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FIELD EXPERIMENTS

Deposit Collectors

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Abstract

Informal lending and savings institutions exist around the world, and often include regular door-to-door deposit collection of cash. Some banks have adopted similar services in order to expand access to banking services in areas that lack physical branches. Using a randomized control trial, we investigate determinants of participation in a deposit collection service and evaluate the impact of offering the service for micro-savers of a rural bank in the Philippines. Of 137 individuals offered the service in the treatment group, 38 agreed to sign-up, and 20 regularly used the service. Take-up is predicted by distance to the bank (a measure of transaction costs of depositing without the service) as well as being married (a suggestion that household bargaining issues are important). Those offered the service saved 188 pesos more (which equates to about a 25% increase in savings stock) and were slightly less likely to borrow from the bank.

KEYWORDS: microfinance, microsavings, development economics, behavioral economics, time management

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A vast economics literature exists on moneylenders and microcredit services, yet little is written about the asset side of microfinance services — microsavings. An informal sector microfinance service often includes regular pickup of cash with unrestricted rights to withdraw it later. These savings often earn a *negative* nominal return, and even more often a negative real return (Rutherford, 2000). While it is clear that firms supply such services both to mobilize savings, as well as to screen for reliable lending clients, it is less clear why deposit-collection services are demanded by savings clients, and whether deposit-collection can generate higher savings.

Explanations from both economics and psychology exist for why individuals may be willing to pay for a deposit-collection service. From an economics perspective, take-up of deposit-collection may simply reduce transaction costs for making deposits. This depends on the amount charged relative to the alternative cost of depositing directly at the bank or saving in real assets. In the case of our experiment, prior to the intervention depositors had to incur the time and monetary cost of going to the bank, but now they only have to pay the monetary cost.[1] In other settings, a deposit-collection service is much akin to a community assigning one person to run an errand for the community as a whole rather than having each person run the same errand independently (Wright 1997).

From a psychological perspective, a simple "planning fallacy" may explain demand for these services. Individuals who may make plans (as an economist assumes is done implicitly or explicitly in typical savings and consumption decisions) often do not succeed in following through with their plans.[2] Some clients may want deposit-collection because they know they manage their time poorly, suffer from procrastination, are forgetful, or are overly optimistic about their available time, and see deposit-collection as an easy way to ensure that they follow through with their intentions.

In one sense, a deposit itself may serve as a commitment device if the hassle cost of a withdrawal is enough to fight off temptation. For example, Thaler (1985) argues that cash in hand leads to higher aggregate personal expenditure because it is more easily spent than cash in a bank account. Thus merely keeping money in a bank account represents a commitment not to spend those funds immediately. Note that while the deposit-collection service is not in and of itself a commitment device, it is a service that lowers the cost of depositing, which is in turn a commitment device. In particular, if an individual faces stochastic

[1] In this sense, a deposit-collection service lowers transaction costs much like ATMs: although they charge a fee, they reduce net transaction costs of using a savings account by removing the time cost of traveling to a bank.

[2] Economists recently have begun to build models that do predict such behavior (O'Donoghue and Rabin 1999; Fudenberg and Levine 2005).

temptation shocks, for instance, and is self-aware, this may be an insightful service for someone to better control one's future self (Banerjee and Mullainathan, 2005).

Deposit-collection also can be seen as a more direct commitment to *making* cash deposits. Face-to-face contact with a deposit collector may provide pressure to make a deposit. Some individuals may not trust their future self to make deposits, for reasons developed in the literature on hyperbolic preferences and temptation and dual-self (Laibson 1997; Gul and Pesendorfer 2004; Fudenberg and Levine 2005, respectively). The decision to take-up the service can be seen as a commitment to routinely face this pressure in the future. Similar arguments have been made to explain why individuals join rotating savings and credit associations (ROSCA-s), e.g., see Gugerty (2001).

From the bank's perspective, deposit-collection services may also affect their lending profits (as well as the obvious benefit from holding higher deposits). On the positive side, deposit-collection services may help to reduce information asymmetries, an important cause of friction in credit markets (Stiglitz and Weiss 1981; Karlan and Zinman 2005), by providing lenders a low risk method of learning more about potential lending clients. For potential clients, the reward of a future loan may be incentive enough to encourage them to save regularly via the service.[3] On the other hand, since individuals may find that the deposit-collection service helps build savings, this may lower their demand for credit. When large expenditures are needed (whether planned or due to a shock), there is no need to borrow since savings are drawn down instead. Thus, the deposit-collection services could reduce borrowing from the bank. The net effect is an empirical question.

Using a randomized control methodology, we evaluate the impact on savings balances and borrowing behavior from a deposit-collecting program at the Green Bank of Caraga in Mindanao in the Philippines. Anecdotal evidence, discussed below, suggests that deposit-collection services are popular throughout the developing world; however, high savings of desposit-collection clients may simply reflect the selection bias of those who choose to use such a service. Without a proper control group these anecdotes cannot conclude that the service *causes* higher savings.

We find a substantial increase in savings for those offered the service. This occurred despite the fact that the deposit-collection services were not daily, as is the case for many informal arrangements, but monthly (or in a few cases weekly), and despite the fact that only 38 (28%) of the 137 offered the service took it up. Comparing those who were offered the service to those who were not, we find an impact on savings balance equivalent to 188 pesos, or approximately 4 US Dollars, over a 15-month period.

[3] *Safesave* in Bangladesh reports this as a common motivation for their clients.

Further, we find a slight *decrease* in borrowing for those clients randomly offered the deposit-collection service. Deposit-collection may still help to eliminate information asymmetries in the credit market. However, in *net*, the deposit-collection service leads to lower borrowing from the clients.

To gain insight into the mechanisms causing the increase in savings, and the type of individuals who demand this specialized savings service, we investigate the determinants of take-up. Consistent with a pure transaction cost story, we find that a client's distance to the local bank branch is a statistically significant predictor of take-up of deposit-collection services. However, the distance accounts for little of the variation in the take-up analysis. The large residual variation suggests that other (unobserved) factors are indeed important determinants of taking-up the collection service. Green Bank management reported to us that in the past clients have asked Green Bank for such a service because it would help them to remember to save, or help them to move cash out of the house. This suggests that psychological, household bargaining mechanisms, or crime may play a relevant role in the popularity of the deposit service. We find that married women are more likely to take up the service relative to single women (but married men are no more likely than single men). The gender difference suggests that intra-household decision making factors play a strong role in the take-up of deposit-collection services.

This paper proceeds as follows. Section 2 discusses the presence of deposit-collection services elsewhere, section 3 presents the experimental design and setting. Section 4 analyses who takes-up the service. Section 5 analyses the impact on savings and borrowing at the bank. Section 6 concludes.

1. Background on Deposit Collection Services

The financial impact, and relative popularity, of the deposit-collection service is consistent with the observed expansion of deposit-collection around the world (Rutherford, Mutesasira, Sampangi and Mugwanga 1999).[4] In Asia, several large microfinance institutions employ similar deposit-collecting systems in remote areas. Seibel and Shrader (1999) documents the development of Himalaya Finance & Savings Company (HFSC), one of a few saving associations in Nepal

[4] Rutherford, Mutesasira, Sampangi and Mugwanga (1999) also notes that such services vary greatly by region and institution. For example, in West Africa we often observe deposit collectors who *only* take deposits, whereas in other areas such as East Africa deposit collectors are also moneylenders (Steel, Aryeetey, Hettige and Nissanke 1997). In Ghana, Aryeetey and Gockel (1991) observes that over seventy-five percent of women who participate in credit markets in three major cities also save through professional deposit collectors, also known as *susu* collectors (and *tontiniers* in francophone Africa). As a means to encourage savings, some collectors provide savings prizes, such as radio cassette and bicycles, for the best savers of the month.

that uses a door-to-door collecting service. Daily deposit collecting services played an important role for HFSC in mobilizing savings and then transforming the organization into a formal financial institution, eventually expanding to over 50,000 clients. *SafeSave* in Bangladesh also adopted deposit collectors for their savings services to increase the accessibility for the clients, offering a flexible combination of savings and loans, and helping to teach the discipline of making small deposits (or loan payments). Clients are explicitly rewarded with access to credit based on their successful deposit history. As of June, 2005, *Safesave* served 10,000 clients in the slums of Dhaka.

The existence of profitable money keepers in developing countries, where formal financial services are often absent, suggests that people are willing to earn a *negative* nominal return on savings simply in order to have money held for them. This implies that the demand for safe saving is quite high, and that within-household solutions (such as the mattress) are not sufficient. Where a government certified bank is available in more remote areas, as in the Philippines, the demand for deposit collectors suggests that the simple presence of a safe place to save is not sufficient to mobilize savings.

2. Experimental Design and Setting

We partnered with the Green Bank of Caraga (Green Bank), a rural bank in Mindanao in the Philippines. The Green Bank is a well-established and reputable Philippine rural bank, having won many awards for community activism and responsible banking practices. Deposits (up to $50,000) are insured by the Philippine Deposit Insurance Corporation. The Green Bank also participated in an earlier study on a commitment savings product, called SEED (Ashraf, Karlan and Yin 2006).[5]

The sample frame used for this study is a subset of the sample from the SEED study. In the prior study, we first obtained administrative data for 3,153 clients from Green Bank. We then, independently of the Green Bank, administered a household survey of 1,777 existing clients of the bank. These same baseline data are used for this study, including hypothetical time discounting

[5] In the earlier study, we randomly chose half of the clients and two to four weeks after the survey, the Green Bank offered them a new account called a "SEED" (Save, Earn, Enjoy Deposits) account. This account was a commitment savings product that restricted access to deposits as per the client's instructions upon opening the account, but did not compensate the client for this restriction. The other half of the surveyed individuals were assigned to either a control group that received no further contact or a marketing group that received a special visit to encourage savings using existing savings products only (i.e., these individuals were encouraged to save more, but were not offered the new product). We found that the SEED product had a significant positive impact on savings held at the Green Bank.

questions in order to identify time-inconsistent individuals (although with a six month delay before the deposit-collection intervention began, the interpretation of state-sensitive questions is admittedly questionable). However, whereas the SEED product offering was made two to four weeks after the baseline survey, the deposit-collection service was offered six months later. This may explain some of the difficulty in predicting take-up from the baseline survey.

Table 1 describes the participants in this study. Although the individuals are well educated by typical developing country standards, the average level of education in the Philippines is generally high, even among lower classes; literacy for the region in which this study takes place (Northern Mindanao) is 92%.[6] The average household income of this region was 106,897 pesos or 294 daily.[7] Our sample has an average daily wage of 370 pesos, a median of 290 pesos, and a 25th percentile of 160 pesos. Hence, the individuals in our study represent a wide cross-section of the Philippines, likely including individuals from upper, middle and lower classes.

In the deposit-collection experiment, the Green Bank offered door-to-door deposit-collection services in five barangays around Butuan City in northern Mindanao, where the head office of the Green Bank is located.[8] The service was an "add-on" to either the clients normal savings account (which pays 4% per annum interest) or to their SEED account (which also pays 4% per annum interest, but has restrictions on withdrawals, as discussed above and in Ashraf et al, 2006). No other features of the account were changed.

Green Bank first identified ten barangays[9] (out of 60 in the area) that were good candidates for the deposit-collection service. These areas were reasonably accessible and had a significant enough number of existing clients to warrant sending an employee into the area. The ten barangays were then grouped into five pairs, so that the two barangays in each pairing were similar in terms of depth of their outreach, density of population, distance to their branch and number of SEED clients. We then randomly chose one of the two barangays from each of these pairings. The Green Bank offered deposit-collection services to all existing clients in the five randomly chosen barangays. In all analyses, we estimate standard errors allowing for clustering within the barangays, and include fixed effects for each pair of matched barangays.

In these ten barangays, we have administrative data from the Green Bank for 640 individuals (399 in the five treatment barangays and 241 in the control barangays) from the earlier SEED study and 346 individuals (196 in the treatment

[6] National Statistics Office, Republic of the Philippines, 2000 Census of Population and Housing.
[7] National Statistics Office, Republic of the Philippines, 2003 Family Income and Expenditure Survey Final Results.
[8] See the Appendix for a description of the marketing procedures.
[9] A "barangay" is a small political and community unit, containing on average 1000 individuals.

barangays and 150 in the control barangays) who were part of the SEED survey which serves as a baseline for this study as well. In February 2004 (six months after the baseline survey was conducted), the Green Bank marketing representatives went to the 196 clients' houses in the treatment barangay and offered the collection service. The cost of the service was 4 pesos per pickup, and clients could choose either a monthly or bi-weekly pickup schedule.

Although recruiters offered the service primarily to the existing clients, anyone who belonged to the treatment barangays could sign up for the service even if he/she did not previously have an account at the Green Bank. Of the 196 clients in the treatment barangays, 137 were reached by the marketing representatives and offered the door-to-door deposit-collection service. Since no attempt was made to contact the control group, we do not know which of these clients would have been reached. Hence, the impact analysis will include all 196 individuals in the treatment barangays (the 59 not reached as well as the 137 contacted individuals) and 150 individuals in the control barangays. Since the impact analysis includes the 59 individuals not offered the service in our treatment group, we consider the estimate of the intent-to-treat effect to be conservative.

Of the 137 clients in the treatment group "contacted" by the marketing team, 38 (28%) agreed to take up the service. 18 new individuals, not in the baseline survey, and 2 clients not in the treatment barangays also signed up for the service (for a total of 58 deposit-collection clients). These 20 individuals are *not* included in the impact and take-up analysis since they were not part of the sample frame at the time of the randomization. Of the 38 clients who took up the deposit-collection service and are included in the analysis, 35 chose monthly service, and 18 of them never deposited money through the collectors during the 10-month study period. Individuals who did not make a deposit were still supposed to pay the transport cost of the deposit collector, although this was not always enforced.

Table 1 (Panel A and B) reports summary statistics for major administrative variables (pre-intervention savings balances, participation in the previous SEED study, borrowing status at the Green Bank) and for key demographic variables gathered from the baseline survey (household income, sex, age, hyperbolic preferences obtained from hypothetical time preference questions, and level of education). Column 4 reports F-statistics for differences in variable means across individuals in the treatment and control groups. Of the 12 key outcome and control variables used throughout the analysis, only one variable is statistically different across the treatment groups: control group individuals completed the baseline survey more often than those in the treatment group.

The average number of deposits for these 38 clients was 3.85, and the average amount of a single deposit was 497 pesos (Table 1, Panel C). Over fifteen months, the average total savings stock for those who used the deposit-collection service was 1910 pesos.

Table 1: Summary Statistics

	All	Treatment	Control	T-test
	(1)	(2)	(3)	(4)
A. Administrative Data				
Total savings balance 6 months prior to the project (pesos)	487.664	473.126	511.732	0.337
	(19.473)	(24.577)	(31.920)	
Total savings balance 1 month prior to the project (pesos)	754.824	719.846	812.733	0.590
	(83.342)	(106.764)	(133.392)	
SEED treatment	0.520	0.531	0.507	0.660
	(0.027)	(0.036)	(0.041)	
SEED takeup	0.078	0.080	0.075	0.802
	(0.011)	(0.014)	(0.017)	
Completed survey	0.541	0.491	0.622	0.001
	(0.020)	(0.025)	(0.031)	
Proportion of clients who are borrowing from GB at follow-up		0.123	0.158	0.213
		(0.016)	(0.024)	
Observations	640	399	241	
B. Survey Data				
Annual household income (hundreds of thousands, pesos)	1.353	1.298	1.423	0.367
	(0.069)	(0.086)	(0.112)	
Female	0.587	0.622	0.540	0.123
	(0.027)	(0.035)	(0.041)	
Age	42.708	42.306	43.233	0.543
	(0.755)	(1.024)	(1.115)	
Time inconsistent, impatient now, patient later	0.251	0.219	0.293	0.117
	(0.023)	(0.030)	(0.037)	
Some college	0.633	0.628	0.640	0.813
	(0.026)	(0.035)	(0.039)	
SEED treatment	0.520	0.531	0.507	0.660
	(0.027)	(0.036)	(0.041)	
Observations	346	196	150	
C. Deposit Collection Data				
Proportion of clients who signed up for the service*		0.284		
Proportion of clients who signed up for the service and made at least one deposit		0.142		
Average number of deposits made in 10 months (conditional on >0 deposit)		3.85		
Average deposit amount (conditional on >0 deposit)		497.39		

Standard errors in parentheses. 52 pesos = US$1. *Proportion of clients who signed up for the service and the proportion of those who used the service are calculated by the number of those who signed up for deposit collector service in treatment barangays divided by the number of people who are reached by a GB marketer.

3. Determinants of Take-up

In Table 2, we examine the determinants of take-up of the sample of clients reached by the marketers.[10] The take-up rate is 28% (slightly higher for women, but insignificant statistically). Column (1) reports the correlation between client demographic variables and take-up of the deposit-collection.[11] Married individuals are more likely to take-up, while more educated individuals are less likely to take-up. Distance to the bank branch, a measure of the transaction cost of deposit without the service, is a strong determinant of take-up: each additional 10 kilometers a client must travel from home to make a deposit increases the probability of take-up by six percentage-points. This result is consistent with a pure economic transaction cost story. The coefficient is precisely estimated, but the distance variable explains only 0.1% of the variation in take-up.[12]

As mentioned above, the face-to-face contact with the deposit collector may provide pressure to make a deposit. While neither explicit nor binding, the decision to take-up the service can be seen as a commitment to face this pressure in the future. Someone may not trust their future self, for reasons elaborated in a series of papers on hyperbolic preferences, temptation models or dual-self models (Laibson 1997; Gul and Pesendorfer 2004; Fudenberg and Levine 2005, respectively). We test whether individual time preference variables predict take-up of the collection service. In the SEED study, these variables were found to predict take-up of a commitment savings product for women. Column (2) includes variables reflecting individual time preferences derived from hypothetical survey questions in the baseline survey. Clients who exhibit impatience in the near-term frame were more likely to take up the product. Here, present-biased discounting does *not* significantly predict take-up of the collection service. In columns (3) and (4), we separately estimate the take-up regression for women and men and find that present-biased women are *less* likely to take-up.

[10] Appendix Table 1 analyzes the how those who were reached differ from those who were not reached. Clients who were female, married, older, in the SEED treatment group and with larger households were more likely to be reached by the marketers. Appendix Table 2 describes determinants of take-up when the sample is not restricted to those just those reached by the marketer. All individuals assigned to treatment are included, whether the marketer reached them or not.

[11] Marginal effects reported for all probit specifications in the tables.

[12] When take-up is regressed on distance alone the adjusted R-squared is 0.0085, explaining less than 1% of variation.

Table 2: Determinants of Signing up for Deposit Collection Service

Dependent Variable: Indicator variable for signing up for the service

Probit

	All	All	Female	Male
	(1)	(2)	(3)	(4)
Time inconsistent, Money		-0.039	-0.063**	-0.000
		(0.107)	(0.032)	(0.149)
Impatient, Now versus 1 Month		0.076	0.051	0.146
		(0.072)	(0.080)	(0.123)
Patient, Now versus 1 Month		0.040	-0.012	0.140
		(0.088)	(0.076)	(0.087)
Impatient, 6 months versus 7 Months		-0.111	-0.097*	-0.068
		(0.077)	(0.055)	(0.081)
Patient, 6 months versus 7 Months		-0.009	-0.004	0.015
		(0.119)	(0.089)	(0.131)
Married	0.120***	0.101***	0.129**	-0.040
	(0.024)	(0.028)	(0.061)	(0.031)
Some College	-0.054***	-0.054	-0.159***	0.139**
	(0.015)	(0.033)	(0.020)	(0.069)
Number of household members	-0.006	-0.006	-0.001	0.008
	(0.015)	(0.016)	(0.006)	(0.022)
Has at least one school-aged child	0.004	0.004	-0.007	0.005
	(0.006)	(0.005)	(0.009)	(0.012)
Unemployed	0.168	0.193	0.053	0.342
	(0.317)	(0.347)	(0.162)	(0.453)
Age	-0.002	-0.002	-0.003**	0.005
	(0.002)	(0.002)	(0.001)	(0.004)
Total household income	0.111	0.107	0.181***	0.108
	(0.070)	(0.077)	(0.038)	(0.138)
Total household monthly income - squared	-0.029*	-0.029*	-0.039***	-0.106***
	(0.016)	(0.016)	(0.007)	(0.041)
Female	0.028	0.027*		
	(0.019)	(0.015)		
SEED treatment	0.193***	0.187***	0.114*	0.217**
	(0.069)	(0.069)	(0.066)	(0.108)
SEED marketing	0.043	0.039	-0.026	0.020
	(0.103)	(0.117)	(0.064)	(0.205)
Active savings client prior to deposit collector service	0.016	-0.001	0.030	-0.110**
	(0.070)	(0.069)	(0.057)	(0.051)
Distance to Green Bank	0.005***	0.006***	0.003	0.007***
	(0.001)	(0.001)	(0.002)	(0.002)
Pseudo R-Squared	0.130	0.151	0.268	0.212
Observations	196	196	122	74

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. 52 pesos = US$1. Sample is limited to those who were surveyed in the SEED study. Time inconsistent and impatient variables derived from responses to hypothetical time preference questions asked six months prior the offering of the deposit collection service. See the text and Ashraf, Karlan and Yin (2006) for more details on these questions. "Active savings client" defined as an individual with transactions the six months prior the offering of the deposit collection service. We report marginal effects for the probit specifications.

Married clients were more likely to take up the service. Columns (3) and (4) show that the married effect in the pooled sample masks differences across gender . For women, being married increases the likelihood of take-up by 12.9%. This result is consistent with evidence that married women in the Philippines typically are responsible for household finances (Ashraf, 2005). In related work on ROSCAs, it has been suggested that women join savings programs in order to find a way to fulfill their responsibilities to the family to save (Anderson and Baland, 2002). This responsibility may give rise to shielding motives, which the presence of a deposit collector may help to carry-out. In contrast with this idea, we find the effect of having at least one child of school-age on take-up of deposit-collection services to be insignificant. We interpret this result to mean that married women are more likely to take up the service due to spousal control issues, independent of any responsibility to care for children.

Higher household income positively predicts take-up of the service; but the effect is negative at high levels of income (also, the mean income of individuals who take-up is slightly below the mean income of the full sample). Again, this effect differs across gender. This inverted-u relationship holds for women; yet for men, we find no statistically significant predictive effect of household income. We also find that less educated and younger women were significantly more likely to take-up. For men, on the other hand, age and education do not predict take-up.

4. Impact

4.1 Savings

Over 15 months, the amount deposited through door-to-door collection service varied greatly. While 7% of the clients saved over 3000 pesos using this service, 17 clients (40% of those who took up the service) never used the service after initially taking-up. Despite the wide variance in the impact on savings of the deposit-collection, we find that on average, the impact is positive relative to savings changes of clients in the control barangays. To test for the treatment impact, we regress savings balances after a specified period on the randomized treatment assignment of a client's barangay of residence. While randomization ensures that, in expectation, the distribution of client characteristics is statistically similar across the two groups, the modest sample size and barangay-level randomization compel us to include client demographics in the regression to control for differences in characteristics of clients in the treatment and control groups. Also, a fixed effect is included for each "block," or pair of barangays, within which we randomized into treatment and control. Since we randomized at

the barangay level, all regression specifications include standard error estimations that allow for clustering within barangays.[13]

Table 3 reports these regression results. Coefficient estimates on the treatment variable represents the effect on savings of being randomly assigned to the treatment group. After six months there was no impact, but after 10 months, clients residing in treatment barangays increased their total savings by 262 pesos (Column 2, specification without individual demographic control variables) and 228 pesos (Column 5, specification with individual demographic control variables) relative to clients in the control barangays. After 15 months, the increases were 268 pesos and 198 pesos for the specifications without and with control variables, respectively. These results are significant statistically, at 95% and 99% for the ten-month and fifteen month results, respectively.

Table 4 reports savings impact regression results where various interaction effects with various demographic and time preference characteristics. We do not find any significant evidence of heterogeneous treatment effects, where impact is higher (or lower) for any demographic or time preference characteristics.

The impact on savings is economically significant when considered in the context of large financial expenditures. Savings stock increased up to 40%. Nominally, the savings increases are also important: a doctor visit in this area of the Philippines costs about 150 pesos, and a one-month supply of rice for a family of five costs 400 pesos.

The magnitude of the impact of the deposit-collection service is significant but less than that of the SEED commitment savings experiment discussed earlier. In both cases, about 10% of the sample frame offered the service ended up using it actively. SEED, after 12 months, increased savings by about 80% (intent to treat), whereas the deposit-collection service after 10 months increased savings by about 25%. We do not find that the two programs additively are any better than the sum of the parts (Column 7 and 8 in Table 3).

[13] Standard errors are also calculated, but not reported, with the White robust estimator. For the treatment impact estimate, the corresponding White standard errors are higher relative to clustered standard errors. The estimated treatment effect declines in significance; for the 10-month analysis (Table 3, column 7), the estimated impact with White standard errors is significant at the 5% level (with clustered standard errors, the effect is significant at 1%); for the 15-month analysis (Table 3, column 8), the estimated impact is positive and significant at the 10% (with clustered standard errors, the effect is significant at 5%). Randomization at the barangay level, as well as inefficiency of the White estimator with small sample size, justifies our reporting barangay clustered standard errors.

Table 3: Impact of Deposit Collection Service

Dependent Variable:	Total savings balance								Borrowing	
	OLS								Probit	
Length:	6 months	10 months	15 months	6 months	10 months	15 months	10 months	15 months	15 months	15 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	-42.818	262.311***	268.790**	-89.093	227.340***	197.964*	343.413***	530.415**	-0.029	-0.034**
	(51.128)	(49.487)	(97.962)	(63.376)	(61.238)	(94.092)	(100.282)	(192.420)	(0.018)	(0.016)
SEED Treatment							346.160	702.233***		
							(361.628)	(175.185)		
Female							-268.246	68.702		
							(265.534)	(346.441)		
Treatment * SEED Treatment							-524.033	-1,037.369**		
							(322.871)	(442.314)		
Treatment * Female							9.399	-629.212		
							(380.653)	(364.985)		
Treatment * SEED Treatment * Female							204.750	1,088.405		
							(535.365)	(844.982)		
Constant	-298.212**	-401.781*	-617.886**	-342.060*	-476.948**	-742.663**	-513.974**	-904.079***		
	(95.786)	(201.847)	(218.094)	(161.634)	(200.704)	(233.947)	(198.386)	(261.957)		
Observations	640	640	640	640	640	640	640	640	640	640
R-squared	0.09	0.07	0.04	0.12	0.10	0.06	0.10	0.06		
Fixed effect for block in randomization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control for pre-intervention savings balan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control for individual characteristics	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes

Standard errors in parentheses, and corrected for clustering within barangay. * significant at 10%; ** significant at 5%; *** significant at 1%. 52 pesos = US$1. Columns (1) through (3) do not include covariates for individual-level demographics. Columns (4) through (6) include covaraites for female, married, unemployed, age, number of household members, education, active clients, and household income. For 294 out of the 640 individuals, no baseline survey was completed and hence no individual-level information is available. Covariates are included as zero, and an indicator variable is included for whether the individual was surveyed or not (hence has these data or not). Dependent variable for Columns (1) through (8) is total savings balance after either 6 months, 10 months or 15 months. The dependent variable for Columns (9) and (10) is an indicator variable for active lending client at Green Bank 15 months after the deposit collection service started. For probit specifications (columns 9 and 10), we report the marginal effects.

Table 4: Impact of Deposit Collection Service, Interaction Terms

Dependent Variables:	Total savings balance	Borrowing
	OLS	Probit
	(1)	(2)
Time inconsistent, impatient now, patient later	-730.918	-0.089***
	(566.561)	(0.030)
Impatient, now versus 1 month	92.032	0.000
	(126.856)	(0.031)
Impatient, 6 months versus 7 months	-312.975	-0.026
	(370.351)	(0.034)
Female	-199.726	0.087
	(361.882)	(0.056)
Married	-353.453	-0.067**
	(227.947)	(0.028)
Some college	-375.052	-0.042
	(353.409)	(0.031)
Age	-5.153	-0.001
	(5.964)	(0.001)
Unemployed	-25.145	
	(60.195)	
Number of household members	-1,022.408*	-0.004
	(522.923)	(0.007)
Total household income (thousands, pesos)	187.143	-0.016
	(150.642)	(0.019)
Active savings client prior to deposit collector service	-164.585	-0.088***
	(711.739)	(0.034)

Standard errors in parentheses, and corrected for clustering within barangay. * significant at 10%; ** significant at 5%; *** significant at 1%. Each cell reports the coefficient on the interaction term from a separate regression. In each regression, one (and only one) demographic variable is intereacted with treatment, and the coefficient on the interaction term is reported in the above table. All specifications include the same control variables as included in Table 3 Column 4 through 6. Total savings amount is in Philippine pesos (52pesos = US$1). There are no unemployed clients in the sample who are borrowing from Green Bank, hence the missing coefficient in Column 2. Each specification has 640 observations. For the probit specification (column 2), we report marginal effects.

4.2 Borrowing

We also examine the impact of savings mobilization on borrowing behavior. The effect is a priori ambiguous. While it may help lenders overcome adverse selection problems, hence making clients more likely to receive a loan from the bank, we have no anecdotal evidence from the bank that the deposit history of the clients contributed to any loan decisions. Yet, this notion remains a practical possibility. Deposit-collection could also affect the demand for credit: clients who use the service may become more loyal to or familiar with this particular bank. When they need a loan, they may be more likely to borrow from Green Bank rather than from another lender. On the other hand, accumulation of savings could lessen the demand for a loan because it builds the asset base of clients, which they could subsequently draw down when capital is needed.

To test these competing hypotheses, we repeat the savings impact analysis above, but replace savings levels with a binary outcome variable for borrowing from the Green Bank. This variable takes the value one when a client is borrowing (or has borrowed) from the bank after 10 months; it takes zero otherwise. Without covariates, we find that clients who reside in a barangay that is randomly assigned to be treated are 3.4 percentage points *less* likely to be active borrowers (Table 3 Column 9). However, once we include covariates (Column 10), this effect falls to 1.6 percentage points, and is no longer significant statistically.

In Table 4, just as with savings, we now examine whether the impact is driven by any particular individual characteristics. We find that married individuals, prior savers and hyperbolic individuals are even less likely to borrow after being offered the deposit-collection services. If lower borrowing (noted in Table 3) is occurring because individuals are accumulating sufficient savings to avoid having to borrow, then it follows that the effect should be strongest on those who actually raise sufficient savings to reach the minimum loan size. Since prior active borrowers start with more savings, they are perhaps more likely to reach that critical point.

5. Conclusion

Many believe that individuals need financial services that allow for frequent small deposits and infrequent large withdrawals. If the withdrawal comes first, this is called a loan; if the deposits come first, this is called savings. Some argue that the order is not important, what matters is merely the access to a safe and reliable vehicle for the inflows and outflows (Rutherford 2000). A deposit-collection service helps individuals make little deposits (with perhaps a goal towards later large withdrawals).

In this paper, we found that offering the financial service of deposit-collection had an economically and statistically significant impact on increasing savings and a small, but significant, impact on decreasing borrowing. There are several mechanisms, both psychological and economic, through which deposit-collection could increase savings: decreasing transaction costs, facilitating following through on financial planning, providing a public commitment device for impulse-control or for spousal control, among other explanations. We do not distinguish empirically between these mechanisms in this paper. Although the analysis on the factors driving demand for the service is suggestive of certain explanations, particularly regarding married women, a larger sample would be needed in order to distinguish between the possible motivations.

The impact of higher savings and lower debt, barring substitution to or from other non-Green Bank financial assets or liabilities, has one clear implication: individuals consumed less if offered the deposit-collection service. Given the entirely voluntary nature of the program, it suggests that there is demand for new savings vehicles that help individuals save. When given the right (voluntary) vehicle to facilitate savings, individuals consume less now (since savings rises and debt falls). This implication should be verified with further field work and experimentation.

Informal deposit-collection has long been popular among the poor,[14] but these informal services have drawbacks. Different moral hazard problems generate risks for the depositors. If the collectors are individual operators rather than employees monitored by microfinance institutions (and hence regulators), the operator is effectively an unregulated bank. If the operator (individual money-collector) is on-lending, bank runs could be a problem. Or the collector could simply commit fraud if the reward were high enough: Aryeetey and Gockel (1991) notes that 40.3 % of savers in Ghana had lost their money to run-away deposit

[14] Note that in this study, although some participants are poor, the study includes individuals from all strata in this area of the Philippines.

collectors and 79.6% knew people who lost money to these collectors. This type of fraud is less likely to occur in a regulated financial institution.

The shift to the formalization (and hence commercialization) of deposit collecting may be helpful not just for mobilizing deposits but also for removing information asymmetries in lending markets. In many cases, such saving services are accompanied by loan offers, so that daily deposit collectors are also money-lenders. Aryeetey and Steel (1995) analyzes the efficiency of door-to-door lending/saving services by comparing the cost of lending between two types of informal services in Ghana: a credit association that uses daily savings collectors (Greater Accra *Susu* Collectors' Cooperative Society (GASCCS)), and regular commercial banks. They calculate the cost of lending by valuing the time spent on lending activity on the basis of the *susu* collectors' monthly (which equals one-thirtieth of the deposits they collect during the month). Because savings collectors already have information on clients' reliability from their saving patterns, screening cost for lending is substantially lower for GASCCS than for commercial banks. In addition, monitoring cost is essentially zero since savings collectors have daily contact with borrowers. They conclude that the expansion of lending mechanisms through savings collectors will reduce the cost associated with individual-collector savings mechanism.

While there is a growing volume of the literature on the impact assessment of various lending programs in developing countries, studies on the impact of micro-saving devices are still limited. We have evidence that such programs work, but much remains to be learned about *why* they work and, correspondingly, how best to design such programs. Learning about the behavioral responses these savings products invoke not only can deepen our understanding of what drives the decision to save, but would also inform us about how to best design savings products and whom to target.

Appendix Table 1: Determinants of Being Reached by Marketers

Dependent Variable: Indicator variable for being reached

Probit

	All
Time inconsistent, Money	-0.100
	(0.101)
Impatient, Now versus 1 Month	0.007
	(0.085)
Patient, Now versus 1 Month	-0.042
	(0.111)
Impatient, 6 months versus 7 Months	0.003
	(0.080)
Patient, 6 months versus 7 Months	0.113
	(0.097)
Married	0.243***
	(0.093)
Some College	-0.023
	(0.104)
Number of household members	0.025**
	(0.012)
Unemployed	0.031
	(0.147)
Age	0.007***
	(0.002)
Total household income	-0.000
	(0.113)
Total household monthly income - squared	-0.005
	(0.014)
Female	0.094**
	(0.046)
SEED treatment	0.207**
	(0.087)
SEED marketing	0.032
	(0.092)
Active savings client prior to deposit collector service	-0.044
	(0.051)
Distance to Green Bank	0.010
	(0.006)
Observations	399

Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. We report marginal effects for the probit specification.

Appendix Table 2: Determinants of Signing up for Deposit Collection Service

Dependent Variable: Indicator variable for signing up for the service

Probit

	Al	Al	Femal	Mal
	(1)	(2)	(3)	(4)
Time inconsistent,		-0.014	-	0.372**
		(0.176)	(0.075)	(0.162)
Impatient, Now versus 1 Month		0.176**	0.17	0.19
		(0.084)	(0.204)	(0.202)
Patient, Now versus 1 Month		0.14	0.01	0.467***
		(0.193)	(0.261)	(0.104)
Impatient, 6 months versus 7 Months		-0.185	-0.182	-0.108
		(0.155)	(0.163)	(0.212)
Patient, 6 months versus 7 Months		-0.042	0.00	-0.132
		(0.212)	(0.272)	(0.190)
Married	0.10	0.08	0.258***	-0.610***
	(0.068)	(0.056)	(0.048)	(0.171)
Some	-0.057	-0.058**	-0.251***	0.158
	(0.049)	(0.027)	(0.074)	(0.095)
Number of household	-0.013	-0.013	-0.019	-0.009
	(0.015)	(0.013)	(0.012)	(0.026)
Has at least one school-aged	0.01	0.02	-0.109	0.232**
	(0.086)	(0.073)	-0.134	-0.115
Unemploye	0.28	0.38	0.08	
	(0.485)	(0.507)	(0.391)	
Ag	-0.005	-0.004	-0.009***	0.00
	(0.003)	(0.003)	(0.002)	(0.006)
Total household income	0.202***	0.204***	0.455***	0.133
	(0.051)	(0.054)	(0.128)	(0.140)
Total household monthly income -	-0.050***	-0.052***	-0.097***	-0.129***
	(0.015)	(0.013)	(0.028)	(0.048)
Femal	0.01	-0.007		
	(0.040)	(0.030)		
SEED	0.258***	0.264***	0.203	0.284
	(0.087)	-0.088	(0.115)	(0.160)
SEED	0.07	0.06	-0.027	-0.053
	(0.172)	(0.210)	(0.172)	(0.228)
Active savings client prior to deposit collector service	0.03	0.01	0.13	-0.061
	(0.140)	(0.150)	(0.191)	(0.101)
Distance to Green	0.006***	0.007***	0.010***	0.004***
	(0.002)	(0.002)	(0.003)	(0.001)
Pseudo R-Squared				
Observations	0.116	0.145	0.258	0.286
	137	137	83	54

Appendix: Instructions Given to Deposit-Collector Marketing Team

WHAT:
A new service is being offered by Green Bank to its valued clients in a specially chosen set of barangays. This service makes saving easy–it provides you with home pick up of your deposits! A representative from Green Bank, with official ID, can schedule a time with you, once a month, to come to your house to pick up your deposits. You know that they'll be coming so it helps remind you to save too!

WHY: *(This is really where you sell them on the service-don't let them say no to begin; make sure they get a chance to hear all the great reasons for this service!)*
Sometimes it's easy to forget to deposit your money or even sometimes to spend the money before even getting to the Bank! (give personal examples/stories, Jollibee, etc.) This is a service to help you save more and reach your dreams and goals. This service saves you and time and money coming to the Bank, and helps make sure the money you intended for savings actually goes–derecho, segurado–into savings. Some expressions to use: Init Ang Kwarta!!! When the money is in the house or hands it is easily spent.

HOW:
You the client schedule a time with the Green Bank representative who will be visiting your barangays once a month. All we charge for this great service is 4 pesos, for the fuel of the Green Bank representative that comes to pick up your deposits. If you sign up for this service, we schedule your pickup and come to your house. Because we plan to come to your house, you will need to pay the 4 pesos each time (once every month) even when you don't have anything to deposit. Then, you can deposit as much or as little as you like!! Remember that no amount is too small to be deposited into your account! Even 50 pesos is not too small–50 pesos a month becomes 300 in 6 months and 600 in a year! 100 pesos a month becomes 1,200 pesos in a year! Just think of how much extra money you can have in your account just by saving little by little.

You can also feel safe depositing large sums of money with us. You sign 3 deposit slips-one is your copy, and 2 we take to the Bank. Your deposits will be posted by the next day and you can come in anytime to update your passbook. As well, when we return the following month to your barangay, we will return with one of the Bank's copy of the deposit slip showing that the money was posted. Your original copy will always be with you as proof of the deposits you made with us.

WHEN:
We will be scheduling one day a month to come to your barangay *(could be 2 days for bigger barangays like San Vicente)*. Please let us know your preferred dates and times and we will try to accommodate everybody's schedule.

WHERE:
Wherever you, the client, likes: home, office or store!

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