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Incentives and Endorsement for Technology Adoption: Evidence from Mobile Banking in Ghana

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Abstract

How can we encourage the adoption of new digital financial services? We use an RCT with 115 microfinance groups in Ghana to understand the respective roles of individual incentives to adopt a new technology and endorsement of the technology from a trusted peer. We study this in the context of mobile banking services, a technology allowing transfers between a mobile phone and bank account, dramatically lowering the costs of accessing the bank account. We find that while individual incentives increase adoption of mobile banking services by 50%, adding endorsement by a peer doubles the impact of the individual subsidy alone. Peer endorsement is particularly effective at increasing confidence in dealing with fraud and peer interaction around mobile banking. The increased use of mobile banking services leads to 30% higher savings in the linked bank account 6 months later. Our study highlights the importance of peers in encouraging technology adoption and facilitating formal financial inclusion.

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1 Introduction

Robust evidence highlights the benefits of bank expansion for reducing household poverty (Bruhn and Love, 2009; Burgess and Pande, 2005). However, studies that have provided low-cost bank accounts to individuals have found mixed evidence of their benefits, often as takeup is low and there is limited use of the accounts (Dupas et al., 2018a; Dupas and Robinson, 2013; Prina, 2015; Schaner, 2018). One potential explanation for this is that even with access to low-cost bank accounts, individuals may struggle to use them in part due to the high transaction costs of travelling to bank branches that are far away. The rapid spread of digital financial services in developing countries offers a solution to the problem of far away bank branches, as users gain the ability to link their bank account and their phone. However, individuals may under-adopt these novel financial services despite their potential benefits for reducing transaction costs.

One explanation for low adoption of new digital financial services is the need to learn about how to use these services and their benefits in a hands-on manner through learning-by-doing. Evidence suggests that inducing individuals to gain repeated practical experience of a technology can drive subsequent use (Breza et al., 2020; Bachas et al., 2021). Subsidies, or one-off incentives, may also provide a sufficient push to experiment with new technology and spark adoption (Bryan et al., 2014; Meriggi et al., 2021). However subsidies alone may not be sufficient to spur adoption, particularly for those with the least experience with such technology. Alternatively, a large literature has highlighted the crucial role that central individuals play in encouraging the adoption of others for agricultural technology adoption (Foster and Rosenzweig, 1995; Conley and Udry, 2010; Besley et al., 1994; Munshi, 2004; BenYishay and Mobarak, 2019). However, this organic adoption through "passive learning" can take years due to slow knowledge diffusion and lack of incentives to encourage others to adopt.

In this study, we examine how to encourage the adoption of a new digital financial product and study whether the adoption of such a digital financial service facilitates savings in formal financial institutes. Specifically, we test whether a small, one-off incentive for trying out the technology is sufficient to encourage the adoption and continued usage of digital financial services. Additionally, we examine whether utilising a peer to endorse the new technology generated greater adoption and usage. We find that while individual incentives are effective at encouraging technology adoption in both the immediate and medium term, utilising a peer to endorse the technology results in twice as much adoption as incentives alone, and increases formal saving substantially and persistently.

We study this using a cluster randomised controlled trial (RCT) with female microfinance

groups in rural Ghana. The microfinance group setting is attractive because it consists of real-world groups that meet regularly and with an existing individual, the group leader, who can act as a focal person for endorsing technology adoption within the group. The technology we consider, mobile banking services, allows access to a bank account directly from a mobile money account. This allows individuals to save safety in a bank account that they can access readily and at low cost through the existing mobile money infrastructure. We consider this technology as dramatically lowering the costs of saving in a formal bank account.[1]

To encourage mobile banking take-up and usage, we randomly assigned 400 women from 115 microfinance groups to one of the two treatment arms or a control arm. In groups assigned to the "Incentive" treatment arm, women received a one-off incentive for their own use of mobile banking within a one month period, alongside information on how to use mobile banking. The "Endorsement" treatment arm included the same incentive offered in the Incentive treatment plus the encouragement of knowledge transfer and adoption within the group, achieved by providing the group leaders with intensive training on mobile banking, asking them to pass on their knowledge to other group members, and providing them with a referral incentive for each member of the group that used mobile banking service within a month. Women in control groups received no encouragement to adopt mobile banking, but were free to use it if they chose to.

We utilise rich monthly administrative data from our microfinance partner during the intervention period and six months after it ended to examine the impact of these treatments on use of mobile banking services and saving in the linked bank account in the short and medium term. We combine this high-frequency administrative data with a detailed survey one month after the intervention ended, in order to study the mechanisms that explain the adoption decision, such as knowledge, trust, and preferences.

Analysis of administrative data shows that the Incentive treatment more than doubled (15 percentage points) and the Endorsement arm tripled (27 percentage points) mobile banking use, from the base of 10% use by the control group, in the month during which the interventions took place. These impacts on the use of mobile banking persist six months after the end of the intervention, with use in the Incentive treatment remaining 50% greater and use in the Endorsement treatment remaining double than that in the control group. Similarly large and persistent effects are seen on the number and value of mobile banking transactions. These findings are robust to multiple hypothesis testing. Effects of the treatment on mobile banking use grow over time for the Endorsement arm, while they decline for the Incentive arm.

[1]The median cost of the round trip to the bank branch in our sample is $1.25 and takes 45 minutes. The cost of a mobile banking transaction is a fixed charge of $0.08 and takes seconds.

The increased use of mobile banking translates into increased savings in the linked bank account, with savings in the bank increasing by 48 cedis (28%) on average during and after the intervention for the Endorsement group only. As a share of their total savings, this represents a 5% increase, a moderately large effect from an intervention that only provided a lower-transaction cost method of accessing an existing account. The positive effect of the Endorsement intervention on savings appears three months after the end of the intervention, with savings in the bank account 65 cedis (44%) higher in the Endorsement arm than in the control group. The Incentive treatment has no positive effect on savings in the linked bank account, potentially because the use of mobile banking declines over time in that arm while saving impacts materialized after a period of use. While we cannot determine if these bank savings crowd-out or are in addition to other forms of saving in the long term,[2] they represent an increase in the formality of savings.[3]

Why is the Endorsement arm more effective than Incentives alone at encouraging sustained adoption of mobile banking and increased savings in the bank? Examining mechanisms using our survey data, we find that the Endorsement intervention resulted in significant improvements in knowledge about mobile banking, interaction and help with mobile banking within the group, and confidence in preventing fraud and safely carrying out digital transactions. The Incentive treatment only resulted in a smaller increase in knowledge, though we cannot reject equality of the knowledge increase between the Endorsement and Incentive arms. This suggests that the Endorsement arm was more effective than the Incentive arm at encouraging confidence around fraud, redress options, and assistance within the microfinance group, facilitating continued adoption and use.

The Endorsement intervention was a bundled intervention containing both training of the group leader and incentives for the group leader to encourage others in her group to use mobile banking (referrals). As a result, we cannot say which element of this was most important for the larger treatment effects of this intervention compared to Incentives alone. However, we provide three pieces of suggestive evidence that the training component mattered, at least in groups where the leader had not previously used mobile banking. Firstly, we see substantial heterogeneity by the group leader's prior use of mobile banking. This heterogeneity is particularly large for the Incentive arm, where the group leader did not receive training. This suggests that the group leader's knowledge of mobile banking was vital for group members to take advantage of the incentives. Secondly, compliance with the training was incomplete, allowing us to look at the impact of the Endorsement arm by

[2]Our endline survey took place only one month after the end of the intervention. At this point, the increase in bank savings is not statistically significant. However, the treatment effect of the Endorsement arm on total savings is positive, though insignificant, suggesting no crowd-out is taking place.

[3]At endline, only 15% of the control group reported having another, non-OISL bank account.

whether the leader actually did the training or not.[4] This analysis is suggestive that the effect of the Endorsement arm was larger when the leader complied with the training. Lastly, using our endline survey, we see greater reported information sharing within groups when the leader was present at the training. While these approaches have econometric issues, we take this as suggestive that the training component of the Endorsement arm is important for its positive effect, particularly if the leader had not previously used mobile banking.

Taken together, our findings highlight the importance of influential members of close-knit social groups in encouraging rapid learning and sustained technology adoption. Encouraging existing knowledge sharing between those who have already adopted and those who have not could significantly increase technology uptake. Given the prevalence of group structures in developing countries, from microfinance and Village Saving and Loan Associations (VSLAs) to cooperatives and faith-based institutes (such as churches, mosques, or temples), utilizing focal people within the known group to encourage technology adoption has broader policy relevance.

Our study contributes to the literature in three key areas. Firstly, our study contributes to the literature on peer influence on technology adoption (Conley and Udry, 2010; Duflo et al., 2008; Foster and Rosenzweig, 1995; Oster and Thornton, 2009; Björkegren, 2019; Bailey et al., 2022). Prior papers have utilized a complete network mapping to identify the central person (and influential peers) (Benyishay and Mobarak, 2019; Beaman et al., 2021), or surveys to identify the most likely central individual to promote information transfer and technology adoption (Banerjee et al., 2019). This is a costly and time-consuming process, making the policy implications of such approaches challenging. Our experiment shows that the knowledge diffusion process within a close-knit network can be facilitated by training and incentivising a pre-existing, easy to identify influential group member.[5] Groups such as microcredit and savings groups (ROSCAs) are widespread in developing countries, making this approach to technology adoption applicable to a variety of existing settings.

Secondly, we document increases in bank savings as a result of the increased use of mobile banking services, thus contributing to the literature on how to increase formal savings. While prior research has looked at lowering bank account opening fees (Dupas et al., 2018b), transaction costs remained an obstacle to use. One paper that has studied a digital financial service close to ours is Habyarimana and Jack (2018). They study a saving account integrated into mobile money and labeled for school fees, finding high use, increased savings and increased likelihood of school enrollment. We show that the effects

[4]The decision by the group leader of whether to attend the training may be endogenous, so these results should be interpreted with caution and taken as suggestive.

[5]Involving peers may further influence technology adoption through changing aspirations or helping to overcome social norms (Field et al., 2016).

of mobile banking use on savings generalise to a bank account without a specific label and goal attached. Our findings align with those of Bachas et al. (2021), who show that debit cards, which also substantially lower the costs of accessing a bank account in a context with widespread ATMs, lead to increased saving in the bank account over time. Our findings contrast with De Mel et al. (2022), who studied an early technology using airtime scratch cards to deposit (but not withdraw) to a bank account and found limited effects on savings. This suggests that perceived ease of access might also be vital for people to be willing to save in the account, potentially due to the risk of adverse shocks and the need to be able to also withdraw funds quickly and cheaply.

Lastly, our detailed data on mechanisms highlights the importance of fraud awareness and confidence in addressing it for financial technology adoption. Other studies have documented widespread over-charging by mobile money agents (Annan et al., 2022) and poor consumer protection in developing countries (Garz et al., 2021). Attempts to improve people's ability to detect scams have had mixed success and found that people become over-cautious (Kubilay et al., 2023), which could potentially further reduce their willingness to adopt new digital financial services. However, there is evidence that increasing users' experience with a technology can reduce market-level over-charging by agents (Breza et al., 2020). We show that peer interaction around new technologies and learning to use them together can also increase general knowledge of fraud, and confidence in the ability to use financial accounts safely, while supporting the adoption of a new financial service.

The paper is organized as follows. Section 2 describes the setting and background, Section 3 the intervention and study design, Section 4 discusses the data and empirical specification and Section 5 the results. Section 6 discusses the findings and concludes.

2 Setting

2.1 Financial inclusion in Ghana

Mobile money services were introduced in Ghana in 2013 and have taken off dramatically since then, rising to 60% of the population having an account in 2021 (Demirguc-Kunt et al., 2022). Mobile money allows the transfer of money from one mobile phone to another. Cash is deposited and withdrawn via widespread agent networks, which can be individual kiosks within shops or service centres run by the telecom provider. Like most countries where mobile money is first introduced, it is primarily used for remittance transfers: only 13% of users have used mobile money to make a purchase in a store, 6% have received wages through mobile money and 8% made a utility payment, though 37% report saving with mobile money

(Demirguc-Kunt et al., 2022).

Bank account ownership is also moderately high in Ghana, with 39% owning a bank account (Demirguc-Kunt et al., 2022). However, active use of mobile money accounts is much higher than use of bank accounts, with 86% of mobile money users using the account multiple times a month while only 60% of bank account owners made a deposit in the last year. Part of the explanation for this is likely the different distances to these services that users must travel: 80% of bank account users live more than 30 minutes' travel,[6] from the branch, while 90% of people live within 30 minutes walk of a mobile money agent (FII, 2015).

2.2 OISL microfinance

We partner with Opportunity International Saving and Loans (OISL), the largest microfinance provider in Ghana with 40 microfinance branches across the country. OISL targets poor, traditionally un-banked populations for its loans, and focuses on rural areas that would not be served by other financial institutions. The loan is meant to develop a small enterprise. Two-thirds of all OISL microfinance clients are women.

In order to receive a microfinance loan, women must first form a group with others in their community of 4-10 members. They also select a leader in their group, who is responsible for organizing their meetings. The group leader is selected from amongst the members by a vote. On average, we see that group leaders are slightly more educated, have marginally higher saving balances with the bank and are more likely to have used mobile banking services before, but are a similar age and have been running a business for as long as group members (Appendix Table A1). While the group leader plays a coordination and organisational role, she does not have any additional power compared to the other group members, for example in determining who can join the group. If the group leader leaves, another is selected from the remaining group members. While clients must form a group in order to obtain a loan, the loans are given under individual liability contracts.

The clients receive a bank account at OISL when they take out a loan, which the loan is deposited into. Women must go to the branch to complete paperwork when the loan is disbursed and usually withdraw the loan as cash at disbursement. Women repay the loan in cash to the credit officer at group meetings. The group meetings take place within the woman's community, with an OISL credit officer traveling to the group to collect loan repayments as cash. 55% of the OISL groups repay their loans fortnightly, 20% weekly and 25% monthly and loans are given for 4-8 months. The average loan size is $150, starting from $75 to a maximum of $1,500. When a client repays a loan, they are eligible for a subsequent

[6] usually requiring the use of a costly transport means

loan, the value of which increases progressively.

2.3 Mobile banking

Mobile banking services allow bank deposit and withdraw services using the existing mobile money infrastructure. Saving in a bank account has several key advantages over using mobile money to save: 1) interest is earned on the bank account, 2) the account is protected by banking regulation against losses, 3) there is no limit to the balance you can hold, and 4) banks offer different types of saving accounts and access to other financial products such as loans to account holders. Further, mobile money is designed for transfers, and so there are mental accounting benefits to keeping savings in a separate account designated for saving.

Mobile banking requires both an existing bank account and an existing mobile money account to link together. The mobile banking platform that we consider here, Opportunity Mobile, works over the USSD system on the cellular network, so no smartphone or internet data is needed. It uses the mobile money infrastructure, and so is a familiar system to existing mobile money users. In order to deposit cash into your bank account, you first visit any mobile money agent to deposit cash into your mobile money wallet. The mobile banking platform is then used to move money from the mobile money account to the bank account, paying a fixed cost of 1 cedi ($0.16).[7] To withdraw money from bank account, you use the mobile banking platform to withdraw money from your bank account and deposit it into your mobile money account, after which you can withdraw it from an agent as cash or send it to someone else. There is no fee for withdrawals, beyond the usual mobile money fee.

We consider this technology as substantially reducing the time and money cost of saving in a formal bank account. In our sample, the median cost of a round trip to the local bank branch was 15 cedis ($1.25) and took 45 minutes. Carrying out the sample transaction using mobile banking costs 1 cedi and takes less than a minute.[8]

3 Intervention and Study Design

3.1 Interventions

The study uses a cluster randomisation design with 115 microfinance groups distributed into three treatment/control arms as follows:

[7] This compares favourably to the 1% fee and minimum charge of 0.5 cedis for mobile money transfers.

[8] Even if the cost of visiting a mobile money agent is included, 68% of women live less than 5 minutes from a mobile money agent. There is no charge for depositing funds to your mobile money account, and the withdrawal charge is 1%.

1. **Personal incentive (I - Incentive) 29 groups, 99 clients**:

   (a) Clients in this arm received a one-time 10 cedi ($1.66) monetary incentive if they carried out a mobile banking transaction (withdrawal or deposit to/from the account) within a one-month period. This incentive was sent as mobile money. Clients were provided with a flyer containing this information during their group meeting (see Appendix 1 for this).

   (b) Clients received basic information on mobile banking covering what it is, how to sign up and transaction types eligible for the incentive from their OISL credit officer during the group meeting. This is the standard information that OISL shares with clients to teach them how to use its mobile banking service.

2. **Peer-led training and referral incentive + Personal incentive (E - Endorsement) 59 groups, 194 clients**:

   (a) Microfinance group leaders received a comprehensive half-day training on mobile banking use and its benefits. This included being provided with money that they could use to conduct practice transactions, which were verified by enumerators.[9] The group leader provided information about mobile banking to the rest of their microfinance group at the next group meeting, with support from the OISL credit officer.[10] The group leader was encouraged to support her group members in using mobile banking and help them complete eligible transactions to receive the incentive.

   (b) The group leader received an incentive of 10 cedi ($1.66) for each member of her microfinance group who completed a mobile banking transaction (withdrawal or deposit to/from the account) during a one-month period, up to a maximum of 50 cedis. Group leaders were provided with a flyer containing information on the referral incentive during the group meeting. The referral incentive and flyer were given to the group leader regardless of whether they attended the training. Group members were informed that the leader would receive an incentive for their use of mobile banking.

[9] Half of the group leaders also received an additional training module on consumer protection directly following the main mobile banking training. This covered components on how to identify and be aware of fraud, fraud protection and redress measures. We do not find any differences depending on whether the group leader received this additional fraud module, and so pooled these arms for all analysis. Anecdotally, fraud came up as a discussion topic frequently even at the trainings that didn't cover fraud explicitly, which may have diluted the difference between these treatment arms.

[10] If the group leader did not attend the training session, the OISL credit officer provided information about mobile banking in the same way as in the Incentive arm.

(c) Each member of the microfinance group (including the leader), was eligible to receive an individual monetary incentive of 10 cedi ($1.66) if they carried out a mobile banking transaction (withdrawal or deposit to/from the account) themselves during a one-month period. Clients were provided with a flyer containing information on the incentive during their group meeting. This is the same as the Incentive arm.

3. **Control (C) 27 groups, 114 clients**: Clients in this arm did not receive any encouragement to use mobile banking. However, clients could still use mobile banking services if they choose to.

Table 1: Intervention design

Arm	Information on Mobile Banking	Incentive (own)	Training	Incentive (referral)
Control	-	-	-	-
Incentive	All group members - provided by credit officer	All group members	-	-
Endorsement	All group members - provided by group leader	All group members	Group leader	Group leader

Table 1 summarises the intervention design. All the women who were offered the individual incentive accepted the treatment. In the Endorsement arm, 36 out of 59 group leaders attended the group training (61% attendance). All group leaders were offered the referral incentive, regardless of whether they attended the training, and all leaders accepted this. We discuss compliance extensively in Appendix A.

3.2 Sample and Randomisation

The sample selection and randomisation was done using OISL administrative data from February 2021. We selected 4 branches for this study, and included all active microfinance groups that were composed of only women[11], had at least 3 members and had at least one member already registered for mobile banking.[12] These criteria ensured that we had a relatively homogeneous set of microfinance groups containing only female clients. We included the restriction of at least one member already being registered for mobile banking so we would be powered to look at heterogeneous effects by this variable.

[11] 75% of OISL's microfinance clients are women

[12] At the time OISL was registering all clients for mobile banking automatically, such that approximately 30% of clients were registered for mobile banking. However, even amongst those registered, less than 30% had ever used mobile banking. This restriction only resulted in 40 out of 555 groups being dropped.

We assigned microfinance groups, and all the clients of that group, to treatment using a stratified randomisation. The stratification is based on three variables that represented median splits of the sample:

1. **Mobile money agent distance:** a dummy variable capturing if the group had a mobile banking agent within 10 minutes walk of the group meeting place.

2. **Branch distance:** a dummy variable capturing if the group had a less than 45 minute travel time to the nearest branch from the group meeting point.

3. **Use of accounts:** a dummy capturing if the average balance in the OISL bank account of the group members is less then 15 cedis.

This yielded eight strata blocks. We carried out the randomisationin STATA using the *randtreat* command with no allocation of misfits. 136 groups were randomised, but after randomisation, we learnt from OISL that 21 of the randomised groups were delinquent and no longer have active client status with OISL. Members of these groups were not told their assigned treatment status or received any part of the intervention. We drop these 21 groups from the study and from all analysis. This resulted in 115 groups being included in the study with the following allocation; 27 in control (C), 29 in Incentive (I) and 59 in Endorsement (E).[13]

After randomisation, the group leader in groups assigned to the Endorsement arm was invited to a training session. The training of the group leaders took place on a single day at a location near to the microfinance branch of that group.

Alongside the group leader training, we approached all the 115 groups selected to take part in the study to carry out the consent process. The consent process was carried out with all group members present at the microfinance group meeting on the selected day. 407 women consented to take part in the study, 114 in the control group, 99 in the Incentive arm and 194 in the Endorsement arm.[14] During the consent process, we also collected some data on clients' prior knowledge and use of mobile banking. After consenting to take part in the study, group members were told about their assigned intervention in the treatment arms.

[13]The Endorsement group was further divided into two subtreatments, which differed only in the inclusion of an additional training module during the group leader training on consumer protection. We pool these for all analysis presented here.

[14]We did not experience any non-consent. Not every group member was present when we did the consent fielding and any member not present was not included in our study sample. Additionally, 42 members had joined our study groups between the randomisation and consent process. Every new member was verified individually with OISL to ensure they were a valid member of the group. We include all new members in the study, but do not have administrative baseline data on them.

4 Data and Empirical Specification

The sources of data for this study are participant responses from the consent enrolment, OISL administrative records, and an endline survey. The endline survey was conducted one month after the end of the intervention. A timeline for the study is shown in Appendix Figure 2.

The endline survey instruments cover background characteristics (marital status, education), business outcomes, saving behaviour, mobile money knowledge, mobile banking use, fraud and women's empowerment.

We supplement this collected data with administrative records from our banking partner OISL, available throughout the study. The administrative data are composed of two data source:

1. **Mobile Banking transactions**: The universe of deposit and withdrawal transactions each month using the OISL Mobile Banking platform. Available from February 2021-December 2021.

2. **Saving account balance:** The month-end saving balance in all OISL accounts. Available from February 2021-December 2021.

Additionally, basic demographic data was obtained from OISL records, including gender, age and associated branch (location).

4.1 Attrition

Attrition was minimal in our study: the endline survey was only carried out 2 months after the study consent, and we only lost 9 women at followup, or 2% of the sample. Attrition did not vary systematically by treatment arm, as shown in Appendix Table A2. We also examine predictors of attrition in Appendix Table A3 using the small set of variables from the admin data or captured during the consent process. Clients who had heard of Opportunity Mobile were less likely to attrit, as were clients in groups where the leader had previously used mobile banking. Own use of mobile banking and loan characteristics do not predict attrition.

Since the administrative data contained the universe of mobile money transactions, there is no attrition when examining this data source. If no mobile banking transactions took place we code these outcomes as zero. No accounts were closed for our study sample during the study, and so we always observe the saving balance in the OISL accounts, including if it is zero.

4.2 Outcome measures

We pre-specified four primary outcomes capturing use of mobile banking. Three captured use of mobile banking at the intensive and extensive margin from the administrative data, all captured at the monthly level: whether mobile banking was used in that month, the value of mobile banking transactions in that month, and the number of mobile banking transactions in that month. The fourth was an index of expected use of mobile banking from the endline survey. We also consider the end-of-the-month saving balance in the OISL account, noting that this was specified as a secondary not primary outcome in our pre-analysis plan because of the need to build up balances over time to see any changes in savings and because when we first wrote the pre-analysis plan, we did not know we would be able to obtain data on savings balances for 6 months after the end of the interventions.

We specified five indexes capturing potential mechanisms through which the interventions might have worked that were captured in the endline survey: knowledge of mobile banking, trust in mobile banking, fraud knowledge, peer effects and preferences. We further specified we would examine 5 downstream secondary outcomes captured in the endline survey (savings, loans, business outcomes and women's empowerment), taking these as exploratory given the short period between our intervention and endline survey. All indices are constructed following (Anderson, 2008) with the components coded to be the same sign and standardised against the control group.

4.3 Baseline balance and descriptive statistics

We do not see any imbalance by treatment across the variables examined in Table 2. We also perform an omnibus test where we regress each treatment on all covariates and examine whether they jointly predict treatment. The F-statistics from these tests for the Incentive and Endorsement arms are 1.22 and 0.94 respectively, which are not statistically significant.

This table also displays summary statistics. Nearly everyone in the sample had used mobile money (95%). 80% of women had heard of opportunity mobile banking, confirming that OISL had previously provided information to clients about the service, but only 7% reported using it. In the transaction data, we see a slightly higher percentage of mobile banking use (12%), suggesting some women might be asking others to conduct transactions on their behalf. The women are on average 43 years old, 13% have no education, 24% have only primary and 63% have secondary schooling or above. 58% of them are married. They have 0.65 children under the age of 5 on average, 1 child aged between 6 - 11, and 1 child aged between 12 - 18. Their businesses have been operating for 103 months (8.5 years). We can also documented that while the groups are on average only 11 minutes from a mobile

money agent, they are 50 minutes travel from the nearest branch. 11% of women are in groups where the group leader has used mobile banking before. The average loan amount is 1173 cedis ($153) and the average balance in the OISL saving account is 103 cedis ($8.5). As noted earlier, all OISL clients are given a bank account when they take out a microfinance loan, but most of them do not use this account due to the large travel time to the branch.

4.4 Empirical Strategy

As stated in the pre-analysis plan,[15] to estimate the effect of the treatments, we estimated the following intention-to-treat (ITT) ANCOVA equation :

$$\begin{aligned} Y_{ig} &= \beta_0 + \beta_I \text{Incentive}_g + \beta_E \text{Endorsement}_g \\ &+ \beta_y Y_{ig}^0 + \mu_s + \epsilon_{ig} \end{aligned} \tag{1}$$

Where Y_{ig} is the outcome variables of interest for OISL client i, in strata s, in microfinance group g. Incentive and Endorsement are the Incentive treatment and Endorsement treatment assignments of the client's microfinance group. β_I and β_E are the ITT effects of the Incentive and Endorsement treatments. Y_{ig}^0 is the value of the outcome measure at the baseline, if available. μ_s is a vector of strata dummies and ϵ_{ig} are clustered standard errors at the microfinance group level.

For the data on mobile banking adoption and saving in the OISL account, where we have monthly administrative data for a 6 month period, we estimate the following:

$$\begin{aligned} Y_{igt} &= \beta_0 + \beta_I \text{Incentive}_g + \beta_E \text{Endorsement}_g \\ &+ \beta_y Y_{ig}^0 + \mu_s + \sum_{2}^{6} \theta_t + \epsilon_{ig} \end{aligned} \tag{2}$$

where t denotes the month and θ_t are month dummies. All outcomes are calculated for a given month.

Multiple test corrections are carried out according to the procedure outlined in (Benjamini et al., 2006) to calculate q-values adjusting for the false discovery rate. We do this across the 4 primary outcomes and 5 mechanisms that we pre-specified.

[15]Note that our pre-analysis plan splits the Endorsement intervention into two based on whether the consumer protection (CP) component was included in the training. We pre-specified that if we found no differences between the impact of the interventions including this additional component ("Peer" and "CP") or not, we would pool them. As a result, all analysis shown here pools the Peer and CP arms together as the Endorsement intervention.

5 Results

5.1 Use of mobile banking during incentivised period

Results for the impacts of assignment to treatment on mobile banking use during the one-month incentivised period are shown in Table 3.[16] The first three columns show administrative data for any mobile banking transaction (extensive margin), the value of all mobile banking transactions and the number of mobile banking transactions (intensive margin), all captured for the 30 days starting the day after the consent was carried out, which represented the incentivised period in the treatment arms. The fourth column shows an index of mobile banking use capturing self-reported measures of registering for mobile banking, resetting the mobile banking pin, using mobile banking in the last 30 days and likelihood of using mobile banking in the next 30 days, as captured in the endline survey at the end of the intervention period.

The Incentive intervention resulted in a 14.8 percentage point increase in the likelihood of making a mobile banking transaction in the month, more than double the control group mean of 10.6%. However, the Endorsement intervention resulted in a 26.7 percentage point increase in the likelihood of making a mobile banking transaction, more than triple the control group. The Endorsement intervention also resulted in a significantly higher likelihood of making a mobile banking transaction than the Incentive intervention. The significantly increased likelihood of mobile banking use in the Endorsement arm also survives a multiple test correction at the 1% level, unlike the Incentive intervention. Overall, while both interventions increased the use of mobile banking, the Endorsement intervention was more effective.

The value and number of transactions during the incentivised month are also greater in both treatment arms, though not significantly different from each-other. Given only one transaction was incentivised and it is a relatively short time period, this is not unexpected.

The index of mobile banking use increases 0.4 standard deviations in the Endorsement arm (see Appendix Table A5 for impacts on the components of the mobile banking use index). The Incentive arm only leads to a significant increase in the likelihood of making a mobile banking transaction of 0.23 standard deviations that does not survive a multiple hypothesis test correction. The increase in mobile banking transactions as a result of either treatment is driven by deposit transactions rather than withdrawals (see Appendix Table A6). Overall, we document strong evidence that the Endorsement intervention successfully increased the use of mobile banking services.

[16] In Table A4 we show robustness of these results to controlling for variables selected by LASSO.

5.2 Adoption of mobile banking services

The interventions were effective at increasing mobile banking use during the incentivised period on the extensive margin. Yet, the crucial question remains: did this experimentation result in sustained adoption and use of mobile banking services?

To examine continued adoption, we utilise monthly administrative data from OISL for the 6 month period following the intervention. We present treatment effects on use of mobile banking, value and number of mobile banking transactions pooled over all months following specification 2.

We see in Table 4 that both interventions led to sustained higher adoption of mobile banking, with the Incentive intervention leading to 6.1 percentage points increased use per month and the Endorsement intervention leading to significantly higher use of 11.6 percentage points per month.[17] This compares to a control group mean of 10.3% using mobile banking each month, meaning the interventions led to a 50-100% increase in adoption of mobile banking. Similar patterns are seen for the value and number of transactions, with the Endorsement intervention leading to significantly higher impacts than the Incentive intervention alone. Histograms of the value and number of transactions show that while most treated women shift to doing only one mobile banking transaction a month, these transactions span the entire distribution of values (Figure 3 and 4). As during the incentivised period, the increase in use is driven by an increase in deposits (Table A8).

When we break down treatment effects by month in Table A9, we see that treatment effects are initially constant then decline slightly in the Incentive arm from October. Use of mobile banking services also began to increase strongly in the control group from October,[18] resulting in them catching up with the Intervention arm. In contrast, mobile banking use increases over time in the Endorsement arm, with the value of transactions also increasing over time.

Overall, this implies our interventions were successful at encouraging sustained use of mobile banking services over a 6 month period, though the Endorsement intervention led to significantly larger effects that grow and persist more strongly over time.

5.3 Savings

We examine two forms of savings. Firstly the saving balance in the OISL bank account, for which we have the monthly end-of-month balance during and for 6 months after the

[17] In Table A7 we show robustness of these results to controlling for variables selected by LASSO.

[18] OISL began a campaign to encourage mobile banking adoption in all microfinance groups from October utilising group leader training and encouragement for group members to adoption, but without any incentives.

intervention. We complement this rich admin data with survey data on total savings in all forms, one month after the end of the intervention.

Results for the effect of the treatments on the account balance in the OISL bank account during and 6 months after the intervention are shown in Table 5 following specification 2. We see in column (1) that women in the Endorsement arm save 48 cedis ($4) more a month on average, significant at the 10% level, a 28% increase in bank savings. The Incentive arm does not increase savings on average.

This average over all months hides changes in savings over time, as seen in column (2). From October onwards, women in the Endorsement arm save 64 cedis-82 cedis ($5-7) per month more than the control group, significant at the 1% level, approximately a 44-55% increase in bank savings. This is consistent with the pattern of coefficients seen in column (2) of Table A9, where the value of transactions with mobile banking is increasing over time in the Endorsement arm, and suggests it takes time to increase savings after starting to use mobile banking.[19] The Incentive arm never led to a significant increase in savings in any month.

Unfortunately, we do not have the data to understand whether these medium term increases in savings are in addition to or crowding-out saving in other forms. Regardless, they represent an increase in the formality of women's savings, as they shift to saving in a bank account.[20]

Results for the effect of the treatments on saving outcomes measured in the survey, one month after the intervention, are shown in Table A10.[21] We see that self-reported total savings are not statistically significant for either treatment group, though very noisy. Total savings, deposits minus withdrawals in the last 30 days, savings with mobile money and financial satisfaction are all higher but not statistically significant for the Endorsement group. Column (5) also shows the same administrative data on the OISL account balance for July 2023, where the coefficient on the Endorsement arm is positive but not statistically significant. These results are not inconsistent with the possibility that in the short term, total savings alongside bank savings are increasing in the Endorsement arm.[22]

[19]Interestingly, savings are rising in the control group from September-December, which could be due to seasonality, although it also corresponds with the increased use of mobile banking seen in the control group in Table A9.

[20]Saving in bank accounts other than OISLs was rare, with only 15% of the control group reporting that they had another, non-OISL bank account at endline.

[21]We also pre-specified 4 additional downstream outcomes capturing loan repayment, business profit, trust in mobile money and empowerment outcomes. We pre-specified these as speculative given the short time frame of one month that our survey took place after, and so would not interpret null effects as indicative of null long-term effects. We see no significant impacts on any of these outcomes (results not shown).

[22]Other studies have also found evidence that bank savings do not completely crowd out other forms of saving (Dupas et al., 2018a).

5.4 Mechanisms

Results for our five pre-specified mechanisms are shown in Table 6.[23] The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL on a 1-5 scale, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures engagement with others about mobile banking and the preferences index is composed of incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money.

We see that the Endorsement intervention leads to large and significant increases in knowledge about mobile banking of 0.24 standard deviations, fraud knowledge of 0.36 standard deviations and peer interaction around mobile banking of 0.65 standard deviations, all of which survive multiple test corrections. The Incentive intervention leads to an increase in knowledge that is significant at the 10% level and doesn't survive the multiple test correction. The increases in fraud knowledge and the peer interaction are significantly higher in the Endorsement arm than the Incentive arm, though the later is true only when the controls selected by lasso are included (Table A11. There is no change in trust in OISL for either treatment, likely as trust was already 4.8 on average out of 5, nor is there any change in preferences for digital transactions over cash.

All the components of the knowledge index increased significantly in the Endorsement intervention, with respondents being 26 percentage points more likely to report having heard of mobile banking on a mean of 65% in the control group (Table A12). Interestingly, having heard of mobile banking only increases to 77% in the Incentive arm despite them all receiving a training on mobile banking and being given a flyer explaining the incentive. This suggests the clients quickly forgot about mobile banking without it being reinforced within the group. Confidence in using mobile banking increases 2.1 points on a mean of 3.5 in the Endorsement arm. This finding is consistent with other evidence on the importance of knowledge for financial technology adoption (Riley and Shonchoy, 2022), but that knowledge alone is not sufficient for high and sustained adoption.

Likewise most of the components of the fraud index increase in the Endorsement arm (Table A13), particularly those around worries of losses due to fraud and confidence in detecting it. However, correct scores on an index of responding to fraud scenarios do not change in either treatment arm, though women in the Endorsement arm score insignificantly higher than women in the Incentive arm (p-value=0.13). This pattern could be driven by clients trusting in redress options more if they experience fraud. Experience of fraud

[23] In Table A11 we show robustness of these results to controlling for variables selected by LASSO. The components of each mechanism index are shown in Appendix Tables A12-A15.

by individuals in developing countries is widespread (Garz et al., 2021), but attempts to directly improve it have had limited success (Kubilay et al., 2023). Like Breza et al. (2020), our findings support the idea that more widespread adoption of a technology can lead to improvements in consumers' experience using it and reduce fraud.

Increases in the peer interaction index in the Endorsement arm are driven by reporting knowing more members using mobile banking in the group and increased likelihood of receiving help from others in the group on how to use mobile banking (Table A14). We also see evidence that knowing other members using mobile banking increased in the Incentive arm, but is significantly higher in the Endorsement arm, consistent with the stronger effects on adoption of mobile banking in this arm. The Endorsement arm is significantly better at enabling members to receive help from others in the group.[24] Interestingly, we do not see an increase in either arm in reports of providing help, perhaps because help was provided in an informal way or in passing without the giver internalising that they were providing help.

There are no changes in any components of the preference index (Table A15), including no change in willingness to accept mobile money over cash in an incentivised game or increases in willingness to pay with goods using mobile money over cash (unincentivised). This may be because it takes longer than one month to affect these preferences.

Overall, the mechanisms analysis suggests that the Endorsement intervention was better able to increase knowledge of mobile banking and confidence in redress options if money was lost while using mobile banking than the Incentive arm. The Endorsement intervention also led to more interaction and help with others in the group in using mobile banking. Overall, this led to substantially higher adoption and persistent use compared to the Incentive intervention alone. Since both arms included own incentives for carrying out a transaction, the different impacts must be due to the intensive training of the group leader, creating a source of knowledge within the group, or the incentives for the group leader, creating a strong reason for them to pass-on their knowledge and encourage adoption amongst the group. We explore this further in the next section.

5.5 Why the Endorsement intervention is more effective

An important question is whether the Endorsement intervention worked primary through training a focal individual who can then pass-on her knowledge to other peers in the microfinance group, or through the referral incentives. We use four sets of findings to shed light on this question, though acknowledge that without randomisation of these features we cannot say for sure which element mattered the most. We examine: 1) heterogeneity

[24]The people providing help were a mixture of the group leader and group members.

analysis by group leader's prior knowledge of mobile banking, 2) LATE analysis by whether the group leader attended the training, 3) examination of treatment effects dependent on whether the group leader attended the training or not, and 4) endline checks on the leader's support of group members in using mobile banking.

We document large heterogeneity by whether the group leader had previously used mobile banking before (Table 7). 12% of groups had a leader with prior experience of mobile banking at baseline. In the Incentive arm, women in groups where the leader had used mobile banking before were 54 percentage points more likely to use mobile banking and in the Endorsement arm they are 37 percentage points more likely to use mobile banking when the group leader already had. There remains a significant impact of the Endorsement intervention on the likelihood of using mobile banking for groups where the leader had not previously used mobile banking of 7 percentage points, suggesting the training is able to partially compensate for lack of knowledge about mobile banking of the group leader. Similar patterns are seen for the value and number of transactions (columns 2 and 3, respectively, in Table 7). Interestingly, women in control groups where the leader had used mobile banking before are if anything less likely to adopt mobile banking than women in control groups where the leader has not used mobile banking before, suggesting the leader is not passing on knowledge without the incentives.[25] We see similar patterns of heterogeneity for the mechanisms, though estimates are noisy (Appendix Table A19).

While this is a small number of groups and clients, and so should be interpreted with caution, it does suggest that prior knowledge of the group leader was extremely important for group members being able to use mobile banking. Prior use by the group leader mattered more in the Incentive arm, because in the Endorsement arm group leader received a training which provided them with experience using mobile banking. Anecdotally, in focus groups, the women in the Incentive arm described how the information session was not useful unless someone in the group already knew how to use mobile banking. As a result, many women in the Incentive arm who would have liked to use mobile banking struggled to know how to use it. In Incentive groups where the group leader already knew how to use mobile banking, they could support their members in a similar fashion to those in the Endorsement arm.[26] In the Endorsement arm, the group leader was better able to pass on knowledge if she was experienced with using mobile banking, but the training was enough to enable her to help

[25]We also show robustness to controlling for group leader prior use of mobile banking in the Appendix Tables A17 and A18. The coefficients do not change, though some lose significance.

[26]We would expect own mobile banking prior use to also matter for the same reason for the Incentive treatment, and indeed we see in Table A16 a large coefficient on the interaction between the Incentive treatment and own prior use of mobile banking, which is marginally statistically significant for the value of transactions. Own prior use of mobile banking does not matter as much for the Endorsement intervention (and the coefficient is small), as would be expected, since the group leader can provide this knowledge.

fellow group members adopt regardless.

In Tables A20 and A21 we show local average treatment effects for those who complied with the intervention. For the Incentive treatment, compliance required accepting the incentive, which everyone did, so we have 100% compliance. For the Endorsement arm, compliance required the group leader to attend the intensive training, which 36 out of 59 did, so we have 61% compliance. All group leaders accepted the peer referral incentive, regardless of whether they attended the intensive training. [27]

LATE estimates are uniformly larger, with, for example, women in groups where the group leader attended the training 49 percentage points more likely to use mobile banking during the incentivised period and 18 percentage points more likely to adopt mobile banking beyond the incentivised period than women in control groups. Likewise, increases in mobile banking knowledge, fraud protection confidence and peer interaction in the Endorsement arm are larger in the LATE estimates and significantly difference from Incentives. This suggests that the group leader attending the intensive training was an important driver of the impact of the Endorsement intervention. This also supports the findings from the heterogeneity analysis that leader competence with mobile banking (either through prior use or through attending the intensive training) was the key driver of the impact of the Endorsement intervention on group member mobile banking adoption.

Another piece of analysis we can draw on to support the importance of the training in the Endorsement intervention, is to assume that attendance at the training was quasi-random and look at treatment impacts by whether the group leader attended the training or not. This is a strong assumption, but a few features of the intervention make this assumption more plausible. Firstly, we held all the training on a single day, and so if a group leader could not attend that day due to other commitments she would not receive the training. Secondly, we provided strong financial incentives to the group leader to attend (100 cedis, or $16,) in a context where average business profits by the micro-credit clients are 600 cedis a month. Therefore the training was attractive to attend, not only for those interested in mobile banking or without alternative things to do on that day. Thirdly, we do not see any significant differences in characteristics between group leaders who attended and didn't attend, as seen in Table A27, though this analysis is underpowered with only 61 group leaders, and some differences are moderate in size.

Taking these limitations into account, in Table A22 and A23 we show treatment effects on the primary outcomes and mechanisms with the Endorsement intervention split into whether

[27]For the LATE analysis to be valid, we must assume that there was no way for the training in the Endorsement arm to have an effect except through the group leader attending the training. This is a strong assumption and would not be true if for example the offer of training led the group leader to seek out more information from the credit officer about mobile banking.

the group leader received training or not. We see that for adoption of mobile banking we can reject equality of the Endorsement intervention when the group leader did and didn't attend the training, with effects larger when the group leader attended. The coefficients on the value and number of transactions, mobile banking knowledge and peer interaction are also larger when the group leader attended the training than when she didn't, though not significantly different. While we are underpowered for this analysis, it is also indicative that effects are larger when the group leader did attend the training than when they didn't, supporting the importance of the training part of the intervention.

Finally, we captured at endline what the group leader reported carrying out to teach their group members about mobile banking. This is shown in Table A31. We see that the group leader reports sharing significantly more knowledge with their group members, providing more support to group members and being more confident providing support if they attended the training than if they didn't. This suggests that the Endorsement intervention was most successful when the group leader attended the training. Overall, we take these results as supportive of the importance of the training component of the Endorsement intervention.

Since we have no variation in the referral incentives, we are unable to assess the role these played in the impact of the intervention, but note that since all group members would receive an individual incentive for completing a mobile banking transaction, they were well motivated to ask for help from their group leader if that leader knew how to use mobile banking. This is apparent in the large impact of the Incentive intervention when the group leader had prior knowledge of mobile banking.

We also examine whether the impacts we see in the treatment arms are driven by the group leaders themselves or by the group members.[28] We do this by interacting the treatments with the client's role in the group, to see if treatment effects differ for group leaders versus other group members. It is possible that group leaders have either larger or smaller treatment effects from either treatment. However, it's an important check that, particularly in the Endorsement arm where the group leader received extensive training, they are not driving the entire treatment effect. These results are shown in Tables A24 and A25.

Looking at adoption of mobile banking, we see similar heterogeneity by group leader role for the Incentive as well as the Endorsement arm, despite there not being any differences in the treatment received by members and leaders in the Incentive arm. Indeed, we fail to reject equality of the treatment effects for the incentive and endorsement arms for group leaders, and the coefficients are extremely similar, suggesting that the endorsement arm is not providing additional encouragement to group leaders to adopt compared to the incentive arm alone. This implies that the group leaders may be easier to encourage to adopt a

[28]This analysis was not pre-specified.

technology using incentives alone, potentially due to their different characteristics, such as higher education (compared to group members). We see an effect of the treatment for group members only in the Endorsement arm. There is no evidence of heterogeneity in the mechanisms, though estimates are more noisy. It seems that the improvements in knowledge, fraud confidence and peer interaction in the Endorsement arm are driven by group members.

Overall, we see that the greater effectiveness of the Endorsement arm seems to be driven by its ability to facilitate information flow and interaction around mobile banking within the group, resulting in adoption of mobile banking by group members as well as group leaders. For this to occur, the group leader needs to either have experience using mobile banking themselves or to attend the training, so that they are able to support group members. The (smaller) effects of the Incentive intervention seem to be primarily driven by the leader choosing to adopt, suggesting that leaders are easier to incentivize to adopt new technologies, perhaps due to unobservable characteristics.

6 Conclusion and Discussion

We use an RCT to study how to encourage the adoption of a new technology, mobile banking, and examine whether use of mobile banking leads to higher savings in the linked bank account. While individual incentives double adoption from 15 to 30 percent in the short term, utilising endorsement by an influential peer within the microfinance group triples adoption. The positive effects of both treatments on mobile banking use persist over 6 months, with women in the Incentive arm 50% more likely to use mobile banking and the Endorsement treatment remaining twice as effective as the Incentive treatment. The Endorsement treatment leads to a large increase in savings in the linked bank account, with balances increasing by 30% on average and increasing over time.

We show that knowledge acquisition and transfer is significantly higher in the Endorsement arm. We also documented that fraud is an important mechanism that determines technology adoption, with a well-trained peer able to support knowledge and confidence in dealing with fraud. This suggests that the Endorsement arm was more effective at encouraging discussion and sharing around how to safely use the technology, which facilitated greater adoption. While our Endorsement intervention was bundled, we provide some suggestive evidence that the training of the group leader was key to its effectiveness.

Our study has some limitations. Firstly, our survey data is from only one month after the intervention ended. This means that we cannot fully explore whether bank savings crowd-out other forms of saving, or whether there are longer term impacts on other downstream outcomes such as households ability to cope with shocks. Additionally, since

out partner organisation continued to train and encourage mobile banking adoption by their microfinance clients, we are unable to examine effects beyond 6 months. Secondly, our context of microfinance groups is a relatively homogeneous setting, where individuals are in small groups with others that they know well and interact with weekly. Our findings may not generalise to other contexts with less tightly integrated groups.

In terms of policy recommendations, our study context is highly relevant to any setting with existing, close-knit groups. This includes not just the estimated 300 million microfinance borrowers, but also those in savings groups such as VSLAs and ROSCAs. The ease of identifying a natural central person in such a group setting makes this a more scaleable approach to increasing technology adoption than network-based methods. Our findings are relevant to other MFIs beyond OISL, who have found limited success introducing new technologies through their credit officers, and instead can utilise the group structure to encourage and facilitate technology adoption.

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Table 2: Baseline Balance

	(1) Control Mean	(2) Incentive	(3) Endorsement	(4) p-value I=E	(5) N
Panel A: Individual Characteristics					
Used Mobile money	0.95	-0.02	-0.02	0.82	398.00
		(0.04)	(0.03)		
Heard MB	0.80	-0.00	0.00	1.00	398.00
		(0.08)	(0.07)		
Registered MB	0.71	-0.08	-0.03	0.42	398.00
		(0.08)	(0.06)		
Used MB	0.07	-0.01	-0.01	0.93	398.00
		(0.05)	(0.04)		
MB Transaction†	0.12	-0.01	0.03	0.79	398.00
		(0.08)	(0.07)		
MB Amount Transaction†	61.83	15.65	23.33	0.89	398.00
		(54.60)	(47.32)		
MB No. Transaction†	0.35	-0.10	0.04	0.75	398.00
		(0.23)	(0.23)		
Age	43.27	-0.15	2.66*	0.10	398.00
		(1.62)	(1.48)		
Primary School	0.24	0.05	-0.06	0.16	398.00
		(0.06)	(0.05)		
Secondary School	0.63	-0.00	0.08	0.27	398.00
		(0.07)	(0.06)		
No schooling	0.13	-0.05	-0.03	0.58	398.00
		(0.05)	(0.04)		
Married	0.58	0.05	0.01	0.70	398.00
		(0.06)	(0.06)		
Children under 5	0.65	-0.02	-0.01	0.99	398.00
		(0.13)	(0.10)		
Children 6 - 11	1.06	-0.18	-0.03	0.45	398.00
		(0.16)	(0.14)		
Children 12-18	1.00	-0.04	0.10	0.53	398.00
		(0.11)	(0.11)		
Business age (months)	103.42	-5.11	18.74	0.27	396.00
		(16.61)	(14.51)		
Panel B: Group Variables					
Distance to Agent	10.97	-2.64	-1.36	0.49	398.00
		(2.43)	(2.32)		
Distance to Branch	50.65	0.02	-2.69	0.83	398.00
		(6.02)	(5.17)		
Leader Used MB	0.11	-0.00	0.04	0.82	398.00
		(0.08)	(0.07)		
Panel C: Account Variables					
Loan Amount	2214.45	-62.91	11.00	0.77	380.00
		(286.47)	(292.41)		
Account Balance	103.18	30.59	11.52	0.65	380.00
		(42.70)	(30.42)		
F test p-value		0.23	0.55		

† Denotes a variable from administrative data. ‡ denotes a variable collected during the endline survey but not expected to change over a 2 month period. All values in Ghana Cedis. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ Account variables are missing for new members or join the group between the randomisation and consent. F-test p-value from an omnibus test of joint explanatory power of the covariates for each treatment.

Table 3: Effect of treatment on mobile banking use during the incentivised period

	(1) Any Transaction	(2) Value Transactions	(3) No. Transactions	(4) MoB Use Index
Incentive	0.148	18.153	0.338	0.227
	(0.069)	(52.886)	(0.171)	(0.136)
	[0.035]**	[0.732]	[0.051]*	[0.097]*
	{0.211}	{1.000}	{0.211}	{0.269}
Endorsement	0.267	62.507	0.329	0.391
	(0.062)	(54.502)	(0.121)	(0.099)
	[0.000]***	[0.254]	[0.007]***	[0.000]***
	{0.000}***	{0.529}	{0.021}**	{0.001}***
Observations	398	398	398	398
Control Mean	0.106	105.575	0.319	0.000
Incentive = Endorsement	0.071	0.154	0.961	0.196

*Notes: Individual mobile banking use during the incentivised period (Jun 2021) from administrative data. All regressions include strata fixed effects and controls for mobile banking use at baseline. Columns (1)-(3) is administrative data during the incentivised period (Jul 2021). Column (1) is a dummy variable for use of mobile banking, column (2) is the value of all mobile banking transactions in Ghanian cedis, and column (3) the number of mobile banking transactions - all defined over a 1 month period. Column (4) shows an index of mobile banking use capturing self-reported measures of registering for mobile banking, resetting the mobile banking pin, using mobile banking and likelihood of using mobile banking in the future. Clustered standard errors in parentheses. p-values in square brackets. q-values in curly brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 4: Effect of treatment on mobile banking adoption

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.061**	29.910**	0.114*
	(0.025)	(14.167)	(0.067)
Endorsement	0.116***	62.258***	0.158***
	(0.025)	(14.642)	(0.059)
Observations	2388	2388	2388
Outcome at baseline	yes	yes	yes
Control Mean	0.103	46.046	0.201
Incentive = Endorsement	0.047	0.050	0.509

*Notes:Individual adoption of mobile banking during the 6 months after the incentives ended (Jul-Dec 2021) from administrative data. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 5: Effect of treatment on savings

	(1) Account Balance	(2) Account Balance
Incentive	-7.911	8.522
	(32.348)	(41.073)
Endorsement	47.989*	29.621
	(28.470)	(28.435)
Incentive × Jul		-24.690
		(19.665)
Incentive × Aug		-24.604
		(20.570)
Incentive × Sep		-15.836
		(21.289)
Incentive × Oct		-18.698
		(21.688)
Incentive × Nov		-17.647
		(22.783)
Incentive × Dec		-13.554
		(22.971)
Endorsement × Jul		-8.792
		(8.386)
Endorsement × Aug		-3.188
		(9.971)
Endorsement × Sep		3.572
		(11.112)
Endorsement × Oct		34.324***
		(12.435)
Endorsement × Nov		52.499***
		(14.273)
Endorsement × Dec		50.165***
		(14.956)
Jul		-7.661
		(6.388)
Aug		11.798
		(7.868)
Sep		22.068***
		(8.428)
Oct		34.943***
		(9.044)
Nov		55.685***
		(10.300)
Dec		40.629***
		(11.151)
Observations	2779	2779
Control Mean	171.169	148.675
Incentive = Endorsement	0.054	0.567

*Notes:End of month saving balance in Ghanian cedis in OISL bank account from administrative data. Pooled over all months from June-Dec 2021. All regressions include strata fixed effects and control for the baseline value of the outcome. Column (2) also includes month dummies. Control mean in column (1) is an average over all months and in column (2) for June only. Standard errors in parentheses. p-values in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table 6: Effect of treatment on mechanisms

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Incentive	0.171	-0.013	-0.024	0.276	0.030
	(0.086)	(0.080)	(0.147)	(0.234)	(0.133)
	[0.051]*	[0.876]	[0.868]	[0.241]	[0.821]
	{0.579}	{1.000}	{1.000}	{1.000}	{1.000}
Endorsement	0.235	-0.035	0.363	0.649	0.072
	(0.068)	(0.077)	(0.118)	(0.218)	(0.106)
	[0.001]***	[0.648]	[0.003]***	[0.004]***	[0.499]
	{0.009}***	{1.000}	{0.014}**	{0.014}**	{1.000}
Observations	398	398	398	398	398
Control Mean	0.000	4.841	-0.000	-0.000	0.000
Incentive = Endorsement	0.365	0.773	0.006	0.124	0.694

*Notes:Survey data. All regressions include strata fixed effects and controls for mobile banking use at baseline. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, fraud confidence captures knowledge and confidence in dealing with fraud, peer interaction is interaction with others about mobile banking and preferences is incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. Standard errors in parentheses. p-values in square brackets. q-values in curly brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table 7: Mobile Banking adoption: Heterogeneity by group leader prior use of mobile banking

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.001	-0.694	-0.033
	(0.042)	(17.247)	(0.073)
Endorsement	0.071*	38.627**	0.027
	(0.039)	(18.655)	(0.070)
Incentive × Leader Used MB	0.541***	277.693***	1.325***
	(0.125)	(66.670)	(0.498)
Endorsement × Leader Used MB	0.373***	197.506**	1.074**
	(0.124)	(76.796)	(0.487)
Leader Used MB	-0.063	-24.791	-0.063
	(0.135)	(66.171)	(0.411)
Observations	2388	2388	2388
Control Mean | het=0	0.083	35.035	0.144
Heterogeneity Mean	0.119	0.119	0.119
Inc. = Endorse	0.212	0.218	0.603

*Notes:Individual adoption of mobile banking during the 6 months after the incentives ended (Jul-Dec 2021) from administrative data. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, columns (2) is the value of mobile banking transactions in Ghanian cedis, and columns (3) is the number of mobile banking transactions - all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Appendix

A Compliance

A.1 Group leader training session

Compliance by treatment arm is shown in Appendix Table A26 at the individual level. 100% of group members offered the individual incentive agreed to it, as did 100% of the group leaders offered the referral incentive. As a result, all women in the Incentive arm complied with their assigned treatment. Non-compliance is only present in the leader training attendance within the Endorsement arm. 36 out of 59 group leaders in the Endorsement arm attended the group training, or 61% of them. As a result, 66% of women in the Endorsement arm were in a group where the leader attended the training and so are considered to have fully complied with their assigned treatment.

Since the only factor that affected compliance was the group leaders attendance at the training session, we examine whether the characteristics of the leader predict whether she attended this training or not in Appendix Table A27. Note that since only 57 group leaders were invited to the intensive training and completed the endline survey, this regression is not well-powered. We do not find any significant predictors of whether the leader attended the training.[29] However, it does appear that those who attended training are 16 percentage points more likely to have secondary schooling, 8 percentage points more likely to be married, have businesses nearly 3 years older, are 10 percentage points more likely to have heard of opportunity mobile and are 6 percentage points less likely to be impatient. Given our low power for this analysis, this suggests there could be systematic differences between leaders who did and didn't attend the training.

Enumerators assessed the group leader competence at mobile banking during the training session so that we could assess how good the training was at teaching mobile banking and the leaders at picking up different skills. For the 36 group leaders who attended the training, summary statistics for their ability to carry out different transactions are captured in Appendix Table A28. The group leaders showed high competence in carrying out transactions, with 92% able to perform a deposit, 86% a withdrawal and 97% knowing the number needed to access the mobile banking application. Trained leaders were clear about the benefits of mobile banking, mentioning 3.4 on average and no one not mentioning

[29] Anecdotally, the trainings took place on one day only, so if the group leader could not attend that day there was no mechanisms for her to receive the training. We expect therefore that attendance is driven by whether the leader happened to be free or not on that day, rather than the group leader's characteristics. Leaders were compensated well for attending the training, so seemed to try to attend if they could.

any benefits (Table A29). Trained leaders were most confident with deposit and withdrawal transactions and balance checks, averaging over 2.6 on a 1-3 scale of confidence in carrying out these types of transactions (Table A30). Overall, leaders rated themselves 3.9 on a 1-5 scale of how comfortable they were with mobile banking.

A.2 Information session

An enumerator also verified the topics covered during the information sessions provided to all group members at the group meeting. The set of possible topics covered alongside the probability that each of the group leader in the Endorsement arm and relationship officer in the Incentive arm covered that topic in the information session are shown in Appendix Figure 5. Generally, we see similar topics covered in the information session regardless of whether the group leader or relationship officer conducted the session, though relationship officers were more likely to cover most of the topics.

Further, at endline we asked the group leaders about the amount of training and support they provided to their group on mobile banking. Summary statistics for this are shown in Appendix Table A31, along with the different from a t-test of equality of those leaders invited who did and didn't attend the training. Peer leaders who attended the train were almost 40 percentage points more likely to show their group how to use opportunity mobile compared to leaders who did not attend the training. They were also much more comfortable training others, rating themselves 4.6/10 compared to 1.1/10 for those who didn't attend the training. Interestingly, those who attended the training were more likely to ask for help with Opportunity Mobile from their credit officer. They were significantly more likely to report being comfortable answering questions, by 2 points on a 10 point scale. Finally, those who attended training were 40 percentage points more likely to encourage group members to use opportunity mobile. Overall, this suggests the training was effective in giving group leaders the skills and encouragement they needed to support their fellow group members in mobile banking.

B Additional tables and figures

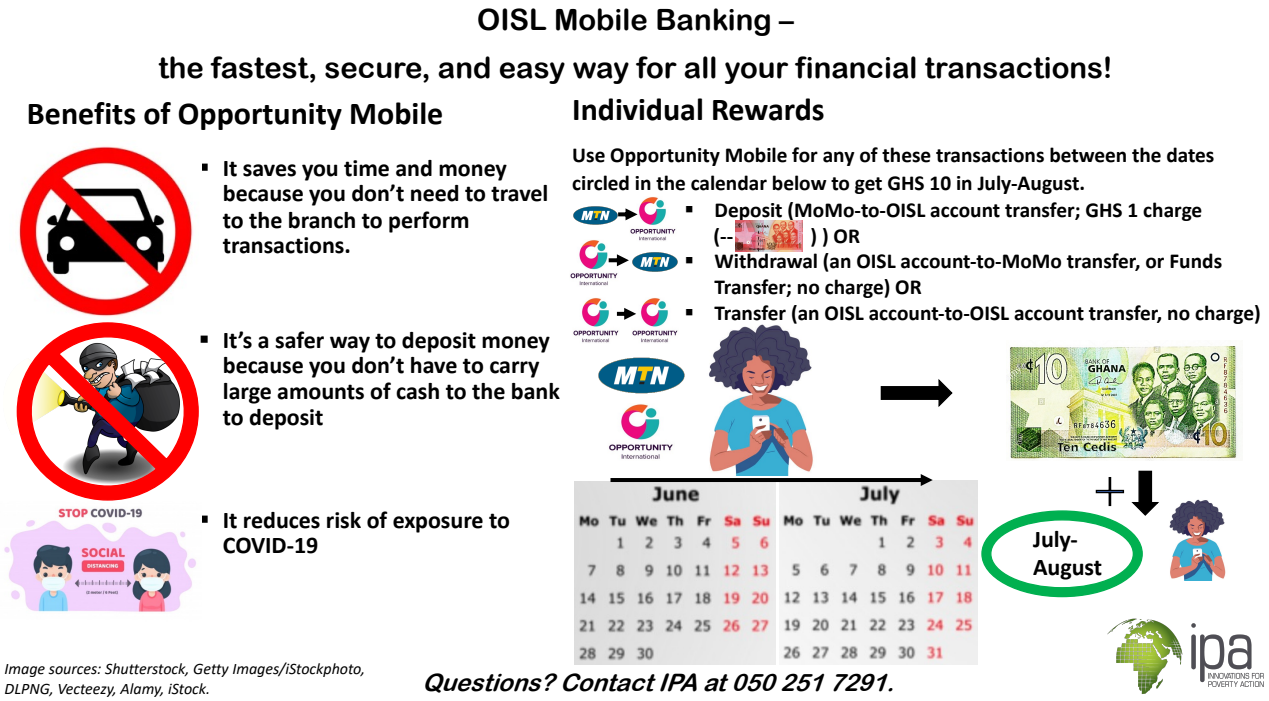


Figure 1: Flyer provided explaining the individual incentive

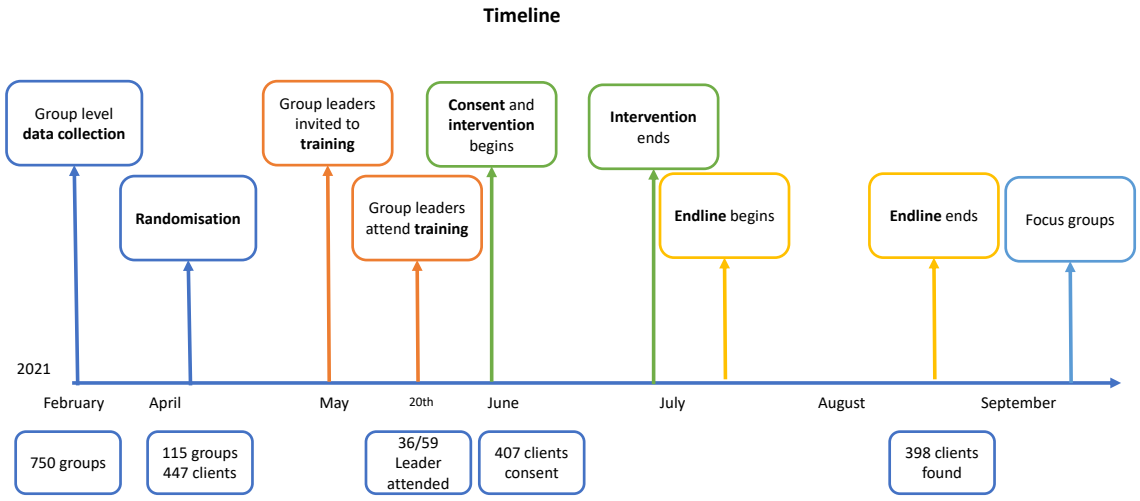
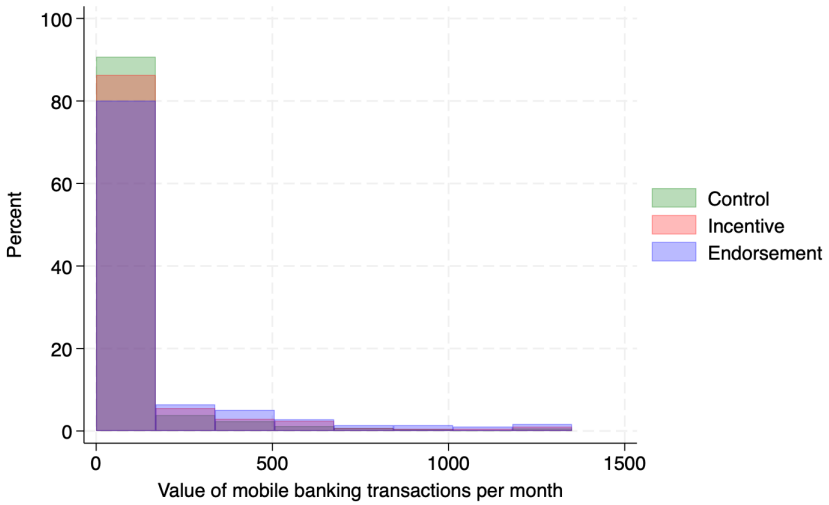
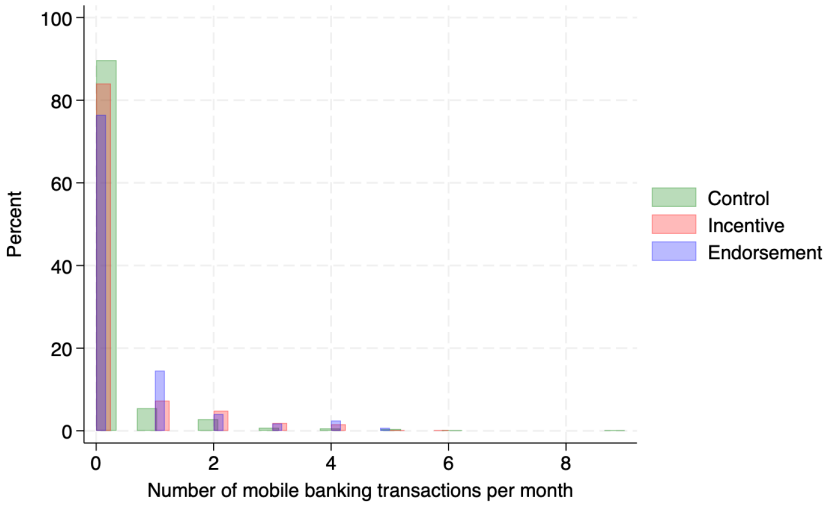


Figure 2: Timeline



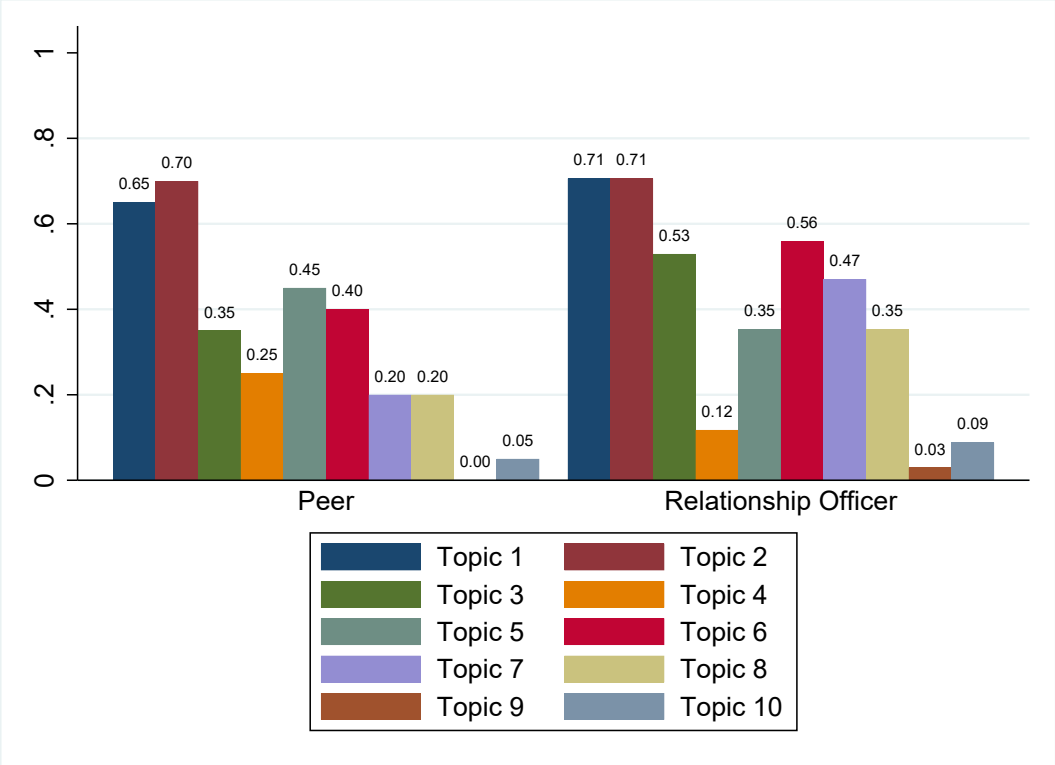
Average value of transactions per month, Ghanian Cedis, July-Dec 2021, by treatment arm

Figure 3: Histogram of the value of mobile banking transactions per month by treatment arm



Average number of transactions per month, July-Dec 2021, by treatment arm

Figure 4: Histogram of the number of mobile banking transactions per month by treatment arm



Topics: 1) what OM is, 2) benefits of OM, 3) how to register for OM, 4) reset PIN, 5) balance check, 6) MoMo deposit, 7) withdrawal/funds transfer, 8) account-to-account transfer, 9) PIN change, 10) Mini statement

Figure 5: Topics Covered in information session about mobile banking, by group leader and credit officer

Table A1: Leader and group member characteristics differences

	Group Members Mean	Group Leader Mean	Difference	N
Age in years	44.17	45.69	1.520	397
			(1.236)	
Children Under 5	0.663	0.574	-0.0889	397
			(0.0970)	
Children between 6-12	0.970	1.106	0.136	397
			(0.117)	
Children between 13-18	1.030	1.128	0.0980	397
			(0.125)	
Business Duration in months	106.9	124.4	17.52	395
			(14.82)	
No School	0.122	0.0745	-0.0476	397
			(0.0331)	
Primary Education	0.238	0.160	-0.0780*	397
			(0.0451)	
Secondary Plus education	0.640	0.766	0.126**	397
			(0.0518)	
Married	0.587	0.670	0.0828	397
			(0.0563)	
Risk (Incentised) Above Median	0.444	0.404	-0.0395	396
			(0.0583)	
Impatient	0.531	0.606	0.0750	397
			(0.0581)	
Hyperbolic	0.145	0.0957	-0.0495	397
			(0.0366)	
Loan Amount	160.6	153.4	-7.200	355
			(34.75)	
Account Balance	0.873	0.932	0.0592*	355
			(0.0338)	
Heard MB	0.786	0.828	0.0415	397
			(0.91)	
Registered MB	0.472	0.447	-0.0251	397
			(0.0589)	
Used MB (report)	0.073	0.064	-0.009	397
			(0.029)	
Used MB (admin)	0.109	0.181	0.0719*	397
			(0.0437)	

Differences in characteristics between group leaders and group members. The mean for each variable for group members is shown in column (1) and for leaders in column (2). Column (3) shows the coefficient on the difference between the leaders and group members. Each row is a separate regression. Account variables are missing for those 42 members who joined the group between the randomisation and consent taking place. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Attrition by treatment arm

	(1) Attrition
Incentive	0.020
	(0.020)
Endorsement	0.017
	(0.015)
Observations	407
Control mean	0.009
Incentive = Endorsement	0.874

*Notes: Attrition defined as not surveyed in the endline survey. Regression controls for strata fixed effects. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A3: Predictors of Attrition

	(1) Attrition
Heard MB	-0.097***
	(0.036)
Used MB (report)	-0.009
	(0.013)
Leader Used MB	-0.041**
	(0.018)
Nearby Agent	0.036*
	(0.021)
Distance to Agent	0.040
	(0.030)
Distance to Branch	-0.008
	(0.017)
Uses MTN	0.003
	(0.030)
Used MB (admin)	0.011
	(0.017)
Meetings Weekly	-0.030
	(0.025)
Meetings Fortnighly	0.007
	(0.026)
Loan Amount	0.057
	(0.042)
Account Balance	0.020
	(0.017)
Outs. Principal Balance	-0.046
	(0.038)
Principal Arrears	0.027
	(0.024)
Observations	407
Joint p-value	0.926
F-statistic	0.519

Notes: Administrative and consent variables that predict attrition.

Table A4: Mobile Banking use during incentivsed period: Treatment effects with controls selected using Lasso

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Any Transaction		Value Transactions		No. Transactions		MoB Use Index	
Incentive	0.163**	0.202**	77.540	52.542	0.409	0.395	0.228	0.216
	(0.080)	(0.090)	(83.365)	(86.412)	(0.256)	(0.324)	(0.143)	(0.138)
Endorsement	0.314***	0.357***	191.595**	153.191*	0.561***	0.602**	0.395***	0.370***
	(0.061)	(0.071)	(91.663)	(79.790)	(0.204)	(0.288)	(0.104)	(0.102)
Observations	398	378	398	378	398	398	398	377
Controls		Lasso		Lasso		Lasso		Lasso
Control Mean	0.150	0.150	156.115	156.115	0.469	0.469	-0.000	-0.000
Incentive = Endorsement	0.056	0.048	0.119	0.168	0.529	0.295	0.211	0.183
Rank	11.000	21.000	11.000	24.000	11.000	17.000	11.000	26.000
Root MSE	0.404	0.418	587.925	536.245	1.264	1.196	0.770	0.703

*Notes: Columns (1) and (2) are a dummy variables for any use of mobile banking, columns (3) and (4) are the value of mobile banking transactions in Ghanian cedis, columns (5) and (6) are the number of mobile banking transactions, all defined on a monthly basis. Columns (7) and (8) are an index of mobile banking use capturing self-reported measures of registering for mobile banking, resetting the mobile banking pin, using mobile banking in the last month and the likelihood of using mobile banking in the future. Some control variables are missing for some observations, and so if selected the observations decreases. Rank shows the number of variables included in the regression. Root mean square error is included as a measure of model accuracy. All regressions include strata fixed effects and controls for mobile banking use at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A5: Effect of Treatment on Mobile Banking Use (self reported index)

	(1)	(2)	(3)	(4)	(5)
	MB Use Index	Travel Register OM	Travel Reset PIN	Used MB 30 Days	Likelihood Use MB
Incentive	0.227*	0.052	0.068*	0.017	0.511*
	(0.136)	(0.036)	(0.037)	(0.015)	(0.264)
Endorsement	0.391***	0.096***	0.026	0.045***	1.034***
	(0.099)	(0.032)	(0.018)	(0.016)	(0.225)
Observations	398	398	398	398	398
Control Mean	-0.000	0.027	0.009	0.000	1.540
Incentive = Endorsement	0.196	0.312	0.273	0.183	0.035

Notes: All regressions include strata fixed effects and control for mobile banking use at baseline. Column (1) is an index of columns (2)-(5). Travel to the bank branch to register or to reset the PIN are required if the woman was not already registered for mobile banking or forgot their PIN number. Used mobile banking in the last 30 days captures use after the end of the incentivised period only. Likelihood of using mobile banking is perception on a 1-5 scale of how likely they are to use mobile banking in the next 30 days. Standard errors in parentheses. p-values in square brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A6: Effect of Treatment on Mobile Banking Use during incentivised period by transaction type

	(1) Any transaction	(2) Any deposit	(3) Any withdrawal	(4) Value transactions	(5) Amount deposit	(6) Amount withdrawal	(7) No. transactions	(8) No. deposit	(9) No. withdrawal
Incentive	0.148**	0.173***	-0.027	18.153	62.107**	-33.564	0.338*	0.340**	-0.003
	(0.069)	(0.060)	(0.033)	(52.886)	(26.754)	(33.841)	(0.171)	(0.167)	(0.049)
Endorsement	0.267***	0.290***	-0.015	62.507	101.800***	-29.867	0.329***	0.321***	0.008
	(0.062)	(0.050)	(0.033)	(54.502)	(28.585)	(33.790)	(0.121)	(0.112)	(0.040)
Observations	398	398	398	398	398	398	398	398	398
Control Mean	0.106	0.071	0.035	105.575	54.708	38.088	0.319	0.283	0.035
Incentive = Endorsement	0.071	0.070	0.392	0.154	0.161	0.689	0.961	0.911	0.803

Notes: Administrative data. All regressions include strata fixed effects and controls for mobile banking use at baseline. Columns (1)-(3) are dummy variables for use of mobile banking, columns (4)-(6) are the value of mobile banking transactions in Ghanian cedis, and columns (7)-(9) are the number of mobile banking transactions. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A7: Mobile Banking adoption: Treatment effects with controls selected using Lasso

	(1) Any transaction	(2) Any transaction	(3) Value transactions	(4) Value transactions	(5) No. transactions	(6) No. transactions
Incentive	0.061**	0.037	34.135**	26.365	0.114*	0.119*
	(0.025)	(0.025)	(15.939)	(18.601)	(0.067)	(0.064)
Endorsement	0.116***	0.125***	81.236***	81.133***	0.158***	0.209***
	(0.025)	(0.025)	(19.309)	(19.405)	(0.059)	(0.061)
Observations	2388	2268	2388	2268	2388	2268
Controls		Lasso		Lasso		Lasso
Control Mean	0.103	0.103	46.599	46.599	0.201	0.201
Incentive = Endorsement	0.047	0.000	0.035	0.012	0.509	0.089
Rank	16.000	35.000	16.000	38.000	16.000	35.000
Root MSE	0.320	0.306	340.292	337.511	0.687	0.631

*Notes: Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Columns (1) and (2) are a dummy variables for use of mobile banking, columns (3) and (4) are the value of mobile banking transactions in Ghanian cedis, and columns (5) and (6) are the number of mobile banking transactions, all defined on a monthly basis. Note that some control variables are missing for some observations, and so if selected the observations decreases. Rank shows the number of variables included in the regression. Root mean square error is included as a measure of model accuracy. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A8: Effect of Treatment on Mobile Banking adoption by transaction type

	(1) Any transaction	(2) Any deposit	(3) Any withdrawal	(4) Value transactions	(5) Amount deposit	(6) Amount withdrawal	(7) No. transactions	(8) No. deposit	(9) No. withdrawal
Incentive	0.061**	0.061**	0.003	29.910**	26.521**	0.000	0.114*	0.121**	-0.007
	(0.025)	(0.025)	(0.009)	(14.167)	(13.364)	(.)	(0.067)	(0.058)	(0.029)
Endorsement	0.116***	0.117***	-0.003	62.258***	58.268***	0.000	0.158***	0.173***	-0.015
	(0.025)	(0.025)	(0.008)	(14.642)	(13.772)	(.)	(0.059)	(0.051)	(0.030)
Observations	2388	2388	2388	2388	2388	2388	2388	2388	2388
Outcome at baseline	yes	yes	yes	yes	yes	yes	yes	yes	yes
Control Mean	0.103	0.097	0.007	46.046	44.369	0.000	0.201	0.176	0.025
Incentive = Endorsement	0.047	0.041	0.436	0.050	0.039	.	0.509	0.382	0.647

Notes: Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Columns (1)-(3) are dummy variables for use of mobile banking, columns (4)-(6) are the value of mobile banking transactions in Ghanian cedis, and columns (7)-(9) are the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A9: Mobile Banking adoption: Treatment effects by month

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.076**	39.285**	0.140**
	(0.035)	(16.238)	(0.063)
Endorsement	0.068**	28.689**	0.114**
	(0.028)	(13.769)	(0.056)
Incentive × Aug	0.003	32.719	0.105
	(0.038)	(27.565)	(0.070)
Incentive × Sep	0.024	-10.066	-0.023
	(0.041)	(24.752)	(0.073)
Incentive × Oct	-0.032	-33.626	-0.089
	(0.044)	(30.566)	(0.104)
Incentive × Nov	-0.072	-36.456	-0.027
	(0.054)	(30.282)	(0.120)
Incentive × Dec	-0.016	-8.821	-0.121
	(0.053)	(29.380)	(0.106)
Endorsement × Aug	0.093***	54.469***	0.171***
	(0.030)	(16.210)	(0.063)
Endorsement × Sep	0.072**	31.590	0.031
	(0.034)	(19.745)	(0.062)
Endorsement × Oct	0.063	60.418**	0.098
	(0.040)	(29.470)	(0.104)
Endorsement × Nov	0.024	41.330	-0.019
	(0.047)	(28.813)	(0.100)
Endorsement × Dec	0.033	13.607	-0.019
	(0.045)	(24.071)	(0.097)
Aug	0.018	14.177***	0.062***
	(0.012)	(5.180)	(0.023)
Sept	0.018	24.097**	0.106***
	(0.012)	(9.407)	(0.039)
Oct	0.053**	45.407**	0.204**
	(0.025)	(19.873)	(0.081)
Nov	0.124***	70.779***	0.257***
	(0.036)	(19.527)	(0.091)
Dec	0.088***	49.602***	0.257***
	(0.032)	(16.860)	(0.081)
Observations	2388	2388	2388
Control Mean July	0.053	12.035	0.053
Incentive = Endorsement	0.821	0.549	0.686

*Notes: Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A10: Effect of treatment on saving outcomes (survey)

	(1) Total Savings	(2) Net Savings	(3) Savings MoMo	(4) Financial Satisfaction	(5) Account Balance
Incentive	16.314	-105.735	2.407	-0.226	-11.855
	(191.753)	(69.219)	(15.816)	(0.196)	(55.801)
Endorsement	75.729	45.431	19.287	0.136	24.182
	(151.572)	(72.967)	(14.407)	(0.175)	(50.645)
Observations	398	398	398	398	398
Control Mean	942.062	86.115	17.876	2.894	148.675
Incentive = Endorsement	0.747	0.020	0.299	0.025	0.366

*Notes: Columns (1)-(4) are survey outcomes measured in July and August 2021, 1 month after the end of the intervention. Column (5) is administrative data for July 2021, approximately 1 month after the end of the intervention. Column (1) is total self-reported savings in all forms. Column (2) is deposits minus withdrawals from all saving forms in the last 30 days. Column (3) is savings with mobile money. Column (4) is a 1-5 scale of financial satisfaction. Column (5) is the end of month saving balance in the OISL bank account. All regressions include strata fixed effects. Column (5) controls for the baseline value of account savings. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A11: Mechanisms: Treatment effects with controls selected using Lasso

	(1) MB Knowledge Index	(2) MB Knowledge Index	(3) Trust MB	(4) Trust MB	(5) Fraud Confidence Index	(6) Fraud Confidence Index	(7) Peer Effects Index	(8) Peer Effects Index	(9) Preferences Index	(10) Preferences Index
Incentive	0.171*	0.176**	-0.013	0.001	-0.024	-0.055	0.276	0.197	0.030	-0.066
	(0.086)	(0.079)	(0.080)	(0.076)	(0.147)	(0.142)	(0.234)	(0.209)	(0.133)	(0.092)
Endorsement	0.235***	0.237***	-0.035	-0.002	0.363***	0.396***	0.649***	0.559***	0.072	0.010
	(0.068)	(0.064)	(0.077)	(0.073)	(0.118)	(0.116)	(0.218)	(0.202)	(0.106)	(0.079)
Observations	398	396	398	396	398	378	398	396	398	395
Controls	None	Lasso	None	Lasso	None	Lasso	None	Lasso	None	Lasso
Control Mean	0.000	0.000	4.841	4.841	-0.000	-0.000	-0.000	-0.000	0.000	0.000
Individual = Leader	0.365	0.336	0.773	0.964	0.006	0.000	0.124	0.091	0.694	0.318
Rank	11.000	22.000	11.000	21.000	11.000	22.000	11.000	20.000	11.000	25.000
Root MSE	0.492	0.474	0.611	0.587	0.845	0.773	1.554	1.500	0.639	0.548

*Notes: Control variables selected using lasso in even columns. Note that some control variables are missing for some observations, and so if selected the observations decreases. Rank shows the number of variables included in the regression. Root mean square error is included as a measure of model accuracy. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. All regressions include strata fixed effects and control for mobile banking use at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A12: Mechanisms: Knowledge of Mobile Banking Index components

	(1) Knowledge Index	(2) Knowlegde Transact	(3) Heard MB	(4) Confidence MB
Incentive	0.171*	0.171*	0.121*	1.175
	(0.086)	(0.091)	(0.072)	(0.778)
Endorsement	0.235***	0.282***	0.259***	2.097***
	(0.068)	(0.067)	(0.053)	(0.572)
Observations	398	398	398	398
Control Mean	0.000	0.000	0.646	3.469
Incentive = Endorsement	0.365	0.149	0.024	0.204

Notes: Column (1) is composed of columns (2)-(4). Column (2) is composed of 5 questions about what kinds of transactions can be carried out with mobile banking. Column (3) is a dummy variable if the respondent had heard of OISL mobile banking and column (4) is a 1-10 scale of confidence using OISL mobile banking. All regressions include strata fixed effects and control for mobile banking use at baseline. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table A13: Mechanisms: the fraud confidence index Index components

	(1) Fraud Confidence Index	(2) Fraud Scenario Index	(3) Less Worried Fraud	(4) Unlikely Experience Fraud	(5) Not Worried Experiencing Fraud	(6) Confident Detect Fraud
Incentive	-0.024	-0.088	0.076	0.482	0.730	0.299
	(0.147)	(0.085)	(0.585)	(0.573)	(0.649)	(0.725)
Endorsement	0.363***	0.042	1.988***	1.470***	2.072***	1.581***
	(0.118)	(0.063)	(0.485)	(0.438)	(0.503)	(0.543)
Observations	398	398	398	398	398	398
Control Mean	-0.000	-0.003	4.841	4.310	4.265	5.434
Incentive = Endorsement	0.006	0.130	0.000	0.074	0.032	0.049

Notes: Column (1) is composed of columns (2)-(6). Column (2) is an index of 5 scenarios coded as correct if the respondent knew how to handle a fraudulent situation. Column (3) is a 1-10 scale of how worried the respondent is about losing money to fraud, reverse coded such that higher scores indicate less worry. Columns (4)-(6) are 1-10 scales of how likely a respondent thinks it is they'll experience loss from fraud fraud (reverse coded), whether they are worried about experiencing loss from fraud (reverse coded) and how confident they are in detecting fraud. All regressions include strata fixed effects and control for mobile banking use at baseline. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table A14: Mechanisms: Peer Index components

	(1) Peer Effects Index	(2) Know MB In Group	(3) Know MB Out Group	(4) Received Help	(5) Helped someone
Incentive	0.276	0.074**	-0.042	-0.002	0.022
	(0.234)	(0.030)	(0.040)	(0.004)	(0.019)
Endorsement	0.649***	0.154***	0.010	0.024**	0.022
	(0.218)	(0.039)	(0.040)	(0.010)	(0.016)
Observations	398	398	398	398	398
Control Mean	-0.000	0.000	0.088	0.000	0.009
Incentive = Endorsement	0.124	0.068	0.100	0.026	0.990

Notes: Column (1) is composed of columns (2)-(5). Columns (2) and (3) are whether the respondent knows someone else in or outside their microfinance group who uses mobile banking. Column (4) is a dummy variable if the respondent received any help in using mobile banking in the last 30 days and column (5) if they offered any help to use mobile banking in the last 30 days. All regressions include strata fixed effects and control for mobile banking use at baseline. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table A15: Mechanisms: Preferences Index components

	(1) Preferences Index	(2) Prefer MB to Cash now	(3) Prefer MB to Cash 2 weeks	(4) WTP MB: Rice	(5) WTP MB: Cola	(6) WTP MB: Soap	(7) WTP MB: Haircut
Incentive	0.030	0.081	0.024	-0.069	0.013	-0.052	0.002
	(0.133)	(0.084)	(0.086)	(0.081)	(0.093)	(0.092)	(0.093)
Endorsement	0.072	0.024	0.051	-0.011	0.041	0.015	0.059
	(0.106)	(0.060)	(0.072)	(0.075)	(0.081)	(0.078)	(0.082)
Observations	398	398	398	398	398	398	398
Control Mean	0.000	0.381	0.584	0.434	0.398	0.407	0.363
Incentive = Endorsement	0.694	0.422	0.703	0.452	0.731	0.413	0.449

Notes: Column (1) is composed of columns (2)-(7). Column (2) captures whether the person chose mobile money or cash when offered equal amounts now (incentivised). Column (3) is whether the person chose mobile money or cash when offered equal amounts in 2 weeks time (unincentivised). Columns (4)-(7) are dummies capturing if someone is willing to pay more to purchase an item as mobile money instead of cash. All regressions include strata fixed effects and control for mobile banking use at baseline. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table A16: Mobile Banking adoption: Heterogeneity by own prior use of mobile banking

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.038	13.156	0.083
	(0.039)	(16.553)	(0.080)
Endorsement	0.109***	54.565***	0.102**
	(0.032)	(16.684)	(0.047)
Incentive × Any transaction	0.208	150.764*	0.246
	(0.147)	(84.820)	(0.474)
Endorsement × Any transaction	0.064	66.367	0.430
	(0.162)	(86.028)	(0.541)
Any transaction	0.494***	229.128***	1.223***
	(0.135)	(66.149)	(0.420)
Observations	2388	2388	2388
Control Mean | het=0	0.045	18.788	0.057
Heterogeneity Mean	0.125	0.125	0.125
Inc. = Endorse	0.141	0.274	0.646

*Notes: Individual adoption of mobile banking during the 6 months after the incentives ended (Jul-Dec 2021). Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions - all defined on a monthly basis. Any transaction is a dummy variable for whether the woman had used mobile banking before at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A17: Mobile Banking adoption: Robustness to controlling for group leader prior use of mobile banking

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.060	29.593	0.112
	(0.045)	(20.275)	(0.102)
Endorsement	0.113***	60.858***	0.150
	(0.042)	(20.778)	(0.099)
Observations	2388	2388	2388
Control Mean	0.103	46.046	0.201
Incentive = Endorsement	0.151	0.077	0.640

*Notes: Controls for group leader prior use of mobile banking. Individual adoption of mobile banking during the 6 months after the incentives ended (Jul-Dec 2021). Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions - all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A18: Mechanisms: Robustness to controlling for group leader prior use of mobile banking

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Incentive	0.171*	-0.013	-0.025	0.276	0.030
	(0.087)	(0.079)	(0.146)	(0.235)	(0.133)
Endorsement	0.235***	-0.037	0.360***	0.647***	0.071
	(0.069)	(0.076)	(0.119)	(0.219)	(0.107)
Observations	398	398	398	398	398
Control Mean	0.000	4.841	-0.000	-0.000	0.000
Incentive = Endorsement	0.367	0.753	0.005	0.128	0.702

*Notes: Controls for group leader prior use of mobile banking. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. All regressions include strata fixed effects and control for mobile banking use at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A19: Mechanisms: Heterogeneity by group leader prior use of mobile banking

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Incentive	0.144	-0.009	-0.119	0.479**	0.078
	(0.094)	(0.085)	(0.158)	(0.227)	(0.144)
Endorsement	0.226***	-0.045	0.310**	0.806***	0.127
	(0.075)	(0.087)	(0.124)	(0.208)	(0.114)
Incentive × Leader Used MB	0.251	-0.044	0.873***	-1.860**	-0.435
	(0.213)	(0.248)	(0.295)	(0.863)	(0.263)
Endorsement × Leader Used MB	0.091	0.053	0.474	-1.395	-0.475**
	(0.167)	(0.178)	(0.348)	(0.895)	(0.216)
Leader Used MB	-0.054	0.192	-0.179	1.243*	0.461**
	(0.143)	(0.124)	(0.211)	(0.711)	(0.214)
Observations	398	398	398	398	398
Control Mean	0.003	4.832	0.050	-0.099	-0.060
Heterogeneity Mean	0.123	0.123	0.123	0.123	0.123
Inccentive = Endorsement	0.396	0.721	0.228	0.304	0.864

*Notes: All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. Leader Used MB is a dummy variable for if the group leader had ever used mobile banking services at baseline. All regressions include strata fixed effects and control for mobile banking use at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A20: LATE: Instrumental variable regression of compliance on Mobile Banking adoption Outcomes

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Complied Incentive	0.066**	32.634**	0.121*
	(0.026)	(14.339)	(0.068)
Complied Endorsement	0.180***	96.557***	0.245***
	(0.040)	(23.244)	(0.092)
Observations	2388	2388	2388
Control Mean	0.103	46.046	0.201
Incentive = Endorsement	0.002	0.004	0.143

*Notes: Impact of compliance with the treatments on mobile banking adoption outcomes, where compliance is instrumented with assignment to treatment. For the Individual treatment, compliance required accepting the incentive, which everyone did (100% compliance). For the Endorsement intervention, compliance required the group leader to attend the intensive training session, which 36/59 leaders did. Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A21: LATE: Instrumental variable regression of compliance on Mechanisms

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Complied Incentive	0.181**	-0.014	-0.008	0.304	0.033
	(0.086)	(0.081)	(0.149)	(0.231)	(0.133)
Complied Endorsement	0.365***	-0.054	0.563***	1.007***	0.112
	(0.106)	(0.117)	(0.186)	(0.337)	(0.163)
Observations	398	398	398	398	398
Control Mean	0.000	4.841	-0.000	-0.000	0.000
Incentive = Endorsement	0.038	0.689	0.001	0.024	0.541

*Notes: Impact of compliance with the treatments on mechanisms, where compliance is instrumented with assignment to treatment. For the Individual treatment, compliance required accepting the incentive, which everyone did (100% compliance). For the Endorsement intervention, compliance required the group leader to attend the intensive training session, which 36/59 leaders did. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. All regressions include strata fixed effects and control for mobile banking use at baseline. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A22: Treatment effects on Mobile Banking adoption outcomes by group leader training attendance

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.058**	29.088**	0.109*
	(0.026)	(14.252)	(0.066)
Endorsement attended	0.140***	68.001***	0.203***
	(0.029)	(16.639)	(0.063)
Endorsement didn't attend	0.064*	47.605*	0.052
	(0.039)	(25.943)	(0.098)
Observations	2388	2388	2388
Control Mean	0.103	46.046	0.201
Endorsement attended = Endorsement didn't attend	0.069	0.485	0.126

*Notes: Endorsement intervention split by whether the group leader attended the training session, which 36/59 leaders did. Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A23: Treatment effects on mechanisms by group leader training attendance

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Incentive	0.173**	-0.011	-0.026	0.285	0.034
	(0.087)	(0.079)	(0.146)	(0.233)	(0.133)
Endorsement attended	0.302***	0.009	0.341**	0.895**	0.184
	(0.082)	(0.083)	(0.158)	(0.360)	(0.136)
Endorsement didn't attend	0.199***	-0.062	0.371***	0.514**	0.010
	(0.071)	(0.091)	(0.131)	(0.224)	(0.111)
Observations	398	398	398	398	398
Control Mean	0.000	4.841	-0.000	-0.000	0.000
Endorsement attended = Endorsement didn't attend	0.117	0.452	0.848	0.314	0.141

*Notes: Endorsement intervention split by whether the group leader attended the training session, which 36/59 leaders did. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. All regressions include strata fixed effects and control for mobile banking use at baseline.Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A24: Mobile Banking adoption: Treatment effects interacted with group role

	(1) Any transaction	(2) Value transactions	(3) No. transactions
Incentive	0.036	7.255	0.039
	(0.045)	(16.093)	(0.095)
Endorsement	0.083**	36.703**	0.062
	(0.040)	(16.366)	(0.084)
Incentive* group leader	0.136**	124.830**	0.409***
	(0.059)	(55.331)	(0.154)
Endorsement* group leader	0.144***	97.598**	0.417***
	(0.054)	(38.318)	(0.122)
Group leader	-0.084**	-23.377	-0.247**
	(0.042)	(23.430)	(0.101)
Observations	2388	2388	2388
Control Mean group leader	0.079	49.627	0.119
Control Mean group member	0.109	45.228	0.219
Incentive = Endorsement	0.269	0.068	0.801
Incentive leader = Endorsement leader	0.881	0.639	0.947

*Notes: Group leader is a dummy variable for being the leader of the microfinance group at baseline. Long run administrative outcomes for the 5 months following the intervention. Outcomes at the monthly level, pooled over all months. All regressions include strata fixed effects, control for mobile banking use at baseline and include month dummies. Column (1) is a dummy variables for use of mobile banking, column (2) is the value of mobile banking transactions in Ghanian cedis, and column (3) is the number of mobile banking transactions, all defined on a monthly basis. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A25: Mechanism: Treatment effects interacted with group role

	(1) Knowledge Index	(2) Trust MB	(3) Fraud Confidence Index	(4) Peer Effects Index	(5) Preferences Index
Incentive	0.215**	-0.017	0.042	0.289	0.069
	(0.087)	(0.079)	(0.145)	(0.265)	(0.150)
Endorsement	0.231***	-0.040	0.359***	0.514**	0.046
	(0.072)	(0.079)	(0.130)	(0.212)	(0.120)
Incentive* group leader	-0.240	0.017	-0.360	-0.072	-0.218
	(0.170)	(0.210)	(0.308)	(0.403)	(0.203)
Endorsement* group leader	-0.031	0.084	-0.053	0.473	0.086
	(0.120)	(0.168)	(0.222)	(0.353)	(0.163)
Group leader	0.141	-0.202*	0.211	0.025	0.024
	(0.099)	(0.109)	(0.195)	(0.186)	(0.128)
Observations	398	398	398	398	398
Control Mean group leader	0.116	4.667	0.127	0.071	0.037
Control Mean group member	-0.027	4.880	-0.029	-0.016	-0.009
Incentive = Endorsement	0.824	0.775	0.021	0.382	0.845
Incentive leader = Endorsement leader	0.176	0.762	0.245	0.235	0.108

*Notes: All regressions include strata fixed effects and control for mobile banking use at baseline. All columns are indices except column (2), which is a 1-5 scale. The knowledge index captures knowledge about and confidence in performing mobile banking transactions, the trust scale is self-assessed trust in OISL, the fraud confidence index captures knowledge and confidence in dealing with fraud, the peer effects index captures interaction with others about mobile banking and the preferences index captures incentivised measures of choosing digital payments over cash and unincentivised measures of willingness to pay for goods with cash or mobile money. Clustered standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table A26: Compliance with the intervention

	Partial Compliance	Full Compliance	Total
Incentive	0	96	96
	(0.00)	(100.00)	(100.00)
Endorsement	63	126	189
	(33.33)	(66.67)	(100.00)
Total	63	222	285
	(22.11)	(77.89)	(100.00)

Notes: Observations at individual client level. Percentage out of row's total in parentheses. 113 individuals in control group not displayed in table. In the Individual treatment group, full compliance required individuals to accept incentives and for the group to receive training, partial compliance required individuals to accept incentives but no training to be provide to the group, non-compliance required the individual to reject incentives (we have no non-compliance). In the Endorsement group, full compliance required individuals to accept incentives and the group's leader to have attended the training session and accepted incentives. Partial compliance required the individual and the group leader to have accepted incentives but the group leader to not have attended their training session. Non-compliance required the individual and/or group leader to reject incentives (we have no non-compliance)

Table A27: Predictors of Group leader training attendance

	Did not attend training	Attended Training	Difference	N
Age in years	45.09	47.06	1.966 (2.992)	57
No Schooling	0.0455	0.0286	-0.0169 (0.0535)	57
Primary Education	0.227	0.0857	-0.142 (0.103)	57
Secondary Education or above	0.727	0.886	0.158 (0.111)	57
Married	0.545	0.629	0.0831 (0.136)	57
HH size	5.364	5.286	-0.0779 (0.828)	57
Business Duration (months)	103.2	137.7	34.48 (34.12)	57
Heard OM	0.818	0.917	0.0985 (0.0959)	58
Used MB	0.0909	0.0833	-0.00758 (0.0780)	58
Impatient	0.636	0.571	-0.0649 (0.135)	57
Hyperbolic	0.0909	0.114	0.0234 (0.0830)	57

Notes: Administrative and individual variables that predict lead attendance at the intensive training. Column (1) shows the mean amongst leaders who did not attended the training, column (2) the mean amongst those who did attend the training and column (3) shows the difference (standard error in brackets) between those who attended and those who didn't attend the training. Each row is a separate regression. Heard OM and Used MB were asked at consent, hence why we have 1 more observation for these compared to the other variables, which were asked at endline, by which point one leader had attrited.

Table A28: Group leader comprehension checks at training: Ability to do transactions

	N	Mean	SD	Min	10th p.	Median	90th p.	Max
Carry out Deposit Transaction	36	0.917	0.280	0	1	1	1	1
Carry out Balance Check	36	0.861	0.351	0	0	1	1	1
Number Access OM	36	0.972	0.167	0	1	1	1	1

Notes: Observations at individual Leader level for the 36/59 Leaders who attended the intensive training. Outcomes are dummy variables, except for "Number of Benefits Mentioned".

Table A29: Group leader comprehension checks at training: Benefits of Mobile banking

	Benefits							
	N	Mean	SD	Min	10th p.	Median	90th p.	Max
Save money and time	36	0.917	0.280	0	1	1	1	1
Safer way to deposit	36	0.806	0.401	0	0	1	1	1
Reduce exposure to Covid	36	0.444	0.504	0	0	0	1	1
Top-ups, deposits and withdrawals	36	0.667	0.478	0	0	1	1	1
Easier to save	36	0.500	0.507	0	0	1	1	1
Easier to keep track of money	36	0.028	0.167	0	0	0	0	1
Keep business money separate	36	0.000	0.000	0	0	0	0	0
None	36	0.000	0.000	0	0	0	0	0
Number of Benefits Mentioned	36	3.361	0.990	2	2	3	5	6

Notes: Observations at individual Leader level for the 36/59 Leaders who attended the intensive training. Outcomes are dummy variables.

Table A30: Group leader comprehension checks at training: Confidence using mobile banking

	Confidence							
	N	Mean	SD	Min	10th p.	Median	90th p.	Max
Leader								
MoMo deposit	36	2.750	0.500	1	2	3	3	3
Withdrawal/payment	36	2.667	0.632	1	2	3	3	3
Balance check	36	2.722	0.615	1	2	3	3	3
Airtime top-up	36	2.556	0.607	1	2	3	3	3
Funds transfer	36	2.250	0.874	1	1	3	3	3
Balance check	36	2.833	0.447	1	2	3	3	3
Change PIN	36	2.417	0.770	1	1	3	3	3
Overall Comfort	36	3.861	0.798	2	3	4	5	5

Notes: Observations at individual Leader level for the 36/59 Leaders who attended the intensive training. Outcomes are on a 1 to 3 scale, wherein 1 is "Not confident" and 3 is "Confident".

Table A31: Endline leader checks - Attended versus didn't attend Training

	Attended		Not attend				
	Mean	SD	Mean	SD	Difference	Standard Error	p value
Show Group how to use OM	0.600	0.497	0.227	0.429	-0.373	0.128	0.005
Comfortable Trainign Others	4.629	4.138	1.091	2.635	-3.538	0.990	0.001
Ask for Help from CO	0.429	0.502	0.182	0.395	-0.247	0.126	0.056
Times Helped	0.600	0.976	0.364	1.136	-0.236	0.283	0.407
Comfortable Answering Questions	2.571	3.890	0.636	2.194	-1.935	0.910	0.038
Encourage Group to Use OM	0.714	0.458	0.318	0.477	-0.396	0.127	0.003
Observations	35		22		57		

Notes: Outcomes asked at endline to group leaders. Observations at group leader level. Attended means the group leader attended the training session. Not attend means the group leader did not attend the training session. Outcomes are dummy variables, except for "Times Helped", "Comfortable Training Others", and "Comfortable Answering Questions". "Times Helped" is number of times peer helped a group member. "Comfortable Training Others" and "Comfortable Answering Questions" are on a 1 to 10 scale, where 1 is "very uncomfortable" and 10 is "very comfortable". Two leaders were not found at the endline survey (one who attended the training and one who didn't).