The Potential of Using Mobile Money Systems for Enhancing Financial Inclusion in Sri Lanka[1]

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Abstract

In common with many developing countries, financial exclusion among the poor is a major constraint to poverty reduction in Sri Lanka. Mobile phones have been increasingly used as a means to overcome this constraint in several developing countries, the most prominent among them being Kenya and the Philippines. The objective of this study is to explore the potential of using mobile money systems in Sri Lanka to extend financial facilities to the poor so as to smoothen their economic activities. The findings of the study reveal that although mobile phones have become common in Sri Lanka over the last decade covering rural areas where there is acute poverty and lack of access to formal banking institutions, they are hardly used for financial transfers and payments. As a result, the country has been losing opportunities to use mobile phones to extend financial facilities to the poor who do not have access to formal finance.

The study also reveals that lack of awareness about mobile banking acts as a major impediment to the expansion of mobile money systems. The application of mobile banking is largely limited to commercial bank customers in Sri Lanka making it an additive model. Our focus group discussions reveal that most of the bank customers are unaware of such facilities. A major reason for this could be that mobile banking is not widely

1. This paper is based on a study conducted by the author in collaboration with the Institute of Money, Technology and Financial Inclusion (IMTFI), University of California, Irvine,USA. An earlier version of the paper was presented at IMTFI's Annual Conference-held in California in October 2010.

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publicized. In Sri Lanka, the mobile phone operators have not yet launched mobile money systems. The mobile transactions platform needs to be harnessed in the country without further delay to overcome the problem of financial exclusion.

Keywords: Mobile Money - Financial Exclusion - Electronic Banking - Mobile Phones - E-Money

Introduction

The use of mobile phones has expanded rapidly in Sri Lanka during the last decade. Around 70 percent of the population owns a mobile phone. These are mainly used for communication purposes, and hence, mobile money transfer systems are almost nonexistent in the county. Experiences of several developing countries have shown that the poor majority are in need of a wide range of financial services that could potentially be delivered via mobile phones or mobile phone operators. Safaricom's M-PESA in Kenya, Globe Telecom's GCash in the Philippines, WIZZIT in South Africa and the Grameen Village Phone Programme in Bangladesh are some of the successful mobile banking initiatives adopted in developing countries for the benefit of the poor.

There are a number of reasons why the bottom of the pyramid does not have access to formal financial institutions; for reasons such as low incomes, geographical isolation and lack of collateral. It is increasingly recognized worldwide that e-banking solutions will help the poor to overcome such constraints, and enable them to become more involved in mainstream economic activities. Recent studies indicate that factors contributing to the adoption of mobile banking are related to convenience, access to the service regardless of time and place, privacy and cost effectiveness.

Poverty is more acute in rural and estate sectors where the Poverty Headcount Index HCI is 15.7 percent and 32 percent, respectively, as shown in Table 1. HCI is defined as the proportion of poor population to total population. The overall HCI for the country is about 15.2 percent, which is equivalent to 2.8 million persons. High inequality of income distribution is also prevalent in the country reflecting a disparity in access to basic consumption needs and resources such as financial facilities.

Table 1 indicates that poverty is a rural phenomenon in Sri Lanka. More than four fifths of the poor live in rural areas. Most of

these people do not have access to conventional banking facilities. They have to travel long distances to reach the closest bank branches. Amenities such as drinking water, public transport, electricity, banking facilities and conventional phone services are not available in remote villages. These villages are very often subject to natural calamities and wild elephant attacks which destroy not only human lives but also the limited physical assets of poor farmers. As mentioned earlier, banks are not inclined to entertain them for reasons such as high risks and costs involved or socioeconomic and cultural factors. Therefore, the potential of mobile phones to extend financial facilities to such financially excluded people needs to be investigated in the backdrop of the rapid penetration of mobile phones throughout the country.

Table 1 : Key Poverty Indicators of Sri Lanka

Sector	Poverty Head count Index (%)	Number of Poor Persons ('000)	Share of Total Poverty (%)
Urban	6.7	184	6.6
Rural	15.7	2,303	82.1
Estate	32	318	11.3
All island	15.2	2,805	100.0

Source: Department of Census and Statistics: Household Income & Expenditure Survey 2006/07

The primary objective of this study is to assess the potential to use mobile payment systems for the benefit of the poor in Sri Lanka. It is expected that this study will provide new insights into innovative banking technologies, and help the stakeholders in the financial industry to take the necessary steps forward. This study will provide empirical evidence from Sri Lanka regarding the availability of e-banking and the poor's accessibility to such facilities.

As a basis for the study, several focus group discussions and in-depth interviews were conducted with members of 25 households earning less than a dollar a day. These households were selected from different areas based on the information collected from a previous field research project conducted by the author who was the key researcher. The in-depth interviews and focus group discussions we had with the selected households provided some useful information on their perceptions on mobile banking.

Based on the outcomes of these discussions, a structured questionnaire was developed to conduct a broader household sample survey on the usage of new technology for transaction purposes. This quantitative survey covered a total of 1,000 households chosen from different parts of the island. The research design was based on a stratified sampling approach. Accordingly, the sample households were allocated among the rural, urban, and estate sectors depending of the size of population in each sector, as shown in the Table 2.

Table 2 : Composition of the Sample

Sector	Number of Census Blocks	Number of Households
Rural	78	780
Urban	16	160
Estate	6	60
Total	100	1,000

Source: Compiled by the Author

The Use of Mobile Phones for Reducing Financial Exclusion Among the Poor

The concept of financial exclusion (or conversely, financial inclusion) is defined in the literature in a wider context of 'social exclusion' in a society. From among the pioneering writings on the subject, Leyshon & Thrift (1995) define financial exclusion as referring to those "processes that serve to prevent certain social groups and individuals from gaining access to the financial system." Sinclair (2001) states that "financial exclusion means the inability to access necessary financial services in an appropriate form. Exclusion can come about as a result of problems with access, conditions, prices, marketing or self-exclusion in response to negative experiences of perceptions." Carbo et al. (2005) define financial exclusion "as broadly the inability (however occasioned) of some societal groups to access the financial system."

It is a common characteristic in both developed and developing countries that a segment of the population is excluded from financial services. In general, the excluded segments are mainly poor people living in rural and harsh geographical areas. These

people are compelled to rely on moneylenders and shopkeepers in the informal sector for finance, which is usually provided at exorbitant interest rates and other charges. These conditions lead to a vicious circle of poverty. First, high cost of finance means that a poor person has to earn much more than a rich person who has access to finance at lower cost. Second, a major portion of the earnings of the poor is paid to moneylenders and, as a result, the person can never come out of poverty. Third, financial exclusion hinders consumption smoothing in the bottom of the pyramid.

Financial exclusion can be attributed to a number of factors. First, the high cost of financial services may deter the poor from accessing them. For example, the minimum deposit requirement to open a bank account may be exorbitantly high. High costs may also be involved in transferring money domestically and internationally. Second, there may be non-price barriers. For instance, formal financial services may require documents of proof regarding a person's identity and income. Banks may also require collateral for disbursing loans. The poor rarely have such assets Geographically, the financial institutions may be located far away from the isolated rural areas where the poor live. Third, behavioral aspects may also hinder the ability of the poor to access formal financial institutions. Specifically, the poor and less-privileged people are not comfortable with the use of the English language in communication and documents in these institutions. These considerations amply demonstrate the fact that financial inclusion does not evolve automatically through market forces; rather it requires a certain degree of policy intervention. Thus, it has become necessary to take policy initiatives to facilitate financial inclusion.

The fostering of financial inclusion, particularly in developing countries, has been justified for a variety of reasons. Finance has come a long way since the time when it was not considered as a factor needed for growth and development. Recent empirical evidence has shown that financial inclusion is critical for economic development. Having recognized this need, the policy makers in several countries have set up task forces/committees to understand how financial inclusion can be achieved even in advanced economies like the United Kingdom. The Indian Government set up a committee under the chairmanship of Rangarajan (2008) to suggest possible ways of increasing financial inclusion. Global attention on financial inclusion was drawn when the World Bank organized a conference in March 2007, and released a report titled "Finance for All" in November 2007.

It is argued that a well-functioning financial sector that allocates finance without barriers will contribute not only to generating more production and income, but also to reducing poverty. The main functions of the financial sector are to mobilize savings and, to divert available capital to productive use through credit disbursements, to allow for risk-sharing and to facilitate efficient transfer of money through payment systems. Essentially, the financial sector should be able to facilitate market transactions. As Sen (1999) notes, "we have good reason to buy and sell, to exchange and to seek lives that flourish on the basis of transactions. To deny that freedom would be in itself a major failing of a society".

In this context, mere fulfillment of the basic functions by a financial market is inadequate. That market must also be accessible, so that as many people as possible can obtain financial facilities and participate in economic activities and enjoy the benefits generated by economic growth (Napier, 2007).

Traditional bankers, in general, regard business with poor households as unprofitable for reasons such as follows:

(a) High risk: Bankers perceive that financial transactions with poor households and small enterprises involve high risks. The general perception is that such clients do not have sustainable enterprises for them to earn a stable income and capacity to repay their loans. Also, they do not have traditional collateral to mortgage against credit.

(b) High cost: Bankers believe that loans for poor households are small and short-term, and therefore, such operations are costly and inefficient.

(c) Socioeconomic and cultural barriers: Bankers assume that small enterprise clients do not have the capacity to approach a bank as they are less educated, and they do not have business records to prove their cash flows. Also, social, cultural, and language barriers do not generally permit the poor to have access to a modern financial institution.

In this context, mobile phones have emerged as a main instrument to deliver financial services to the poor in Africa and Asia. Mobile banking in Kenya and the Philippines are two successful cases.

Empirical evidence from these countries proves that mobile phones have the ability to offer a low-cost, accessible transaction platform for the unbanked poor. Microfinance clients in these countries, for example, use their mobile phones to repay their loans to microfinance institutions. Also, they can use them to receive remittances from abroad. Thus, mobile phones provide financial facilities to the poor living in remote rural areas that do not have access to conventional banking facilities. Mobile money systems are provided in two ways. First, financial institutions in cooperation with mobile operators provide mobile banking (m-banking) facilities to their customers. Second, mobile operators and third parties such as merchants and retailers offer mobile payments (m-payments) facilities even without a bank account or the participation of a bank. For example, a mobile phone user can use the prepaid units bought from a mobile operator to buy goods and services from the partnering service providers.

Financial Landscape in Sri Lanka

As in the case of many other developing countries, the financial sector in Sri Lanka had been suppressed by state interventions prior to the adoption of economic liberalization. These included dominance of state-owned banks, interest ceilings, and credit controls. The government initiated the first phase of financial sector reforms in Sri Lanka in 1977. A major reform was the removal of restrictions on foreign banks to open branches in Sri Lanka. Also, commercial banks were allowed to operate foreign currency banking units, and to develop offshore banking facilities in the country. Action was also taken to deregulate interest rates. In the early 1980s the Central Bank took action to promote a secondary market for Treasury Bills. In the second phase of the reforms that began in 1989, a wide range of reforms was implemented. These included encouragement of foreign participation in the share market, greater use of Treasury Bills as a monetary policy instrument and introduction of Treasury Bonds as a debt instrument. The government also took several steps to strengthen the financial position of the two state-owned banks – the Bank of Ceylon and the People's Bank – during the 1990s. Since the early 1990s, the Central Bank has moved away from direct credit controls towards market-oriented monetary policy tools, mainly open market operations.

Following the economic liberalization policy package implemented in 1977, the financial system of Sri Lanka has grown at

a faster pace and achieved vast strides in financial inclusion. Prior to economic liberalization, the financial system had been subject to stringent entry barriers, and as a result a few state-owned banks had enjoyed a monopolistic status. There were a very few private commercial banks and other financial institutions. As the government had intervened in economic activities heavily during that period, the state-owned banks were used as a major tool to direct resources to the desired sectors of the economy. For instance, the concessionary loan schemes were made available to paddy farmers through these banks. Nevertheless, by and large the poorer segments did not have much access to financial services in the formal sector. Lack of competition in the financial sector further deterred the process of financial inclusion.

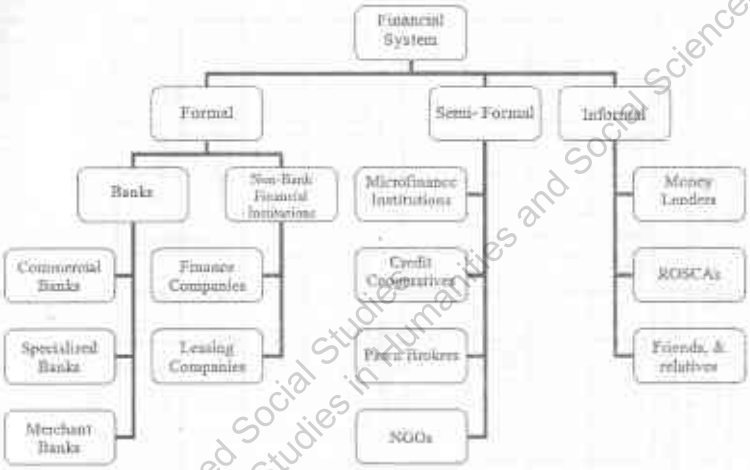
As in many other developing countries, Sri Lanka inherited a dualistic financial system in which the organized or institutional financial market catered to the modern (formal) sector, while the unorganized or informal (non-institutional) financial market served the credit needs of the traditional (informal) sector of the economy.

As illustrated in Figure 1, the financial system of Sri Lanka consists of formal, semi-formal and informal sectors. The financial institutions in the formal sector include commercial banks, specialized banks, merchant banks, finance companies and leasing establishments. Although it is mandatory to register all these financial institutions with the Central Bank of Sri Lanka, which is the apex body of the financial system, there are a few finance companies that do not adhere to the registration requirements. Money-lenders, indigenous bankers, pawn brokers, retail traders, landlords, friends and relatives are some examples of intermediaries in the informal financial market. Poorer households which are generally excluded from formal financial institutions rely on such informal sources to borrow money.

In the background of the above-mentioned financial constraints faced by the poor, microfinance has evolved as a major institutional source to provide financial facilities to such people, both in developing and developed countries. So, microfinance is a relatively new concept. Some form of micro or small credit delivery mechanism has existed in Sri Lanka since the beginning of the last century. Co-operatives, rural banks, state banks and the Central Bank were instrumental in such small credit disbursements to farmers and other small entrepreneurs. These credit arrangements were, however, not identified as

microfinance. Microfinance replaced the traditional state-sponsored credit schemes that became a failure over the past decades, and was expected to play a vital role in meeting a variety of credit, saving, and risk-management needs of the poor who run small enterprises.

Figure 1 : Financial Structure of Sri Lanka



Source: Compiled by the Author

The Expansion of Information and Communication Technology

In common with many other developing countries, Sri Lanka has experienced a phenomenal growth in telecommunication services during the last decade. In particular, the expansion of the use of mobile phones has been remarkable. As shown in Table 3, the number of mobile phones in use rose from 430,000 in 2001 to almost 14 million by 2009. This implies that every 68 persons out of 100 persons have a mobile phone. Thus, there is tremendous potential to popularize mobile banking in Sri Lanka.

Table 3 : Telecommunication Services in Sri Lanka

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fixed Access Services										
Subscriber Base ('000)	767	829	883	934	991	1,244	1,884	2,742	3,446	3,431
Fixed Access Services ('000)	653	708	769	818	860	919	910	932	934	871
Wireless Access Services ('000)	114	121	114	116	131	325	974	1,810	2,513	2,560
Telephones per 1,000 Persons	4.2	4.4	4.7	4.9	5.1	6.3	9.5	13.7	17.1	16.8
Other Services										
Mobile Phones ('000)	430	668	932	1,393	2,211	3,362	5,412	7,983	11,083	13,950
Mobile Phones per 100 Persons	4	5	7	12	15	17	27	40	55	68
Public Pay Phone Booths	8,222	7,281	6,681	6,440	6,095	6,285	7,561	8,526	7,417	7,936
E-mail / Internet Subscribers	40,497	61,532	70,082	85,500	93,300	115,000	130,000	202,348	234,000	240,000

Sources: Sri Lanka Telecom Ltd. and Central Bank of Sri Lanka

Table 4 : Ownership of Information and Communication Equipment (As a Percentage of Households, n=859)

Item	Non-Poor	Moderate Poor	Ultra Poor	All
Electricity	95.9	86.3	83.3	92.9
Radio	89.0	76.0	77.1	85.2
Radio	89.0	76.0	77.1	85.2
Television	94.1	82.4	72.9	90.1
Land Phone	66.2	48.0	56.3	61.4
Mobile Phone	78.6	53.9	47.9	71.0
Fax Machine	7.7	5.4	0.0	6.8
Desktop Computer	16.3	7.8	0.0	13.4
Laptop Computer	6.8	3.9	0.0	5.7
Computer Printer	8.4	5.9	0.0	7.3
CD Drive	19.4	11.8	0.0	16.5
Scanner	7.1	4.4	0.0	6.1
Email	7.1	4.9	2.1	6.3
Internet	8.6	4.4	0.0	7.1

Source: Household Survey on E-Money, Conducted by the Author - 2008/09

As shown in Table 4, our survey data on the availability of information and communication equipment in the households reflects the country's enormous capacity to adopt mobile banking even among the poor. Basic amenities such as electricity, radio, and televisions are available to the majority of households across different income groups. Electricity supply is available to around 93 percent of households. Around 61 percent of the surveyed households have fixed phones and 71 percent have mobile phones. This means that every 3 out of 5 households have a mobile phone. It is significant that around 50 percent of poor households, including the ultra-poor, have mobile phones as shown in Table 4. The expansion of telecommunication networks by competing firms has led to a phenomenal growth in mobile phone usage. Household ownership of other equipment such as computers, e-mail and internet facilities also showed a significant growth in recent years. Overall, around 13 percent of the households have desktop computers, and 6 percent of them have laptops.

However, the ultra-poor households do not possess any computers or related equipment. Access to e-mail and internet facilities is also largely confined to the non-poor and moderately poor groups.

The Use of Electronic Banking

In tandem with the growth of information and communication technology (ICT), the use of electronic banking (e-banking) facilities such as credit and debit cards, internet banking and phone banking has emerged in Sri Lanka in recent years. As shown in Table 5, internet banking, which accounts for about 4.9 percent of total retail payments in 2009, has surfaced as the most prominent electronic payment system. The use of phone banking is only 0.1 percent. The shares of credit cards and debit cards are 1.3 percent and 0.2 percent, respectively. Thus, the use of e-banking is still at an early stage in Sri Lanka. Bank cheques continue to remain as the main non-cash payment mode accounting for nearly 90 percent of the total value of non-cash payments in the country.

Commercial banks, specialized banks and several non-bank financial institutions have introduced a variety of e-facilities in recent times. Online internet (virtual) banking includes facilities such as balance inquiry, cheque status, stop payments, bill payments, inward remittances and fund transfers. Internet banking customers can also access their account from anywhere in the world on mobile phones. The use of mobile telephones is rapidly growing in Sri Lanka, and most of the internet banking services can now be accessed through mobile phones.

While the country has been enjoying an exceptionally high (traditionally-measured) literacy rate among developing countries, its computer literacy rate also has now risen to about 40 percent. As shown in Table 6, nearly 70 percent of the households have some knowledge about ATM machines, and 37 percent of them have knowledge about internet banking. Knowledge about phone banking is limited to about 17 percent of the households and SMS banking to about 12 percent of them. With regards to e-remittances, the moderate and ultra poor have more knowledge relatively to the non-poor. This can be attributed to the fact that a larger proportion of migrant workers are mainly from the poorer segments of the population, and they have acquired knowledge about e-remittances. But the usage of such facilities is limited to non-poor households. The widespread e-banking literacy across different

income groups has the potential to boost the mobile banking in the country.

Table 5 : Composition of Values of Non-Cash Payments in Sri Lanka (%)

Payment System	2002	2003	2004	2005	2006	2007	2008	2009
Main Cheque Clearing System	62.5	4.4	95.0	94.3	92.1	90.3	89.9	87.7
Sri Lanka Interbank Payment System	34.2	83.7	1.9	2.4	2.9	3.7	4.5	5.6
Credit Cards	0.5	2.0	1.1	1.2	1.3	1.4	1.4	1.3
Debit Cards	0.6	2.8	0.0	0.0	0.0	0.1	0.1	0.2
Internet Banking	1.5	6.9	1.3	1.4	2.4	4.2	3.8	4.9
Phone Banking	0.8	0.2	0.2	0.1	0.8	0.0	0.1	0.1
Postal Instruments			0.4	0.3	0.3	0.2	0.2	0.2
Total	100	100	100	100	100	100	100	100

Source: Central Bank of Sri Lanka

According to our survey, only 0.8 percent of the households use their mobile phones for mobile banking as shown in Table 7. The majority use mobile phones for communication purposes including SMS messaging, which is very popular among the youth. A larger proportion of mobile phone users are familiar with some form of e-transactions. For instance, it is reported that USD 10 million worth of reloading was carried out by small communication shops and boutiques largely located in rural areas for a particular mobile network last year. In this process the clients hand over the money to such small shopkeepers as a prepayment to increase their balance for mobile phone usage. In most instances, these transactions take place without any documents, and this implies that the mobile phone clients have confidence in such small shopkeepers and mobile phone companies.

Table 6 : Awareness and Use of Electronic Banking - Percentage of Household Members who are above 16 years of Age, n=2,133

Item	Have Knowledge				Using			
	Non-Poor	Mod-erate Poor	Ultra Poor	All	Non-Poor	Mod-erate Poor	Ultra Poor	All
Internet Banking	39.81	29.27	33.67	36.90	3.60	2.44	-	3.14
ATM Machines	73.90	60.60	47.96	69.39	28.23	11.44	7.14	23.07
Phone Banking	18.84	10.88	15.31	16.69	1.40	-	-	0.98
SMS Banking	14.45	5.63	4.08	11.77	0.27	-	-	0.19
Cyber Banking	4.53	1.13	-	3.47	0.27	-	-	0.19
E-Remit-tances	20.24	24.77	35.71	22.08	1.60	-	-	1.13
Mobile Cash	15.71	9.01	2.04	13.41	0.33	-	-	0.23

Source: Household Survey on E-Money, Conducted by the Author - 2008/09

Table 7 : Purposes of Using Mobile Phones Percentage of Adult Households who use Mobile Phones

Purpose	Percentage
Communicate	52.7
Send SMS	32.1
Business	1.5
Obtain information	17.6
Employment	6.1
Banking	0.8
Purchase goods	2.3

Source: Household Survey on E-Money, Conducted by the Author, Sample Size: 834

As depicted in Table 8, around 85 percent of the households have an account in commercial banks and about 43 percent have accounts in credit co-operatives and microfinance institutions (MFIs). A major reason for the high proportion of the banked in Sri Lanka is the rapid expansion of the banking network. In particular, on the initiative of the government, the two state-owned banks – the Bank of Ceylon and the People's Bank – have established a large number of branches in rural areas during the last four decades. Private banks also have expanded their outreach through expanding branch networks. As mentioned earlier, the survey reveals that 71 percent of the households have mobile phones. This ratio is lower than the ratio of households who have a bank account, which stands at 85 percent. This somewhat contrasts with the popular belief that the proportion of the banked is usually lower than the proportion of mobile phone owners in developing countries. There is an inverse relationship between the ratio of households who have bank accounts and income levels. As expected, a larger proportion of non-poor households have bank accounts. It should also be noted here that the survey reveals that the amounts of deposits held by poor households are extremely low. Therefore, the mere ownership of a bank account does not necessarily reflect the savings capacity of a household.

A larger proportion of ultra-poor households have an account in specialized banks. This finding is to be expected as most of these banks are savings and rural development banks which cater to lower income groups. The semi-financial sector which consists of credit co-operatives and microfinance institutions (MFIs) plays a crucial role in providing deposit facilities, particularly to the poorer segments of the population. Overall, 43 percent of the total number of households have deposits in such institutions. There is a clear positive relationship between proportions of account holdings in the semi-formal sector and income groups. Over 50 percent of poor households have such deposits in comparison to only 37 percent of non-poor households.

Table 8 : Percentage of Households who Have an Account - n=834

Sector	Non-Poor	Moderate Poor	Ultra Poor	All
Formal Sector				
Commercial Banks	89.2	74.9	68.8	84.7
Specialized Banks	17.1	13.3	25.0	16.7
Non-Bank Financial Institutions	4.1	1.5	0.0	3.3
Semi-Formal Sector				
Credit Cooperatives & MFIs	37.3	57.1	54.2	42.9

Source: Household Survey on E-Money, Conducted by the Author - 2008/09

Table 9 : Use of Commercial Bank Facilities as a Percentage of Households - n=834

Facility	Non Poor	Moderate Poor	Ultra Poor	All
Commercial Bank Account	89.20	74.90	68.80	84.70
ATM Card	41.79	22.05	16.67	35.73
Credit Card	8.80	2.56	-	6.83
Mobile Phone Banking	2.88	1.03	-	2.28

Source: Household Survey on E-Money, Conducted by the Author - 2008/09

Our focus group discussions indicate that people are increasingly using e-cards. However, non-availability of ATM facilities in most villages in the rural sector is pointed out as a major constraint. This is reflected in the lower proportion of ATM card users as against the high proportion of bank account holders, as shown in Table 9.

Although the extent of the banked population is satisfactory, our qualitative survey reveals that a larger proportion of them are found to be under-banked for various reasons. A major factor is the inadequacy of their incomes to meet household expenses, which results in low savings. We have observed through the focus group discussions a diminishing trend of savings culture among the poor. Failure of household income to rise in line with rising expenses was

pointed out as a main reason for such decline by many households. Also, the negative real interest rates emanating from high inflation have inclined the households to purchase property and durable goods rather than to save money. Several households point out that they merely keep a minimum balance in their bank accounts for the purpose of obtaining a loan from the bank at a future date. Hence, motivation to build up savings could not be observed among many households during our discussions with them. Some low-income earners have borrowed from all possible sources, and the bulk of their monthly earnings is used to repay their debts. As shown in Table 10, another major reason for limited accessibility to mobile banking is that they did not have sufficient knowledge about how it works. Some households express their concerns about the security of accessing financial information using a mobile phone. A large number of households indicated that they do not have sufficient savings in banks, and therefore, they do not require m-banking.

Table 11 shows the computed Pearson Correlation coefficients which reflect the relationships between e-banking and determining factors such as age, education, occupation and income. Both the knowledge about e-banking and usage show a negative correlation with age. This finding is also supported by our focus group discussion which indicated that younger people are more accustomed to e-banking. However, the correlation coefficients are only significant for knowledge about internet banking and not in terms of usage. E-banking is positively linked to education, and most coefficients are statistically significant at the 0.01 level. There does not seem to be a decisive link between the level of occupation and knowledge/usage with regard to e-banking. Some low-income earners have borrowed from all possible sources, and the bulk of their monthly earnings is used to repay the debts. The relation between income and e-banking is positive, as expected. The coefficients are statistically significant at 0.01 level in most instances reflecting a strong nexus. As mentioned earlier, our focus group discussions also indicated the profound influence of household income on the use of e-banking facilities.

Table 10 : Major Reason for Not Using Mobile Banking as a Percentage of Households who do not Use Mobile Banking

Reason	Percentage
High Costs	8.0
Less Security	2.3
Difficulty to Use	9.4
No Understanding About Mobile Banking	39.3
Never Heard About Mobile Banking	15.5
Not Necessary	25.6
All	100.0

Source: Household Survey on E-Money, Conducted by the Author. Sample Size: 934

The Potential of Mobile Money Systems

This study has revealed that there are two specific segments which have vast potential to apply e-banking for the benefit of the poor. They are the microfinance industry and the inward remittance market. The country has a widespread network of microfinance institutions, as mentioned earlier. These institutions, which are built up on the basis of 'group-lending', are much more flexible in providing financial facilities to low-income families. According to our survey, 44 percent of the surveyed households are members of microfinance organizations. This reflects the extensive outreach of microfinance industry in the country.

However, we have observed that none of these institutions including the major ones have adopted e-banking facilities. A main reason for this is the non-application of information and communication technology (ICT) in their operations. Taking into account the large amounts of transactions they handle daily, on the one hand, and the widespread availability of mobile phones in households, on the other, there is considerable potential to adopt mobile banking in the microfinance sector. This will not only help to improve efficiency but also to reduce transaction costs.

Table 11 : Pearson Correlation Coefficients (n=1,672)

Variables	Age	Education	Occupation	Income
Know About Internet Banking	-0.050*	0.196**	-0.007	0.136**
Using Internet Banking	-0.005	0.036	0.045	0.109**
Know About ATM Machines	-0.043	0.256**	-0.340	0.090**
Using ATM Machines	-0.047	0.251**	0.004	0.233**
Know About Phone Banking	-0.040	0.212**	-0.067**	0.130**
Using Phone Banking	-0.015	0.055**	0.010	0.073**
Know About SMS Banking	-0.039	0.187**	-0.044	0.130**
Using SMS Banking	-0.012	0.027	-0.014	0.009
Know About Cyber Banking	-0.015	0.127**	-0.035	0.068**
Using Cyber Banking	-0.004	0.017	-0.026	0.010
Know About E-Remittances	-0.035	0.079**	-0.031	0.210
Using E-Remittances	-0.012	0.037	-0.002	0.076**
Know About Mobile Cash	-0.045	0.197**	-0.071**	0.039
Using Mobile Cash	-0.014	0.020	-0.027	0.008

*** Indicates Correlation is Significant at the 0.01 level (2-tailed)*
** Indicates Correlation is Significant at the 0.05 level (2-tailed)*
Source: Household Survey on E-Money, Conducted by the Author

The other area that has potential to apply mobile banking is the inward remittance market. An estimated stock of over 1.6 million Sri Lankan migrant workers, mainly in the Middle East, annually remit foreign exchange over USD 2.5 billion, which eases the balance of payments disequilibrium. They account for about 8 percent of the country's GDP. Migrant workers send their earnings to their relatives and friends living in Sri Lanka by using different channels including (a) formal banking channels, (b) by hand through persons travelling to the country, and (c) informal channels. Although the bulk of remittances are channeled though formal means, as much as 45 percent of total remittances are estimated to be remitted trough informal channels. The oligopolistic remittance setting in Sri Lanka as well as in host countries have led to the growth of informal channels. Meanwhile, banks have been increasingly popularizing e-remittance facilities such as internet banking, e-Cash, X-press Money, MoneyGram, Ez-Money and Telemoney. As a result, a rapid expansion of e-remittance could be expected in the near future.

This study shows that currently the use of e-banking facilities is relatively low in Sri Lanka. Nevertheless, the country's widespread banking network and ICT infrastructure provide considerable potential to foster e-banking at a faster pace, benefiting the bottom of the pyramid. The recently improved computer literacy rate as well as the long-standing high literacy level will also facilitate this. Banks need to expand mobile banking and similar instruments to isolated rural and urban areas where customers have to spend a lot of time and money to visit a bank branch. This is feasible as mobile phones have penetrated in such areas as well. The banks will have to play an unconventional and proactive role in this regard to cater to the bottom of the pyramid through such devices. It is evident from our study that profit making and economies of scale are the overriding factors in the decision making process of banks and other financial institutions, rather than reaching out the low-end customers through devices such as mobile banking. The household survey indicates that the majority of the poor, who are usually characterized by low financial literacy, do not have any understanding about mobile or e-banking facilities. This kind of information asymmetry can be overcome through counseling, advertising and publicity programs. Early action needs to be taken by the stakeholders to harness the potential to adopt m-banking in the microfinance industry and remittance market.

Conclusion

It is widely recognized that mobile applications are likely to improve the socio-economic conditions of the people at the base of the pyramid in developing countries. As in the case in many other developing countries, availability of cheaper mobile phones and low-cost prepaid phone cards have led to an exponential growth of mobile telephony in Sri Lanka. While the people at the bottom of the pyramid have been increasingly using mobile phones, a vast majority of them remain unbanked or under-banked in Sri Lanka. If they use m-banking, they would be able to overcome the opportunity costs related to geographic access to bank branches.

The objective of this study was to explore the potential of using mobile money systems in Sri Lanka to extend financial facilities to the poor so as to smoothen their economic activities. The findings of the study reveal that although mobile phones have rapidly penetrated in Sri Lanka during the last decade covering rural areas where there is acute poverty and lack of access to formal

banking institutions, they are hardly used for financial transfers and payments. As a result, the country has been losing opportunities to use mobile phones to extend financial facilities to the poor who do not have access to formal finance. The study also reveals that there is considerable potential to popularize mobile money systems in the country in the backdrop of the extensive use of mobile phones. The lack of awareness about mobile banking acts as a major impediment to the expansion of mobile money systems. The application of mobile banking is largely limited to commercial bank customers in Sri Lanka, making it an additive model. Our focus group discussions reveal that most of the bank customers are unaware of such facilities. A major reason for this could be that mobile banking is not widely publicized. In Sri Lanka, the mobile phone operators are yet to launch mobile transaction systems. The mobile transactions platform needs to be harnessed in the country without further delay to overcome the problem of financial exclusion.

As evident from the empirical results of this study, the use of modern e-banking as well as conventional banking by the poor has been severely constrained by inadequacy of savings and borrowing capacities owing to their poor income levels. Hence, a mere expansion of the innovative banking facilities will not guarantee a corresponding increase in usage of such facilities by the poor. Once the livelihoods of these households improve by means of safety nets at the initial stage, and income-generating activities at later stages, e-banking could provide a platform for them to access formal financial institutions from their remote villages.

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