The new information ecosystem being developed around mobile money: A behavioural analysis of mobile money users in South India

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Abstract

With the introduction of mobile money in India beginning in 2010, we wanted to research empirical understandings about the role of mobile money in replacing cash among migrant workers in South India. We also wanted to understand the role of middlemen in this broad ecosystem. Lastly we wanted to understand whether the users feel a sense of trust when using mobile money. We find that on average, mobile money users' transfer of both money per month and emergency money as compared to non-mobile users was significantly higher. There was also greater interstate transfer of cash by mobile money users. Our regression results clearly show that mobile money users send about 64% more than non- mobile users. Also mobile money users send about 44% more emergency money than non-mobile users. Its usage also increases with age, education level, and marital status.

Four distinct outcomes emanated as to the rationale for why both the agents and the clients believe in this system. They are:

1. The clients' potential to save in their home bank accounts through remittances.
2. The automatic client attraction to the product; the pull-not-push strategy.
3. The employer who remits on behalf of his client had created a sub-ecosystem of mobile money over unsafe cash. This is evolving and requires further study.
4. The SMS which the clients receive instantly upon transferring money had created trust and safety.

We further propose a “model” for financial inclusion which includes both the shift of migrant workers from cash transactions to mobile money and towards inclusive banking, as well as a revenue model for mobile network operators.

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Note. We would like to acknowledge the research assistance of Mr. Ravi Shankar, Ms. Anuradha Rao, and Ms. Manasa Venkatesh.

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1 Introduction

Mobile money is at the intersection of finance and telecommunications, and would hence face regulations originating from both these sectors. Most underdeveloped economies have a poorly regulated financial sector, while developed economies havewell regulated and developed financial and telecommunications sectors. In poor economies the bottom third of the population have hardly any access to the banks, and mobile money has provided the needed solution. However, when scaling up, how can these customers be assured that the data they provide are protected? Looking at it another way, how much customer protection is there, and how willing are they to shift from their comfortable cash transactions to mobile money? India faces a unique challenge in that we are caught in the middle with a reasonably well developed banking system, but banking has still not penetrated to the bottom 30%, among whom the penetration of mobile phones has been deep. (Basu and Srivastava, 2005)

In India, there are an estimated 310 million savings accounts with banks, and the mobile subscriber base is 680 million, out of which 32% are subscribers based in rural areas. (TRAI, 2012-13). The growth rate in mobile subscriptions in rural areas is anticipated to be between 45% and 50% over the next couple of years. (TRAI, 2012-13). The link between financial inclusion and information technology has been critical, and one can observe that where the banks have not been able to penetrate, mobile services have succeeded. The Telecom Regulation Authority of India reports that 91% of the villages in India are covered by at least one mobile network operator.

In other countries where mobile money services have been implemented, the mobile network operators (MNOs) have played the dominant role. In India, however, the banking system is relatively developed compared to other similar countries, with the Reserve Bank of India taking charge of regulation and policy implications. The Central Bank has currently

ruled out MNOs from offering any cash-out or mobile wallet facility unless they convert their services as banking business correspondents (BC). The role of a BC is to act as an interface between the bank and its customers in places where traditional banking is not feasible. Banks can appoint a trusted third-party as a BC in a village. All of the villagers who wish to transact with the bank can get in touch with the BC.

Mobile money ecosystems span a wide range of different players, including MNOs, banks, airtime sales agents, retailers, utility companies, employers, regulators, international financial institutions and donors, and even civil society organizations (Jenkins, Beth, 2008).All of these players need to co-exist and provide their services to ensure seamless transition to financial inclusion. The question here is whether or not the roles been defined for each of these entities and their applicability in India. One can also observe that some of these functions can take place without human intervention, which once again raises questions about the level of information technology and its ability to eliminate the middlemen without any glitches.

Additionally, mobile money transfers entail huge transaction risks, security risks, and risks of stolen identities. In most cases, the physical possession of the asset (in this case, the mobile) can provide the right to use the mobile account as a store of value, not unlike cases of theft of regular cash or credit cards. Privacy and data protection concerns are distinct issues that arise in e-commerce transactions. They are linked to consumer protection policies within e-commerce and telecommunications, as well as certain practices in financial regulation. For a m-payments scenario, data may include payer and payee IDs, their geographic locations, times of day, purchased items, and their value and transaction value. There has been positive evidence where the mobile money trail could be obtained with this data, and they have been used by microfinance institutions (MFIs) to expand the range of savings. However, in this context, the data protection laws and privacy regulations should be extended from banks to

include MNOs. The Central Bank can continue to monitor that these guidelines are being implemented to ensure transparency.

Cash seems to be the main barrier to financial inclusion. As long as poor people can only exchange value in cash or, worse, in physical goods then these transactions will remain too costly for formal financial institutions to address in significant numbers. Collecting low-value cash deposits and redeeming their savings back in small sums of cash requires a costly infrastructure which few banks are willing to make extensive in low-income or rural areas. But once poor people have access to cost-effective electronic means of payment such as M-PESA, then they could, in principle, be profitably marketable subjects for a range of financial institutions (Mas, Igancio & Radcliffe, Dan 2010).

So, can the banking system include mobile services, or can they be granted autonomy? Can technology reach the rural poor in terms of encouraging them to save with the BCs and transact using mobile phones? Do they consider mobile money a violation of their privacy which creates an atmosphere of being watched by the government all of the time? If cash is a barrier for financial inclusion, how do the villagers mobilize savings to be deposited with MFIs or BCs, and use mobile phones for these transactions? Is M-PESA replicable in India? This study aims to shed light on these questions, which form the basis of our study.

Section 1 introduces the research, section 2 provides the literature review in this area, and section 3 discusses and contrasts the international and indigenous models prevalent in the mobile money space. Section 4 brings out the research questions, and section 5 proposes the regression model for data analysis. Section 6 analyses and discusses the data, and section 7 concludes with a proposed model for mobile money expansion in India.

2 Literature Review

The term mobile money refers to the *usage* of the mobile phone as a platform for offering financial services. Obviously it does not depend only on the mobile instrument--a prerequisite for its successful implementation--as its cash convertibility. This hence necessitates the presence of a network of agents who receive commissions for performing this task (Donovan, 2012).

Formal financial institutions are often out of reach for the poor in developing nations, causing them to be financially excluded. Reliance on the informal sector, which is usually more expensive, leads to the poor being doubly disadvantaged. Branchless banking through mobile money tackles both of these basic problems effectively by making financial services accessible and less costly for the poor (Alexandre, 2011).

The economically deprived often depend largely, if not entirely, on cash-based storage, transaction, and savings mechanisms. Maurer (2012) highlights how mobile money scores over cash on several counts. Cash is anonymous; in case of loss or theft, there is no possibility of proving ownership in a conclusive manner. Mobile money, on the other hand, is traceable due to the trail of electronic records it leaves behind it. The government backing makes international cash transfers difficult to transport, and storage costs of a physical entity such as cash and coins and currency notes that are subject to wear and degradation are also not negligible. In the mobile money scenario, however, the bank comes to the customer's doorstep. Maurer points out that mobile money does not involve the construction of infrastructure, as it operates through mobile instruments and an existing system of retail outlets. This makes it extremely convenient for the suppliers as well as the users of this form of money (Maurer, 2012).

M-PESA, launched by the MNO Safaricom in Kenya in the year 2007 is one of the most successful mobile money services in the world. Just four years after its initiation, M-PESA

boasted of an astonishing 14 million strong customer base--approximately one-third the population of the entire country. This MNO-led money service has greatly promoted financial inclusion among the unbanked poor in Kenya. Customers can top-up airtime, pay bills, and transfer money via this service. To register, a person needs to visit an authorized M-PESA retail outlet, sign up for the service, and deposit cash into his or her mobile account created by Safaricom. The cash then gets converted into mobile money, also called "e-float." E-float is backed by fully liquid M-PESA accounts in banks that have agreements with Safaricom. A large network of M-PESA agents act as interfaces who enable the exchange of e-float for cash and vice versa (Mas & Morawczynski, 2009).

M-PESA, although extremely successful, was not the first mobile money initiative in the world. The Philippines were one of the initial countries to witness the launch of mobile money. Leading MNOs SMART and Globe launched SmartMoney and GCASH in in the Philippines in 2001 and 2004 respectively. SMART operates with a banking partner--Banco De Oro (BDO)--while GCASH is an open platform that deals with many banks. Need for financial inclusion, the presence of reliable mobile network coverage, high SMS literacy, and large volumes of international remittances are the key factors that contributed to the success of mobile money in this country. Mobile money has made a difference to people at the "Bottom of the Pyramid," i.e. economically deprived users, as can be seen empirically in these developing countries (Alampay & Bala, 2009).

In August 2007, Dialog, a leading MNO in Sri Lanka, began offering eZPay, a mobile money service in partnership with a commercial bank, National Development Bank. In 2008, Vodafone and Roshan, an Afghani telecommunications company, launched M-Paisa in Afghanistan to facilitate transfers of money based on the M-PESA model in Kenya. These are only a few examples of established mobile money projects in an ever-growing industry. The success of a mobile money operation depends on three foundational pillars: utility, capacity,

and an enabling environment. Utility means the usefulness of mobile money for customers, while capacity is the ability of providers to make available an effective and comprehensive service. An enabling environment refers to customer trust and the establishment of a suitable regulatory framework (Jenkins, 2008). Each of these three fundamental aspects is explored in the following paragraphs. Today, mobile money can be put to multifarious uses, catering to the needs of people hailing from different demographics. Additional services are frequently offered in order to diversify and increase the utility of mobile money.

A study conducted by Pickens and Morawczynski reveals that M-PESA in Kenya is primarily used for two purposes: storage and transfers. Small amounts are aggregated into lump sums over time. The liquidity of collected money makes M-PESA a risk deposit for sudden needs. Many urban users of M-PESA consider it to be safer than physical forms of wealth storage such as cash because it prevents theft by family members and others. However, large amounts are not set aside in mobile money accounts since M-PESA provides no interest. M-PESA is often not used for storage in rural areas due to cash float problems with agents. Pickens and Morawczynski observed the demographic profile of M-PESA users making transfers, finding that young men formed the majority of urban users transferring money to rural recipients, comprised mainly of women and retirees (Pickens & Morawczynski, 2009). The use of M-PESA for migrant, urban Kenyans is one motivation for our study. Their use of this medium to remit money to family was a phenomenon we observed among migrants in Chennai, too.

In 2009, Zaad mobile money was launched by Telesom in Somaliland, Somalia. A lack of financial institutions in the region led to the widespread employment of this service. In Somaliland, the average number of transactions per customer is very high. The two major types of transactions that Zaad is used for are purchases of goods and services, and salary

payments to employees. Cash-in/cash-out is not encouraged; customers directly transact with mobile money (Penicaud, 2012). Distribution channels are integral to the smooth functioning of mobile money. Points of contact such as MNO agents, ATMs, and retail stores build the capacity of this service. The role played by middlemen in this system is one that cannot be ignored. Middlemen, too, seemed to play a vital role in the mobile money ecosystem in India. Hence, similar experiences in other countries proved to be important insights.

M-PESA is a classic instance of an arrangement that has successfully tapped agent networks. Under the M-PESA service, agents are required to become completely affiliated with Safaricom; they are not allowed to sell products from any other mobile service. Many are asked to paint their stores green to signify Safaricom ownership, and to display corporate branding. Safaricom performs the training of all of its agents, which is outsourced to a third party. Safaricom area managers make monthly visits to each retail outlet under their command, and rate agents on various measures. The purpose of these visits is to facilitate dialogue and make improvements wherever necessary. The most visible indicator of the smooth functioning of the M-PESA system for clients is the ready availability of cash with agents for cash-in/ cash-out transactions. Safaricom manages its cash through “master agents.” Around 300 master agents exchange cash and e-float with agents either physically or via a bank. Master agents receive 30% of the total commissions given out by Safaricom, and retail agents are given the rest. Agents have to maintain a physical log of transfers that is countersigned by customers. This standardized log is handed out by Safaricom only to authorized agents. The log makes customers feel more secure about their transactions when compared to an SMS confirmation, and it can also be used in cases of discrepancy. One copy of the log is retained with the agent, a second is sent to the master agent, and the third to Safaricom. Agents receive a commission every time a user creates an M-PESA account.

They can also only register customers who live within a certain distance of their retail stores. Agents are disallowed from collecting any fees from customers; all of their commissions are given to them by Safaricom (Mas & Morawczynski, 2009).

The Filipino MNO Globe primarily conducts its business through non-bank agents such as pawn shops, department stores, and rural bank branches. SMART, on the other hand, uses BDO branches, ATMs, and wireless centres in urban areas, and microfinance institutions, money changers, and pawn shops in rural regions to act as its outlets. Licensed agents are allowed to conduct cash-in/cash-out transactions (Leishman, 2009). The ubiquity of these agents is a key factor that enables frequent transactions. In fact, a study in the Philippines found that persons who made more than four transactions per month were 40% more likely to live near an agent when compared to those who made less than four transactions per month (Pickens, 2009).

The final factor on which the growth of a mobile money project depends is an enabling environment. Customer trust is molded by perception of security systems in place and recognized regulatory guidelines. In the M-PESA system, The Central Bank of Kenya (CBK) ensures the implementation of appropriate regulatory measures. The CBK has given Safaricom the space to operate outside the purview of banking law after monitoring the security standards of the M-PESA mobile platform. CBK places emphasis on the need for Safaricom to maintain its funds in a formal financial institution. As directed, Safaricom ensures that interest received on these funds is given to non-profit institutions. Besides, Safaricom has itself taken several measures to help users build trust in M-PESA and its retail network. Safaricom already had a strong presence in Kenya when M-PESA was launched, and hence commanded a certain degree of reliance. Effective marketing ensures that users immediately associate the mobile money service with its parent organization. Standardization across outlets consistently reinforces a good customer experience. Efficient training of

agents, transparent pricing, and implementation of anti-fraud measures also builds customer trust (Mas & Radcliffe, 2011).

In Afghnistan, reluctance in the minds of consumers is a major setback to the usage of M-Paisa, Vodafone and Roshan's mobile money service. The fragile political situation and instability prevalent in the country only increases suspicion among customers. Many Afghanis prefer the hawala agent that their family has been using for generations to mobile money simply because of the familiarity of the known (Chipchase & Lee, 2011). Advertising is thus focused on customer education about the use of mobile money. M-Paisa is regulated by Da Afghanistan Bank and follows required norms (Satchu, 2009).

In the Philippines, GCASH and SMARTMoney have been able to operate to their full potential because of the stand taken by the central bank, BSP (Bangko Sentral ng Pilipinas). BSP allowed MNOs to pilot their services, rooted out the risks that arose, and then implemented necessary regulations. BSP also allowed licensed non-bank agents to exchange mobile money for cash, significantly increasing the reach of the service through informal networks. BSP has set down concrete rules for documentation of ID proof and know your customer (KYC) norms. In 2009, the bank also issued regulatory guidelines that MNOs had to follow while providing the mobile money service (Leishman, 2009).

3 Models: International & Indigenous

Since mobile money lies at the junction of financial, telecommunications, and security services, it is difficult to define who will take the leading role. In most mobile money projects in developing nations particularly in Africa and Asia, the mobile network operator (MNO) has played a leading role in initiation and implementation. MNOs currently spearhead more that 70% of all mobile money initiatives across the globe (Penicaud, 2012). The likely

reasons for this trend include the presence of a highly interconnected mobile network, existing tie-ups with agents for airtime top-up and other services, and customer relationships that merit trust and reliance (Ivatury & Mas, 2008). Coupled with the penetration of mobile technology amongst the lowest economic strata, mobile money brings with it the high possibility of financial inclusion and empowerment.

Mobile money is increasingly finding support in many developing countries for this very reason. Two decades ago, it would have been difficult to even imagine making financial transactions through a handheld device. Today, owing to the advances in technology and communication systems, mobile money is changing the socio-economic setup of communities, and redefining the very idea of banking. Figures indicate that globally, the reach of mobile money is on the rise. As of 2012, there were 150 mobile money services in operation spread across 72 countries; of these, 41 were launched in the year 2012 alone. Almost 30 million active mobile money accounts have been identified around the world. Sub-Saharan Africa is the region that has witnessed the highest number of mobile money deployments, and this figure is only expected to increase in the coming years (Penicaud, 2012). For this very reason, Figure 1 would be an apt description of mobile money models at present internationally. In the MNO-led model, the mobile money operator is the leading player because of: 1) their highly connected and far reaching mobile networks; 2) their existing tie-ups with agents for airtime, top-ups, etc.; and most importantly 3) customer trust. Banks in this set up play the role of liquidity provision only.

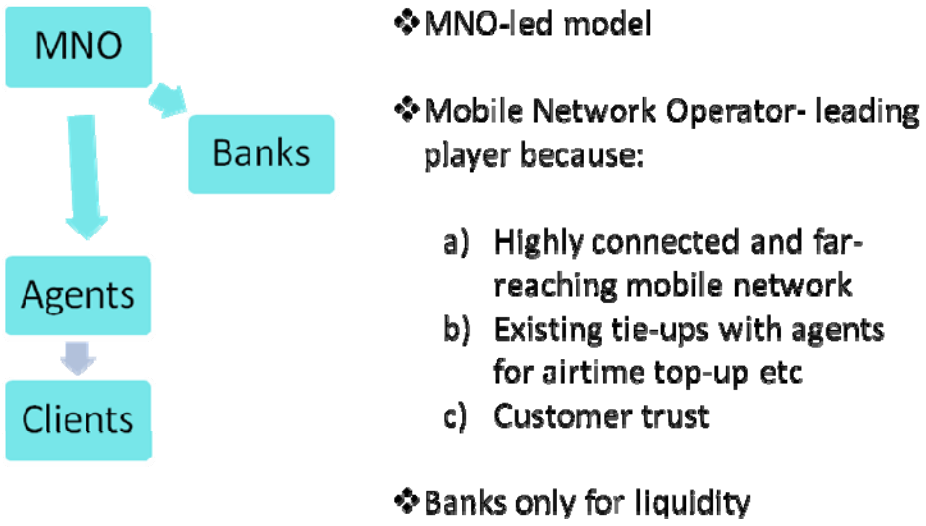

Figure 1: The International Mobile Money Model

In India, however, the concept of mobile money is in a formative stage. There is definitely a need for financial inclusion in the country, especially in rural regions that have not witnessed the introduction of banking services. India's central bank, the Reserve Bank of India (RBI), has extensively highlighted the scope and progress of mobile money in the country. As of March 2012, there were 0.14 million villages out of 0.6 million villages that were covered by formal banking systems, which meant that 145 million households were excluded from the banking system. As of January 2012, there were 313 million rural mobile subscribers out of 936 million subscribers in the country (Khan Committee, 2012). The first set of mobile banking guidelines were released by the RBI in 2008. Ever since, mobile banking has been on the rise, with transactions increasing both in volume and value. The RBI has decided to opt for a bank-led model. The RBI believes that financial inclusion can be brought about when the following four comprehensive products are offered to customers via mobile banking: deposit, credit, micro-insurance, and remittance. Adhering to know your customer (KYC) and anti-money laundering (AML) standards is a priority for the RBI. The commercial banks in the country have these basic standards and processes in place. The RBI cites a two-fold argument for not choosing the MNO-led model. First, in an MNO-led model,

only the remittance product can be made use of. In India, non-bank players cannot offer the other three services that were cited by the RBI as integral for financial inclusion. Second, the bank-led model under the umbrella of the RBI is considered sustainable since there are a large number of competing MNOs in the country. Figure 2 describes the mobile money model present in India, which is rather different from the international model.

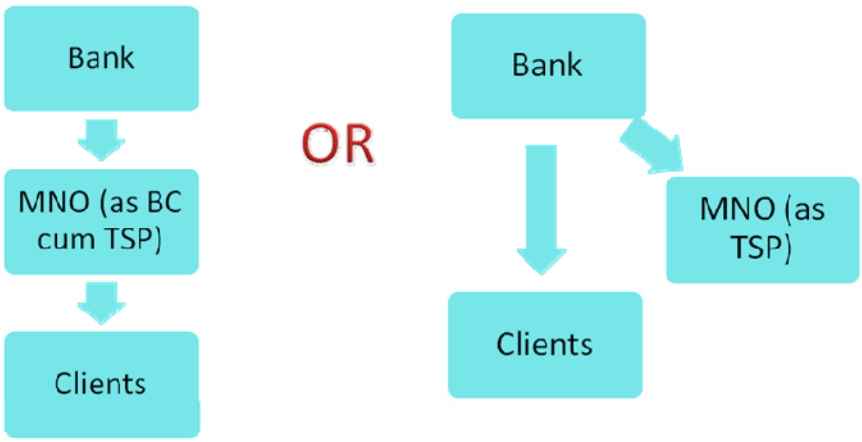

Figure 2: The Indian Mobile Money Model

Since the bank-led model has been adopted in India, customer complaints are handled by banks and not by MNOs. The bank is the player in the partnership that has ownership towards customers. The question that arises at this juncture is the role of MNOs in this model. According to the RBI, MNOs are technology service providers (TSPs), while banks are the sole players offering banking services. MNOs can also assume the roles of BC-cum-TSP, through which they can become the business correspondent of a particular bank. The RBI's goal for mobile money is to achieve the "7A framework" that will guarantee a high degree of utility and financial inclusion (the 7 "As" in this framework stand for Availability, Accessibility, Acceptability, Affordability, Awareness, Assurance, and Appropriateness).

Two unique mobile money services customized to suit the Indian context are the IMPS and m-KCC. The IMPS, or Interbank Mobile Payment System, was launched by the National

Payment Corporation of India (NPCI) in November 2010. It facilitates access to one's account and the transfer of funds through mobile phones. 50 banks have been authorized to carry out IMPS, and as of July 2012 36.32 million mobile money identifiers (MMIDs) have been issued. m-KCC, the mobile-linked Kisan Credit Card pilot project, was launched by the National Bank for Agriculture and Rural Development (NABARD) in October 2011 in Villupuram district, Tamil Nadu, with Pallavan Grama Bank. Under this scheme, farmers' Kisan Credit Cards are linked to their mobile phones, thus making it effortless for them to buy agricultural products from vendors.

Currently, there are several mobile money projects that are operational in India. Examples of bank-MNO pioneered services include Airtel Money by Bharti Airtel, mRupee by Tata Tel, MoneyonMobile by BSNL, Aircel-ICICI by the MNO Aircel and ICICI bank, and the Indian version of M-PESA by Vodafone. A successful mobile money project in the country that caters largely to the unbanked is one spearheaded by the financial services company EKO. A partnership between the State Bank of India (SBI), the largest public sector bank in the country, and EKO led to the initiation of SimpliBank in 2007 in the states of Delhi, Bihar, and Jharkhand. EKO is now the business correspondent of SBI, ICICI Bank, and Yes Bank in India (Nandhi, 2012).

Migrant workers constitute about one-third of the population of our country, and nearly 70% of them are women (UNESCO, 2012). They are treated as second class citizens, and are often excluded from the general economic, social, cultural, and political mainstream of society. They come from different states seeking employment, and their first goal is to remit money home. They have used several forms to transfer money home. Transfer has been in the form of hawala, the post office, the bank, or the present mobile money transfer. We interviewed migrant workers in the outskirts of Chennai and Hyderabad who were either users of the mobile or non-users of the mobile to transfer money to their home.

4 Research Questions

- Cash in hand versus cash in mobile - can mobile money eliminate the risks associated with cash transfers?
- How much is the role of middlemen defined in mobile money, and will this broad ecosystem increase transaction through the mobile? Hence, are there differences between mobile and non-mobile users?
- With growing hesitation to mobile money, can we ensure protection and trust in the minds of low income urban and rural people?
- Are there any other ways to effectively utilize the mobile money trail to facilitate financial inclusion?

5. Proposed Model

In this paper we are trying to estimate the impact of mobile money on the amount of money sent home, and usage of the same as emergency money. The following two models are used for estimating these two situations.

Model 1:

$$Y_{ij} = \alpha + \beta\, usem_{ij} + \gamma X_{ij} + \emptyset_j + \varepsilon_{ij}$$

Where, Y_{ij}=Amount of money sent home

i,j indicates individual i in location j

$usem_{ij}$= 1 for mobile money user

= 0 others

X_{ij}= vector of control variable: age of respondent, years of education of the respondent, occupation type, marital status, family size, number of working family members.

$\emptyset_j$: Location dummy, $\emptyset_j$takes 0 if origin of district and survey place is the same and 1 if origin of district and survey place are different.

Model 2:

$$M_{ij} = \alpha + \beta\, user_{ij} + \gamma X_{ij} + D_{ij}\varphi_j + e_{ij}$$

Where, M_{ij}: Dummy for emergency money sent

$user_{ij}$= 1 for mobile money user

= 0 others

X_{ij}= vector of control variable: age of respondent, years of education of respondent, occupation type, marital status, family size, number of working family member.

φ_j: Location dummy, φ_j takes 0 if origin of district and survey place is the same and 1 if origin of district and survey place are different.

D_{ij}: Distance travelled by respondent to use mobile money

6 Analyses of Data

We analyzed our data using the questionnaire method. We first contacted informally both mobile users and non-users to get an idea about their remittance patterns, their usage frequency of the different modes of transfer of money, and their need for the same. With the help of our estimating model as discussed in Section 5 we developed our final questionnaire, which was administered to all the clients (Annex 1). The model consisted of analyzing both users and non-users of the mobile as a means of transfer of money both as remittance to their hometown as well as a means to transfer money for emergencies. Our sample consisted of 494 mobile users and 300 non-mobile users on the outskirts of Chennai and Hyderabad respectively. This is convenience sampling. Hence, our complete sample was composed of 794 respondents.

Before we go on to analyzing the hypothesis, it will be useful to understand the demographics of the population to understand the differences and similarities between mobile users and non-users. Table 1 provides the descriptive statistics of the population.

Table1: Descriptive Statistics

	Panel 1 Mobile Money User(N=494) in INR					
	Age	Number of Family members	Different State	Average Monthly Income	Average monthly income sent	Emergency money sent
Mean	33	5.5	0.75	11,535	6,850*	5,380
Standard Deviation	5.02	4	0.5	6,050	2,034	1,098
Median	27	5	1	10078	2,045	5,123
Panel 2 Non- Mobile Money User(N=300)						
Mean	32	5.4	0.49	10,165	3,312*	0
Standard deviation	7.98	3.01	0.47	5,347	2,865	0
Median	29	4	0	7,000	3055	0

*Roughly $1= Rs 65

It can be seen from Table 1 that the average age and the average family size of the respondents whether they are mobile money users or non-users is almost the same. Furthermore, 75% of the mobile money users came from a different state in search of better opportunities as compared to non-mobile money users where the percentage from another state was 49%. The average monthly income of the mobile money user and non-user is Rs. 11,535 and Rs.10,165 respectively (roughly US$181 and US$160). The study has found that mobile money users have on average sent about Rs. 6,850 (US$108), whereas non-mobile money users have sent about Rs. 3,312 (US$52). Furthermore, mobile money users also have sent on average Rs. 5,380 (US$85) of emergency money as compared to hardly any money by non-mobile users in similar situations.

For testing if there is any significant difference in the amount of money sent by the mobile money user and the non-mobile money user we have used the *t* test. We have the following hypothesis:

Hypothesis 1:

Ho: The mean of the **average money** sent by the mobile money user is equal to the mean of the average money sent by the non-mobile money user.

H1: The mean of the average money sent by the mobile money user is greater than the average money sent by the non-mobile money user.

Hypothesis 2:

Ho: The mean of the **average emergency money** sent by the mobile money user is equal to the mean of the average emergency money sent by the non-mobile money user.

H1: The mean of the average emergency money sent by the mobile money user is greater than the mean of the average emergency money sent by the non-mobile money user.

Table 2 shows the results of the *t* test for Hypothesis 1, which is the result from the regression results of Model 1. It clearly indicates that respondents using mobile money transfer greater amounts of money than non-mobile users per month. Specifically, they transfer 64% more money to their hometowns as compared to non-mobile users. Hence, we can reject the null hypothesis and conclude that the average money sent by the mobile money user is greater than the average money sent by the non-mobile money user

Table2: Impact of mobile money user on average money sent

	Coefficient
User dummy	0.64***
Age	0.11**
Marital status	0.048
Sex	0.12**
Education	0.13***
Village dummy	0.15*
Constant	0.32
R^2	0.27

Note: ***,**,* indicate 1%,5% and 10% level of significance

To test Hypothesis 2 we look at table 3, which are the results from the regression of Model 2. It clearly indicates that respondents using mobile money for emergencies transfer more per month than non-mobile users. Specifically, they transfer 44% more emergency money to their hometowns as compared to non-mobile users. Hence, we can reject the null hypothesis and conclude that the average emergency money sent by the mobile money user is greater than the average money sent by the non-mobile money user

Table 3: Impact of mobile money user on emergency money sent

	Coefficient
User dummy	0.44***
Age	0.09**
Marital status	0.23***
Sex	0.08
Education	0.08
Village dummy	0.18***
Constant	0.28
R^2	0.27

Note:***,**,* indicate 1%,5% and 10% level of significance

Tables 2 and 3 also show that the several control variables that we used are significant at various levels as indicated under the tables. “Age” is especially significant when it comes to usage of mobile money. Most migrant workers are between the ages of 25 and 35, and are very comfortable with the usage of mobile phones; hence, the target clients for mobile money are youth. We also find that usage of mobile money is significantly higher among married men because men seem to come to other states in search of better opportunities and remit money back home to their families. Obviously the significance of the “village dummy” amplifies the fact that mobile money usage is greater among men who have come from other districts/states.

Transaction activity amongst the mobile money user is more intense than that of non-users. They seem to interact financially with personal networks more often, and make larger transfers over larger distances. Clients transferred money home to save in the bank accounts in their home, either in their personal accounts or their families' accounts. Most of them got to know about mobile money when they were topping up their mobiles for recharge, and hence the MNOs strategy of “pull” worked better than “push.” The trust element was rather high with mobile money, as clients received a SMS notifying them of the delivery of money to their accounts.

However, we found that most mobile clients preferred to keep cash in hand, as there were very few operators who provided below poverty line (BPL) families with mobile wallets. Hence, cash was king presently. Airtel, a MNO, was providing mobile wallets, but this seemed targeted only at well-to-do clients. We also noticed that there was an ecosystem developing among mobile clients. Often it was difficult for migrant workers to open bank accounts in their places of work, and they would hence remit money to their hometowns with the help of their employers. This sub-ecosystem might potentially be developing into a binding one, too. It is hence essential for clients to have independent bank accounts as well as money on the mobile so that they may use them as required.

In terms of policy this implies that banks should encourage clients to open and use their accounts. Today, (in July 2015), the RBI has given licences to 11 payment banks which will excusively deal with small remittances. Such actions can make banking more accessible to these migrant workers.

7 Concluding Remarks: A proposed model for India

Mobile money is catching on quickly in India. In India, mobile money is bank-led, as compared to several other developing and underdeveloped countries like Kenya, Ghana, and

Afghanistan where MNOs have taken the lead in service provision. Clients, particularly migrants, have a need for the same service provision, feel drawn to it, and trust in the same, and this research shows that mobile money has huge potential both from the client perspective as well as from the revenue standpoint. This is one model by which a large percentage of Indian workers can be brought into the formal financial system, an elusive agenda for decades.

The runaway success of the M-PESA model, which is being emulated the world over, is founded on a basic remittance model, a model to drive the client to remit money to his or her family. In India, too, the goal of many MNOs is to create a single product--namely a remittance product--and to target the same at migrant workers. Many MNOs have used this basic model as their revenue model. The question that arises is: what next? Figure 3 below is a proposed model for the mobile money ecosystem in India.

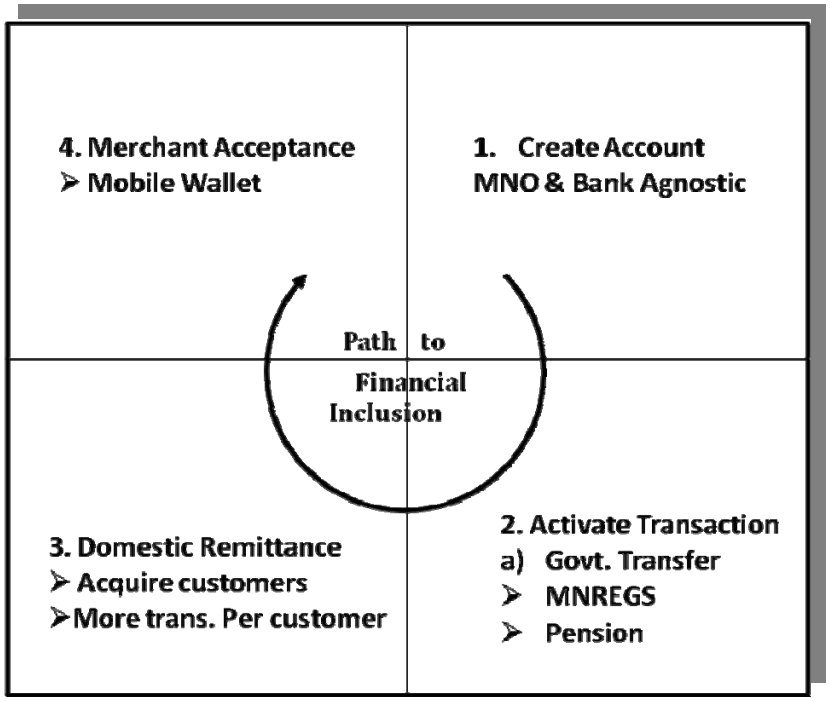

Figure 3: A Model for Mobile Money Ecosystem in India

Interoperability is the mandate of India's central bank, but what seems to happen in reality is very different. We find MNOs tying clients to banks, or, worse still, clients having no access

to bank accounts and left to the mercy of their employers for all of their financial needs. As we can see in Figure 3, under ideal conditions, we create a model path to financial inclusion for migrant workers in India. Ideally we first create a bank account and a mobile account for a client, and then allow the client to transfer money in a manner such that it is bank agnostic. Secondly, the client's account is activated so that he can receive any government transfers to his bank account while he receives a message on his mobile. It is possible for him to transact with his account from any bank/bank branch/MNO. Thirdly, the MNO goes about acquiring many customers and helps them with the basic remittance product. This follows with the client engaging in other bank products, which are asset-oriented products like savings or insurance products. The MNO then develops mobile wallets for the customer, and simultaneously finds acceptance of the mobile wallet at various retail merchants. The MNO's dual role of connecting people to asset products in banks and to mobile wallets can encourage people to hold less cash, and to instead transfer value to mobile accounts. The whole process obviously requires a change in the mindset of the people. Obviously, when there is a need in the mind of a person there is a chance for change. Just like how the remittance product is a success because of an inherent need of the client, it is necessary for the MNO to look out for the client's needs and to create opportunities. But sometimes one can preempt a need or create a need--as suggested in the proposed model in figure 3--by being ahead of the learning curve of the client.

As reported by UNESCO (2012), about 30% of the population in India are migrants, and there is a huge opportunity waiting to tap into this population and to include them in the economic, social, and political systems of the progress of our country.

There are some really important insights and findings in here, but I feel that the introduction is a bit too long, and so by the time that we arrive at the findings the connection to the

literature is unclear. I would suggest a more focused literature review that explains clearly why each of the different mobile money deployments discussed is necessary for understanding the project's findings. Also, it would be good to foreground the hypothesis and research questions more, introducing them earlier so that when they appear again their significance is not lost on the reader. Finally, some extended explanation of methods—such as an explanation of the formulas for the regression modeling—would be helpful for readers who are not well versed in statistical analysis. I look forward to reading more!

Annex 1

Questionnaire

SECTION A

1. **Interview Detail**

- Name of the area (Survey area eg: Nungambakkam):
- Town/ Village/City:
- Name of the respondent:
- Phone Number:
- Name of city, town, or village where respondent lives:
- Residence -Rural/ Urban:
- Origin of State of the respondent:
- Origin of District of the respondent:

2. **Respondent Demographic**

- Age of the respondent:
- Sex: M/F:
- Marital Status? Married/ Singled/ divorced/ widowed:
- Year/s of Education:
- Occupation Type:
- Number of family members:
- Number of Dependents:
- Monthly income:

3. **Financial Transaction**

- Do you have bank account in your home town? Y/N
- Do you have a bank account here? Y/N
- How many family members in your home have a bank account?
- Do you send money to your home? Y/N

  If answer is NO then Stop INTERVIEW here

- How did you send the money?(e.g. through bank/post office/ agent/ you yourself carry/ mobile money)
- How frequently do you send? Weekly/ Quarterly/ Monthly
- How much money did you send on an average?
- How frequently do you go to your home town?
- Did you receive any money from home or from anyone else? Y/ N
- If yes, how frequently do you receive? Weekly/ Quarterly/ Monthly
- How much money did you receive on an average?
- Do you save money? Y/N
- If yes, How and How much?

4. Uses of mobile money

- How did you hear about mobile money?
- What purpose do you use mobile money for? (Deposit/ credit/ micro insurance/ remittance/ receive/ other)
- Rank the usefulness of the following mobile money products?

a. Deposit: Has your deposit/ saving increased after you started using mobile money? If yes what is the amount per month/ per week/ amount per quarter that you deposited/saved on an average?

b. Transfer: Have you been able to transfer more money after using mobile money? If yes what is the amount per month/ per week/per quarter on an average that you transferred?

c. Emergency money: Is mobile money helpful for emergency money transfer? How much money do you send for emergency purpose so far?

- How often do you use mobile money on an average?
- How much distance do you travel to meet your mobile money agent? Any cost?

SECTION B

5. Perception and Risk

- Are you concerned about the safety of mobile money? Y/N
- Which do you feel is safer-cash or mobile money? C/MM
- Do you trust the agents of this service? Y/N
- What is the fee charged per transaction?
- Do you think the charge is minimal/ reasonable/ too much M/R/TM

- Do you have any apprehensions/ complaints regarding mobile money? Y/N Explain

- If yes have you raised these with the bank/ MNO/Agent?
- Are you satisfied with their responses? Explain

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