

# Can mobile money help overcome temptation spending and social pressures among microfinance clients?

## Pre-Analysis Plan Amendment

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This analysis plan amendment pertains to additional data collection associated with the trial “Can mobile money help overcome temptation spending and social pressures among microfinance clients?”\* In this trial, I test how providing microfinance clients of BRAC Uganda with mobile money accounts, and disbursing loans on these accounts, improves their business performance.

This amendment outlines a series of intermediate outcomes relating to data obtained from the mobile telecoms operator, MTN, covering use of the mobile money accounts from January 2017 until December 2017. This data was obtained from MTN in July 2018, 6 months after endline data collection was completed in January 2018.

This data is only available for the two treatment groups, not the control group, and hence will involve a comparison of being given the loan on a mobile money account compared to being given a mobile money account and the loan as cash. In other words, it will look at whether providing an initial balance on the mobile money account changed how it was used going forward.

For a full description of the trial design and outcomes please see the original PAP.

## 1 Outcomes

The mobile money account administrative data covers all transactions made using the mobile money accounts provided to clients as part of the study. This includes the type of transaction (including transfer, payment, cash-in, cash-out), account numbers for whom the transaction was from and to, date and time, amount, fee and balance on the account. I will look at the following outcomes constructed from this data:

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\*See <http://www.socialsciceregistry.org/trials/1836> for the trial registration and <https://www.socialsciceregistry.org/docs/analysisplan/1367/document> for the original pre-analysis plan

## 1.1 Intermediate outcome 1 - Use of the mobile money accounts

Hypothesis: Treatment with mobile disbursement will result in more transactions on the mobile money account

**Summary measure - number of transactions made on the account during the first 180 days of ownership<sup>†</sup>**

## 1.2 Intermediate outcome 2 - saving on the account

Hypothesis: Treatment with mobile disbursement will result in higher balances on the mobile money account

**Summary measure - average balance<sup>‡</sup> over the first 30 days of the account ownership**

# 2 Analysis

## 2.1 Estimation methodology

The administrative data will be analysed using an OLS regression of the form:

$$Y_i = \alpha_0 + \alpha_2 T_{2i} + \alpha_X X_i + \epsilon_{i1} \quad (1)$$

Where  $Y$  is the outcome of interest,  $T_2$  the mobile disbursement treatment dummy,  $X$  a set of randomization strata dummies and  $\epsilon$  random error, for individual  $i$ .

OLS estimation of the above regression will return the unbiased estimate of the Intent to Treat (ITT) effect,  $\alpha_2$ . To estimate the local average treatment effect, the above equation will be estimated where assignment to treatment is replaced with actual active use of the account<sup>§</sup>, which is instrumented by assignment, giving the two-stage least squares estimator.

## 2.2 Hypothesis testing

For each outcome listed, I will test the following hypothesis:

1. whether the disbursement of the loan on the mobile money account has a significant effect over provision of only the mobile money account (and loan as cash) ( $H_0: \alpha_2 = 0$ )

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<sup>†</sup>Transactions are looked at over a 180 day period due to the roll out of the accounts. The final accounts were provided in June 2017 and the account usage data only continues until end of December 2017. Looking only at the first 180 days means a common time period can be examined for all accounts.

<sup>‡</sup>balance is captured daily as the balance at the last transaction of the day. If there were no transactions that day the balance is equal to the previous day's balance.

<sup>§</sup>defined as any transaction during the first 180 days of account opening

### **2.3 Multiple test correction**

When looking at intermediate outcomes, I do not correct for multiple testing as this analysis is informative for understanding the mechanisms by which the mobile money accounts affected the primary outcomes.

When looking at additional outcomes I do not correct for multiple testing as this analysis is informative for robustness checks and understanding which components of aggregates might be driving any impacts.

### 3 Appendix - Outcome measures

The tables below provide details on how the outcome measures are constructed, and their source. The outcome in bold is the primary summary measure for that family. Non-bold outcomes are additional outcomes for secondary mechanism analysis and robustness checks.

#### Intermediate family 1: Account usage

Variable	Definition	Data source
<b>Summary variable: number of transactions</b>	Count of the number of transactions made during the first 180 days of account ownership	<i>count</i> TRANSACTIONNO
Deposit ever	If a deposit was ever made to the account	dummy if ever AMOUNT > 0
Withdrawal ever	If a withdrawal was ever made from the account	dummy if ever AMOUNT < 0
Number deposits	The number of deposits made to the account	count if AMOUNT > 0
Number withdrawals	The number of withdrawals made from the account	count if AMOUNT < 0
Amount deposits	The monetary amount of all deposits to the account	$\sum$ AMOUNT if AMOUNT > 0
Amount withdrawals	The monetary amount of all withdrawals from the account	$\sum$ AMOUNT if AMOUNT < 0

Note - deposits exclude the disbursement of the loan on the account if the sim card was assigned to this treatment. Loan disbursements can be identified using the common from account number corresponding to BRAC's bank account.

## Intermediate family 2: Saving on the account

Variable	Definition	Data source
<b>Summary variable: average balance first 30 days</b>	Mean of the daily balance at the end of each day on the account during the first 30 days of account ownership	BALANCE
Average balance 15 days	average balance over the first 15 days of account	BALANCE
Average balance days 15-30	average balance between days 15 and 30 since account opening	BALANCE
Average balance days 30-45	average balance between days 30 and 45 since account opening	BALANCE
Average balance days 45-60	average balance between days 45 and 60 since account opening	BALANCE
Average balance days 60-90	average balance between days 60 and 90 since account opening	BALANCE
Average balance days 90-180	average balance between days 90 and 180 since account opening	BALANCE
Final balance	balance on account at the last transaction recorded during the 180 day period	BALANCE