

THE ROLE OF PERCEIVED FINANCIAL COST IN THE ADOPTION OF MOBILE MONEY IN INDIA

Hafiz Ubaid Ur Rahman Rahmani & Anita Gill
Faculty of Business and Law
Coventry University, United Kingdom

Abstract: In India, usage of mobile money services is very poor due to several reasons including a lack of understanding of services, low financial literacy rate, and fear of losing their hard-earned money. Moreover, the association between perceived financial cost, perceived fraud, and mobile money adoption has not yet been examined comprehensively. Therefore, this study aims to assess the impact of perceived financial cost and perceived fraud on the adoption of mobile money services in India. This study carried out a cross-sectional survey using a standardized questionnaire to collect primary data from mobile money users in Uttar Pradesh and Maharashtra states of India. Statistical Package for the Social Sciences (SPSS) was employed to analyse the data. The study found that four factors namely, perceived financial cost, perceived fraud, perceived privacy and mobile money agents have a significant impact on the adoption of mobile money services in India. Perceived trust was also found to be a significant factor in mobile money adoption in the country. Moreover, the respondents reported that mobile money services save their time and reduce costs in performing financial transactions. The empirical findings of the study might be useful for policymakers and service providers in enhancing the usage of mobile money services among financially excluded segments of society.

Keywords: Perceived financial cost, perceived fraud, perceived privacy, mobile money agents, mobile money users.

1.0 Introduction

The way we transact business has continued to evolve over the years with the support of technology. The continued development of great ideas and innovations has continued to be a driving force towards economic success and improved the living of the people. Back in the days when technology was still in its developing stage, transacting banking business was through the carrot and stick approach which only allows people to venture into the banking halls, stand in long queues and fill tellers to be handed over to the front cashiers for deposits and withdrawals while going long distance such as from Telangana to Hyderabad to carry out banking transactions which is time-consuming, hazardous and stressful but today, all these have taken on various dimensions with an associated cost involved. These costs can be either monetary or non-monetary which we shall be discussing in detail as we progress in this research study.

The Indian banking industry has evolved from a socialist licensed rigid business to a more liberalized, modernized and technologically oriented industry in India (Gaubha, 2012). The contribution of technology is quite immense as it has helped to change the way businesses are being done as well as the way transactions are being executed. This contribution of science and technology has made it possible for the various financial institutions to witness significant transformation (Okiro & Ndungu, 2013) as it has continued to remain the driving force behind the changes in mobile and internet banking in India which remains a country with a huge market size for financial and banking technology. Based on the IMF report as cited on financialexpress.com (2020) the Indian economy witnessed a great leap out of the twelve major economies in the number of mobile money accounts over the years. This is an indication that the Indian market is quite vibrant in terms of the market availability for mobile money products and the entry of various financial technology companies into the Indian market.

It is quite significant to note that the Indian financial market is a huge market which caters for a high population of banking and financial users that also double as mobile phone users. According to a statistical report by Statista (2022), the number of users of mobile phones in India as of 2022 is about 931.3 million people with an expectation of 1.5 billion users in 2040 which shows that the number of mobile phone users is on the increase, now that ICT has taken the centre stage in every aspect of human life, it has helped to improve the efficiency and effectiveness of services that are being offered by the various financial institutions (Luka & Frank, 2012). The emergence of the internet coupled with the creation of various devices has been of great benefit to the public as well as financial institutions. Now, it is easy for individuals to carry out businesses in the comfort of their homes. The monetary transaction remains one of the most significant transactions across the globe. It allows individuals to make savings and deposits and undergo various investment projects as well as meet up recurrent expenditures. According to Konig (2001), money has always been important to people as well as to the economy in general. This is because human beings have a bundle of wants and needs which must be satisfied and the means of exchange that is legally acceptable and recognized as a means of payment and settlement of deferred payment is money. Though money has taken on different dimensions quite distinct from the normal fiat money, today we now have various e-currencies or digital money which now serve as means of exchange across

the globe. Today a vast number of transactions can be transacted on personal computers as well as on mobile phones with the internet and transfer and receiving of money can be done in the comfort of one's home without venturing into banking halls and staying in the long queue.

The advent of mobile money is a step in the right direction which will further enable the execution of transactions quickly while reducing the influx of customers into the banking halls and it is an avenue of giving the customers a new sense of value as well as comfort. Mobile money is referred to as a type of virtual money stored using a subscriber identity module (SIM) card that acts in a unique way as an identifier of the user of an account (Diniz, Albuquerque & Cernev, 2011 cited in Lubua & Pretorius, 2018) which is a great way of identifying a specific user of an account and enabling security features through the unique identification number assigned to the users. Though, researchers like Sinha et al., (2019) have all investigated the privacy factor associated with the use of mobile money in India. It was reported that the country recently created the world's largest biometric database of over a billion citizens which involve sensitive financial information of citizens in which the privacy in the adoption of mobile payment is being recognized.

The use of mobile payment technology has continued to spread far and wide across the world with the creation of mobile wallets as well as digital currencies which are fast overtaking the use of debit and credit cards (Reuters, 2018 cited in Pal et al., 2021) while the popularity in the usage of mobile money keeps growing in countries like Kenya, Bangladesh as well as China (Pal et al., 2021). According to Statista the value of mobile wallet transactions in India from 2016 to 2021 grew significantly at a value of 0.4 trillion Indian rupees in 2016 to 72.5 trillion rupees in 2022 which is a significant progression in the use of mobile money in the country. Despite this huge leap in the use of mobile money, this also comes with its cost to the users which this study also addressed. The study examined the financial cost of using mobile money to the users looking at the procurement costs and the service charges from the financial institutions and the service providers respectively and its affordability while also examining why users adopt the use of mobile money and its preference in a large economy as that of India.

1.1 The research aims and Objectives

The research focused on the perceived financial cost of the adoption of mobile money in India while focusing on the following objectives:

- i. To examine the effect of perceived financial cost on mobile money usage in India.
- ii. To examine the effect of mobile money fraud on mobile money users in India.
- iii. To examine the impact of mobile money agents on the adoption of mobile money in India.

1.2 Research Questions

- i. What is the effect of perceived financial cost on mobile money usage in India?
- ii. What is the effect of mobile money fraud on mobile money users in India?

- iii. What is the impact of the role of mobile money agents on the adoption of mobile money in India?

1.3 Research Hypothesis

- i. There is no significant relationship between financial cost and the use of mobile money in India
- ii. Mobile money frauds have no significant effect on the usage of mobile money by users in India
- iii. Mobile money agents do not play a significant role in the adoption of mobile money in India

2.0 Literature Review

2.1 What is mobile money?

According to a PWC report, the Indian digital payment space which includes the use of mobile money has seen a tremendous change and growth in the last couple of years while the volume of transactions keeps increasing at an average compounded annual growth rate (CAGR) of up to 23%. Therefore, what is mobile money? The definition of mobile money differs across various industries most especially in the communication sector. It is referred to as electronic financial services carried out using the mobile phone which is being used for three basic services mobile banking, mobile payments as well as mobile transfers (Subia and Martinez, 2014).

The use of mobile money must be channelled towards meeting the demands of the public and in as much as ease and efficiency in the execution of transactions are quite important, the affordability of the usage of mobile money must also be critically considered. The creation of mobile money is a result of the need to meet the desires of the people within the country most of whom are in remote parts of the country and to cater for the need of the unbanked within the economy i.e., those who do not have a formal bank account but are interested in sending and receiving money through their mobile phones. Therefore, we can say that mobile money is a form of money which allows for the payment and receipt of funds for the unbanked through a mobile phone with the aid of a sim card. It is a process that entails users registering with a mobile money agent who serves as an intermediary between the mobile money user and the telecommunication company. The agent sends the money to the telecoms company and the telecoms company credits the mobile wallet of the users. This is depicted in the diagram below:

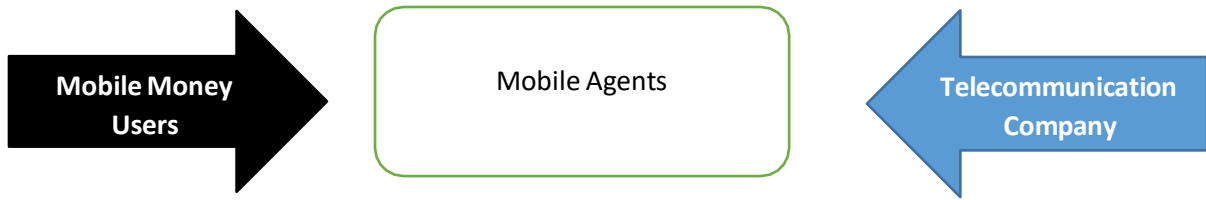


Fig 1: Mobile Money transaction process

The diagram above shows the mobile money transaction process with the mobile agents serving as the go-between in the process of transfer of funds to the mobile money users. Unlike a bank account, the sender’s mobile wallet and that of the receiver are not linked to their respective individual bank accounts but to their SIM cards while the mobile operator maintains the balance in their mobile wallets. The creation of mobile money remains an innovation established to help close the digital space divide and ensure more people who are regarded as the “unbanked” are brought into the global financial system with India included in the financial inclusion process. According to the World Bank cited by Venkatesen (2013), financial inclusion or access to financial services is the absence of price or non-price barriers which allows individuals that are unbanked most especially in developing countries since access to financial services is very exorbitant. A large proportion of the population of India is being excluded from basic banking and financial services as just one in every two Indians has access to a savings account in a bank, while just one out of seven Indians has access to bank credit (Business Standard, 2013 cited in Rajat, 2020). Getting financial services to the unbanked, especially in most rural parts of India remains sacrosanct to the general economy and the market availability portends huge user subscriptions to mobile money which makes it easy for people in the rural parts of the country to be able to make mobile money payments, engage in mobile banking and carry-out money transfers. Mobile money is further divided into three basic services mobile payments, mobile banking and mobile transfers as depicted in the image and further explained below:

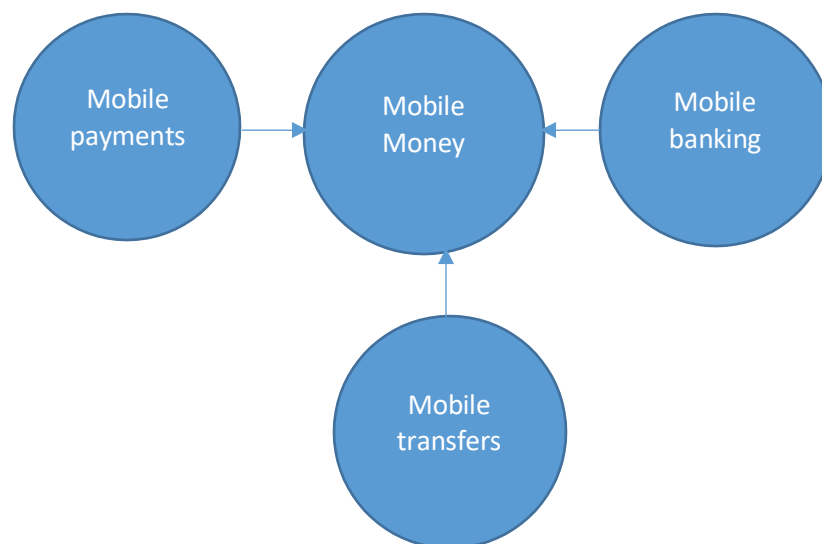


Fig 2: Three basic services of mobile money

Mobile Payments: Mobile payments is a type of mobile money which allows individual users or subscribers to make various bill payments ranging from electricity, subscriptions, water bill, and internet usage as well as other services which are of benefit to the users. Also, mobile payments systems over the years are relatively a recent type of self-service technology with the use of the mobile phone that allows users the ability to carry out payment transactions (Sinha et al., 2019) as convenience plays an important role in users' adaptability of mobile payments (Sobti, 2019).

Mobile Banking: Mobile banking is a type of mobile money that is an innovation carried out by financial institutions to further improve the banking experience of their customers beyond normal banking hall transactions with the use of their mobile phones. It allows users to not only check their account balances, but they can also make fund transfers, redeem loyalty coupons make cheque deposits using their mobile phones (Okiro & Ndungu, 2013).

Mobile Transfers: This is a type of mobile money service that involves the transfer of funds from one party to another using a mobile phone. A typical example is the M-Pesa in Kenya which facilitates financial transactions through mobile phones. For a transfer to be executed, an individual can send money to another individual by just sending a code. The individual takes the code to a local agent within the M-Pesa network, and the fund is transferred (PWC, 2010).

2.2 Evolution of Mobile Money in India

Since the country's economic liberalization in the year 1991, India is referred to as the fastest-growing emerging consumer market in the world with a growth rate as high as 7.3% in 2016 (Sinha et al., 2018). The demonetization resulted in tremendous growth in mobile money based on the government's initiatives such as digital India as well as the increased use of mobile and internet which are contributory factors to the exponential growth in the use of digital payment (Vally and Divya, 2018). According to a report by PWC (2010) report, one of the pioneers of mobile money was Muhammed Yunus who pitched a plan to sell mobile phones to "telephone ladies" in the rural part of Bangladesh to make accessibility to mobile phones possible. Bangladesh is today reported as having nearly half of the people in the villages have mobile access via the telephone lady with over a quarter million phones being sold, and this has made it possible for mobile money transactions to be carried out easily and comfortably.

The rising population of India remains a factor in the development of mobile banking in India as there is a need to meet the demands of the population most especially those who are unbanked within the Indian economy. To meet this demand, the government's digital India remains a great concept channeled towards ensuring that the unbanked are caught in the digital web to ensure that most of the population is well captured in the mobile money digital space. It was reported that government reforms created by Prime Minister Narendra Modi demonetized the high currency values of RS. 500 and RS. 1000 respectively as of 8th November 2016 with the launching of the 'digital India' in the same year (Vally and Divya, 2018). One of the major reasons for its adoption was to reduce the level of corruption as well as the spread

of black money, reduce terror funding and the creation of a cashless economy (Wharton University, 2017).

As the financial institutions continue to grow in leap and bound, the cost of borrowing remains quite high, and the risks associated with venturing into banks are fast becoming alarming with the spate of crime and the stress of having to be in queues for a longer time. The telecommunication companies and the fintech companies see this as a great opportunity to earn a fair share of the market by providing not only messaging and call services but also monetary services using mobile phones. The introduction of mobile money can be traced to Kenya wherein successful exploitation was recorded by M-Pesa and Vodafone and within five years of its launch M-Pesa alone had 15 million customers which were as at then equivalent to 37.5% of the country's population (Rajat, 2020). In the case of India, the Indian Central Bank which is known as the Reserve Bank of India believed that the mobile money contest was quite different compared to that of other countries that have adopted the usage as the need for regulation remains sacrosanct for effective mobile money to be implemented. One of the concerns was that other countries create services that focused only on remittances and not a complete set of mobile banking tools also they have poor banking infrastructure compared to that of India and other countries like Kenya had in place a national identification number which could be used to facilitate mobile money transactions which India does not have as at the period. These and other factors led the RBI to come up with a regulatory framework allowing only banks to operate mobile money services, creating the specific model for mobile money agent networks while also restricting the banks from charging the customers any fees while the banks are required to fund business correspondents and their customer service points through other profits (Lal & Sachdev, 2015).

2.3 Contributions of various financial institutions, fintech and mobile money agents to mobile money development in India

Various organizations including technology companies and financial institutions are playing great roles in the transformation of the banking and finance industry. The basic banking services have been pruned down or improved upon by financial technology companies as well as telecommunication companies. This innovation also serves as a platform on which banks also leverage to create internet and mobile banking services. Most companies rely on one or two of the mobile financial services models which are:

- i. The Bank Model
- ii. The Mobile Network Operator Model
- iii. The Hybrid Model

Based on research literature, a licensed bank takes custody of the funds of customers using mobile wallets which typically provides the customers with access to check bank balances, make transfers between or among accounts and ensure mobile payment with the aid of the internet and the use of a smartphone. This allows the bank to reduce the pressure in its banking halls and make the banking experience a great one for its existing and new customers. Also, the involvement of the mobile network operators has improved upon just wireless calls and network text messages to address the demand of the customers and

identify market opportunities through improved service creation while the service does not require a user to have a bank account before he or she can transact or conduct business. The payments occur within the transaction frame of the network operator with the support of mobile agents. Lastly, the hybrid model allows close collaboration between the telecoms company and the banks or financial institutions (Lake, 2013).

According to a Wharton review, in 2017 Paytm which is India's largest mobile money company launched its Paytm payments bank having been cleared by the Reserve Bank of India. The company was reported to have been able to lock in an investment of up to \$ 1.4 billion from Softbank of Japan which ushered in the creation of a mobile wallet for mobile money subscribers in India (Wharton University, 2017).

2.4 Costs and Risks associated with Mobile Money

There are various costs associated with the use of mobile money in India to customers since the adoption of mobile money usage in India. According to Ang (2020), the cost of using 1Gb of data to carry out mobile transactions is cheaper in India compared to other countries as it stands at 9 cents with a 65% decrease in price compared to the country's average cost in 2019. There are various risks associated with mobile money such as sim swap, identity theft, phishing, fake deposit alerts, as well as promotional scams. It has been reported that some employees of telecom companies also collude with fraudsters to scam users of mobile money. One such scam was that of six MTN employees who stole \$ 3.4 million from the company (Buku, 2017). Gilman and Michael (n.d), managing risks associated with mobile money remains a huge task, especially that which is associated with the fraud. There have been cases of people wrongly transferring more than the value of money requested to customers most especially the mobile money agents and customers abscond. There are also cases of fake alerts being sent to people through their mobile phones while making payments for goods bought and after absconding with the goods, the seller of the goods gets to see the alert message to be fake and not emanating from the bank. These and many more are all risks associated with mobile money and there is a need for strict regulation and proper standard measures to be put in place to check the activities of fraudsters and protect the interest of the customers.

2.5 Why people adopted the use of mobile money in India

There are various reasons why people adopted the use of mobile money in India which is one of the most populated countries in the world. Various organizations and financial technology companies are fast springing up to close the vacuum left by the big financial institutions. One of the needs for the adoption of mobile money boils down to the need for convenience and effective as well as efficient financial transactions devoid of any bottleneck. In the words of despite mobile payment being regarded as a cheaper alternative to conventional banking, many developing countries including Nigeria, Mexico, South Africa including India have failed to show noticeable acceptance even though India is regarded as being among the low adopters until the bank note crisis which resulted from the demonetization which led to the growth of mobile payment coupled with the accessibility and affordability of the internet (Pal et al., 2021). Over the previous years, the frequency by which customers witness the branches

of the banks has reduced drastically as a result of mobile money and mobile banking which provides an alternative to queueing at the banks before being attended to since customers can now make use of the self-service applications created by the mobile banking and money companies right on their mobile phones and in the comfort of their homes (Linah, 2013). There are some key factors responsible for the adoption of mobile money usage and these factors are the consumers, the nature of the transaction, the availability of technology and the role of the regulators who oversee regulating the use and adoption of mobile money. This is depicted in the triangular diagram below:

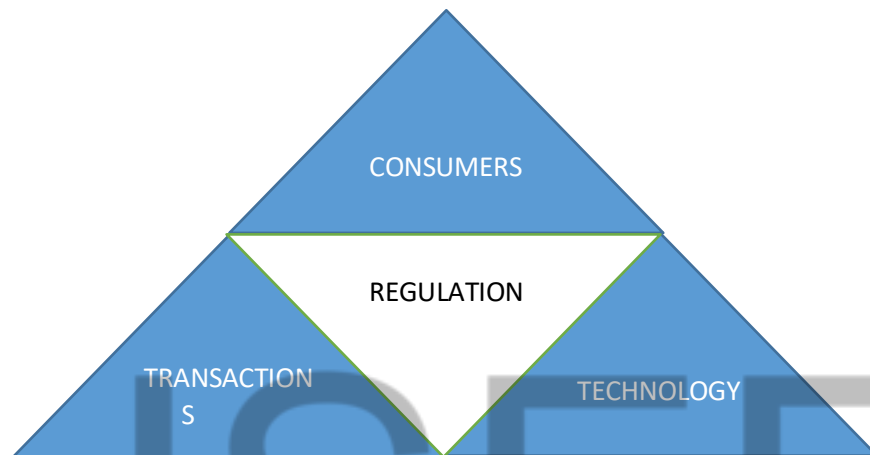


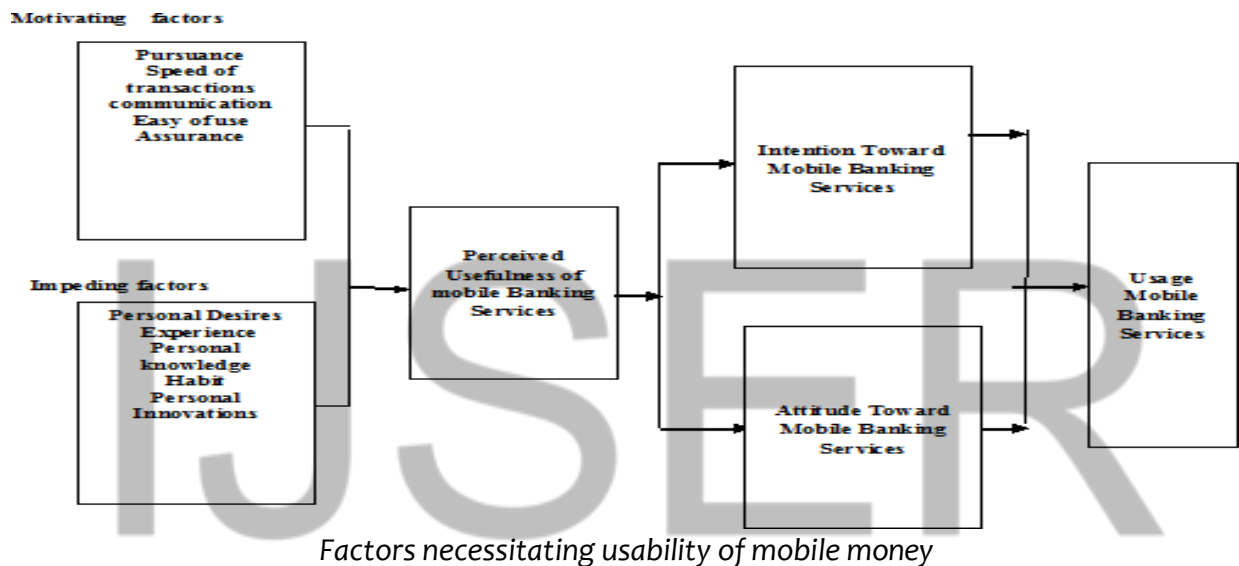
Fig 3: Key factors in mobile money usage adoption in India

Putting in place various laws to guide users of mobile money gives them the confidence to use it for receiving and transferring funds from one mobile phone user to another. Most times, regulating the use of mobile money is done by the Central Bank which allows the users of mobile money to be protected from being exploited while transacting while also serving as an arbitrator in the case of disputes (United Nations, 2012). The consumers or users who are banked or unbanked are key factors in mobile money usage in India. Most of the consumers living in the rural areas of the country require financial services which they can get from the telecommunication companies using their mobile phones. Convenience and avoidance of risks remain crucial factors for consumers in deciding whether to use or not use mobile money for their day-to-day transactions.

The nature of the transaction also remains a key factor in mobile money usage adoption in India. For example, most of the unbanked are found in the rural parts of the country. Making transactions that require the transfer of funds without having a bank account to another person in other parts of the country can be done easily with the use of mobile phones that are internet enabled and have a registered SIM. Mobile money transfer allows users with the use of their mobile Sims to send or receive funds as well as make payments for shopping, bill expenses and other expenses with ease using the mobile phone. Also, the presence of the enabling technology to carry out seamless transactions remains a key factor in mobile money usage in India. The advent of mobile phones and sophisticated applications that can carry out so many functions are making payment and transfer of funds easy.

3.0 Theory Development: Technology Acceptance Theory

A cursory observation of the theoretical approach to this research study is based on the technology acceptance theory (TAT) or technological acceptance model (TAM) which emphasizes the way the members of the public perceive the adoption of mobile money services in the Indian market. This theory of reasoned action emphasized the fact that a user's intention is a direct influence of actual behaviour, attitude and subjective norms with the necessity to create an intention to use or adopt the technology (Rahmani, Bardai & Ramez, 2018). The technology acceptance model or theory explains the reasons behind users' acceptance of a specific innovation which are depicted in the diagram below:



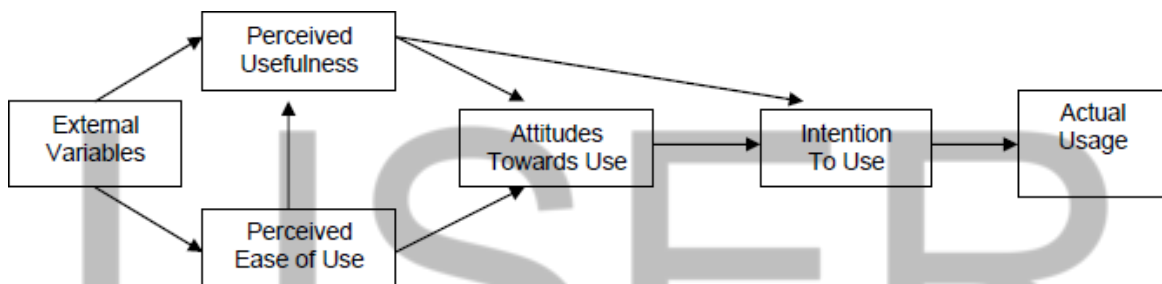
Factors necessitating usability of mobile money

Source: Alsamydai et al., (2014)

Adopting the use of technology is based on two major factors as opined by Alsamydai et al., (2014) which are motivating factors and impeding factors. India over the years is fast becoming a technology hub and it is competing favourably with the rest of the world. The use of technology stems from the need to meet the needs of the population or its huge market base. The motivating factor involved in the use of mobile money technology is as a result of the need for speedy execution of transactions, effective and efficient communication, ease of usage of the technology and the level of innovation and sophistication associated with the technology. It remains quite crucial that user acceptance, as well as confidence, are significant to the further development of a given technology (Taherdoost, 2019). Also, various impeding factors contribute to the usage and acceptance of a given technology most especially the use of mobile money which are personal desires, experience, cost, knowledge, habit and innovation etc. Using mobile money requires experience gathered over the years in the use of financial services, desires of the individual to try out a given technology to know its suitability regarding achieving the desires of the user. User acceptance of a specific technology is the demonstrable willingness within a user group to adopt the use of IT to

achieve specific tasks (Dillon, 2001 cited in Samaradiwakara & Gunawardena, 2014) with the positive intention to use a given innovation (Taherdoost, 2019).

People adopt technology based on its perceived usefulness i.e., its ability to solve their pressing problems and create the required value. This perceived usefulness stems from assurance, ease of use, communication, speed of transaction as well as pursuance which are all motivational factors that aid the use of mobile money. All these are a result of the adoption of technology as well as its acceptability (Alsamydai et al., 2014). People's intentions and attitudes can be geared towards mobile money to meet their obligations and ensure that comfort and delivery of service are ensured by the service providers and mobile money agents in India. Ramayah & Jantan looked at technology acceptance theory from an individual perspective as technology drives growth and economic progress which further helps to improve the well-being of the people. The behaviour or attitude of the users tends towards devices that can aid them in achieving set objectives in a small amount of time.



Technology Acceptance Model by Davis (1989)

Based on the technology acceptance theory, Davis (1989) cited in Ramayah & Jantan (n.d) found that there exists a relationship between users' beliefs about a certain technology's usefulness as well as the attitude and the intention to use the technology. However, it is perceived that usefulness exhibited a stronger relationship with usage compared to other factors. User acceptance and confidence are quite crucial for the further development of any new technology, and it is the decision to use a particular given system (Taherdoost, 2019). The attitude towards usage and the perceived intention to use an item may eventually lead to the usage or acceptance of a given technology. India with its huge population embraced the use of technology to further enhance its economic potential and improve the experience of the people in the use of first-hand technology while also helping to improve their way of life. The changing face of human desires coupled with the changing face of technology and its ability to meet the needs of people has made the acceptance of technology quite relevant. Also, one's cognition and reality play an important factor.

4.0 Research Methodology

There are various research questions this research study drives at providing answers to for the aim and objectives of the research to be achieved. Therefore, adopting a methodology remains of high importance to enable the researcher to not only design a path but also to use the designed path to achieve the research objectives. The research methodology serves as the interventions, activities and strategies developed by the researcher in achieving his aim and objectives (Babikir, Ali and Abed, n.d). Since the research study focused on the role of perceived cost in the adoption of mobile money in India, the use of a quantitative research approach becomes imminent. The quantitative research design approach is geared towards the use of research surveys and carrying out a test of hypothesis. In the words of Pandey & Pandey (2015), a good research methodology must be well-prepared in such a way that it can be generalized. The research problem must be formulated and defined, and appropriate techniques must be adopted while also adopting the use of statistical analysis. Quantitative research studies are based on various divergent theories as well as assumptions or hypotheses required to be tested (Daniel, 2016).

The research methodology focused on the use of a primary source of data gathering with the use of a British online System well-structured research questionnaire which enables the gathering of both demographic and inferential statistical data. This approach is like using an online research survey approach as a result of the outbreak of the covid19 and the omicron virus which may not make it possible to gather primary data using the distribution of a physical questionnaire. Data gathered using a quantitative research methodological approach are often believed to yield more objective as well as accurate information as they are gathered through a standardized form. The research study adopted the use of a purposive sampling technique which is a deliberate or non-probability which involves a deliberate selection of units of the universe for constituting a sample which is used to represent the whole (Kothari, 2004).

The population of the research study consists of mobile money users in India with a focus on a sample size of 600 mobile money users in the country who are either banked or unbanked but make use of mobile money devices as well as mobile money agents. The use of a well-structured online questionnaire was adopted and distributed among the respondents as the questions are being divided into demographic, inferential research questions and statements using a Likert scale of 1-5 i.e., 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree and 5=Strongly agree. The research analysis was conducted using Pearson's coefficient of correlation as well as the Analysis of Variance to test the hypothesis using IBM SPSS for statistical analysis.

Pearson's Co-efficient of correlation:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$$

Where;

r = Pearson's co-efficient

n = number of items

$\sum xy$ = Sum of variable x and y

$\sum x$ = Sum of variable x scores

$\sum y$ = Sum of variable y scores

$\sum x^2$ = Sum of the squared of variable x

$\sum y^2$ = Sum of the squared of variable y

Pearson's coefficient establishes the relationship that exists between or among variables that are being tested.

ANOVA

ANOVA, or analysis of variance, is a powerful statistical tool for demonstrating the difference between two or more means or components using significance tests. It also demonstrates how to do numerous comparisons of the means of several populations. The ANOVA test compares two types of variation: variation between sample means and variation within each sample. One-way ANOVA test statistics are represented by the formula below:

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares (MS)	F
Within	$SSW = \sum_{j=1}^k \sum_{i=1}^l (x - \bar{X}_j)^2$	$df_w = k - 1$	$MSW = \frac{SSW}{df_w}$	$F = \frac{MSB}{MSW}$
Between	$SSB = \sum_{j=1}^k (\bar{X}_j - \bar{X})^2$	$df_b = n - k$	$MSB = \frac{SSB}{df_b}$	
Total	$SST = \sum_{j=1}^n (\bar{X}_j - \bar{X})^2$	$df_t = n - 1$		

Reliability Test

For the test of reliability, this research paper adopted the use of Cronbach's alpha which compares the result of the test based on the standard yardstick of measuring reliability. In the words of Gliem and Gliem (2003), the Cronbach alpha reliability coefficient usually ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. Also, the rule of thumb indicates that a result that is >0.9 is Excellent, >0.8 is Good, >0.7 is Acceptable, >0.6 is Questionable, >0.5 is Poor and <0.5 is Unacceptable. The test of reliability was conducted using IBM Statistical Packages for Social Sciences (SPSS). Since the research is based on people and social sciences as it aids the use of questionnaires (Bonett and Wright, 2014). The reliability test was conducted using IBM SPSS and the result is depicted below:

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.642	.679	31

5.0 Data Collection and Analysis

Data collected are through a primary source with the use of a well-structured questionnaire from which responses are gathered for research analysis with the aid of IBM Statistical Packages for Social Sciences. The data gathered are divided into demographic and inferential statistical data using a Likert scale for scaling the responses received from the respondents.

5.1 Demographic Data

Descriptive Statistics								
	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Distribution of Respondents by Gender	352	1.00	2.00	1.4119	.49288	.243	.359	.130
Distribution of Respondents by Age	352	1.00	4.00	2.2841	.91768	.842	.319	.130
Distribution of Respondents by Marital Status	352	1.00	2.00	1.5937	.49183	.242	-.383	.130
Do you make use of mobile money	352	1.00	2.00	1.1932	.39536	.156	1.561	.130
Do you have to go to an agent before you can send or receive money through your phone?	352	1.00	2.00	1.3239	.46861	.220	.756	.130
Do you have a bank account?	352	1.00	2.00	1.2216	.41591	.173	1.346	.130
In what part of the country are you?	352	1.00	2.00	1.2983	.45816	.210	.886	.130
Level of monthly income (INR)	352	1.00	4.00	2.6307	.89313	.798	.386	.130
What is the monthly financial cost to you on using mobile money?	352	1.00	4.00	3.0568	.69361	.481	-.643	.130
Valid N (listwise)	352							

The descriptive table above shows the demographic distribution of the respondents based on the data collected which includes the gender, age, marital status as well as level of income of the respondents etc. From the data gathered, most of the respondents are females while most of the respondents are within the age range of 15-25 years. Also, based on the descriptive table, most of the respondents are married while most of the respondents do not use mobile money.

Test 1

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Variances	.971	.358	2.510	2.152	7.014	.281	31
Inter-Item Covariances	.053	-.474	.715	1.190	-1.508	.025	31
Inter-Item Correlations	.064	-.563	.691	1.254	-1.226	.032	31

Source: IBM SPSS

Based on the summary item statistics depicted in the table above, the number of items tested is 31 with mean inter-item correlations that show positive values of mean, maximum value, and range as well as the variance at 6.4%, 69.1%, 125.4% and 3.2% respectively. All the values tested on the item variances with mean, minimum, maximum, range, maximum/minimum and variances. The mean value shows a positive item variance of 97.1% which is highly positive showing the relationship between or among all the values tested as being correlated and of a great impact on the objectives of the research study.

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
91.98	79.421	8.912	31

Source: IBM SPSS

The table above is the scale statistics which shows the mean distribution, variance and standard deviation of the data tested. A mean of 91.98 and a variance of 79.421 at a standard deviation of 8.912 by testing 31 variables from the research questionnaire from which the data was collected in regards to the users of mobile money in India. This shows that at least about 100 respondents from the respondents that responded to the research questions make use of mobile money transfers.

ANOVA with Friedman's Test and Tukey's Test for Non-additivity

		Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig	
Between People		1022.219	399	2.562			
Within People	Between Items	7283.677	30	242.789	264.545	.000	
	Residual	Nonadditivity	127.934 ^a	1	127.934	141.028	.000
		Balance	10857.679	11969	.907		
	Total	10985.613	11970	.918			
Total		18269.290	12000	1.522			
Total		19291.510	12399	1.556			

Grand Mean = 2.97

a. Tukey's estimate of power to which observations must be raised to achieve additivity = .370.

Based on the ANOVA with Friedman's Test and Tukey's test for non-additivity, the corresponding p-value is $p = 0.000$. Since this value is less than 0.05 i.e., a 5% level of

significance, we can reject the null hypothesis that the mean response is the same for all three hypotheses tested. This is an indication that there is no significant relationship between financial cost and the use of mobile money in India, mobile money fraud does not have a significant effect on the usage of mobile money by users in India and mobile money agents do not play significant roles on the adoption of mobile money in India.

Test 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.897 ^a	.804	.788	.454	.804	50.570	30	369	.000

Source: IBM SPSS

Based on the model summary above, Pearson's coefficient of correlation shows that there is a high positive correlation among all the variables tested at 89.7% which is very high at an R2 of 80.4% and a low standard error of 0.454. This is an indication that there is a high correlation among all the variables tested based on the data gathered directly from the respondents who are mobile payment users in India. It can be affirmed that the various factors stated in the hypothesis have a significant impact on the use of mobile money in India.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	313.280	30	10.443	50.570	.000 ^b
	Residual	76.198	369	.206		
	Total	389.477	399			

Source: IBM SPSS

The ANOVA test table above shows the variance analysis among the variables being tested. The sum of squares of the regression shows a figure of 313.280 while the sum of squares of residual value is 76.198 at a degree of freedom of 399. The mean square of the regression was computed as 10.443 and at a residual value of 0.206. The F-value (10.443/0.206) was computed as 50.570 while the p-value was finally computed as 0.000 which is lower than the alpha value of 0.05 i.e., 5% level of significance at a confidence level of 95%. Since the P-value is lower than the Alpha-value of 0.05. Therefore, we reject the null hypothesis (H₀) and accept the alternative hypothesis (H₁).

Test 3

KMC and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.661
Approx. Chi-Square	4782.993
Bartlett's Test of Sphericity	df
	465
	Sig.
	.000

Source: IBM SPSS

The Kaiser-Meiyer Olkin (KMO) test as depicted in the table above shows a value that is more than or over 0.5. The computed KMO is at 0.661 which is greater than 0.5. Also, Bartlett's test depicts a figure which is lower than the significance level of 0.05 i.e., Bartlett's test shows a computed value of 0.000 which is lower than 0.05. These tests show that there is a substantial level of correlation among the variables tested at a 95% confidence level. This test shows how strongly the tested variables are correlated.

Component Matrix^a

	Component									
	1	2	3	4	5	6	7	8	9	10
DV Q1	.858	.204	-.135	-.130	-.008	-.024	-.020	-.075	-.119	.085
Q2	-.194	.673	.282	.103	.030	-.001	-.094	.293	.140	-.132
Q3	.087	-.048	.049	-.088	-.308	-.023	.300	.268	-.114	.447
Q4	-.092	.532	.055	-.059	.234	.039	.120	.049	-.238	.248
Q5	-.267	.778	.173	.158	-.030	.107	-.054	.013	.045	.089
Q6	-.181	.674	.204	.218	.029	-.015	-.082	.249	.098	-.056
Q7	-.052	.384	.252	.403	-.159	-.142	.237	.114	.336	.016
Q8	.042	.210	.029	-.328	.355	-.026	-.484	.388	.238	.295
Q9	.658	.235	.018	.078	.109	.274	.027	.046	.039	-.187
Q10	.651	.381	.034	-.002	-.109	-.357	.039	-.011	-.007	-.037
Q11	.482	-.077	-.065	-.071	.249	.550	-.131	.031	.098	.030
Q12	.699	.183	-.145	-.081	-.084	.049	.083	-.048	-.076	.185
Q13	.531	.204	.047	.237	-.199	-.100	.108	-.183	-.036	-.260
Q14	.628	.382	.052	-.002	.060	-.229	-.117	.085	.063	-.065

Q15	.710	.042	-.147	-.199	-.138	-.200	.015	.013	-.049	.150
Q16	.527	.153	-.111	-.052	.281	.473	-.059	-.036	-.081	.021
Q17	.304	.147	.134	.435	-.008	.443	.222	-.098	.203	-.098
Q18	.604	.214	.005	.018	-.198	-.232	-.056	.026	-.073	-.041
Q19	.102	-.143	.246	.509	.467	-.094	.123	-.059	-.272	.328
Q20	.273	-.424	.117	.090	.381	-.230	.176	-.206	.421	.140
Q21	.106	-.204	-.433	.274	-.055	-.153	-.515	.136	.101	-.051
Q22	.186	-.292	.445	-.190	.076	-.052	-.083	.360	-.258	-.342
Q23	.120	-.058	.369	-.401	.407	-.213	.273	.030	.213	-.176
Q24	.052	-.183	-.489	.297	-.243	.135	-.041	.200	.359	.160
Q25	.050	-.191	-.291	.383	.277	-.184	.287	.416	-.207	.132
Q26	.188	-.314	.623	.067	-.125	.035	-.065	-.188	.162	.239
Q27	.385	-.632	-.003	.145	.131	-.155	-.045	.147	.344	-.125
Q28	.104	-.146	.216	-.432	-.390	.197	.269	.272	.271	.176
Q29	.141	-.388	-.131	.078	-.015	.168	.363	.477	-.153	-.263
Q30	.194	-.424	.598	.130	-.209	.206	-.228	.065	-.160	.078
Q31	.230	-.390	.404	.328	-.180	-.049	-.386	.089	-.191	.074

Extraction Method: Principal Component Analysis.

a. 10 components extracted.

The table above depicts the component matrix regarding the responses provided by the respondents to the relevant research questions. It is used to reduce the data having the same components while also establishing a relationship among the variables being tested that have similar resemblances. Also, the possible values of the variables range from -1 to +1. The component matrix table shows that 10 components were extracted which have an Eigenvalue that is greater than 1.

5.3 Findings

Based on the hypothesis tested above, it can be deduced that

- i. There is a significant relationship between financial cost and the use of mobile money in India.
- ii. Mobile money frauds have a significant effect on the usage of mobile money by users in India.
- iii. Mobile money agents play a significant role in the adoption or use of mobile money in India.

6.0 Summary of Findings, Conclusions and Recommendations

The research findings show that mobile agents have continued to play significant roles in the use of mobile money in India due to the rate of unbanking in the rural areas of the country. Also, the financial cost has a significant influence on the use of mobile money in India as well as the level of fraud perpetrated through mobile money in the country. These factors have continued to play significant roles in the usage of mobile money within the country. These findings are in line with the findings of Pal et al., (2021), Sinha et al., (2018), Noreen, Mia and Ghazali (2021) etc.

Therefore, based on this research findings, it is pertinent that strict security measures need to be put in place by all the stakeholders to curb the spate of mobile money frauds on users' accounts as well as on the finances of the financial institutions responsible for its usage. Also, there is a need to reduce transactional costs with the use of mobile money to further encourage people to use it more knowing fully well that it facilitates ease of financial transactions. Also, mobile money companies are expected to verify the mobile money agents to prevent unscrupulous individuals from being agents. If checked, will encourage more people to use mobile money and increase the level of confidence the people will have in its usage.

References

- Ang, C. (2020, July 3). What Does 1GB of Mobile Data Cost in Every Country? Retrieved from <https://www.visualcapitalist.com/>: <https://www.visualcapitalist.com/cost-of-mobile-data-worldwide/>
- Alsamydai, M. J. et al., 2014. The Factors Influencing Customer Usage of Mobile Banking Services in Jordan. *International Journal of Business Management & Research*, pp. 4(2), 63-78.
- Alsamydai, M. J. et al., 2014. The Factors Influencing Customer Usage of Mobile Banking Services in Jordan. *International Journal of Business Management & Research*, pp. 4(2), 63-78.
- Ang, C., 2020. *What Does 1GB of Mobile Data Cost in Every Country?* [Online] Available at: <https://www.visualcapitalist.com/cost-of-mobile-data-worldwide/>
- Babikir, H. E.-H., Ali, A. B. & Abed el Wahab, M. M., n.d. Research Methodology Step by Step Guide for Graduate Students. *Sudanese Journal of Paediatricians*, pp. 9, 9-22.
- Bonett, D. G. & Wright, T. A., 2014. Cronbach's Alpha Reliability: Interval Estimation, Hypothesis Testing, and Sample Size Planning. *Journal of Organizational Behaviour*, pp. 1-14.
- Buku, M., 2017. *Innovation in Mobile Money: What are the Risks?* [Online] Available at: <https://www.cgap.org/blog/innovation-mobile-money-what-are-risks>
- Daniel, E., 2016. The Usefulness of Qualitative and Quantitative Approaches and Methods in Researching Problem-Solving Ability in Science Education Curriculum. *Journal of Education and Practice*, pp. 7(15), 91-100.
- Gaub, R., 2012. The Indian Banking Industry: Evolution, Transformation & the Road Ahead. *Pacific Business Review International*, pp. 5(1), 85-97.
- Gilman, L. & Michael, J., n.d. *Managing the Risk of Fraud in Mobile Money*, London: GSMA.
- Gliem, J. A. & Gliem, R. R., 2003. *Calculating, Interpreting and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales*. Columbus, Midwest Research, pp. 82-88.
- Kothari, C. R., 2004. *Research Methodology Methods and Techniques*. 2nd Revised Edition ed. New Delhi: New Age International (P) Limited.
- Lake, A. J., 2013. *Risk Management in Mobile Money*, s.l.: International Financial Corporation.
- Linah, O., 2013. Mobile Money Transfer: A Focus on the Impact and Usage. *Laurea University of Applied Sciences*, pp. 1-44.
- Lubua, E. W. & Pretorius, P., 2018. The role of the transaction assurance, perceived cost and the perceived innovation in the decision to continue using mobile money services among small business owners. *The African Journal of Information System*, pp. 10(2), 120-134.
- Luka, M. K. & Frank, I. A., 2012. The Impacts of ICTs on Banks. *International Journal of Advanced Computer Science and Applications*, pp. 3(9), 145-149.

- Pal, A., Herath, T., De, R. & Rao, H. R., 2021. Why do people use mobile payment technologies and why would they continue? An examination and implications from India. *Research Policy*, pp. 50, 1-24.
- Pandey, P. & Pandey, M. M., 2015. *Research Methodology Tools and Techniques*. Romania: Bridge Center.
- PWC, 2010. *Mobile Financial Services A Compelling Solution for Financial Inclusion in India*, Delhi: PWC.
- Rahmani, H. U., Bardai, B. & Ramez, A. A., 2018. Risks Associated with Payment Banks and Money Based Money Platforms. *International Journal of Scientific & Engineering Research*, pp. 9(11), 250-269.
- Rajat, 2020. Evolution of Payments Bank and Impact from M-PESA: A Case of Mobile Banking Services in India. *International Journal of Creative Research Thoughts*, pp. 8(7), 703-708.
- Ramayah, T. & Jantan, M., n.d. Technology Acceptance: An Individual Perspective Current and Future Research in Malaysia. pp. 1-9.
- Sinha, M., Majra, H., Hutchins, J. & Saxena, R., 2019. Mobile Payments in India: The Privacy Factor. *International Journal of Bank Marketing*, pp. 37(1), 192-209.
- Sobti, N., 2019. Impact of Demonetization on Diffusion of Mobile Payment Service in India. *Journal of Advances in Management Research*, pp. 16(4), 472-497.
- Statista, 2022. *Number of smartphone users in India in 2010 to 2020, with estimates until 2040*. [Online] Available at: <https://www.statista.com/statistics/467163/forecast-of-smartphone-users-in-india/>
- Subia, M. P. & Martinez, N., 2014. *Mobile Money Services: "A Bank in Your Pocket" Overview and Opportunities*, Brussels: International Organization for Migration.
- Taherdoost, H., 2019. Importance of Technology Acceptance Assessment for Successful Implementation and Development of New Technologies. *Global Journal of Engineering Sciences*, pp. 1-3.
- United Nations Conference on Trade and Development, 2012. *Mobile Money for Business Development in the East African Community*, Switzerland: United Nations.
- Vally, K. S. & Divya, K. H., 2018. A Study on Digital Payments in India with Perspective of Consumer's Adoption. *International Journal of Pure and Applied Mathematics*, pp. 119(15), 1259-1267.
- Venkatesen, M. & Gaurav, K., 2013. *The Mobile Money Revolution*, Geneva: ITU-T Technology Watch Report.
- Wharton university, 2017. *Mobile Money in India: Does Digitalization Follow Demonetization?* [Online] Available at: <https://knowledge.wharton.upenn.edu/article/mobile-money-india-digitalization-follow-demonetization/#:~:text=At%20the%20end%20of%20May%202017%2C%20Paytm%20%E2%80%93,clearance%20from%20the%20Reserve%20Bank%20of%20India%20%28RBI%29.>

APPENDIX

A SURVEY QUESTIONNAIRE

ON

THE ROLE OF PERCEIVED FINANCIAL COST IN THE ADOPTION OF MOBILE MONEY IN INDIA

SECTION A

(DEMOGRAPHIC DATA)

Kindly tick as appropriate [✓]

1. Gender (a) Male (b) Female
2. Age (a) 15-25yrs (b) 26-40yrs (c) 41-50yrs (d) 50yrs+
3. Marital Status (a) Single (b) Married
4. Do you make use of mobile money? Yes () No ()
5. Do you have to go to an agent before you can send or receive money through your phone? (a) Yes (b) No
6. Do you have a bank account? Yes () No ()
7. In what part of the country are you? (a) Urban (b) Rural
8. Level of monthly income (INR) (a) INR1000-INR5000 (b) INR5001-INR10000 (c) INR10001-INR20000 (d) INR20000+
9. What is the monthly financial cost to you of using mobile money? (a) INR10-INR100 (b) INR101-INR500 (c) INR501-INR1000 (d) INR1000+

SECTION B

(Tick one from a Likert Scale of 1-5)

Likert Scale	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scaling	1	2	3	4	5
What is the effect of perceived financial cost on mobile money usage in India?					
1. The cost of mobile money usage is Affordable.					
2. The cost of getting a mobile phone is high in India.					
3. The charges on transactions by mobile money agents are high.					
4. The costs or mobile charges by the telecoms company are unbearable.					
5. Government charges on mobile money usage are also a contributory Cost.					
6. Mobile money payments come with huge service costs to users of mobile money.					
7. The cost of internet subscription in executing mobile money transactions is also a financial cost to mobile money users.					

Likert Scale	Very Low	Low	Medium	High	Very High
Scaling	1	2	3	4	5
What is the effect of mobile money fraud on mobile money users in India?					
8. Mobile money fraud is persistent in India.					
9. Mobile money users' phones are often subjected to hacking.					
10. The spate of mobile money fraud remains a factor discouraging the usage.					
11. Mobile agents are also contributors to the fraud.					
12. Funds being stolen from mobile phone users are not retrieved back.					
13. Mobile money platforms provide the required security to guide users against fraud.					
14. There are no mechanisms or regulations in place to protect users of mobile money against fraud.					

Likert Scale	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Scaling	1	2	3	4	5
What is the impact of the role of mobile money agents on the adoption of mobile money in India?					
15. Mobile money agents make use of mobile money more efficiently for users.					
16. Mobile money agents assist users and educate them on the usage of mobile Money.					
17. Mobile money agents as middlemen make the use of mobile money costly.					
18. Mobile money agents as middlemen exploit users.					
19. Users can have their money refunded by the agents if there is a problem with transfers.					
20. Sub-Saharan African countries need to integrate their monetary policies to ensure a highly competitive Economy.					
21. Sub-Saharan African countries need to ensure efficient monetary integration to improve the standard of living of the people.					
22. The flow of foreign direct investment into sub-Saharan African countries will help to reduce the rate of unemployment in member countries.					