Pre-analysis plan

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1 Trial Title

Incentives for financial inclusion: Experimental evidence on mobile money adoption from Niger

2 Country

Niger

3 Status

Ongoing

4 Keywords

Mobile money, technology adoption, households, Niger

5 Abstract

Remittances and transfers are crucial for households in rural Niger, serving as tools for consumption smoothing and risk mitigation in the face of shocks as well as continuous income support. Mobile money, a non-bank digital payment platform, has the potential to reduce transaction costs and increase the security and efficiency of transfers. While there is demand for reliable and affordable money transfer services, the adoption of mobile money in Niger remains low. We assess the impact of different incentive schemes on

the adoption and sustainable usage of mobile money with an experimental design. We also examine the causal impact of mobile money adoption on household welfare. We hypothesize that the incentives will not only increase the adoption of mobile money but also enhance households' understanding of and demand for the service. The ease and security of mobile money transfers may increase remittances and migration. Ultimately, these changes are expected to strengthen households' capacity to cope with risks and improve their overall welfare.

6 Trial Start Date

February, 2024

7 Intervention Start Date

January 2025

8 Intervention End Date

February 2025

9 Trial End Date

January 2026

10 Outcomes

This pre-analysis plan was finalized prior to the availability of any outcome data related to our main financial incentive intervention. The implementation of the alternative incentive schemes as a randomized controlled trial (RCT) enables the identification of causal effects of these incentives on uptake and usage, and ultimately, their impact on household welfare. The analysis will include the following outcomes:

10.1 Household outcomes

10.1.1 Mobile money adoption (extensive margin)

- Has the respondent heard of mobile money in the last six months?

- Does the respondent have a mobile money account?
- Does any household member own a mobile money account?

10.1.2 Mobile money usage (intensive margin)

- How many cash-in transactions via a mobile money agent has the respondent performed in the last six months?
- How many cash-out transactions has the respondent conducted through a mobile money agent over the last six months?
- How many direct mobile money transactions has the respondent conducted in the last six months?
- Did the respondent use the mobile money account to save money?
- How many days did the respondent save money in the mobile money account?
- How was the respondent's experiences with mobile money?
- How was the respondent's experiences with mobile money agents?

10.1.3 Migration and transfers

- How many household members migrated (inter-)nationally in the last six months?
- What was the main destination of the migrating household members?
- Has any household member migrated and been absent from the household for more than one year?
- Did the household receive transfers from someone outside of the village in the last six months?
- How many transfers has the household received (categorical) in the last six months?
- What was the smallest/ largest transfer size received in the last six months?
- What was the main purpose of these transfers?
- Which transfer channels were used?

- What were the problems with using the respective transfer channel?
- What was the cost of transfer via the respective channel?

10.1.4 Household activities, consumption and well-being

- What are the main income sources for the household?
- Household assets
  - Ownership
  - Quantity
- How much did the household spent on total consumption (weekly)?
- How much did the household spent on food consumption (weekly)?
- How much did the household spent on durable consumption (weekly)?
- Subjective well-being of own household (measured on a Likert scale ranging from 1 (poor) to 5 (rich))
- Subjective well-being of neighbors (measured on a Likert scale ranging from 1 (poor) to 5 (rich))
- Food insecurity
  - In the last six months, were there any months when the household did not have enough food to meet the household's needs?
  - In which months did the household not have enough food to meet the household's needs?
  - In the last six months, did the respondent or an adult in the household refrain from eating for an entire day because they lacked the money to buy food? How often did this situation occur?

10.1.5 Phone usage

- Does the respondent own a mobile phone / smartphone?
- How many phones does the household own in total?
- Does the respondent have access to using the household's phone?
- Who is actively using the household's phone?

- Which mobile network operator does the respondent use?
- What are the respondent's airtime expenditures?
- What did the respondent use the phone for?

10.1.6 Shocks and health expenditures

- Which types of shocks did the household face in the last six months?
- What were the household's strategies to cope with the shock(s)?
- In the last six months, has any member of the household needed medical treatment, but was unable to get it because of lack of money?

11 Experimental Design

11.1 Sampling and data collection

Our sample of households is drawn from 61 villages located in 9 communes and the departments of Dogon-Doutchi and Tibiri in the Dosso region in Niger. The villages have been randomly chosen, but we had to avoid insecure villages while constituting the sample. The household baseline survey was conducted in February 2024 with 978 households. We recorded GIS locations of villages and households. We also implemented a phone survey in September 2024 interviewing the same households to assess the impact of a small randomized information treatment embedded in the baseline survey (see below for further details).

Our sample of agents was obtained through a listing of mobile money and airtime agents in 38 markets in the departments of Dogon-Doutchi and Tibiri. The markets were identified as the key markets associated with the villages from our household sample. The agent baseline survey was carried out in August 2024 and it was conducted with 190 agents from 36 markets. Out of the 190 agents, 92 are mobile money as well as airtime agents and 98 are only working as airtime agents.

We will do two additional follow-up surveys with the households as well as with the agents.

11.2 Interventions

As part of our baseline survey, we conducted an information experiment. The intervention involved a two-page flyer that explains mobile money, detailing

how cash-in, cash-out, and transfer processes are executed. In addition to the flyer, treated respondents received a verbal explanation of mobile money and its services. To vary the treatment intensity, we randomly selected either 50% or 100% of respondents within a village to receive both the flyer and the verbal explanation.

To encourage the adoption and usage of mobile money, we will implement a financial incentive intervention. Households will first receive information about mobile money (as during the baseline survey), and will then be offered an incentive to use the service. The intervention will consist of two treatment arms. In the first arm, the recipient will be offered an incentive of 3000 CFA (via mobile money), if they received a transfer via mobile money within one month. We will refer to this as "Treatment R". In the second arm, the recipient will be offered the same incentive, but in addition, the sender will also receive a financial incentive for making the mobile money transaction to the respective receiver. This treatment tests whether providing an additional incentive to the sender fosters cooperation between the sender and the recipient. We call this "Treatment R+S". The control group will receive no financial incentive.

11.3 Randomization procedure

We are implementing several treatment interventions throughout this project. First, as part of the baseline survey, we conducted an information experiment. We grouped communes into three regions: North, Middle, and South. Next, we created strata based on commune group and participation in a previous study on an adult literacy program. Villages were then randomly assigned to receive no information (1/3) or information (2/3). The villages that received information, the treatment intensity was either 50% or 100%. In the 50% treatment intensity villages, the random assignment of the information was stratified by respondents' gender.

Second, for the random assignment of the financial incentive treatment, we stratified the 61 villages based on their baseline treatment status: whether households received information (grouping 50% and 100% villages together) or did not receive any information. Within each of these groups, we randomly assign villages into "Treatment R", "Treatment R+S" or the control group. Villages are assigned into one of the three groups and in each village all households receive the same treatment. We will test the treatment design in a pilot with villages that are not part of our sample.

11.4 Spillovers

Treated households may share the information or the flyer that is handed out as part of the intervention with other households in the same village or other villages. Information sharing within the same village is not problematic for our identification, because we randomize the treatment at the village level. Since we will analyze intent-to-treat effects, information sharing across treated and control villages may only underestimate the effect of the information. However, we will monitor the extent of information sharing. Since from a policy perspective information sharing is a desired action which should increase the cost-effectiveness of the intervention, we will ask households whether they shared the information about mobile money with other households.

Given the personalized nature of our financial incentive and the in-person monitoring done by our implementing partner, we do not expect significant spillovers from our financial incentive treatment on control villages. The treatment and control villages are geographically dispersed, which minimizes the likelihood of interaction between treated and control units. These factors together suggest that any unintended influence of the treatment on control groups is likely to be minimal.

11.5 Model specification

The primary objective of this analysis is to estimate the impact of the intervention on the outcome variables measured during the follow-up survey. We will estimate intent-to-treat effects. Our main specification is as follows:

$$Y_{ivt} = \beta_0 + \beta_1 R_v + \beta_2 RS_v + X'_{ivt}\gamma + \epsilon_{ivt} \quad (1)$$

where Y_{ict} is the post-treatment outcome for individual i in village v measured in survey wave t. R_v is the treatment indicator equal to 1 if village v received the recipient-only incentive ("Treatment R"). RS_v is the treatment indicator equal to 1 if village v received the recipient and sender incentive ("Treatment R+S"). β_1 and β_2 are the effects of either treatment relative to the control group. X_{ivt} is a vector of control variables measured at baseline and ϵ_{ivt} is the error term. The treatment assignment took place on the village level and standard errors are clustered at the village level.

We will also estimate a second model:

$$Y_{ivt} = \beta_0 + \beta_1 Info_v + \beta_2 R_v + \beta_3 RS_v + \beta_4 (Info_v \times R_v) + \beta_5 (Info_v \times RS_v) + X'_{ivt}\gamma + \epsilon_{ivt} \quad (2)$$

where Y_{ict} is the post-treatment outcome for individual i in village v measured in survey wave t. $Info_v$ is the treatment indicator equal to 1 if village v received the mobile money flyer during our baseline survey. R_v is the treatment indicator equal to 1 if village v received the recipient only incentive ("Treatment R"). RS_v is the treatment indicator equal to 1 if village v received the recipient and sender incentive ("Treatment R+S"). $(Info_v \times R_v)$ and $(Info_v \times RS_v)$ are the treatment indicators equal to 1 if village v received both the mobile money flyer at baseline and the "R" or "R+S" treatment, respectively. $\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 are the effects of either treatment relative to the control group. X_{ivt} is a vector of control variables measured at baseline and ϵ_{ivt} is the error term. The treatment assignment took place on the village level and standard errors are clustered at the village level.

Covariates X_{ivt} are included to address minor imbalances and enhance the precision of the estimates:

- Age
- Gender
- Respondent is household head
- Education
- Respondent's household has national migrant

11.6 Multiple hypothesis testing

Since we estimate a large number of outcomes, there is an increased risk of falsely rejecting the null hypothesis due to multiple comparisons. Therefore, we will control for the False Discovery Rate (FDR) by Benjamini and Hochberg (1995). Specifically, we will calculate sharpened q-values within each family of outcomes.

12 Was the treatment clustered?

Yes

13 Planned Number of Clusters

61

14 Planned Number of Observations

3504 observations from 1168 respondents across three survey rounds. For the baseline survey 978 respondents from households and 190 mobile money and airtime agents were interviewed. With two follow-ups and a phones survey of households and agents, the number of observations for a small number of outcomes is 4672.

We will test for differential attrition in the phone and in-person follow-up surveys. If attrition is less than 10 percent and uncorrelated with treatment, we will proceed without making corrections. If attrition rates are greater than 10% and we find evidence of differential attrition by treatment status, we will estimate pairwise Lee bounds for our treatment effects.

14.1 Power analysis

We use our baseline data to perform power calculations as it provides information on the means, standard deviations and intra-cluster correlation of key outcome variables. Our power calculations are for intention-to-treat effects. The MDEs are based on a 95% confidence interval and a power of 80%. The baseline data shows a mean of households using mobile money of 0.02, with a standard deviation of 0.16 and an intra-cluster correlation (ICC) of 0.125. Given our average cluster size of 16 households per cluster and 61 clusters in total, we are powered to detect a minimum effect of 0.06.

15 Was IRB approval obtained?

IRB Name: Social, Behavioral & Educational Research IRB, Tufts University
IRB Approval Date: April 25, 2024
IRB Approval Number: STUDY00004897