

Examining Mobile Banking as a Tool for Financial Inclusion in India

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ABSTRACT Goals of universal financial inclusion have acquired new wings in India, with the mobile phone now seen as a catalyst in realising such aspirations. This brief analyses India's performance in leveraging mobile phones for financial inclusion. It throws light not only on the various factors that have propelled the use of mobile banking, but also those that have served as obstacles for such use. The brief also proposes a strategy that has been developed around the digitalisation of the informal economy through the use of USSD-based mobile banking.

INTRODUCTION

The following discussion examines the prospects of financial inclusion through mobile banking in India. Mobile banking in India is either smartphone-based or USSD-based, determined by income and literacy (general, financial and digital). As such, increments in financial inclusion through mobile banking can be enjoyed by both low-income individuals and the better-off.

Banking services in India are increasingly being accessed by customers by downloading

mobile-banking apps to their smartphones. These internet-based services include fund transfers, bills and credit card payments, account and loan statements, request for checkbooks, filing of complaints, and management of insurance policy or portfolios, among others.¹

A 2014–15 Fiserv²-commissioned survey—“Mobile Banking Adoption: Where is the Revenue for Financial Institutions?”³—found that mobile banking services ease the

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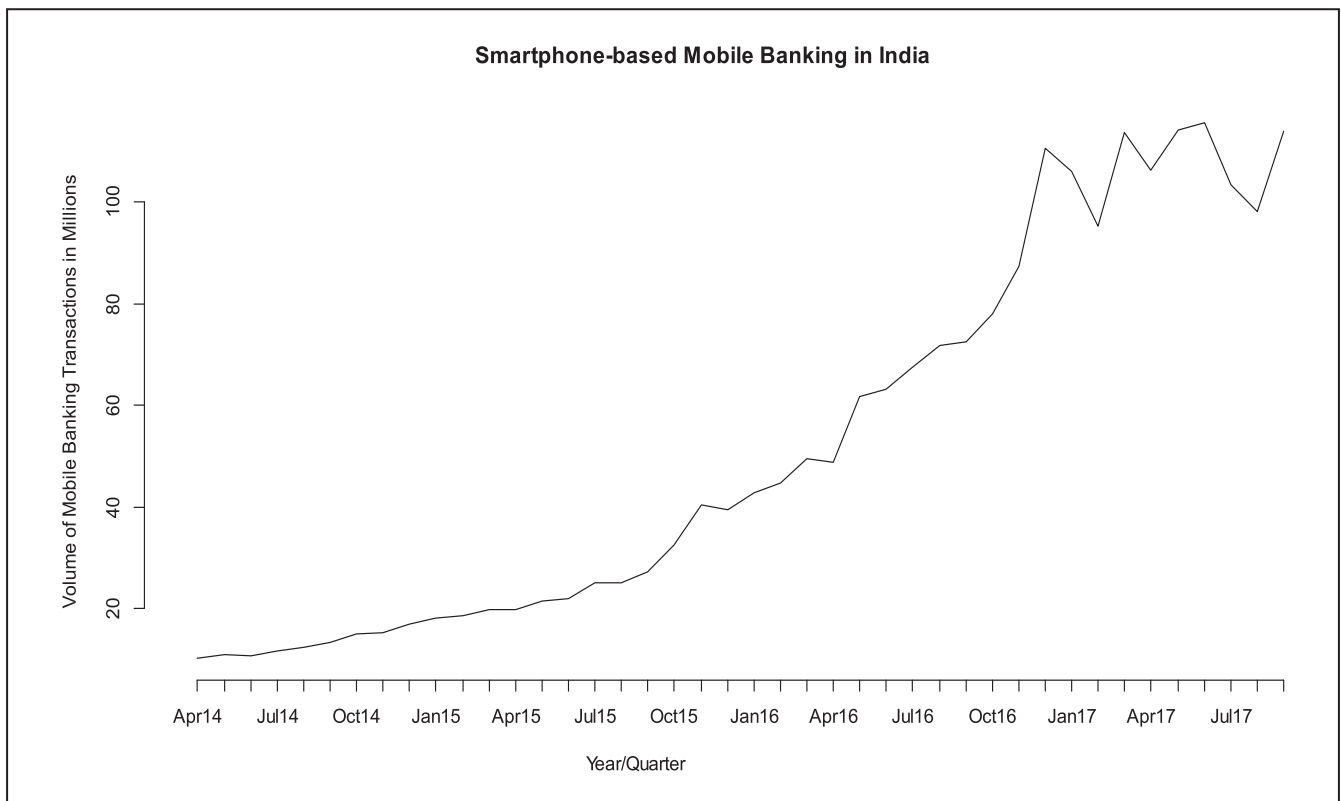


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complexity of managing several financial products. Thus, mobile-banking users are encouraged to expand the basket of financial commodities they own to enjoy improved access to liquidity and enhanced financial inclusion. Research conducted by PwC finds that digitally active customers tend to own larger product holdings; this is true for India as well.⁴ According to the Fiserv survey, mobile banking users exhibited the lowest attrition rates when compared with online banking and branch-only users. Such users share a more involved—and evolved—relationship with the bank and return to its branch for “high-touch, high-engagement transactions with staff, such as asset management, loan origination and resolution of potential fraud activity.”⁵ In India, mobile banking enjoys greater customer satisfaction and, as such, nurtures more customer loyalty than branch banking.⁶ The

USSD (Unstructured Supplementary Service Data)-based mobile banking service is available on basic feature mobile phones and does not require the internet. This makes the service accessible to low-income individuals. The services offered under this mode of banking include sending money, checking account balance and generating a mini-statement.⁷ Its use can be effective in developing the habit of savings, planning savings and watching how close or far off one is from their savings target. This is a crucial first step in managing resources for credit and insurance, as many informal-sector workers are migrants who need to send remittances back home to their families, which the USSD model allows in the form of fund transfers. USSD-based mobile banking can thus become the one-stop shop for all financial services required by informal-sector workers. These services are available in 11 regional

Figure 1: Volume of Smartphone-Based Mobile-Banking Transactions in India



Source: RBI.

languages, increasing accessibility amongst the poor, who are typically unable to utilise the English-language interface. Its round-the-clock availability⁸ further increases the likelihood of this mobile-banking service being used widely.

THE STORY OF SMARTPHONE-BASED MOBILE BANKING IN INDIA

Smartphone-based mobile-banking transactions are on the rise in India (see Figure 1).⁹ This growth can be sustained by identifying the forces that have either propelled it, or else may have undermined it. Income and education, which can promote both digital and financial literacy, not only determine the degree of smartphone-based mobile banking adoption but also affect the affordability of smartphones, financial viability of and monetary incentives associated with active bank-account use, and the ability to comprehend technology and manage complex financial products. Behavioural and/or psychological factors—e.g. perceived risk of or aversion to the use of technology in managing finances, lack of awareness about the benefits of mobile banking, and rigid branch-banking habits—can also discourage users from adopting mobile-banking services. The following discussion offers an empirical analysis of the role these factors play in the growth of mobile banking in India. The analysis covers the period 2011–17 and uses quarterly data of public-sector and domestic private-sector scheduled commercial banks on smartphone-based mobile-banking transactions and bank deposits.

Due to the lack of adequate quarterly data on smartphone use in India (for the period of investigation), the author has utilised

quarterly data on the volume of smartphone unit shipments in the country. The shipment data reflects the aggregate demand for smartphones, including both new purchases and replacement demand by existing users. Thus, the trajectory of smartphone shipments is reasonably indicative of the growth pattern of the smartphone user base in the country.¹⁰ To measure active bank account use, the author has used aggregate deposits with banks.¹¹

This brief postulates the following model in capturing the relationship between mobile banking, on the one hand, and smartphone shipments and bank deposits on the other:

$$\ln y = \alpha + \phi \ln x + \beta (\ln x)^2 + \gamma (\ln x)^3 + \lambda \ln z$$

where:

\ln : Natural logarithm

y : The volume of mobile banking transactions

x : The volume of smartphone unit shipments (in millions)

z : The amount of bank deposits (in rupees millions)

The estimated model:

$$\ln y = -76.1897 + 8.4762 \ln x - 4.2575 (\ln x)^2 + 0.6755 (\ln x)^3 + 4.8678 \ln z$$

(18.1003) (3.2367) (1.4878)
(0.2266) (1.1039)

The following inferences can be drawn from the above regression analysis:

- The impact of an increase in smartphone shipments on mobile banking transactions is statistically significant and positive in magnitude. This is also true for the impact of increase in bank deposits on mobile banking.

Table 1: Results of the Regression Analysis

Parameter	Associated t statistic	Associated p-value
α	-4.209	0.000527
ϕ	2.619	0.017399
β	-2.862	0.010371
γ	2.981	0.008014
λ	4.410	0.000338

Adjusted R² = 0.9862

- For the period under investigation, the elasticity of mobile banking with respect to bank deposits was equal to 4.8678, i.e. a one-percent increase in bank deposits has brought about an approximately five-percent increase in mobile-banking transactions. As seen in Table 2, the elasticity of mobile-banking transactions with respect to smartphone shipments has only increased over time.
- It appears that the above-mentioned behavioural and/or psychological factors have not vitiated the positive impact of increases in smartphone shipments and bank deposits on mobile banking

transactions. However, the influence of these factors cannot be completely ruled out. If behavioural and/or psychological factors are at play, then the compulsion of using mobile banking under cash restrictions and the persuasive advocacy of e-transactions during demonetisation should have led to a distinct rise in such transactions. This rise, in turn, would digress from and disrupt the trajectory followed by e-transactions before demonetisation. As seen in Figure 1, mobile-banking use did exhibit such a rise in the demonetisation period, suggesting behavioural and/or psychological factors influencing mobile banking adoption.

FINANCIAL INCLUSION IN INDIA: CURRENT STATE AND FUTURE GOALS

Even as universal financial inclusion has long been among India's fundamental economic priorities, interventions have largely failed. According to the World Bank's Global Findex Report 2017, India is second to China in terms of the size of its unbanked population of around 190 million.¹²

The demand-side impediments to higher levels of financial inclusion in India include:

Table 2: Elasticity of Mobile-Banking vis-à-vis Smartphone Shipments in India

Period	Elasticity of mobile banking w.r.t. smartphone shipments	Period	Elasticity of mobile banking w.r.t. smartphone shipments	Period	Elasticity of mobile banking w.r.t. smartphone shipments
2015Q1	1.7416575	2016Q1	2.3757200	2017Q1	2.8014165
2015Q2	1.9327764	2016Q2	2.4698964	2017Q2	3.0503229
2015Q3	2.1254914	2016Q3	2.5526075		
2015Q4	2.2632307	2016Q4	2.641744		

(a) poverty; (b) irregularity and uncertainty of income; (c) lack of job security, which reduces the ability to save and manage resources for credit and insurance; and (d) illiteracy. The supply-side hurdles, which are relative to these demand-side factors, are the following: (a) lower penetration of bank branches and ATMs, which increases the cost of physical access to financial services; (b) the cost of maintaining a bank account; © tedious and time-consuming processes involved in banking, overwhelming the illiterate population and making them sceptical about formal banking.¹³

To reduce the costs associated with managing bank accounts, the Basic Savings Bank Deposit Account (BSBDA) has been introduced by Indian banks, as advised by the Reserve Bank of India. This account requires 'nil' or very low minimum balance, involves no or minimal charges, and can be easily opened due to simplified Know Your Customer (KYC) norms.¹⁴ The Pradhan Mantri Jan Dhan Yojana was launched by the Government of India in 2014 to make financial services (such as a basic savings bank account, credit, insurance, pension and remittance facilities) accessible and affordable to the poor sections of society.¹⁵ The banking sector has also been focusing on improving the coverage of brick-and-mortar bank branches and ATMs. Further, the Business Correspondent (BC) model of financial inclusion has been adopted, wherein banks deploy agents who provide basic banking services in more remote areas where setting up bank branches is difficult.¹⁶

CRISIL Inclusix, India's first financial inclusion index, launched in 2013, records a

significant improvement in the level of financial inclusion in India. This index rose from 50.1 in fiscal year 2013 to 58 in 2016 and is reflective of four dimensions of financial inclusion: (i) branch penetration; (ii) deposit penetration; (iii) credit penetration; and (iv) insurance penetration.¹⁷ The Global Findex Report 2017 also records that the number of bank-account holders in India has increased from 53 percent in 2014 to 80 percent in 2017.¹⁸ Of the 515 million accounts opened globally between 2014 and 2017, a whopping 55 percent—281.7 million—are Jan Dhan accounts.¹⁹

Despite such wide account ownership, 48 percent of accounts in India are inactive, i.e. no deposit and withdrawal happened using these accounts in 2017.²⁰ The BC model has failed for various reasons, including poor cost recovery and low profitability due to an inadequate commission structure; heavy workload affecting efficiency and regularity of service provision; low commission for too much work, causing negligence among BCs; and poor rates of usage of BSBDA accounts.²¹

Financial inclusion for low-income individuals enables them to alleviate poverty, achieve economic stability and become more financially independent. Unforeseen exigencies and long-term financial goals should not push them into debt. It is necessary to rethink financial inclusion in terms of a banking model that circumvents the hurdles faced by the measures mentioned above and compensates for their sluggish performance.

Worldwide, considerable importance is placed on the prospects of financial inclusion through mobile banking. In terms of profitability and cost-effectiveness, the

mobile-banking model scores far better than branch banking and the BC model. The cost of a bank transaction through branch banking in India is estimated to be between INR 70 and 75, while that of mobile banking is INR 1 or less.²² Mobile banking also overcomes the barrier of physical access to banks and other financial institutions.²³

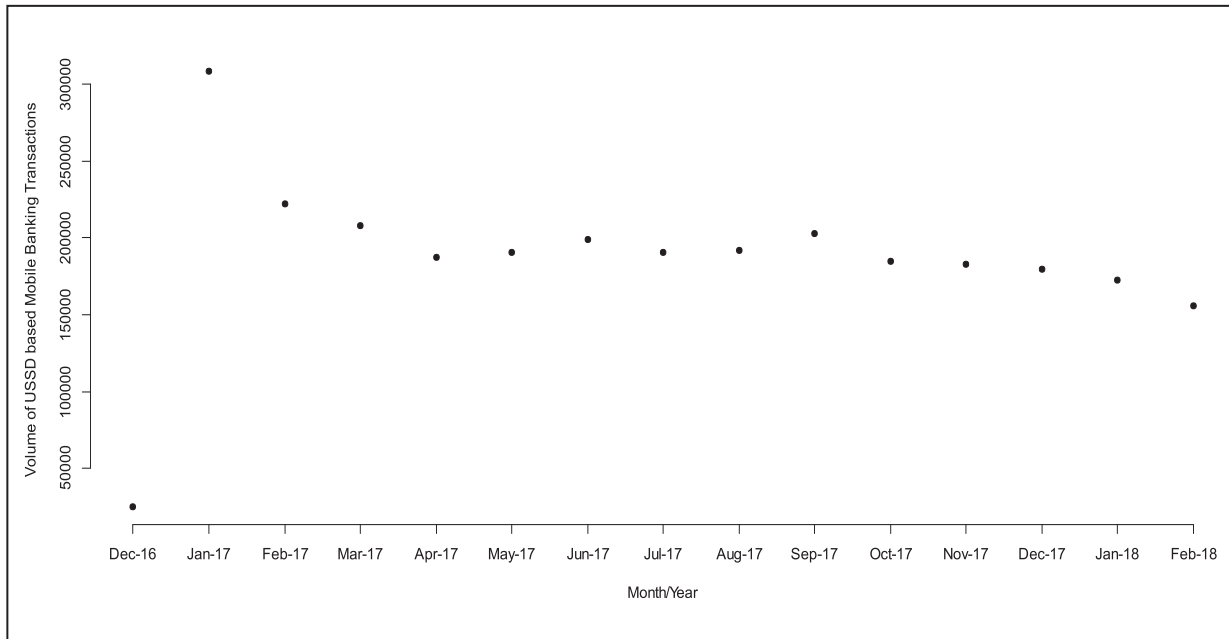
Since more than 50 percent of those unbanked and 66 percent of inactive account holders in India have a mobile phone,²⁴ technology-aided financial inclusion can overcome limited access to bank branches and the lack of financial viability of the BC model. The ubiquitous use of mobile phones among low-income individuals²⁵ makes mobile banking a better contender for financial inclusion, compared to any other application of technology. Since such individuals are generally not highly educated,²⁶ and most likely to be digitally illiterate considering 90 percent of Indians are,²⁷ the comfort that they feel with the use of mobile phones can be leveraged in helping them migrate to mobile banking. This can help relieve users from the tedium associated with banking.

Individuals with low incomes find it difficult to choose between how much to spend and how much to save in a bank account.²⁸ The need to keep cash aside for unforeseen exigencies further exacerbates this dilemma and hardly leaves any incentive to save in a bank account. Mobile banking lends itself to a mechanism that bypasses the conflict between liquidity and savings, as discussed in the next section of this brief. Within this mechanism, withdrawals and deposits are done through the mobile phone, ensuring a greater probability of active bank-account use.

Evidence from the developing world demonstrates that mobile banking among low-income individuals has a positive impact on their culture of savings with formal banks.²⁹ Users regard it as an easy, convenient, cost-effective and safe means to manage savings. Mobile banking has increased the savings capacity of individuals by reducing the possibility of unnecessary expenses and the dependence on informal modes of savings such as stashing cash at home, on their person, with relatives or with neighbourhood shopkeepers.³⁰

FINANCIAL INCLUSION VIA USSD-BASED MOBILE BANKING

Despite the advantages and ease of use associated with USSD-based mobile banking, there has hardly been any growth in the volume of transactions using this mode of mobile banking (see Figure 2).³¹ This is because while this mode of banking is meant to cater to the needs of low-income groups who cannot afford smartphones, these same individuals are not heavy users of banking services, to begin with. The lack of digital and financial literacy hinders their ability to both understand the benefits of USSD-based mobile banking and make use of it. Moreover, payments and other dealings using USSD-based mobile banking cost INR 0.5 per transaction, while those by cash are free. This cost can dissuade low-income individuals from using the service.³² Another limitation of the USSD-based mobile banking service is that once a transaction is initiated, it can no longer be cancelled.³³ This exposes low-income individuals to the risk of monetary losses in case of erroneous transactions.

Figure 2: The Volume of USSD-Based Mobile Banking Transactions in India

Source: NPCI.

The USSD technology is essentially a GSM network service. While being carried between the mobile terminal and the USSD gateway, the data is unencrypted and relies on the encryption of the network. Since the GSM encryption is flawed, in the event of a glitch or failure, it makes the data vulnerable to attacks. Moreover, this encryption occurs only between the mobile terminal and the base station with the data being unencrypted on the remainder of the GSM backbone.³⁴ Thus, the adoption of a model of financial inclusion based on USSD-based mobile banking, must be preceded by measures that circumvent such flaws and risks.

Low-income individuals are typically informally employed and operate within the informal economy, which is predominantly dependent on cash. This brief proposes financial inclusion founded upon a complete digitisation of this ecosystem, with USSD-based mobile banking being the instrument of such digitisation. All transactions such as receiving earnings or salary, making daily

purchases such as food and medicines, and paying utility bills must use the bank account through USSD mobile banking. This model of financial inclusion will maximise the gains in terms of cost-effectiveness, increased account use due to automatic deposit and withdrawal, and increased inclination to create savings. Further, it will create a trail of records reflecting savings behaviour and regularity of making payments, which fin-tech players have recently started using to assess credit-worthiness.³⁵ This helps low-income individuals avail credit more easily.

CONCLUSION & RECOMMENDATIONS

To facilitate digitisation using USSD-based mobile banking, the following factors need to be considered.

- (i) The transaction cost of INR 0.5 per transaction on the adoption of the USSD-based mobile banking must be either subsidised or waived altogether.

- (ii) Digital literacy and training must be provided to enable individuals to use mobile phones for USSD-based mobile banking.
- (iii) Understanding the financial circumstances and needs of prospective users at the individual level can guide financial literacy measures and efforts for sensitisation towards financial inclusion.
- (iv) In India, the government's stance on encryption is sharply skewed in favour of lawful surveillance and interception, and weak encryption policies. The National Encryption Policy is in a state of flux. If the USSD-based mobile banking is to be pitched as the medium of financial inclusion for the low-income segment of the population, then the government must facilitate the adoption of a robust encryption mechanism.³⁶
- (v) Other best practices to fortify USSD-based mobile banking include masking of PIN characters while being typed, strengthening the PIN, discouraging the use of predictable characters such as birth date as the PIN, and periodic changes in the PIN.³⁷

Financial inclusion via USSD-based mobile banking is only an interim strategy towards smartphone-based mobile banking. Behavioural and/or psychological factors—such as perceived risk of or aversion to the use of technology in managing finances, lack of awareness about the benefits, and rigid habits—affect not only mobile banking but also other means of digital transactions. Since demonetisation, advertising and marketing strategies have focused on highlighting discounts and cashbacks, but not much has

been done to address apprehensions and instil confidence regarding digital transactions. The RBI must counsel banks to administer a survey among their customers to tackle their distaste for technology, concerns of privacy, rigid banking habits, and financial illiteracy. The inputs from this survey will guide future action in relation to enhancing security, advertising, awareness and financial literacy campaigns, both locally (at the bank level) and beyond.

Daily-wage labourers who manage to get work one day have no guarantee of employment the next day. The years 2014 and 2015 saw a proliferation of home-services aggregators in India. These aggregators partner with service providers, e.g. electricians and plumbers, and their task is to attract customers for their partner service providers through branding and marketing strategies, allowing the providers to focus on service delivery. Such aggregators also train and skill the service providers with communication and soft skills that enhance customer experience. In return, these service providers have to pay a commission of 10–20 percent to the aggregator.³⁸


Partnering with aggregators has brought about tremendous gains for service providers in terms of work and income, which they could not have accrued by working in isolation. The support that aggregators provide enables service providers to become self-sufficient and economically stable entrepreneurs.³⁹ However, the outcome of this collaboration has not been equally satisfying for the aggregators. High costs of customer acquisition and thin margins have meant a higher rate of cash burn. Many aggregators have shut shop and others have been acquired; even giants such as UrbanClap and Housejoy face losses.⁴⁰ Since private

players are struggling in this sector and the potential of the aggregator model to transform the lives of casual labourers is phenomenal, the government—responsible for employment generation—must consider facilitating an aggregator platform to provide the much-needed infrastructure that can help lift workers out of poverty. Payments and other financial transactions involved in operating this aggregator platform must be made digitally. Informal labourers must be encouraged to open bank accounts so that their earnings can be directly deposited into these accounts. The aggregator model must also be replicated in the context of small stores and *kirana* shops as well as micro-entrepreneurs in the informal economy. Such replication must keep in mind the need for digitisation to allow USSD-based mobile banking.

Enterprises operating in the informal sector find it difficult to avail formal credit. Banks consider such enterprises risky, expensive and low-quality credit assets. The inability to provide collateral and the requisite documentation limit access to formal credit. Fin-tech firms offer collateral-free loans and use an innovative method to assess credit-worthiness. This new method analyses call records, transactions, regularity of various recurrent payments such as utility bills, and uses psychometric data to determine a prospective borrower's credit-worthiness. This process does not require formal documents, which are otherwise essential for accessing loans.⁴¹ The government must collaborate with these firms to enable them to

achieve scale and reach all corners of the nation. In doing so, the government must instruct fin-tech firms to make digitisation of operations an important condition for accessing digital loans. Purchases, sales and other such transactions must be conducted digitally and payments to workers made directly into their bank accounts.

A critical component of the initiatives undertaken to promote digital literacy in the country must focus on training people to use the internet to pursue education and enhance their skillset. Unskilled or semi-skilled workers, school dropouts and aspiring entrepreneurs must be made aware of how digital literacy can help them build skills and gain knowledge to improve their economic situation. Affordable smartphones with affordable data charges⁴² make 'anytime, anywhere education' more cost-effective and convenient than conventional modes of education. The purchase of a smartphone is an investment, which creates opportunity for those who cannot pursue a formal higher education. Government authorities must ensure the availability of relevant content in an accessible and unassuming manner on the internet, and institute an examination and certification process that guarantees employability for those who have opted for such online education.

As this brief has argued, mobile banking can be made ubiquitous in India by employing a strategy that involves USSD -based mobile banking underpinned by digitisation of the informal ecosystem. 

ABOUT THE AUTHOR

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ENDNOTES

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