

The potential of mobile remittances for the bottom of the pyramid: findings from emerging Asia

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Abstract: This paper explores the extent to which low-income migrant workers in emerging Asia are aware of and are likely to use mobile phones for remitting money to family members at home.

Data was obtained through a survey of 1500+ local² and overseas³ migrant workers at the bottom of the socio-economic pyramid and subsequent qualitative research in Bangladesh, Pakistan, India, Sri Lanka, the Philippines and Thailand.

Findings reveal that less than a quarter of respondents in India, Pakistan and Sri Lanka were aware of such services. However, the Philippines and Thailand reported awareness of levels of over 40 percent. Using a logit model to assess socio-economic characteristics of those aware of such services (versus those who aren't), findings revealed those aware of such services tended to enjoy higher standards of living, in terms of both income and education and ownership of mobile phones and bank accounts. Barriers to use are also explored.

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² A migrant worker who was currently working in another town / state / province of his or her home country

³ A migrant worker who was employed abroad

This study is likely one of the first of its kind in attempting to empirically estimate socio-economic characteristics of those aware of such services versus those who aren't. Such findings can, undoubtedly prove useful to operators in deciding how best to market such services, including addressing potential barriers to use, such as perceived ease of use and trust and reliability issues.

*Keywords: bottom of the pyramid, mobile money, migrant worker, remittances, Asia

1. Introduction

Growing ownership of mobile phones across developed and developing markets, coupled with developments in technology, has meant that the mobile phone is likely to become increasingly used for more-than-voice services. One such innovation gaining increasing popularity both in service provision and use are mobile money, or m-money, services. M-money services allow users to conduct financial transactions over mobile phones. Considered a form of electronic money, m-money services can include peer-to-peer mobile money transfers, mobile or person-to-business payments for goods and services (bill and retail payments), and mobile banking (deposits, loans, etc) services. Most mobile banking applications have served as a new delivery channel to existing bank customers; however, transformative models of using the mobile phone to bring in the unbanked into the formal financial sector are also emerging⁴.

M-money services have advantages of ubiquity, convenience and cost-effectiveness over other money transfer or payment intermediaries such as banks and other financial institutions. A 2010 CGAP study which compared pricing of 16 leading “branchless” banking services against ten formal banks found that branchless banking was 19 percent cheaper than its formal counterparts. Furthermore, the lower the transaction value, the cheaper branchless banking was (McKay and Pickens, 2010). This is of particular advantage to the bottom of the pyramid given that it is likely a considerable proportion make payments in small increments due to liquidity constraints. This was confirmed by a GSMA study among unbanked mobile money users in the Philippines which found that such users purchased airtime and SMS services in small increments (Mas and Morawczynski, 2009) as well a 2008 study in Kenya which found that mobile money users began remitting smaller amounts of money with greater frequency due to lower costs and the fact that such services “never closed” (Morawczynski and Pickens, 2009).

While mobile payment services using near-field communication or radio-frequency identification technologies have been most noted in developed markets, peer-to-peer m-money transfers via short

⁴ <http://psdblog.worldbank.org/psdblog/2009/01/emoney-mobile-money-mobile-banking-whats-the-difference.html>

message system (SMS) technology, are becoming increasingly associated with lower-income population groups in developing countries (GSM Association, 2007).

One such user group that can arguably serve to benefit much from m-money transfer services are migrant workers and their remittance beneficiaries. The market for migrant remittances is large and growing. According to World Bank estimates, global migrant remittance outflows⁵ grew at a compound average rate of 10 percent year-on-year between 1999 and 2009 (World Bank, 2010). Furthermore, close to 74 percent of the total \$416 billion remittances received in 2008 went to developing countries, with the Asia-Pacific accounting for the bulk of total receipts (World Bank, 2010). Furthermore, estimates suggest that total remittance flows could be as much as 50 percent higher than the recorded figure, if “informal flows” such as Hundi and Hawala were accounted for (World Bank, 2006; Martin, 2009).

Formal channels for sending remittances include banks or money transfer operators (MTOs) (Ratha, 2007) such as Western Union and MoneyGram. However, commission fees charged by MTOs are often high and regressive, particularly with respect to “South to South” remittance transfers (Ratha, 2007). Furthermore, bank transfers require prior ownership of bank accounts, a barrier for those without access to such facilities (GSM Association, 2008). Mobile remittance services, in contrast, have the potential to extend remittance services to millions of those with limited access to traditional bank services, while also reducing transaction costs in terms of commission fees and transport.

Mobile payments are conducive for micro transactions. In Africa, Kenya’s M-PESA service has proved to be the most widely-used mobile remittance service to date. Commercially launched in March 2007 ([1]; The Economist, 2007), the service is reportedly used by over 50 percent of the country’s adult population (Graham, 2010). Similar initiatives have been introduced in other African countries, including, Tanzania, Uganda, Ghana, Zambia, Congo and South Africa (Laurent, 2006; Mas, and Morawczynski, 2009; [2]).

⁵ Defined as the sum of workers’ remittances, compensation of employees, and migrants’ transfers. Workers’ remittances are current private transfers from migrant workers who are considered residents of the host country to recipients in their country of origin. Compensation of employees comprises wages, salaries, and other benefits earned by individuals in economies other than those in which they are residents. Employees, in this context, include seasonal or other short-term workers who are in the host country for less than a year. Migrants’ transfers are the net worth of migrants that are transferred from one country to another at the time of migration (World Bank, 2003; IMF Balance of Payments manual: <http://www.imf.org/external/np/sta/bop/bopman.pdf>)

In Asia, the Philippines is perhaps the leading country in providing mobile money services, with the country's two leading mobile service providers, SMART Communications and Globe Telecom, both offering peer-to-peer mobile money transfer services, in addition to bill and retail payments. Thailand's mobile service provider, True Move, although mainly focusing on bill and retail payments, also offers peer-to-peer money transfer services, reporting six million registered mobile money customers in 2009 since its launch in 2005 (Leishman, 2010). Pakistan's mobile service providers, Telenor and Mobilink, as well as India's Obopay-Yes Bank initiatives also offer local money transfer services. Sri Lanka's Sampath Bank also offers mobile money transfer facilities while Bangladeshi mobile service provider, Bangalink, recently announced the launch of a local and international mobile money transfer service. More mobile service providers and banks are expected to launch services in the near future (Telenor, 2009; The Economic Times, 2009; The Economic Times, 2010; The Daily Star, 2010 April 14; Obopay, 2008)

Through a survey of 1500+ local⁶ and overseas⁷ migrant workers at the bottom of the socio-economic pyramid (BOP) across six countries in emerging Asia, Bangladesh, Pakistan, India, Sri Lanka, the Philippines and Thailand, this paper examines current remittance patterns and potential use of mobile remittance services. Section 2 explores, in greater detail, the benefits consumers, particularly migrant workers, and service providers can enjoy from the provision of such services. Section 3 presents an overview of the methodology and data, while Section 4 uses a logit model to assess socio-economic characteristics of those aware of such services versus those who aren't. Section 5 briefly examines various barriers to adoption and use, and Section 6 concludes.

2. The case for mobile remittances

Mobile remittance services can present consumers and service providers, as well as regulators with significant opportunities and benefits.

⁶ A migrant worker who was currently working in another town / state / province of his or her home country

⁷ A migrant worker who was employed abroad

Consumers

Mobile remittance services have the potential to extend services to those with limited access to traditional bank accounts and services, while also reducing transaction costs. Global mobile connections, have crossed the five billion mark, with the majority of growth (47 percent) coming from the Asia-Pacific region by the end of June 2010 (GSM Association, 2009). In contrast, 3.5 billion of the world's population did not have access to formal banking services in 2009 (Mas and Morawczynski, 2009). These benefits are evidenced by large-scale studies such as that conducted by Intermedia in Kenya in 2009, which found that over 40 percent of respondents without access to banking services had used a mobile phone for conducting financial-related transactions; 99 percent of these users had engaged mobile money transfer transactions.

Evidence suggests that m-remittance services have the potential to offer speedier and more cost-effective service delivery, than their traditional counterparts (Morawczynski and Pickens, 2009). Commission fees of traditional modes of money transfer among developing countries are often relatively high due to, among other reasons, underdeveloped financial infrastructure, a lack of transparency in the market and limited competition. Furthermore, commission fees are often regressive, such that those transferring a smaller amount of money at a time are often charged higher commission rates than those remitting larger amounts (Ratha, 2007). Independent studies conducted by GCAP and GSMA among M-PESA users in Kenya revealed that the service was found to be more convenient and cheaper than other modes of remitting money such as through the post office or informally through bus drivers (Morawczynski and Pickens, 2009; Mas and Morawczynski, 2009). Similarly, in the Philippines, both Smart Communications and Globe Telecom charge a one percent commission fee for sending/ encashing money, compared with traditional industry revenues estimated to be over 25 percent for remittances below USD 100 ([3]; [4]; GSM Association, 2008).

World Bank estimates suggest that a five percent reduction in a 20 percent transaction fee, can lead to USD 3.5 billion savings in money sent home (Ratha, 2003), Similarly, studies such as those conducted by CGAP conducted in 2008 and 2009 found that majority of respondents in Kenya reported that their

income had increased by as much as 30 percent since adopting M-PESA, due to an increase in the amount of money being sent and through savings in travel costs (Morawczynski and Pickens, 2009)

Service providers

Mobile remittance services offer mobile and financial service providers the opportunity of tapping into market segments previously unreachable. Providers can benefit from increases in subscriber bases, a reduction in churn, and additional sources of revenue. Such benefits are of particular importance, given today's context of declining average revenue per user (ARPU) levels from traditional voice services (Mas, and Morawczynski, 2009). Such services also create a window of opportunity for financial service providers to introduce other products such as mortgages, loans and insurance to the BOP as well ([5])

It should be noted, however that, at the time of writing, research shows that not all service providers and partner agents are prospering, with many yet to recognize real profits for such ventures. For instance, a CGAP study of M-PESA agents in Kenya found that some agents could only maintain a relatively small cash float (often running out of cash) which meant more trips to the bank, and hence additional transport costs (Morawczynski and Pickens, 2009). Similarly, research on the Philippines' GCash service revealed that commission fees from money transfer services was often considerably lower than that charged for airtime sales, which lowered agents' motivation to push GCash services over airtime sales. However, given the significant initial investment (which can exceed USD 2 million to buy and build), and the relative newness of the product in the mainstream market, more time may be needed to effectively assess the true profitability and viability of such ventures (Mas and Morawczynski, 2009).

3 Methodology and data

This paper is based on data from a multi-country, purposive sample study of information and communication technology (ICT) use at the "bottom of the pyramid" (BOP) in emerging Asia, conducted by LIRNEasia. The study took place between 2008 and 2009 among those who had used a telephone (but not necessarily owned one) in the previous three months as well as had remitted money to family

members at home at least once a year. The study was carried out in Bangladesh, India, Pakistan, Sri Lanka, the Philippines and Thailand.

Through face-to-face interviews, quantitative and qualitative data on patterns of use of telecom and money transfer services were obtained. Interviewed migrants mainly belonged to socio-economic classification (SEC)⁸ groups of D and E⁹, while in Pakistan, some respondents from the SEC C group were also considered. Individuals were selected on the basis that they had used a phone to make a call in the last three months and remitted money to their family members at least once a year. Individuals between the ages of 15 and 60 were interviewed.

The study was conducted among both local and overseas migrants. Local migrants were defined as those living and working in cities away from their home but within the same country. Overseas migrants were defined as those living and working outside of their home country; in this study, overseas migrant respondents mainly resided either in the Middle East or Southeast Asia, although there were a small proportion of respondents who had worked in other regions as well. A country-wise sample breakdown by overseas and local migrant respondents is summarized in Table 1. The qualitative module consisted of 22 home visits cum media mapping exercises in the six countries (not equally distributed)¹⁰.

	Country					
	Bangladesh	Pakistan	India	Sri Lanka	The Philippines	Thailand
Overseas Migrant	170	111	116	104	150	0
Local Migrant	180	199	307	106	50	100
Total	350	310	423	210	200	100

Table 1: Sample size and composition

⁸ Defined by the chief wage earner's education and occupation (as well as a few other parameters in certain countries), but closely correlated to an income level of around USD 2 a day in five of the six countries studied

⁹ In Thailand, only respondents belonging to SEC E group were interviewed.

¹⁰ Further details can be found at <http://lrneasia.net/wp-content/uploads/2008/04/qualitativereport.pdf>

3.1 Patterns in Communications

The most popular means by which both overseas and local migrant workers communicated with family and friends was through phone calls and SMSs (Figure 1 and 2); SMS was particularly popular among Pakistani and Filipino migrants. Some use of letters, Internet calls and text chatting was also observed among overseas migrants.

Figure 1: Means of communication by overseas migrants (% of BOP respondents)

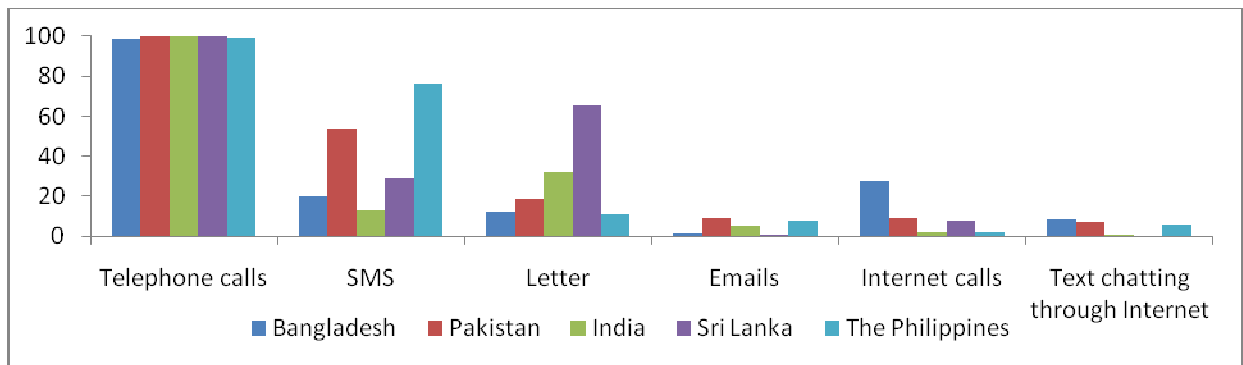
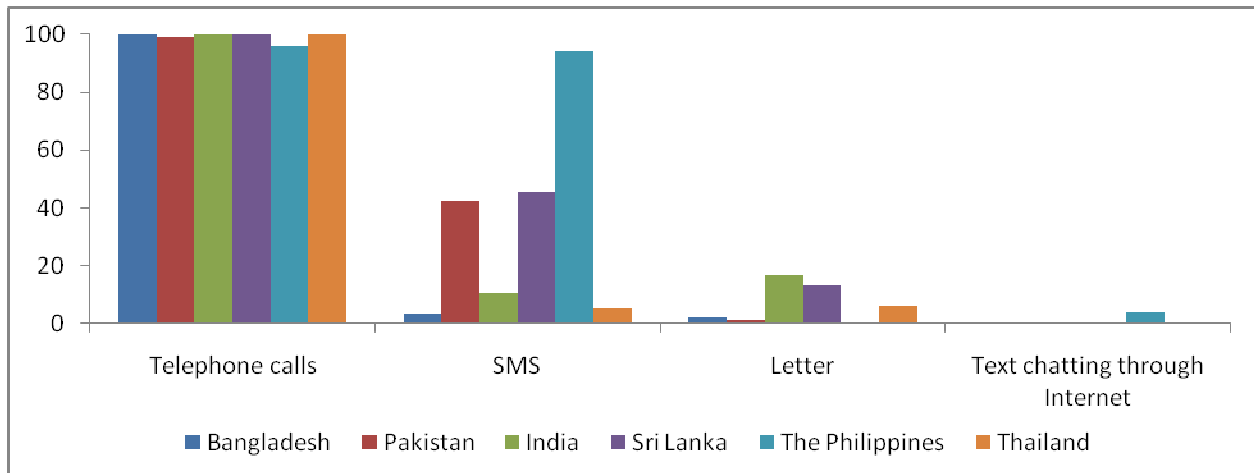
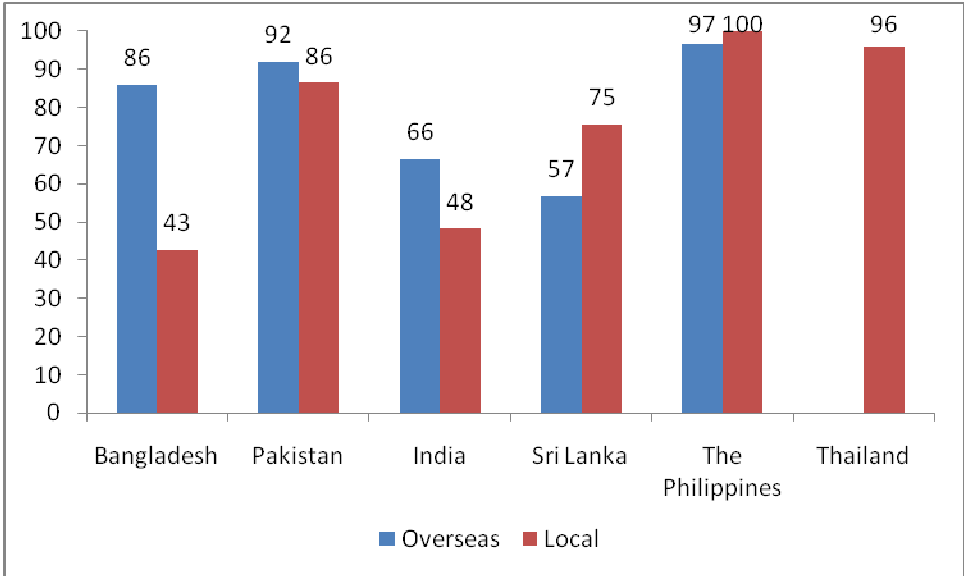


Figure 2: Means of communication by local migrants (% of BOP respondents)



Respondents from Pakistan, the Philippines and Thailand reported the highest mobile ownership levels of over 85 percent. In Bangladesh and India, a significantly higher percentage of overseas to local migrants owned mobile phones, although the reverse was true for Sri Lanka (Figure 3).

Figure 3: Mobile phone ownership of migrants (% of BOP respondents)



3.2 Patterns in remittances

Among overseas migrants, most respondent either sent money through banks, or physically carried cash home, either personally, or through a friend or relative. Qualitative findings revealed that bank drafts and wire transfers were generally considered to be among the cheapest and most reliable options available. Respondents from Sri Lanka and Bangladesh indicated that while they initially used to send bank drafts in their letters, in the last two to three years, most overseas migrants had opened up bank accounts for their family members, through which they sent money. Furthermore, respondents noted that in cities such as Dubai, migrant workers could send money through banks such as Etisalat, even if they didn't own an account. Workers were given bank IDs, through which money could be sent to any account of their choice, in return for a service charge of 2.5 percent. Respondents found such services very useful, as banks often sent their own representative to migrant workplaces to collect the money, which saved the migrant a trip to the bank (CKS Consulting, 2009).

Some use of Hundi or Hawala systems was also seen, particularly among overseas respondents in Bangladesh and Pakistan (see Figures 4 and 5). Qualitative findings revealed that respondents often chose this method when remitting to remote villages, which lacked banks, post offices or any other formalized infrastructure for delivery of money. Furthermore, users could also obtain loans from brokers when they were short in cash. Although commission rates for Hundi or Hawala services were often higher than that charged by banks, respondents stated they did not mind paying the higher amount, given the above advantages, and the guarantee that their money would be delivered in time. Among those respondents aware that such services were illegal, some stated they would be willing to shift to an alternative mode that could offer them the same level of service, but would need prior proof of the system's success before they would be willing to adopt it (CKS Consulting, 2009).

In contrast, very little use of mobile money services was reported, with only a few respondents from the Philippines and Bangladesh stating they used such services. It should be noted, however, that, as mentioned earlier, only the Philippines and Thailand had working mobile money transfer services in place at the time of writing. Qualitative findings reveal that it is likely that Bangladeshi respondents were, in fact, referring to the use of peer-to-peer electronic load (or prepaid credit) sharing, a seemingly popular informal mobile money system in the country (CKS Consulting, 2009).

Figure 4: Modes of sending remittances by overseas migrants (% of BOP respondents)

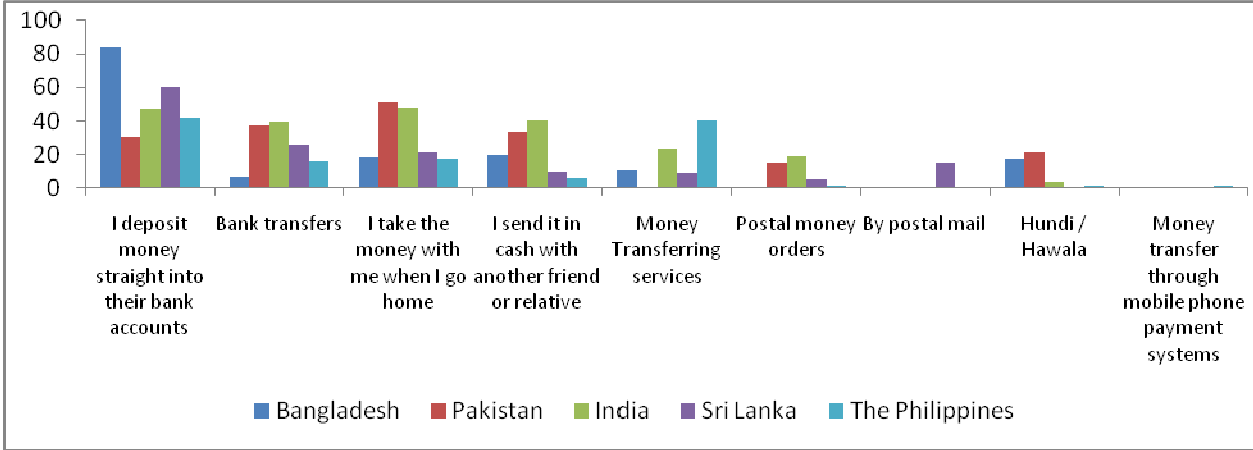
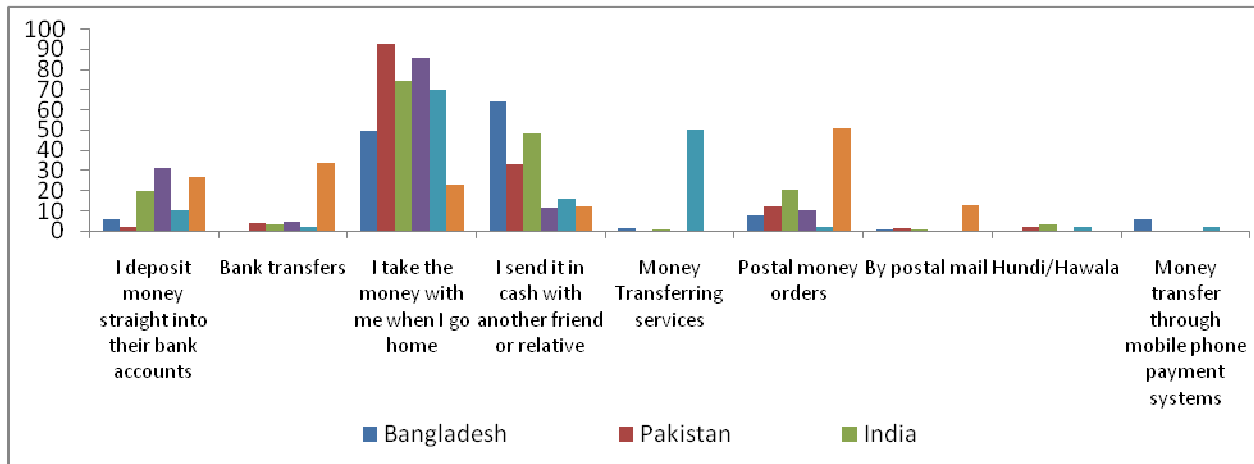
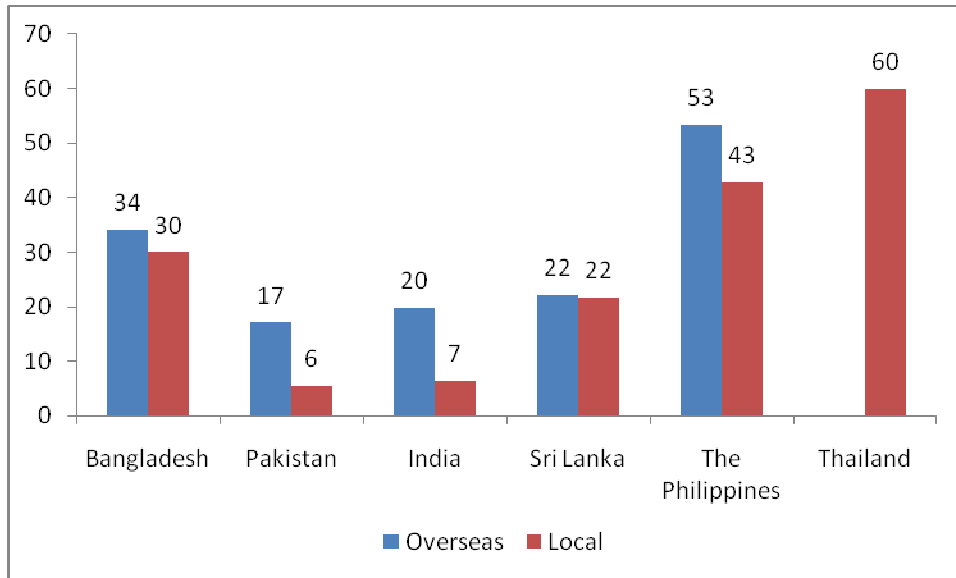


Figure 5: Modes of sending remittances by local migrants (% of BOP respondents)



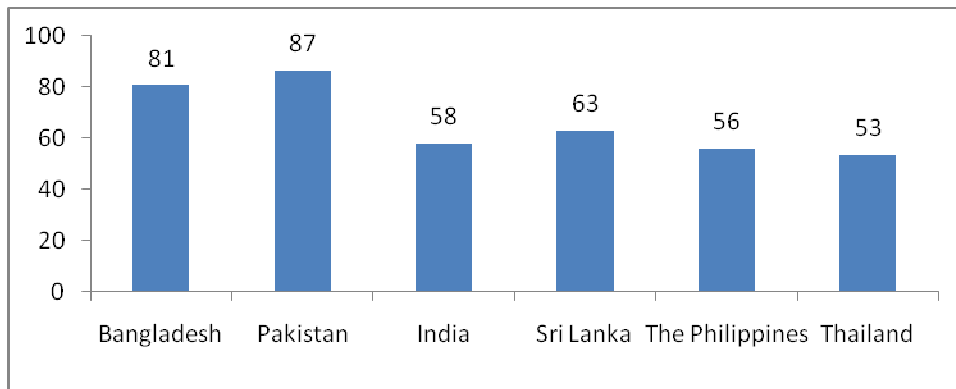
However, although the use of m-remittances was low, some awareness of such services exists, particularly among the Southeast Asian countries studied (Figure 6). Between 40 – 60 percent of respondents from the Philippines and Thailand were aware of mobile remittance services; however, awareness was considerably lower among the South Asian countries studied. This finding is intuitive, however, given that, as mentioned earlier, only the Philippines and Thailand had working mobile money transfer services in place at the time of writing.

Figure 6: Awareness of mobile remittance services among overseas and local migrants (% of BOP respondents)



Furthermore, the majority of survey respondents stated their preference of shifting to such services if available and affordably priced (Figure 7).

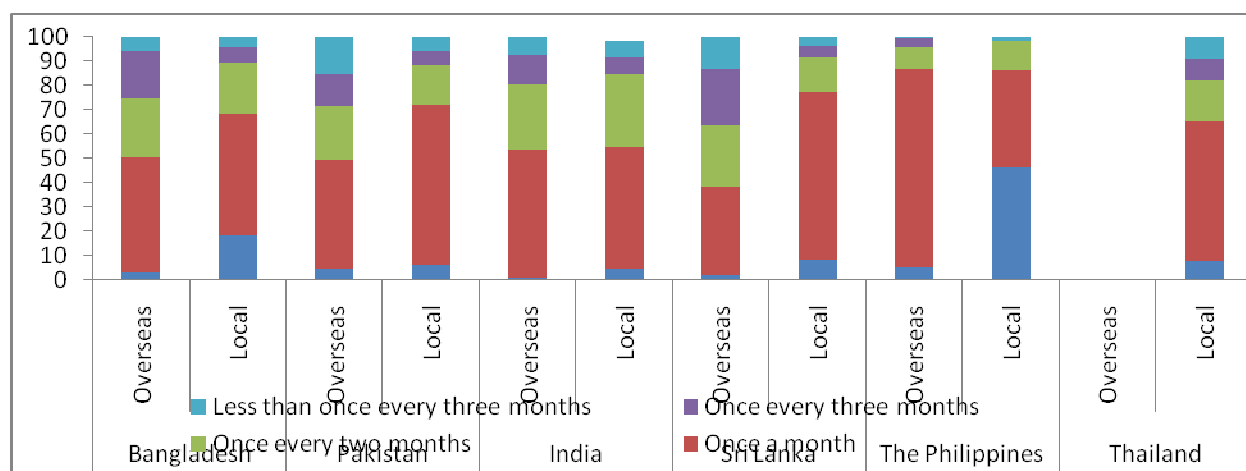
Figure 7: Preferred use of mobile remittance services if available and affordably priced among overseas and local migrants (% of BOP respondents)



Over 55 percent of local respondents remitted money to their family at least once a month, with as many as 46 percent of Filipino respondents remitting money more than once a month. Filipino respondents remitted money considerably more frequently than respondents in other countries (Figure 8). If one combines these findings with data on average remittance amounts sent per transfer (Table 2), it can be seen that, on average, local migrant respondents from Bangladesh and the Philippines made a larger

number of transfers, but remitted smaller amounts each time, than their counterparts in other countries. Such remittance transfer patterns are similar to what one would expect if sending money through a mobile phone (smaller amounts, but higher frequencies of sending), and hence is an important finding to take into consideration, when exploring the potential for m-remittance services in these countries.

Figure 8: Frequency of sending remittances to family at home among overseas and local migrants (% of BOP respondents)



Country	Overseas migrants					Local migrants				
	Mean	Median	SD	Min	Max	Mean	Median	SD	Min	Max
Bangladesh	313	288	221	72	1439	28	29	18	3	86
Pakistan	286	261	208	13	1307	97	78	82	13	654
India	326	222	264	44	1600	76	56	69	2	511
Sri Lanka	270	183	271	46	1835	60	46	60	7	459
Philippines	256	217	197	22	1957	64	49	47	11	217
Thailand						60	58	33	14	173

Table 2: Amount of money remitted at a time (per transaction, in USD)

4 The role of awareness in m-remittance service adoption

There are both theoretical and empirical arguments supporting the critical role awareness of such services has on the likelihood of subsequent adoption.

Extant literature on theories of technology adoption and use can be classified into three main schools of thought: diffusion, adoption and domestication (Pedersen and Ling, 2002; de Silva *et al.*, 2009; Rogers, 2003; Kiljander, 2004; Davis *et al.*, 1989; Fishbein and Ajzen, 1975; Silverstone and Haddon, 1996). However, Rogers (2003)'s diffusion of innovations theory can be argued to be the most relevant, in terms of highlighting awareness as a critical first step in the process towards trial, adoption and use of technology services. Rogers (2003) theorizes awareness or knowledge as the first in a series of steps in the process of adopting a product or service.

Empirically, although large-scale studies are relatively sparse, studies by prominent organizations such as CGAP (Mas and Morawczynski, 2009; Morawczynski and Pickens, 2009), The Economist (2009) and Intermedia (Bowen, 2010a; Bowen, 2010b) highlight the importance of the level of consumer awareness of mobile money services as a key determinant of ultimate adoption, and hence, success of such services. An in-depth study conducted the GSM Association (Mas and Morawczynski, 2009) on successful mobile service providers and consumer research in the Philippines and Kenya suggested "driving awareness", along with "creating demand" and "optimizing trial" as distinct strategies which providers needed to focus on in driving adoption (Mas and Morawczynski, 2009).

It is in the aforementioned theoretical and empirical context, that this section uses a logit model to examine socioeconomic factors determining the likelihood of a respondent being aware of mobile remittance services.

It should be stated, however, that more subtle factors such as the characteristics and spread of one's social network and the effectiveness of operator marketing campaigns likely to play important "trigger" roles in determining whether or not a respondent is aware of such services are often unobservable and difficult to capture and quantify in a theoretical model. For instance, both CGAP and GSM Association studies argue how differing marketing campaigns deployed by M-PESA providers in Kenya and Tanzania, respectively, were likely one of the main factors contributing to differing initial adoption rates (CGAP,

2009; Camner, Pulver, and Sjoblom, 2009). While Tanzania's ad was perceived as a service for the upper class, Kenya's advertisements sold the service as remittance mechanism between urban workers and their families back home (CGAP, 2009).

Furthermore, as both CGAP and GSM Association highlight, there are, without question, other factors such as those related to geography, culture, market competition, agent networks, economic development and access to finance that are likely to have significant impacts on adoption rates which are not examined in the model (Camner, Pulver and Sjoblom, 2009)

The logit model which includes variables such as income, education, gender and mobile ownership, serves more as a tool of understanding the *characteristics* of users that are aware of such services versus those not aware, rather than as a "deterministic" model in itself. While one can argue that this poses a limit on the functionality of a model as a tool for determining one's likelihood of being aware of such services, it, nevertheless, sheds light on the characteristics of those currently aware (versus those unaware) and hence, those arguably more (or less) likely to adopt such services in the future. Such findings are important for mobile service providers as a gauge for how best to market their service or product to potential consumers, and identify where (and the degree to which) current knowledge/awareness gaps exist and how these can be overcome.

4.1 Model findings and discussion

Logit (and probit) models assign the dependent variable a probabilistic value between 0 and 1, which represents a choice, or categories, from a set of mutually exclusive choices or categories (Knoke and Burke, 1980).

The general formula of the logit model is:

$$\text{Probability}(Y) = \frac{1}{1 + \exp(-\alpha - \sum_{i=1}^n \beta_i X_i)}$$

In this context, Y represents awareness of mobile remittance services (a dichotomous variable taking the value 1 if the respondent is awareness of such services and 0 if the respondent isn't) and X_i are the factors that impact levels of awareness. β_i values are factor sensitivities of each influential factor, X_i . Influential factors, X_i , can be quantitative or qualitative variables; dummy variables are used to represent the 'states' in case of qualitative variables. The influential variables, X_i , used in the study as well as their expected signs are given below in the Table 3. The influential variables are self-explanatory and expected signs logical. Separate models were constructed for overseas and local migrant workers, respectively.

A positive value for a coefficient variable indicates that the variable has a positive impact on the dependent variable and vice versa. Marginal effect statistics were used to allow for interpretation of the size of the impact as coefficients; such statistics measure the percentage change in the dependent variable (between 0 and 1), in response to a unit change in the value of an independent variable, with other covariates held constant at their mean values. In the case of non-binary, categorical variables, marginal effects measure the percentage change in the independent variable, with respect to a unit movement up (or down) the set of specified categories; in the case of binary, dichotomous (or dummy) variables (taking a value of either 0 and 1), marginal effect measures the difference in awareness levels, between the two states (0 or 1), with all other independent variables held constant at their means. Higher marginal effect values imply a greater impact (either positive or negative, depending on the sign) on the dependent variable.

In this model, five influential observations were removed, as they had a significant impact on the model. There are several influence measures or criteria that can be used to analyze and detect such kind of observations. In this case, Pearson residuals, deviance residuals and Pregibon leverage diagnostics were used to detect such observations; those considered influential based on this criteria were removed.¹¹ The model was estimated with and without each of the influential observations, and the best model, in terms

¹¹ Pearson residuals are the standardized difference between the observed frequency and the predicted frequency; they measure the relative deviations between the observed and fitted values. Deviance residual, another type of residual, measures the disagreement between the maxima of the observed and the fitted log likelihood functions. Since logistic regression uses the maximal likelihood principle, the goal in logistic regression is to minimize the sum of the deviance residuals. The Pregibon leverage, also called the hat diagonal since technically it is the diagonal of the hat matrix, measures the leverage of an observation.

of goodness of fit indicators, obtained. Our estimations were finally performed with 550 and 890 observations for overseas and local migrant models respectively, based on availability of data.

It should be noted that aside from the variables listed in Table 3, we also previously considered credit card ownership, country dummies and the frequency with which money was sent home. However, the contribution of these variables to the model's goodness of fit was none.

Variable	Remarks	Expected sign
<i>Dependent variable</i>		
Awareness of mobile remittance services	0 = respondent is not aware, 1= respondent is aware	N/A
<i>Independent/influential variables</i>		
Gender	Male =0, female =1	-
Education	Highest educational qualification of the respondent	+
Education squared	Highest educational qualification of the respondent	+
Income	Monthly personal income of the respondent	+
Income square-rooted	Income levels and squared-root of income	+
Age	Age of the respondent	-
Age squared ¹²	Age squared of the respondent	-
Mobile ownership	0 = respondent does not own a mobile phone, 1=	+

¹² Age² has a higher explanatory power compared to Age.

	respondent owns a mobile phone	
Use of banks to transfer money	0 = respondent does not use banks to transfer money, 1= respondent uses banks to transfer money	
Worked in a Middle Eastern country	0 = respondent did not work in any Middle Eastern country, 1= respondent worked in a Middle Eastern country	
Worked in a Western country	0 = respondent did not work in any Western country (Europe or North America), 1= respondent worked in a Western country (Europe or North America)	
Worked in South Asia	0 = respondent does not work in any South Asian country, 1= respondent works in a South Asian country	
Use of informal methods to send money	0 = respondent does not use informal methods to send money, 1= respondent uses informal methods to send money	
Months of mobile ownership	Number of months the respondent has been an owner of a mobile phone	+
SMS uses to communicate with family in home country	0 = respondent does not use SMS to communicate with home country, 1= respondent uses SMS to communicate with home country	+

Table 3: Variables in the m-remittance service awareness model

Table 4 provides an easy-to-interpret breakdown of the sample showing the characteristics of respondents aware of m-remittance services versus those who aren't. The Chi-Square value given in the

table indicates where there are significant associations between the two variables¹³. Table 5 contains the model results, while Annex 1 contains standard errors as well.

	Overseas migrants		Local migrants	
	<i>Aware of m-remittance services (% of sample)</i>	<i>Unaware of m-remittance services (% of sample)</i>	<i>Aware of m-remittance services (% of sample)</i>	<i>Unaware of m-remittance services (% of sample)</i>
Overall	31.1	68.9	20	80
N	202	447	186	745
Gender (Chi-Square=0.7193; 25.9117***)	Male: 77 Female: 23 N:202	74 26 447	Male: 58 Female: 41 186	77 23 745
Education (Chi-square=15.316***, 30.2285***)	Primary:16.7 Secondary:30.1 Tertiary:39.6 N: 202	83.3 69.8 60.4 447	13.16 23.38 22.97 186	86.84 76.62 77.03 745
Monthly Personal Income (USD) (Chi-Square=29.1804***, 27.7068***)	Less than the median:30 More than the median: 70 N: 202	53 47 447	32 68 186	53 47 745
Age (Chi-Square=0.9241, 0.6954)	Less than 35 yrs: 66 More than 35 yrs: 34	62 38 447	75 25 186	78 22 745

¹³ A significant Chi-Square value indicates the existence of a relationship between the concerned variable and mobile adoption.

	N: 202			
Mobile ownership (Chi-square=20.7107***, 31.8632***)	Yes: 92 No: 8 N: 202	77 23 447	84 16 186	62 38 745
Months of mobile ownership (Chi-square=0.041, 0.588)	Less than 36: 30.68 More than 36: 69.32 N: 186	39.54 60.46 342	21.34 78.66	19.24 80.76
SMS use to communicate with home country (21.3560***, 5.6017***)	Yes:52 No:48 N:202	33 67 447	30 70 186	22 78 745
Bank account ownership (Chi-Square=9.0911***, 35.0719***)	Yes: 68 No: 32 N:202	55 45 447	60 40 186	36 64 745
Use of banks to transfer money (Chi-Square=0.7775, 14.9166***)	Yes: 70 No: 30 N: 202	73 27 447	30 70 186	17 83 745
Use of informal methods to send money (Chi-Square=4.1675***, 23.9132***)	Yes: 37 No: 63 N: 202	45 56 447	70 30 186	85 15 745

Work in Middle Eastern countries(Chi-Square=0.5323)	Yes: 59 No: 41 N: 202	62 38 447	N/A	N/A
Work in Western countries (Chi-Square=0.0039)	Yes: 6 No: 94 N: 202	6 94 447	N/A	N/A
Work in South Asia (7.9239***)	Yes: 12 No: 88 N: 202	22 78 447	N/A	N/A

Note *** Chi-Square is significant at 95%

Table 4: Descriptive statistics of respondent aware of m-remittance services versus those not

	Model for overseas migrants		Model for local migrants	
	<i>Coefficients</i>	Marginal effects	<i>Coefficients</i>	Marginal effects
Female	-0.2425	-0.0463	0.7640***	0.1217***
Education	0.3217***	0.0633***	0.8261***	0.1179***
Income ⁺	0.0860***	0.0169***	0.0021***	0.0003**
Age	0.0129	0.0025	-0.0233	-0.0033
Age ²	-0.0001	0.0000	0.0005	0.0001
Mobile ownership	0.6998*	0.1235**	0.6033**	0.0812**
Bank account ownership	0.5844***	0.1123***	0.4175**	0.0611**
Use of banks to transfer money	-0.3887	-0.0795	-0.0644	-0.0091
Work in Middle Eastern countries	-0.2406	-0.0480	-	-
Work in Western countries	-1.0013*	-0.1545**	-	-
Work in South Asia	-1.0903***	-0.1811*	-	-

Use of informal methods to send money	-0.4744**	-0.0920**	-0.3807*	-0.0587*
Months of mobile ownership	0.0071	0.0014	0.0045	0.0006
SMS use to communicate with home country	0.4333*	0.0874*	0.0582	0.0084
Education ^2			-0.1206***	-0.0172***
Constant	-4.2328**		-3.2122***	
Number of observations	550		890	
Pseudo R2	0.1638		0.1162	

+ For overseas migrants we use the squared root version of the variable.

*** Significance level = 0.01.

** Significance level = 0.05.

* Significance level = 0.1.

Table 5: Logit model results

Table 4 shows that at a high level, mobile users aware of mobile remittance services tended to be more highly educated, with a higher relative income. They were also more likely to own mobile phones and bank accounts. Logit model results (Table 5) reveal similar findings. The logit models showed a reasonable fit with an R-square (Pseudo R-square) value of 0.16 and 0.12 for overseas and local migrants, respectively. The signs of the coefficients of significant variables are as expected except in the case of countries of work, where we pre-supposed no difference.

Starting with demographic variables, the model finds that those on higher incomes are more likely to be aware of mobile money transfer services; a unit increase in income raises the probability of being aware of such services by 1.69 percent. Similarly, those possessing higher educational qualifications are more likely to be aware of such services. Both variables were significant at the 99 percent confidence interval, and were true of both local and overseas migrants. There were no significant difference in awareness levels among younger respondents and their older counterparts.

In the case of income, however, it should be kept in mind that incomes of those at the BOP are often vulnerable to fluctuations, and hence, a measure of income at a single point in time may be a poor indicator of one's overall standard of living. As such, average monthly expenditure levels may serve as more accurate measures of average monthly incomes. As Girma and Kedir (2002) note, expenditure reflects not only what a household can acquire with a certain income level, but also what that household can acquire either because it has access to the credit market or because it has savings that it can use if its income reduces. As a consequence, expenditure constitutes a better indicator of a household's standard of living over a longer term than income.

Ownership of bank accounts is another important factor in determining respondents' awareness of mobile money remittance services. Since all the aforementioned factors are indicators of a respondent's overall standard of living, one can conclude that respondents enjoying a higher standard of living, in terms of income, education and access to financial services, are more likely to be aware of value-added services over the mobile, such as m-remittance services. These findings corroborate other studies such as by Bowen (2010a) in Kenya which found that mobile money users tended to possess higher educational qualifications, own bank accounts and use other ICTs and mobile services such as SMS to obtain news and information, than their non-user counterparts. Similar studies conducted by the GSM Association (Krugel *et al.*, 2009) in Kenya and the Philippines in 2009 found that early adopters of mobile money services tended to have higher incomes and were better educated, underscoring one of the goals of m-money services in targeting the bottom of the socio-economic pyramid.

Another finding, although less significant than the factors above, was that respondents owning mobile phones were more likely to be aware of such m-remittance services. This finding is intuitive given the fact that those already possessing mobile phones are more likely to be aware of other services mobile phones are capable of supporting, than those who don't; this could be both in terms of the exposure received through publicity (such as through SMS and print advertising) or through conversations with peers within one's social network ("push" information). However, although mobile ownership was a significant factor, months of mobile ownership was not, indicating "older" adopters were no more likely to be aware of such

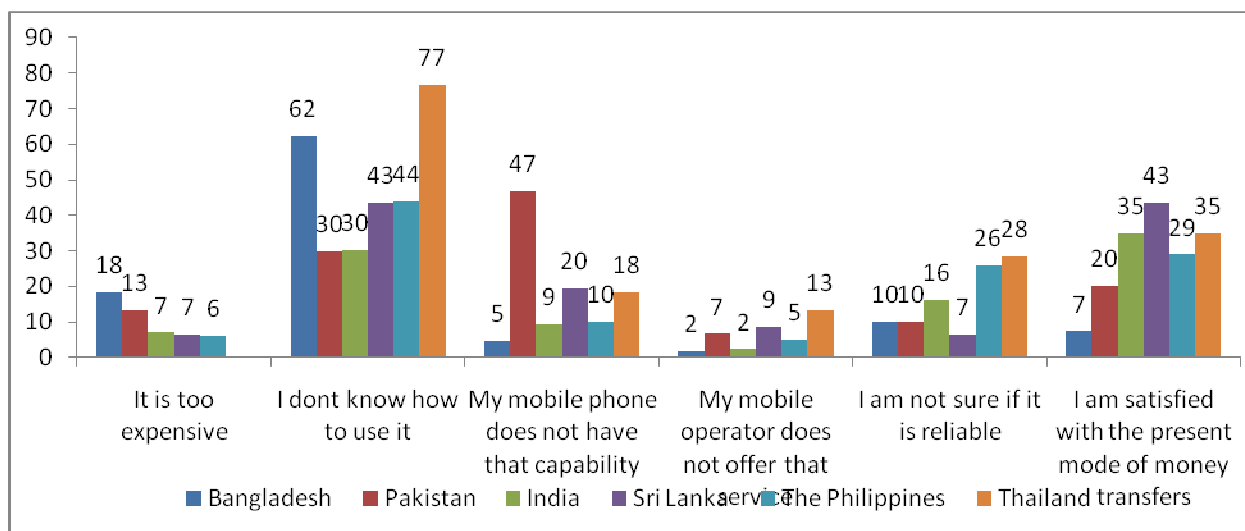
services than their more recent counterparts. Overseas migrants who used SMS to communicate with their family and friends at home were also more likely to be aware of such services; however, no significant differences were seen among local migrants.

5 Barriers to uptake and sustainability

Although the benefits accrued to both users and providers of mobile remittance services is potentially large, there are various barriers to uptake, both demand-side and supply-side, which need to be effectively overcome for the continued uptake and overall sustainability of such ventures. This subsection briefly examines some of the main barriers to uptake and use, identified by the quantitative survey and qualitative discussion, and highlights resultant implications for both service providers and regulators.

As Figures 9 (below) illustrates, most respondents who were aware of these services but didn't use it was either because they didn't know how or were satisfied with their present modes of transfer. Such findings challenge the notion that mobile banking could be a "leapfrogging" technology which would be taken up at equal or faster rates by the unbanked rather than banked (Bowen and Goldstein, 2010).

Figure 9: Reasons for not using mobile remittance services among overseas and local migrants (% of BOP respondents aware that such services exist)



Qualitative findings on barriers to adoption and use also revealed similar results. Although respondents acknowledged the convenience afforded by being able to transfer money over mobile phones, the service was often too complex for the elderly to understand and navigate, which ran the risk of errors taking place in sending money. As a result, some respondents stated they preferred using traditional methods such as banks which involved a person facilitating the transfer for them. Low levels of literacy are also a likely factor hindering the use of such services, given that most phones are programmed in the English language (CKS Consulting, 2009).

Such findings corroborate other large-scale empirical studies as well as theoretical models of technology adoption which postulate the potentially significant impact that an individual's perceived ease of use of a technology or service has on his or her decision to adopt and use (de Silva *et al.*, 2009; Davis *et al.*, 1989). One study conducted among potential M-PESA users in Kenya found that users cited the inability to obtain help from Safaricom, the telecom operator running M-PESA, as one of the reasons discouraging them from using such services (Morawczynski and Pickens, 2009). Bowen and Goldstein (2010)'s study in Kenya also found that among those who didn't use their mobile phones for financial-related transactions, 33 percent stated they didn't have access to a phone, while 8 percent and 11 percent said such services were too expensive or difficult to use, respectively.

Between 7 – 26% of respondents in the study countries also highlighted issues of trust and reliability in using the service. Qualitative findings revealed that respondents perceived banking networks and money transfer operators such as Western Union more trustworthy than their mobile counterparts. As a result, some respondents preferred having a bank involved in some stage of the process of transferring money, as they perceived their involvement as assurance of a reduced likelihood of being exploited financially through the system. Respondents also highlighted the need to have the service recommended by peers before adopting it, as well as be competitively priced (CKS Consulting, 2009). Other large-scale studies also highlight trust issues, the impact of an individual's social networks and financial literacy skills as factors affecting one's decision to adopt and use such services (Bowen and Goldstein, 2010; Mas, and

Morawczynski, 2009.; de Silva et al, 2009; Van Biljon and Kotze, 2008; Chabassou, Stork, C., Stork, M. and Zahonogo, 2009; Valente, 1996; Ivatury and Pickens, 2006).

Given relatively low awareness levels among relatively lower-income earners and the unbanked, the very market that can serve to benefit the most from such services, concrete steps need to be taken by service providers in effectively marketing their service to these market segments. As the GSM Association (2009) notes “the biggest barrier that exists is the struggle to effectively understand and serve unbanked customer needs...especially those at the base of the pyramid”.

In terms of usability and trust, trust in both the operator and service offered is vital for user buy-in, especially at the BOP. Service providers need to effectively address these concerns through targeted publicity and customer support emphasizing safety and reliability of mobile networks.

From a policy angle, given that such services can blur lines of authority and responsibility between mobile service providers and financial institutions, and telecommunications and financial regulators, proportionate regulatory policies and guidelines which clearly delineates responsibilities between each of the aforementioned institutions may be needed to promote stability, innovation and growth of services (Zainudeen et al, 2010; Alampay and Bala, 2010; Mas and Morawczynski, 2009; Solin, 2009; Vodafone, 2007).

6 Concluding remarks

This paper examined the potential use of mobile remittance services, a subset of m-money transfers, among migrant workers in emerging Asia. Mobile remittance services have the potential to extend services to those with limited access to traditional bank accounts and services, particularly those at the bottom of the pyramid, while also reducing transaction costs in terms of commission fees and transport costs.

However, awareness and use of such remittance services among the BOP is still relatively low, particularly among the South Asian countries under study. Furthermore, those aware are more likely to be already banked and possess relatively higher incomes. This suggests a contradiction to or ineffective marketing in positioning the product as a financial solution for the unbanked masses, the very market that can serve to benefit the most from such services. Among those aware, most respondents stated they either were satisfied with their present modes of transfer or didn't know how to use it. Some respondents also cited a lack of trust and reliability in using the service. However, the majority surveyed stated they would prefer switching to mobile-based services if available and affordably priced.

Findings from the study suggest that the Philippines and Bangladesh could be two countries best positioned for the uptake of mobile remittance services at present. The Philippines, already has relatively well-established mobile money services in place, with both SMART Telecommunications and Globe Telecom, the country's two leading mobile operators, offering such services. The country benefits from some of the highest mobile phone subscription densities in Asia (75 percent in 2008) and SMS use (often dubbed the "SMS capital of the world") (International Telecommunications Union, 2008). High mobile ownership levels as well as SMS use imply familiarity and comfort with using mobiles and more-than-voice services. Furthermore, from a regulatory perspective, the Central Bank, Bangko Sentral ng Pilipinas has taken a flexible, yet hands-on approach to permitting such services. Such a stance has served to promote service innovations among mobile money service providers, whilst effectively managing the risk that goes along with it.

Bangladesh, on the other hand, did not have operational m-remittance services in place at the time the study was conducted. However, it recorded the highest level of awareness in the South Asian countries studied (over 30 percent). Over 90 percent of those aware also said they would be willing to switch to m-remittance services if available and affordably priced. Bangladeshi respondents already report some use of an informal method of m-money transfers called "flex-loads". The service involves the transfer of money via prepaid credit to a local reload agent, who then converts it into cash and hands it over to the

intended recipient, minus a commission fee. This implies familiarity with m-money transfer-based services, which will prove beneficial if and when formal m-remittance services are introduced.

Given relatively low awareness among lower-income earners and the unbanked, concrete steps need to be taken by service providers in effectively marketing their service to these segments. Past research shows that below-the-line marketing techniques have been successful in raising awareness, trial and use of other more-than-voice mobile services. Service providers also need to effectively address issues of trust through publicity and customer which emphasize safety and reliability of mobile networks. Overall success is, nevertheless, dependent on a conducive policy and regulatory environment. The collaboration of mobile operators and financial institutions in the provision of these services means that both telecom and financial regulators may have significant roles to play in this space. Proportionate regulatory policies which explicitly delineate responsibilities between each regulator and service providers, respectively, are needed to offer stability and protection, while encouraging overall innovation and growth.

End notes

[1] <http://www.safaricom.co.ke/index.php?id=745>

[2] <http://www.itnewsafrika.com/?p=2949>

[3] <http://smart.com.ph/corporate/services/SmartPadala/>

[4] <http://www.globe.com.ph/gcash/>

[5] http://www.gsmworld.com/our-work/mobile_lifestyle/mobile_money/mobile_money_transfer/mobile_operators.htm

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Annex 1: Logit model results with standard deviation

	Model for overseas migrants				Model for local migrants			
	<i>Coefficients</i>	p-value	Marginal effects	p-value	<i>Coefficients</i>	p-value	Marginal effects	p-value
Female	-0.2425		-0.0463		0.7640	***	0.1217	***
	0.2653		0.0492		0.1938		0.0334	
Education	0.3217	***	0.0633	***	0.8261	***	0.1179	***
	0.0953		0.0189		0.2330		0.0327	
Income ⁺	0.0860	***	0.0169	***	0.0021	***	0.0003	**
	0.0210		0.0041		0.0008		0.0001	
Age	0.0129		0.0025		-0.0233		-0.0033	
	0.0972		0.0191		0.0643		0.0092	
Age ²	-0.0001		0.0000		0.0005		0.0001	
	0.0013		0.0003		0.0009		0.0001	
Mobile ownership	0.6998	*	0.1235	**	0.6033	**	0.0812	**
	0.3597		0.0555		0.2598		0.0319	
Bank account ownership	0.5844	***	0.1123	***	0.4175	**	0.0611	**
	0.2235		0.0414		0.1954		0.0292	
Use of banks to transfer money	-0.3887		-0.0795		-0.0644		-0.0091	
	0.2486		0.0523		0.2212		0.0308	
Work in Middle Eastern countries	-0.2406		-0.0480					
	0.2363		0.0479					
Work in Western countries	-1.0013	*	-0.1545	**				
	0.5308		0.0604					

Work in South Asia	-1.0903	***	-0.1811	*				
	0.3080		0.0418					
Use of informal methods to send money	-0.4744	**	-0.0920	**	-0.3807	*	-0.0587	*
	0.2319		0.0442		0.2215		0.0366	
Months of mobile ownership	0.0071		0.0014		0.0045		0.0006	
	0.0044		0.0009		0.0030		0.0004	
SMS use to communicate with home country	0.4333	*	0.0874	*	0.0582		0.0084	
	0.2347		0.0486		0.2248		0.0328	
Education ^2					-0.1206	***	-0.0172	***
					0.0393		0.0056	
Constant	-4.2328	**			-3.2122	***		
	1.8162				1.1633			
Number of observations	550				890			
Pseudo R2	0.1638				0.1162			
Degrees of freedom	14				12			
Chi-squared test of global significance	83.27				79.09			
	0.000				0.000			
Hosmer-Lemeshow Test	7.12				12.96			
	0.5241				0.1131			
Classification table								
Positive predictive value	60.82%				64.10%			
Negative predictive value	75.28%				81.43%			

Correctly classified	72.73%				80.67%			
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