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

By Shilpa Aggarwal, Valentina Brailovskaya, and Jonathan Robinson

Mobile money has spread rapidly across Africa since it was first introduced in Kenya in 2007 and has been extensively studied in recent years. However, identification is challenging because mobile money is typically rapidly adopted, making it difficult to preserve 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 mobile money rollout and find that mobile money reduced vulnerability to shocks as well as overall poverty.

However, to date there have only been a few RCTs about basic access to mobile money. These include Batista and Vicente (2018), which randomizes mobile money access at the community level; Lee et al. (forthcoming), which offers mobile banking to rural-urban migrants in Bangladesh (to both the urban migrant and the sending rural household); and Wieser et al.

In this paper, we add to this literature with an RCT conducted among microentrepreneurs in urban Malawi in 2017–2018, where usage of mobile money was still modest even though a nascent mobile money agent network existed. Treatment was three-pronged: assistance in opening a mobile money account, training on how to perform basic transactions, and a withdrawal fee waiver.

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 mixed evidence of an increase in expenditures. In contrast to the existing literature, effects 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. After a census of small businesses in

3 Given the growing interest in mobile money, there are likely other evaluations currently ongoing.
4 Twenty percent of people in Malawi had a mobile money account in the 2017 Findex.
5 In our companion paper Aggarwal, Brailovskaya, and Robinson (2019), we also find evidence of effects on other outcomes but do not discuss those results in detail here and instead focus on primary outcomes.
6 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, Brailovskaya, and Robinson (2020). For the purposes of this paper, we pool treatment groups given one and multiple mobile money accounts. Take-up of multiple mobile money accounts was modest due to logistical
the area, we sampled those businesses that met inclusion conditions related to firm size and involvement in day-to-day business activities.\footnote{We excluded businesses with more than 2 employees (6 percent), businesses in which the owner worked less than 5 days a week (9 percent), and businesses that planned to shut down within 6 months (16 percent). We also excluded any business that was also a mobile money agent (3 percent). Finally, we excluded illiterate business owner (20 percent) and owners who could not read written text due to poor eyesight (10 percent).} 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. Two-thirds of the sample received a mobile money account, and one-third served as control.\footnote{Online Appendix Table A1 shows that the treatment and control groups were largely balanced on covariates at baseline.}

### B. Study Design

In July 2017, treatment respondents received mobile money accounts with Airtel Malawi. Those who already had an account had an option of opening a new account or keeping their existing one. Since many people already had mobile money accounts\footnote{Many respondents already had mobile money (56 percent had an account, and 32 percent reported using it to save)—see online Appendix Table 1. However, the average balance in mobile money was only about $5 (out of $120 in total cash savings). The rate of mobile money usage is higher than the Malawi average in the 2017 Findex, suggesting that microentrepreneurs are positively selected relative to the average Malawian.} and mobile money was widely available, it may seem surprising that our treatment would change behavior. However, there are three channels through which we could have induced more usage than in the status quo.

First, to minimize transaction costs associated with usage, we reimbursed withdrawal fees for the duration of the project.\footnote{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 the following week.} The average withdrawal fee would have been about 5 percent in the absence of this waiver.\footnote{The schedule of withdrawal fees is included as online Appendix Table A2. The average fee for transactions observed in our sample would have been about 5 percent.} Second, 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 (note that such a training is supposed to be provided by agents, but this has not been common practice). Third, we encouraged the treatment group to set goals for their accounts and to use the accounts to save. While we view each of these interventions as relatively light-touch actions that could easily be implemented by the telco absent our involvement, it is nevertheless the case that our treatment differed from as-is mobile money.

While most respondents (94 percent) already had a cell phone, many of these phones were in poor condition, so we gave out feature phones (worth $12) to all respondents, making it possible to conduct phone surveys.

### C. Data

In addition to a baseline survey and a short intake survey, we fielded three surveys. First, for half the sample, we conducted two rounds of high-frequency phone surveys (which we call the HFPS). The first round occurred in September–October 2017 (with twice-per-week surveys) and the second in February–March 2018 (with once-per-week surveys). The HFPS measured business outcomes, labor supply, 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 and March 2018 (also via phone), measuring outcomes over a longer recall period (up to three months for some variables).\footnote{All surveys can be found on the authors’ websites.}

Finally, we have access to Airtel’s administrative data on all transactions from account opening until August 2019 (about two years later). Online Appendix Figure A1 presents a timeline.

Withdrawal fees are determined using a step function: the fee for the maximum allowable withdrawal within a range would be about 4 percent, while the fee for a withdrawal at the bottom of the range can be as high as 10 percent (and even higher for very small withdrawals).
II. Results

A. Take-up and Usage

The majority of people who were offered an account used it: 99 percent opened an account (or continued to use their own account), 73 percent made at least 1 deposit over the first 10 months, and 53 percent 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. 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.

In online Appendix Table A3, we examine predictors of usage and find that people who live farther away from the agent use accounts less frequently. The magnitude is large and significant at 10 percent: a standard deviation increase in distance (0.2 hours) lowers deposits by approximately $15.50 (on a mean of $88). While distance is not exogenous, we take it as suggestive evidence of the importance of transactions costs.

Table 2 shows the first stage, that is, the effect of the accounts on total mobile money activity. Perhaps surprisingly, even though accounts were commercially available and 56 percent already

13 Online Appendix Figure A2 shows the distribution of amounts deposited—while a minority never used the account, a sizable fraction of respondents deposited large sums.
had them, we find a strong first stage—the likelihood of making any deposit went up by 55–80 percent and the value of daily deposits increased by 67–83 percent, depending on the survey.

B. Effects on Downstream Outcomes

Table 3 shows effects on key downstream outcomes, specifically labor supply, expenditures, and interpersonal transfers. We find that treatment respondents worked less in their primary business and more on their farm. (We also find some evidence of an increase in hours in other occupations in our companion paper.) We also find a marginally significant effect on total expenditures.

A possible explanation for the labor supply result is that farm labor has a higher expected marginal return, but the delay in realizing these returns (until after harvest) or the risk of 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 of mobile money may allow households a tool to overcome these constraints. This result is related to several recent papers including Fink, Jack, and Masiye (2018), which finds that providing credit to smallholder farmers decreases off-farm labor and increases own-farm labor, and Callen et al. (2019), which finds that deposit collection allowed Sri Lankan households to transition from self-employment to wage work.

Why was mobile money effective? The two most likely candidate explanations are that mobile money allowed people to save or that it facilitated interpersonal transfers. To explore this, in Table 3, columns 8–9, we show effects on the value of transfers. 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 effect on the value of transfers received.

Debriefing surveys conducted at end-line (online Appendix Table A6) support the notion that people used the accounts to save. Eighty-three percent of respondents reported that they used the accounts for long-term savings and 12 percent for storing money for a short period of time.

III. Conclusion

This paper represents one of the first RCTs of access to mobile money. We find that people actively used mobile money accounts and that mobile money had several important downstream effects, including on labor supply. However, unlike much of the literature on mobile money, results appear to be driven by people using the accounts to save rather than to lower the cost of interpersonal transfers. The relatively modest effect on transfers is likely because our experiment was at the individual level, providing mobile money to individuals and not to whole communities, so the intervention would have had a minimal effect on the risk-sharing networks of treated respondents.

Why do we find such robust demand for mobile money as a savings vehicle? One possibility may be that the withdrawal fee waiver played a large role. However, in online Appendix Figure A3, we document substantial usage even after the waiver was removed. We take this as evidence that, at least once people started using the accounts, the fee may not have been the determining factor. However, it is possible that an introductory fee waiver was effective in encouraging initial usage. We leave this question for future research to explore.

Our results may also be unique to Malawi, a country where banking access is particularly limited, or to the fact that our sample is composed of microentrepreneurs, who have high cash turnover and may have greater value for safe and easy ways to store money. Nevertheless, the results grant credence to the
notion that mobile money can be used as a vehicle for facilitating savings and not just 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 toward providing access to more sophisticated financial products.

REFERENCES


Table 3—Treatment Effects on Downstream Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Labor supply</th>
<th>Farming</th>
<th>Transfers (value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>=1 if worked</td>
<td>Hours</td>
<td>=1 if</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>farmed (3)</td>
</tr>
<tr>
<td>Panel A. HFPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile money</td>
<td>–0.07</td>
<td>–0.49</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.42)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Observations</td>
<td>18,883</td>
<td>18,883</td>
<td>2,724</td>
</tr>
<tr>
<td>Businesses</td>
<td>233</td>
<td>233</td>
<td>232</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.82</td>
<td>8.27</td>
<td>0.06</td>
</tr>
<tr>
<td>Control SD</td>
<td>—</td>
<td>4.64</td>
<td>—</td>
</tr>
<tr>
<td>Panel B. Monitoring surveys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile money</td>
<td>–0.05</td>
<td>–0.62</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.38)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Observations</td>
<td>5,502</td>
<td>5,502</td>
<td>786</td>
</tr>
<tr>
<td>Businesses</td>
<td>429</td>
<td>429</td>
<td>429</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.75</td>
<td>7.41</td>
<td>0.24</td>
</tr>
<tr>
<td>Control SD</td>
<td>—</td>
<td>5.06</td>
<td>—</td>
</tr>
</tbody>
</table>

Notes: All outcomes are daily averages other than labor supply in farming and other occupations (which are weekly). All regressions in panel A control for a measure of the dependent variable during the intake survey, calendar date fixed effects, and an indicator for winning an experimentally induced lottery. All regressions in panel B control for participation in HFPS and date of the survey fixed effect. Labor supply in panel B (columns 1 and 2) is measured over the past seven days before the survey. All regressions control for strata and baseline controls and are probability weighted. All monetary variables are expressed in US dollars and winsorized at 5 percent. Standard errors clustered at individual level in parentheses. In panel B, this variable is the proportion of days worked over the seven days prior to the survey.

