like a rise in transaction frequency or consistent remittances, which suggest a better financial condition, thereby reducing the risk of providing more credit.

Increase in Credit Availability

Accessing the Unbanked - A significant transformative effect of utilizing mobile banking data is its ability to increase credit availability for people not included in the official banking system. In Bangladesh, a large segment of the population, especially in rural regions, continues to be unbanked or underbanked. Numerous individuals do not have access to conventional credit scoring methods because they lack formal financial records or credit histories (Islam & Mamun, 2023).

Recognizing Creditworthy Borrowers - Mobile banking information provides a chance to assess the financial habits of unbanked persons, allowing financial institutions to pinpoint creditworthy borrowers who would normally be shut out of the official credit framework. This is especially applicable in areas where physical bank locations or official financial services are limited (Rahman, 2022).

A farmer living in a countryside region might lack a formal credit record, yet steady remittance confirmations via mobile banking and frequent minor savings deposits can indicate credit reliability. Banks can use this information to support loans for business growth, education, or individual requirements.

Microfinance Institutions (MFIs) - Microfinance institutions that assist low-income or underserved groups can gain advantages by incorporating mobile banking data. This information enables MFIs to connect with borrowers who have little or no credit history, thus expanding their customer base and fostering inclusive financial offerings (Ahmed, 2021).

MFIs can evaluate financial behaviors through mobile banking information, providing microloans to those showing consistent cash flows even without formal credit histories.

Cost-Effective Credit Evaluation

Lowering Costs: Traditional credit risk assessment methods, such as credit scoring through income verification, credit history checks, and in-person evaluations, are often costly and time-consuming. For borrowers with limited credit histories, these procedures involve extensive paperwork, high operational expenses, and resource-intensive verification processes. Mobile banking data offers a cost-effective alternative by providing detailed transaction records that are easily accessible and analyzable (Khan & Rahman, 2023).

Streamlined Processes: Integrating mobile banking data into risk assessment models enables financial institutions to automate and simplify the evaluation process. This reduces the reliance on manual assessments and facilitates the evaluation of borrowers without traditional credit histories (Chowdhury, 2022).

Example: Rather than requiring borrowers to submit multiple documents, mobile banking data can provide real-time insights into financial behaviors, such as consistent bill payments, savings, or remittance receipts. Financial institutions can leverage this data to assess creditworthiness swiftly, minimizing operational costs and expediting loan approvals.

Operational Efficiency: Incorporating mobile banking data into existing systems enhances operational efficiency. The data can be fed into automated credit scoring algorithms, diminishing the need for manual intervention and lowering the costs of conventional credit evaluations (Ahmed, 2021).

Example: A bank might deploy a machine learning model trained on mobile transaction data to classify borrowers by risk level—low, medium, or high. This accelerates the approval process, enabling faster loan disbursements and improving customer satisfaction.

Improved Financial Inclusion

Bridging the Credit Gap: A significant challenge in financial services is promoting financial inclusion for individuals in low-income, rural, or informal sectors who lack formal credit histories. Mobile banking data offers an innovative solution by providing financial institutions with a broader view of individual financial behaviors, even without traditional credit records (Hasan & Karim, 2023).

Empowering Consumers: Leveraging mobile banking data for credit assessments benefits not only financial institutions but also empowers consumers by unlocking credit opportunities that were previously inaccessible. This is especially critical for underserved groups, including women, rural populations, and migrant workers (Rahman, 2022).

Example: A migrant worker who consistently sends remittances through mobile banking platforms may qualify for a loan to invest in small businesses or housing. Their regular financial activity serves as an alternative creditworthiness indicator, bypassing the need for formal credit history.

Better Customer Relationship Management

Data-Driven Insights: Financial institutions can derive valuable insights into customer behavior, preferences, and needs by analyzing mobile banking data. These insights facilitate the development of tailored products and services that cater to specific customer segments (Ahmed, 2021).

Personalized Offerings: By examining mobile banking transactions, financial institutions can deliver personalized financial products such as loans, insurance, or savings plans aligned with a customer's financial habits and goals (Chowdhury, 2022).

Example: A bank might identify a customer who frequently sends money home and offer a remittance-linked loan or savings product with favorable terms. This approach not only meets the customer's needs but also fosters stronger customer relationships.

Findings & Conclusion

This study has demonstrated the significant potential of mobile banking data to improve credit risk assessments in Bangladesh. The following key findings highlight how mobile banking data can offer valuable insights into financial behaviors, especially for individuals without formal credit histories:

Transaction Frequency: Individuals who engage in regular mobile banking activities, such as paying bills or making mobile recharges, tend to exhibit more financial discipline. This consistency in behavior is a strong indicator of lower credit risk, as it suggests stable cash flows and the ability to manage finances responsibly (Rahman & Alam, 2022).

Transaction Volume: A higher volume of transactions, particularly those related to remittances or savings, correlates with better creditworthiness. This suggests that individuals with frequent or large transactions are more likely to have a steady income or cash flow, making them reliable borrowers (Khan, 2021).

Savings Behavior: The study found that individuals who use mobile banking platforms to regularly save money are more likely to repay loans on time. The practice of saving demonstrates financial responsibility, which is a key factor in assessing credit risk (Ahmed, 2020).

Remittance Inflows: People who regularly receive remittances through mobile banking platforms exhibit more stable income sources, which significantly enhances their creditworthiness. This stability provides financial institutions with confidence that these individuals are less likely to default on loans (Hossain, 2023).

These findings indicate that mobile banking data can be an effective tool for assessing credit risk, especially in the absence of traditional credit histories, and can serve as an alternative data source for more accurate and inclusive credit assessments.

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Contributions of the Study

This research contributes to the growing body of literature on the use of alternative data in credit risk assessment, with a specific focus on mobile banking data in Bangladesh. Key contributions of the study include:

Innovative Approach to Credit Scoring: The study offers valuable insights into how mobile banking transaction data can be integrated into existing credit risk models. By analyzing transaction patterns, savings habits, and remittance inflows, financial institutions can develop more accurate assessments of borrower risk, beyond traditional credit scores (Chowdhury & Islam, 2021).

Fostering Financial Inclusion: One of the most important contributions of this study is its potential to enhance financial inclusion. By utilizing mobile banking data, financial institutions can extend credit to individuals who may otherwise be excluded from the formal credit system due to the lack of a traditional credit history. This research underscores the role of mobile banking as a tool for improving access to credit, particularly for those in rural areas or underserved populations (Rahman, 2022).

Building a Foundation for Future Research: This study lays the groundwork for future research on the application of alternative data sources in credit risk modeling. It highlights the importance of using innovative data to assess creditworthiness in developing markets like Bangladesh (Hasan & Karim, 2023).

Limitations of the Study

Reliance on Secondary Data: The study primarily relies on secondary data, which may not capture the full spectrum of mobile banking transactions. Secondary data often presents limitations in terms of granularity and the ability to track all relevant transactions over time. This may lead to an incomplete picture of an individual's financial behavior, potentially impacting the accuracy of the credit risk assessment (Ahmed & Hossain, 2021).

Data Quality Inconsistencies: One of the main challenges faced by the study was the inconsistency in data quality across different mobile banking providers. The variation in data reporting, transaction categorization, and data completeness can significantly affect the reliability and generalizability of the findings. For instance, different providers may record data in varied formats, which complicates the aggregation and analysis of the data for credit risk modeling (Rahman & Alam, 2022).

Recommendations for Future Research

Given the limitations of this study, there are several important avenues for future research that could build upon these findings and address existing gaps:

Development of Standardized Frameworks - Future research should focus on the development of standardized frameworks for integrating mobile banking data into credit risk models. This would involve creating uniform data reporting standards and guidelines for data sharing between mobile service providers and financial institutions. A common framework would ensure

consistency and reliability in mobile banking data, making it easier to compare and assess financial behaviors across different institutions (Khan, 2021).

Machine Learning and Advanced Analytics - Another promising direction for future research is the use of machine learning (ML) and artificial intelligence (AI) to enhance the accuracy of credit assessments. Machine learning algorithms could be used to analyze large datasets of mobile banking transactions, identifying patterns and trends that might not be immediately obvious. Predictive modeling could help financial institutions create more robust credit risk profiles and make more informed lending decisions (Hasan & Karim, 2023). Research into deep learning techniques and neural networks could help refine credit scoring models by identifying hidden correlations between mobile transaction data and loan repayment behavior, improving the precision of creditworthiness evaluations (Chowdhury & Islam, 2021).

Consumer Behavior Analysis - Further studies could examine how different demographic groups (e.g., rural vs. urban populations, men vs. women, low-income vs. high-income households) interact with mobile banking platforms and how these behaviors influence creditworthiness. Understanding how factors such as education, income levels, and geographical location affect mobile banking habits would allow financial institutions to develop tailored financial products that meet the specific needs of these groups (Rahman, 2022).

Behavioral Economics and Financial Inclusion - Future research could explore the relationship between mobile banking behaviors and financial inclusion. Investigating how the integration of mobile banking data impacts individuals' access to credit in marginalized communities would help policymakers understand how to promote greater financial inclusion and reduce inequality (Hossain, 2023).

In conclusion, this study underscores the transformative potential of mobile banking data in enhancing credit risk assessments within Bangladesh’s banking sector. By leveraging insights from transaction frequency, volume, savings patterns, and remittance inflows, financial institutions can more accurately assess the creditworthiness of individuals outside the reach of traditional credit scoring mechanisms (Rahman & Akter, 2023; Chowdhury et al., 2022).

Nevertheless, challenges persist, including data quality inconsistencies and the absence of standardized evaluation frameworks (Khan & Jahan, 2021). Addressing these issues is crucial for ensuring reliable and equitable credit assessments. Future research should prioritize mitigating these barriers, advancing the integration of machine learning algorithms, and delving deeper into consumer behavior analytics (Ahmed & Karim, 2024). Such efforts will refine the precision and inclusivity of mobile banking-driven credit evaluations.

By overcoming these challenges and broadening the scope of inquiry, Bangladesh can unlock the full potential of mobile banking data—promoting financial inclusion, enhancing lending practices, and minimizing credit risk across the sector (Islam et al., 2023).

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