

Working paper

Linking Savings Accounts to Mobile Phones

Are Potential Users
Interested?

Suresh de Mel
Dammika Herath
Craig McIntosh
Christopher Woodruff

March 2012



International
Growth Centre



DIRECTED BY



FUNDED BY



Linking Savings Accounts to Mobile Phones: Are Potential Users Interested?

Suresh de Mel[#], Dammika Herath[#], Craig McIntosh^{*}, Christopher Woodruff[‡]

Preliminary draft: March 31, 2012

Introduction:

The debate about the impact of microfinance on low-income households has drawn attention to the fact that microfinance is generally synonymous with microcredit. The poor lack of low-cost and secure microsavings alternatives. Technological advances, particularly related to mobile telephony, raise the possibility of low transactions cost savings programs. The widespread use of M-PESA in Kenya has generated considerable attention. (See Jack and Suri, 2010.) But the business model of M-PESA is built very much on money transfers rather than personal savings. Can a bank-linked savings product be viable as a savings alternative? Which types of households will use the product, and how will those households be affected by access to secure, low-cost savings? Those are the questions that motivate the research described here.

The need for regular savings is generated by the income and expenditure patterns of low-income households, described in intricate detail in both Rutherford (2000) and Collins et al (2009). Income comes in small amounts on a regular basis: the majority of the participants in our study receive income on a daily basis as either self-employed workers or daily-paid casual wage workers. But some expenditures – for medical or other emergencies, weddings and other festivals, and durable goods – are large but infrequent. Low-cost, secure savings may help low-income household accumulate the larger amounts they need.

[#] The University of Perideniya

^{*} The University of California, San Diego

⁺ The University of Warwick

[‡] The authors thank the International Initiative for Impact Evaluation (3ie) and the International Growth Centre for funding this research. The views expressed, and any errors of judgment or analysis are the responsibility of the individual authors.

Two recent studies which have gotten considerable attention show very large impacts from either regular savings accounts (Dupas and Robinson 2010) or commitment savings products (Brune et al 2011). Dupas and Robinson conduct an randomized experiment in which they open savings accounts for a randomly selected subsample of self employed workers in urban areas in western Kenya. While a minority of the treatment group makes even a single deposit in the account, they find very large effects of the savings account on investments in the businesses, on consumption, and on health outcomes. Brune et al (2011) conduct a randomized trial among tobacco farmers in rural Malawi. They find that regular savings accounts have no effect, but commitment savings accounts have significant effects on the use of inputs in the next planting season, in farm output, and in consumption.

The ultimate goal of this project is two fold. First, we aim to examine the effect of access to low-cost savings products on a variety of outcomes at the household and enterprise level. We expect to make several contributions to the literature. First, we work with a larger sample than Dupas and Robinson. We are also conducting surveys with much more frequency than any of the existing studies. We survey half the sample on a monthly basis. The more frequent surveys will provide us with higher quality data and more power to detect outcomes.¹

The project is also designed to provide evidence on the demand for savings services at various pricing schedules. The mobile operator and bank must recover costs if they are to provide the service. The mobile operator we are working with pays about 8 % of revenues to the distribution channel. When top-ups are used for mobile calls or texts, this 8% represents a cost of service. But if the funds are deposited in the bank, then they need to be recovered either from the client or the bank. Many participants in the mobile money product space feel that clients are unlikely to be willing to pay 8% for the privilege of depositing money through the mobile agent network.² We vary the cost of using the service

¹ See McKenzie 2011 for a discussion of the benefits of multiple baseline and follow-up surveys for variables which are stochastic or noisily measured.

² Space reserved for cite to work by Ignacio Mas or others on this point.

in our design. Those offered the product are divided into groups which pay the full 8%, pay a subsidized rate of 4% or 2%, or are able to use the service without incurring any fee. In other words, for each 100 LKR deposited through their phone, those paying the 8% fee will see 92 LKR show up in the savings account, while those paying no fee will see the entire 100 LKR show up in their account.

In this paper, we focus on take-up of the service, measured by the willingness of the respondent to come to the bank and open an account. Our initial baseline survey was conducted in November and December 2010. But delays in launching the product, caused by the need to fine tune the technological platform and by the time needed to approve various procedures within the bank and mobile phone company, meant that we were able to begin the process of opening bank accounts only in December 2011. The account openings for the core participants in the project were completed in February 2012.³ There were further short delays after the accounts were opened – which we discuss in the section describing the product – which mean that the majority of the treatment group was able to begin using the product only within in the past week.

The Product:

We worked with a large mobile operator and a small software company in Sri Lanka to develop a savings product which allows deposits to be made directly a savings account in a large, government-owned bank. Users purchase mobile phone top-up scratch card. The same scratch card may be used either to add credit to the phone or – by dialing a different number – to make a deposit in an *m-purse* account which is linked to a savings account. By entering a PIN, the user can then move the money to the savings account. This is the first product of this type offered in Sri Lanka. The mobile operator has agreed not to market the product in the region where we are conducting research for a period of at least

³ A part of the project, which we leave to the side for now, examines how the savings product affects demand for informal savings services. We have oversampled members of rotating savings and credit associations (ROSCAS, known in Sri Lanka as Seetus), and varied the intensity of treatment of members of a given ROSCA. The last round of account opening, for ROSCA members who are not part of the survey, will occur in early April.

one year. This gives us an unusual level of control of access to the savings product.

The service is targeted to workers who receive income with high frequency – the self employed and workers paid on a daily or weekly basis. These groups were targeted for two reasons. First, frequent payments imply that these workers may benefit from the ability to make many small deposits in to their savings accounts. The advantage of making these frequent, small deposits may interact with challenges to savings in cash, either because of difficulty resisting temptations to spend cash themselves, or because of difficulty resisting pressures for cash from other household members. Second, these two groups represent a large share of the urban / semi-urban households in Sri Lanka. According to the 2006 Sri Lankan Labor Force Survey, 24% of non-agricultural households in Sri Lanka (29% of all households) have at least one member who is self employed. The labor force survey does not indicate the frequency of payment for wage workers. But a survey in urban / semi-urban areas in three districts in southern Sri Lanka described in de Mel et al (2010) found that 31% of wage workers are paid daily and an additional 3% paid weekly. If wage workers represent three-quarters of the labor force, this implies that almost another quarter of the workforce is paid at daily or weekly frequency. That is, around half of the urban / semi-urban households have members receiving income on a daily basis. Moreover, daily paid workers and the self employed have earnings which are lower, on average, than monthly paid wage workers.⁴ We conjecture - though we presently lack data which shows this - that they are likely to make less frequent use of banking services, both because their earnings are lower and because they work during normal banking hours.

Sample selection:

The sample was selected by listing households in six municipalities in central Sri Lanka: Kandy (KN), Katugastota (KT), Pelimathalawa (PL), Matale (MT),

⁴ The data from the de Mel et al (2010) survey indicates that both median and mean earnings of daily paid workers are 75% of the comparable measure of earnings of monthly paid workers.

Kurunegala (KR), and Kegalle (KG). We gathered information from a total of 10,300 households - between 1600 and 1850 households in each municipality. The listing was also stratified by population density, with 4400 households listed in urban areas and 4400 households in semi-urban areas across the six municipalities. In each of Matale, Kurunegala, and Kegalle we also listed 500 households in the rural areas surrounding the towns. The listing provides a representative sample of households in the six municipalities, and a random sample of households in rural areas around the three municipalities.

The listing survey gathered information on each adult aged 18 to 65 who was active in the labor market. We screened out households in which there were no working adults, households in which all working adults were received salary on a monthly basis, and households which reported not having, and not being willing to open, an interest-bearing savings account. The target sample was 1950 individuals, with 825 from urban areas, 825 from semi-urban areas, and 300 from rural areas.⁵

The actual baseline sample was 2006 individuals, of which 1625 were assigned to treatment. Because we have an interest in understanding the impact of formal savings on household behavior, the largest treatment group (683 individuals). The treatment groups assigned to the 2% fee level (316 individuals), the 4% fee level (310 individuals) and the 8% fee level (316 individuals) were about half the size. is assigned to the 0% transaction fee group. All of the treated individuals were also provided with an handset and SIM card from the mobile operator, and with the 500 LKR required to open a savings account at the bank. The variation in fees allows us to examine variation extending from a powerful but potentially non-economically viable product (cost-free deposits) to one that is commercially viable but will likely generate fewer savings (8% cash-in fees).

⁵ The full sample includes an additional 340 individuals who are members of 48 Seetus. These individuals are part of the separate examination of the impact of formal credit on Seetu participation.

Treatment was assigned at the individual level, stratified on the quartiles of baseline savings balances as well as three values of the ease with which the core respondent was able to read a text message written in Sinhala using the English characters. These two variables thus produced twelve blocks were used in the randomization.

Sample characteristics and treatment balance:

Table 1 shows characteristics of the full sample and each of the treatment groups.⁶ Differences in characteristics between the 0% treatment group and any of the other treatment groups are show in italics (indicating a difference significant at the 10% level), bold (indicating a difference significant at the 5% level), or bold and italics (indicating a difference significant at the 1% level). Because the sample sizes in the 0% treatment group is largest, almost all of the significant differences are with this group.

On average, participants are 41 years of age, with the 4% treatment group a year older. About a fifth are female, 85 percent are married and 4 percent are Muslim. The 8% treatment group is significantly less likely (at 1 percent) to be married, and the 4 percent group is less likely (at 1 percent) to be Muslim. These are the only two differences which are significant at the 1 percent level. More than two-thirds of the sample (72 percent) is self employed, almost three quarters (73 percent) has a bank account, and 31 percent participate in at least one Seetu. Surprisingly, 56 percent report having changes a SIM at some point (though only 52 percent in the 4 percent group, a difference significant at the .10 level), and a similar percentage (59 percent) reports topping up their phone at least weekly. Only a fifth are able to read a text message with Sinhala words written phonetically in the Latin alphabet “very easily” according to the enumerator.

The baseline survey contains a series of other questions designed to measure the technical savvy of the respondents, to measure the convenience of using the mobile phone as a savings product, and the costs of using banks. These further

⁶ We do not include the control group because the analysis here is limited to take-up within the group offered the product.

characteristics are discussed in the next section, where we examine differences in characteristics of the sub-sample that initially took up the product and the sub-sample that did not.

Take-up:

In Tables 2 and 3, we explore which characteristics are associated with take up of the product. We define take-up as coming to the bank to open the account. Note that those taking up the offer also received a phone and SIM card. Overall, 85.5 percent of those eligible to receive the treatment took up the offer by this measure. Among the 236 individuals not taking up the offer, two thirds (159) received the offer and chose not to open the account; one-third (77) did not receive the offer because they had attrited from the survey.⁷ This represents an attrition rate of 4.5 percent over the year between the time of the initial baseline survey and the time the offer was made. Because the attrition rate is somewhat higher in the 8 percent treatment group, we treat attrition as equivalent to declining the offer for the purposes of this initial analysis.

Table 2 shows differences between those taking up and not taking up the offer in the average of characteristics clustered into 4 groups. We begin by noting that the take-up rates are very similar in the 0 percent, 2 percent and 4 percent treatment groups (87.1, 86.3 and 86.2 percent, respectively), but significantly lower in the 8 percent treatment group (80.4 percent). (See Table 1.) This suggests that interest in the product may be dampened with high transactions fees.

Looking first at the relationship between take-up and demographic characteristics, the data indicate that married respondents are more likely to have opened the account (86% of those taking up are married, vs. 79% of those not taking up), while Muslims are less likely to have done so (3.6% vs. 6.4%).⁸

⁷ These include 31 individuals who had moved – 22 overseas and 9 outside the area – 20 individuals who declined to be interviewed further, 18 who could not (yet) be located, and 8 who had died.

⁸ Perhaps the more intuitive way to show this relationship would be to say that take-up was 77% among Muslims and 86% among non-Muslims. We report

Take-up rates do not differ significantly by any of the other demographic characteristics.

Panel B of Table 2 shows the relationship between take-up and measures of the use of mobile phones. The overall impression from the data is that neither mobile phone usage patterns nor technical savvy is strongly correlated with take-up. Those opening the account are slightly less likely to say they use the phone daily for calls or texts, with the latter difference significant at the .02 level. Those taking up the offer are more likely to say they top up their phone at least weekly (60% vs. 51%), but not more likely to say they can fix most problems with their phone themselves or to be able to read a phonetically-written text. The group opening an account is more likely to have said they would be interested in a mobile banking product if there were no transaction fees ($p=.04$), and reports an average willingness to pay which is higher than the group not taking up the offer ($p=.06$).

The next set of characteristics measures use of and trust in banks. Here we find somewhat stringer associations with opening the account. Those opening an account are more likely to have an existing account in a commercial or state-owned bank (74 vs. 70 percent, $p=.11$) and more likely to have an account with a Sanasa or Samurdhi bank (12 vs. 7 percent, $p=.03$). There is also a strong relationship between participation in Seetus and opening the account. Finally, those opening the account report an lower average travel time to their nearest bank branch (16.1 vs. 14.4 minutes, $p=.02$).

The final panel reports correlations with measures of discount rates, risk preferences, and various ability measures. We find no association between take-up and measures of risk aversion or discount rates. We do find a relationship between measures of numeracy (counting backwards from 100 by 7 and filling

instead the average of each characteristic in the group of individuals opening the account and the group of individuals not opening the account because this allows us to show comparable data for both binary and continuous variables.

in missing numbers in sequences). But surprisingly, the data suggest that the more numerate are less likely to have opened the account.

Table 3 examines some of these patterns in a regression framework, reporting the results of probits with take-up as the dependent variable and various groups of independent variable. The strongest and most robust relationship is with the transactions fee. Each percentage point increase is (in a linear relationship) associated with a .78 percent decrease in the take-up rate. Muslims are about 9 percentage points less likely to open the account. When we control for characteristics related to use of the bank and mobile phone (column 3), we find lower take-up rates among the young – those less than 40 years of age – and among the self employed. Seetu members are 4 percentage points more likely to take up the offer, and those topping up their phone at least weekly are 5 percentage points more likely to do so. Finally, those reporting a willingness to pay a higher transaction fee for the product are more likely to have opened the account.

Conclusions:

We conduct an initial analysis of the take-up of the mobile phone based savings product among a sample of self employed and daily / weekly paid workers in Sri Lanka. Of course, the actual usage of the product will be more telling with regard to both its viability and to the sensitivity of transaction fees to usage. Delays in obtaining approvals to launch the product at the bank, and further delays in establishing the necessary accounts by the mobile operator have resulted in delays in being able to roll out the product. But as of the end of March 2012, the product is now fully operational and the rollout is progressing as fast as is feasible. Barring some further glitches, we expect to have data allowing for a more detailed analysis within the next few months.

Patterns in the initial take-up are encouraging, however. While the overall take-up rate may have been exaggerated by the offer of a free phone, the fact that take-up was lower among the group that will pay transactions fees of 8 percent, and the fact that the take-up was higher among those who said they would be

willing to pay a higher transaction fee both suggest that respondents have thought about the value of the product when deciding whether or not to take up the offer. While we have experienced some delays in rollout, we are now in a position of having a viable mobile savings product for which we can completely control access. That is, we have very clean treatment and control groups. We also retain an ability to make some modifications in the product during the trial. Thus, the conditions are right to learn quite a lot about the demand for and usage of the mobile savings product.

References:

Brune, Lasse, Xavier Gine, Jessica Goldberg, and Dean Yang, 2011, "Commitments to Save: A Field Experiment in Rural Malawi," World Bank WPS 5748.

Collins, Daryl, Jonathan Morduch, Stuart Rutherford, and Orlanda Ruthven, 2009, *Portfolios of the Poor*. Princeton: Princeton University Press.

De Mel, Suresh, David J. McKenzie and Christopher Woodruff, 2010, "Who are the Microenterprise Owners?: Evidence from Sri Lanka on Tokman v. de Soto", in *International Differences in Entrepreneurship*, Lerner and Schoar, eds., *University of Chicago Press, 2010*.

Dupas, Pascaline and Jonathan Robinson, 2010, "Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya," mimeo UCLA

Jack, William, and Tavneet Suri, 2010, "The Economics of M-PESA," working paper MIT.

McKenzie, David, 2011, "Beyond Baseline and Follow-up: The Case for More T in Experiments," World Bank.

Rutherford, Stuart, 2000, *The Poor and Their Money*. London: Department for International Development.

	Table 1: Balance Tests				
	Treatment Group				
	All	0%	2%	4%	8%
Observations	1625	683	316	310	316
Take-up rate	85.5%	87.1%	86.3%	86.1%	80.4%
Age	40.9	40.3	41.5	42.0	40.6
Female	19.1%	18.2%	19.0%	19.7%	20.9%
Married	85.0%	85.7%	86.1%	88.7%	78.8%
Muslim	4.0%	5.0%	4.7%	1.6%	3.5%
Years of Schooling	10.1	10.2	9.9	10.1	10.1
Household Head	61.5%	64.0%	61.7%	60.6%	57.0%
Household owns mobile phone	89.0%	89.5%	90.2%	87.1%	88.9%
Member Seetu	31.1%	31.8%	29.1%	31.3%	31.3%
Has bank account	73.7%	75.0%	74.7%	73.5%	70.3%
Financial Literacy	75.6%	75.5%	76.9%	76.8%	73.1%
Self Employed	71.9%	70.7%	73.7%	72.3%	72.2%
Has changed SIM	56.0%	58.1%	54.4%	51.9%	57.0%
Tops up at least weekly	58.5%	60.6%	59.8%	52.6%	58.2%
Reads text "Very easily"	19.2%	19.0%	19.6%	19.0%	19.3%
Bold and Italics: Significantly different from 0% group at the 1% level Bold: Significantly different from 0% group at the 5% level <i>Italics: Significantly different from 0% group at the 10% level</i>					

Characteristic	Table 2: Comparison of means by take-up			p-value Take-up = 1 vs. Take-up=0
	Mean in sample	Mean among those opening an account (Take-up=1)	Mean among those not opening account (Take-up = 0)	
	1625	1389	236	
Respondent is female	19.1%	19.5%	16.9%	0.36
Age of respondent	40.9	41.0	40.5	0.53
Respondent is married	85.0%	86.0%	79.2%	0.01
Respondent is Muslim	4.0%	3.6%	6.4%	0.05
Household head	61.5%	61.9%	59.3%	0.45
Self employed	71.9%	71.3%	75.0%	0.25
Use mobile daily: calls	62.5%	62.2%	64.0%	0.60
Use mobile daily: texts	6.9%	6.3%	10.6%	0.02
Have changed a SIM	56.0%	56.7%	51.7%	0.15
Call quality at home Excellent or Good	93.8%	93.6%	94.9%	0.44
Tops up at least weekly	58.5%	59.7%	51.3%	0.02
Closest tupup point w/in 200M	71.8%	71.0%	76.3%	0.10
Can fix phone problems yourself	18.6%	18.3%	20.3%	0.45
Number of 13 other uses for phone	1.5	1.5	1.8	0.14
Use phone for at least one of the 13 other uses	48.1%	47.9%	49.2%	0.72
Interested in mobile banking if fee is 0%	81.4%	82.2%	76.7%	0.04
Average % fee would be willing to pay	4.2	4.2	3.8	0.06
Can read phonetic text Excellently	19.2%	18.6%	22.9%	0.12
Have account at bank	73.7%	74.4%	69.5%	0.11
Have account at Samurdhi / Sanasa bank	11.4%	12.1%	7.2%	0.03
Member of at least one Seetu	31.1%	32.3%	24.2%	0.01
Use ATM at least yearly	19.8%	19.9%	19.5%	0.89
Travel time to nearest bank (minutes)	15.8	16.1	14.4	0.02
Time needed to make deposit (minutes)	23.2	22.9	25.2	0.59
Cost of travel to banks (LKR)	9.0	9.0	8.9	0.94
Most people can be trusted	10.2%	10.1%	10.6%	0.81
Have "A great deal" of trust in banks	60.9%	61.6%	56.8%	0.16
1 Month discount rate	8.58%	8.61%	8.42%	0.82
Answers 2 financial literacy question correctly	75.6%	75.4%	76.7%	0.66
Years of schooling	10.1	10.1	10.2	0.51
Numeracy test: sequences	41.5%	40.3%	48.7%	0.02
Numeracy test: counting backward by 7	34.0%	32.8%	41.1%	0.01
Raven test (out of 12)	4.2	4.2	4.4	0.20
Digitspan: Longest sequence recalled	6.1	6.1	6.3	0.22
Willing to take risks (scale 1 to 10)	5.6	5.6	5.7	0.71

Table 3: Dependent Variable: Opened Bank Account				
	(1)	(2)	(3)	(4)
VARIABLES	Probit	Probit	Probit	Probit
Transaction fee (%)	-0.0078*** (0.003)	-0.0078*** (0.003)	-0.0075*** (0.003)	-0.0074*** (0.003)
Younger than 40 years of age	-0.0249 (0.018)	-0.0170 (0.018)	-0.0613*** (0.019)	-0.0625*** (0.019)
Female	0.0188 (0.021)	0.0127 (0.022)	0.0362* (0.021)	0.0357* (0.021)
Muslim	-0.0945* (0.053)	-0.0897* (0.053)	-0.0863* (0.051)	-0.0869* (0.051)
Self Employed			-0.0372** (0.019)	-0.0370** (0.018)
Member of Seetu			0.0420** (0.018)	0.0409** (0.018)
Has bank account			0.0211 (0.020)	0.0205 (0.020)
Tops up at least weekly			0.0516** (0.022)	0.0517** (0.022)
Have changed a SIM			0.0279 (0.022)	0.0234 (0.021)
Years of schooling		0.0012 (0.004)		
Numeracy (First PC)		-0.0160** (0.008)		
Raven test (out of 12)		-0.0008 (0.004)		
Can read phonetic text Excellently		-0.0112 (0.024)		
Average % fee would be willing to pay				0.0044* (0.002)
Observations	1,625	1,618	1,625	1,625
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Table 4: Dependent variable: Transaction fee respondent would be willing to pay [Truncated at 10%]			
VARIABLES	(1) Tobit	(2) Tobit	(3) Tobit
Younger than 40 years of age	0.2716 (0.206)	-0.1380 (0.214)	-0.1404 (0.213)
Female	0.1601 (0.250)	0.3633 (0.247)	0.3339 (0.247)
Muslim	0.0478 (0.424)	-0.1655 (0.437)	-0.1295 (0.424)
Self Employed	0.0512 (0.223)	-0.1086 (0.220)	-0.1098 (0.220)
Member of Seetu	0.2283 (0.201)	0.1925 (0.200)	0.1551 (0.199)
Has bank account	0.2212 (0.223)		
Tops up at least weekly	0.0927 (0.224)		
Have changed a SIM	1.0440*** (0.223)		
Ease of using banks (first PC)		0.0255 (0.083)	0.0394 (0.084)
Use of mobile phone (first PC)		0.4954*** (0.064)	0.5147*** (0.064)
Financial literacy			1.0839*** (0.225)
Numeracy (First PC)			-0.2843*** (0.076)
Sigma	3.6540*** (0.075)	3.6082*** (0.075)	3.5684*** (0.074)
Observations	1,625	1,623	1,616
Robust standard errors in parent			
*** p<0.01, ** p<0.05, * p<0.1			

The International Growth Centre (IGC) aims to promote sustainable growth in developing countries by providing demand-led policy advice based on frontier research.

Find out more about our work on our website
www.theigc.org

For media or communications enquiries, please contact
mail@theigc.org

Subscribe to our newsletter and topic updates
www.theigc.org/newsletter

Follow us on Twitter
[@the_igc](https://twitter.com/the_igc)

Contact us
International Growth Centre,
London School of Economic and Political Science,
Houghton Street,
London WC2A 2AE

IGC

**International
Growth Centre**

DIRECTED BY



FUNDED BY



Designed by soapbox.co.uk