Cashing In (and Out): Experimental Evidence on the Effects of Mobile Money in Malawi

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Mobile money has spread rapidly across Africa since it was first introduced in Kenya in 2007. Mobile money has been extensively studied in recent years, though identification is challenging because of the lack of a control group. The seminal studies on mobile money are the difference-in-difference studies by William Jack and Tavneet Suri (Jack and Suri 2014; Suri and Jack 2016), which are identified from plausibly exogenous regional differences in adoption timing, and which find that mobile money reduced vulnerability to shocks as well as overall poverty.[1]

However, to date, there have only been a few RCTs about basic access to mobile money, primarily because mobile money is typically rapidly adopted, so there is a limited window to evaluate its effect before it becomes impossible to preserve a control group.[2] In this paper, we examine the direct effect of basic mobile money access; on this topic, the only other completed RCT we are aware of is Batista and Vicente (2019a), a community-level experiment on mobile money access in Mozambique, which finds that mobile money made treated households less vulnerable to shocks.

In this paper, we present results from an RCT conducted in urban Malawi in 2017-18, where a nascent mobile money agent network existed but adoption (and especially, active usage) was still modest (20% of people in Malawi had a mobile money account in the 2017 Findex). In the experiment, the treatment group received assistance in opening a mobile money account, and training on how to perform basic transactions. Withdrawal fees were waived during the experiment.

[1] Munyegara and Matsumoto (2016) replicate this design in Uganda.

[2] There have been a number of interventions which layer other financial interventions on top of basic mobile money, but we do not discuss them in detail here due to space constraints. See Suri (2017) for an overview, as well as our companion paper Aggarwal et al. (2020).

We find that the majority of people opened accounts and used them extensively. We find strong evidence that treated respondents reallocated labor from business to agriculture, and we find more mixed evidence of an increase in expenditures. In our companion paper, we also find evidence of effects on other outcomes, but do not discuss those results in detail here and instead focus on primary outcomes. In some contrast to the existing literature, the effects in this study appear to be driven by using the accounts to save rather than to make transfers.

I. The experiment

A. Context and sampling

Our experiment took place with 480 small-scale entrepreneurs in the city of Blantyre, Malawi.[3] We conducted a census of small businesses in the area, and sampled those businesses which met inclusion conditions related to firm size and about involvement in day-to-day business activities.[4] We stratified treatment by financial access (mobile money or bank account ownership) and a dummy for above or below median distance to the nearest mobile money agent (self-reported). Two-thirds of the sample received a mobile money account and one-third served as the common control for both studies.[5]

B. Study design

In July 2017, treatment respondents received mobile money accounts with Airtel, the leading telecom company in Malawi. The accounts were identical to those already commercially available, except that we reimbursed withdrawal fees for the duration of the project.[6] The schedule of withdrawal fees is included as Appendix Table A2. The average fee for transactions observed in our sample would have been about 5%.[7]

In pilot work, we found that respondents had limited knowledge of the basic features and fees of mobile money. Therefore, we developed and administered training modules at the time of account-opening. At this time, we

[3] The mobile money treatment is part of a larger experiment with 801 microentrepreneurs. In addition to the mobile money treatment, the experiment also provided lockboxes, and varied the number of accounts given to respondents. The results of the combined experiment are described in Aggarwal et al. (2020).

[4] We excluded businesses with more than 2 employees (6%), businesses in which the owner worked less than 5 days a week (9%), and businesses which planned to shut down within 6 months (16%). We also excluded any business that was also a mobile money agent (3%). Finally, we excluded illiterate business owner (20%) and owners who could not read written text due to poor eyesight (10%).

[5] Web Appendix Table A1 shows that the treatment and control groups were largely balanced on covariates at baseline.

[6] It was not technologically possible to waive these fees directly; instead, we received the set of transactions at the end of the week and reimbursed respondents by making transfers equivalent to the fee amount afterwards.

[7] Withdrawal fees are determined using a step function: making the maximum allowable withdrawal within a range would entail an average fee of around 4%; however, if someone were to withdraw at the bottom of a range, the fee can be as high as 10% (and even higher for very small withdrawals).

also encouraged the treatment group to use their account to save towards their goal(s).

While most respondents (94%) had a cell phone at baseline (Appendix Table A1), many of these phones were in poor condition and we were concerned that they might break before the end of the study. We therefore gave out feature phones (worth $12) to all respondents, which enabled us to later do phone surveys.

C. Data

In addition to a baseline survey, we use two surveys to measure impacts. First, for half the sample, we conducted high-frequency phone surveys (which we call the HFPS). These surveys were conducted in two rounds: September-October 2017 (in which surveys were done twice per week) and February-March 2018 (in which surveys were done once per week). The HFPS measured business outcomes, labor supply, household expenditures, transfers, savings, credit, and shocks (at the daily or weekly level, depending on the outcome). Second, for the entire sample, we collected two rounds of "monitoring surveys" in January 2018 and March 2018 (these surveys were also conducted over the phone). These surveys measure outcomes over a longer recall period (up to 3 months for some variables).[8]

Finally, we have access to administrative data from the telco on all transactions made from account opening until August 2019 (about 2 years later) on the mobile money accounts opened as part of the project.

II. Results

A. Take-up and usage

The majority of people offered an account used it: 99% opened an account, 73% made at least 1 deposit, and 53% made at least 5 deposits (see Table 1). The average respondent made 11 deposits amounting to $90, a substantial sum in this context in which daily profits average about $2.50 (Appendix Table A1). Appendix Figure A1 shows the distribution of amounts deposited - while a minority never used the account, a sizeable fraction of respondents deposited large sums. Fifty-two percent of people used the accounts to make transfers and the average (unconditional) value of transfers sent and received over the study period was $11 and $9.50, respectively, compared to deposits worth $90.

[8] The surveys can be found on the authors' websites.

Table 1. Take-up and usage during study period

Panel A. Take-up and usage	
Opened account	0.99
Made at least 1 deposit	0.73
Made at least 2 deposits	0.63
Made at least 5 deposits	0.53
Total value of deposits	90.31
	(139.86)
Number of deposits	10.83
	(13.89)
Total value of withdrawals	97.29
	(160.04)
Number of withdrawals	11.91
	(16.33)
Panel B. Usage of mobile money for transfers and other transactions	
Made or received a transfer	0.52
Value of transfers sent	10.83
	(23.54)
Value of transfers received	9.45
	(26.29)
Used mobile money to pay bills or make merchant purchase[1]	0.56
Value of transactions	8.22
	(15.65)
Observations	320

Notes: Administrative data from telco from July 2017-May 2018. The value and number of deposits and withdrawals are winsorized at 1%.

In Appendix Table A3, we examine predictors of take-up and find that people who live farther away from the agent use accounts less frequently. The magnitude is large: a standard deviation increase in distance (0.2 hours) lowers deposits by approximately $15.5 (on a mean of $88). While distance is not random, we note that this coefficient is significant at 10% even with a host of other baseline controls. We take this as suggestive evidence of the importance of transactions costs in explaining usage of the accounts.

B. Effects on Downstream Outcomes

Table 2 show effects of the mobile money account on key downstream outcomes, specifically labor supply, expenditures, and inter-personal transfers. For a fuller analysis of the combined experiment, see Aggarwal et al. (2020).[9] We find that mobile money affected labor supply: treatment respondents worked less in their primary business[10], and worked more on their farm (we also find some evidence of an increase in hours in other occupations). A possible explanation for this finding is that the marginal return to farm labor has a higher expected return on the margin, but that the delay in realizing these returns (until after the harvest), or the risk around shocks such as bad rain, induces people to instead work in their primary business in which returns are more immediate and/or more certain. The provision

[9] Appendix Tables A4 shows mixed effects on our primary measure of savings (deposits). We therefore rely on the downstream effects as our primary evidence. Aggarwal et al. (2020) includes a fuller discussion.

[10] Consistent with this, we also find a reduction in business profits but the coefficient is omitted for space. See Aggarwal et al. (2020) for more detail.

of mobile money allows households a tool to overcome these constraints. This labor supply result is related to several recent papers, including Fink, Jack, and Masiye (2018), who find that providing credit to smallholder farmers decreases off-farm labor and increases own-farm labor, and is Callen et al. (2014), who find that deposit-collection allowed Sri Lankan households to transition from self-employment to wage-work.

We also find a marginally significant effect on total expenditures in the monitoring survey (and a positive coefficient in both surveys).

Table 2. Treatment effects on downstream outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Labor supply							Transfers (Value)	
	Main Business		Other occupations		Farming		Total expenditures	Given to others	Received from others
	=1 if worked[1]	Hours	=1 if worked[1]	Hours	=1 if farmed	Hours			
Panel A. HFPS									
Mobile money	-0.07**	-0.49	0.05*	-0.23	0.02	0.23**	0.32	0.02	-0.04
	(0.03)	(0.42)	(0.03)	(0.46)	(0.02)	(0.10)	(0.29)	(0.08)	(0.13)
Observations	18883	18883	2763	2763	2724	2724	2727	2727	2727
Number of Businesses	233	233	232	232	232	232	232	232	232
Control Mean	0.82	8.27	0.18	1.80	0.06	0.21	3.91	0.73	0.76
Control SD	-	4.64	-	7.28	-	1.21	2.86	1.18	1.77
Panel B. Monitoring surveys									
Mobile money	-0.05	-0.61	0.03	0.81	0.01	1.03*	0.67*	0.07*	-0.02
	(0.03)	(0.39)	(0.03)	(0.71)	(0.04)	(0.58)	(0.37)	(0.04)	(0.06)
Observations	786	786	785	785	786	785	786	784	786
Number of Businesses	429	429	429	429	429	429	429	427	429
Control Mean	0.75	7.38	0.13	1.84	0.24	2.07	4.88	0.26	0.42
Control SD	-	3.90	-	8.37	-	5.78	3.49	0.39	0.72

Notes: All outcomes are daily averages, other than farming hours (which are weekly). All regressions in include a measure of the dependent variable during the intake survey as a control. All regressions control for strata, date fixed effects and baseline controls, and are probability weighted. All monetary variables are expressed in USD and are winsorized at 5%. Standard errors clustered at individual level in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% respectively.

[1]In Panel B, this variable is the proportion of days worked over the 7 days prior to the survey.

Why was mobile money effective in this context? The three most likely candidate explanations are that mobile money allowed people to save, that it facilitated interpersonal transfers, or that it facilitated other transactions such as bill paying or merchant purchases. To explore this, in Table 2, Columns 8-9, we show effects on the value of transfers given and

received. In the HFPS, coefficients are small and insignificant; in the monitoring surveys, we find a marginally significant increase in values of transfers given, but a negative point estimate on the value of transfers received. and find relatively small, statistically insignificant effects.[11]

Moreover, in debriefing surveys conducted at endline (Appendix Table A6), 83% of respondents reported that they used the accounts for long-term savings and 12% for shorter-term savings.

III. Conclusion

Mobile money has proliferated rapidly in Africa and has revolutionized the financial ecosystem. This paper represents one of the first RCTs of mobile money. We find that people actively used basic mobile money accounts, and that mobile money had several important downstream effects. Mobile money allowed people to adjust their labor supply decisions, in particular switching from small business to farming. We also find evidence of several other outcomes in Aggarwal et al. (2020). However, unlike much of the nascent literature on mobile money, in our context results appear to be driven by people using the accounts to save money, rather than to lower the cost of interpersonal transfers. The relatively modest effect we find on transfers is likely because our experiment was at the individual level, and provided mobile money to individuals and not to whole communities. As such, our intervention would have had at most a minimal effect on the risk-sharing networks of treated respondents. Our finding of robust demand for mobile money as a savings vehicle may also be unique to Malawi, a country where banking access is particularly limited. Nevertheless, the results grant credence to the notion that mobile money can be used as a vehicle for facilitating savings and not only as a method of transferring money or making transactions. This insight can be particularly useful as mobile money evolves from simply being a safe and cheap means to send and store money towards providing access to more sophisticated financial products.

[11] In Web Appendix Table A5, we look at the results in somewhat more detail, and find an effect on the extensive margin for giving transfers but no effect on receiving.

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