Smartphone Ownership, Economic Empowerment and Women's Property Rights: Experimental Evidence from Malawi*

Philip Roessler†, Tanu Kumar‡, Shreya Bhattacharya§,
Peter Carroll¶, Boniface Dulani‖, and Daniel Nielson**

December 30, 2023

Abstract

One of the most important technological advances over the last quarter-century has been the global diffusion of mobile phones. Yet, important inequities in digital rights persist. In many low-income countries, women are significantly less likely to own smartphones than men. We report the results of a large-scale randomized controlled trial (n=1,500) in Blantyre, Malawi that aims to better understand the causal impact of reducing the mobile gender gap and effective strategies to bolster women's property rights over smartphones. We target our intervention to married women who at the outset of the study did not own a mobile phone. Participants were randomly assigned to one of four treatment groups: individual smartphone treatment; couples smartphone treatment; cash; and control. We are thus able to identify the effects of mobile connectivity on women's economic well-being, household bargaining, and empowerment, benchmarked to the cash equivalent value of the smartphones. In the couples' treatment, women participants received the handsets, but their husbands were also invited to the phone distribution to take part in a training program designed to increase acceptance of women's use of smartphones, property rights over the device, and men's public recognition of those rights in front of other community members. Drawing on data collected 9 months after the intervention, we estimate the impact of smartphone ownership and couples' training on women's household bargaining power, empowerment, and community beliefs about the rights of women to own and use smartphones. Our research thus provides important insights into the influence of household and social factors on the effects of digital technologies in low-income countries—and mechanisms to strengthen digital rights for women.

Keywords: Digital Rights; Technology; Smartphones; Economic Empowerment; Norms

JEL classification: J16, L96, O12, O33

---

*This study was implemented in partnership with the Institute of Public Opinion and Research (IPOR) based in Zomba, Malawi and the Girls Empowerment Network (GENET) based in Blantyre, Malawi. We are grateful for funding from a 2019 Bill & Melinda Gates Foundation, Grand Challenges Call to Action Award, the University of Texas-Austin, and Women's Economic Empowerment and Digital Finance (WEE-DiFine) Initiative at BRAC Institute of Governance and Development (BIGD), Brac. We are grateful for feedback from participants at the BRAC Institute of Governance and Development conference, "Making Digital Financial Services Work for Women", June 2023, the Annual Meeting of the American Political Science Association, August 2023 and the IPA Research Gathering 2023. IRB approval was obtained from William & Mary (PHSC-2021-09-28-15230) and University of Malawi Research and Ethics Committee (P.09/20/25). Our pre analysis plan is available at the AEA registry (https://www.socialscienceregistry.org/trials/7845)

† William & Mary, proessler@wm.edu. Corresponding author
‡ Claremont Graduate University, tanu.kumar@cgu.edu
§ Digital Inclusion and Governance Lab, William & Mary, sbhattacharya@wm.edu
¶ University of Michigan, Ann Arbor, peterpc@umich.edu
‖ Institute of Public Opinion and Research (IPOR), bdulani@ipormw.org
** University of Texas, Austin, daniel.nielson@austin.utexas.edu

1 Introduction

One of the most important technological advances over the last half-century has been the global diffusion of mobile phones. Since Motorola engineer, Martin Cooper, made the first cell phone call in New York City in 1973, there are now more than 5.5 billion unique mobile subscribers worldwide.[1]With the advent of the smartphone, the mobile phone has transformed from a portable phone to the dominant gateway billions of people use to access the internet and internet-based applications—from social media and entertainment to advanced digital financial services and weather forecasting.

Despite the exponential increase in mobile connectivity since 1973, significant disparities in mobile phone ownership exist. In many low-and-middle income countries, women are significantly less likely to own a mobile phone compared to men. For example, according to Afrobarometer surveys across 39 countries between 2021 and 2023, men are nearly 20 percent more likely to report owning a phone that can access the internet compared to women.[2] The mobile gender gap is even higher in South Asia and the Middle East. Limited levels of smartphone ownership and use by women not only reflect existing gender inequalities, but also threaten to worsen them.

We address this socio-economic problem fielding one of the first large-scale randomized controlled trials on smartphone uptake in a low-income country, targeting women non-phone owners. Our study analyzes four fundamental questions.

- How do new smartphone adopters use the technology? And what are its effects on end-users' technical efficacy, or capabilities to enact their preferences?
- What is the causal impact of smartphone technology on economic well-being? As significant as the smartphone revolution has been the world over, we lack well-identified estimates of its economic and social impact.
- How do the technological benefits of owning a smartphone compare to receiving the equivalent value of the handset as an unconditional cash grant? A large and influential literature points to the efficacy and cost-effectiveness of providing households with cash that they can allocate according to their priorities and needs. Comparing smartphones to a cash benchmark thus provides an opportunity to better understand the mechanisms by which mobile technology affects household economic growth relative to an infusion of financial capital.
- What are effective strategies to strengthen women's *digital rights*—that is, their property rights and control over smartphones—to ensure they possess the capabilities to reap benefits from emerging technologies and can fully participate in increasingly digitalized societies?

[1] See GSMA Intelligence dataset https://www.gsmaintelligence.com/data/

[2] 50.8% of males report owning a mobile handset that can access the internet compared to 42.4% of females

To address these questions, in early 2021 working with the Institute of Public Opinion and Research (IPOR) and the Girls Empowerment Network (GENET) we fielded an RCT in Blantyre, Malawi with 1,500 married women who, at the time, did not personally own a mobile phone. Participants predominantly came from low-income households, with only 30% of respondents reporting their household possessed at least one mobile phone at baseline (compared to the country average of 64.6%). Participants were randomly assigned to one of four treatment groups:

- Control (n=300)
- Cash (n=400)—an unconditional cash grant the equivalent value of the smartphone, around $70 USD
- Individual Smartphone (n=400)—provision of SIM card and entry-level smartphone (itel A16+) to the participant as well as training on how to use the smartphone, mobile money and WhatsApp;
- Couples Smartphone (n=400)—identical to the Individual condition except the participant's spouse was also required to attend the training to jointly learn how to use the new technology while also affirming women's property rights over the phone.

In both the Individual and Couples conditions, SIM cards and smartphones were provided and registered to the women participants. They key difference was that in the Couples treatment, the participant's spouse also attended the smartphone distribution and training program.

Our treatment conditions enable us to directly test two main hypotheses on the effects of mobile technology on economic and social change.

Our first hypothesis is that providing women with smartphones combined with training on how to use the smartphone will increase their technical capabilities to enact their own preferences. Here, both access to the phones and the ability to use them contribute to technical efficacy.

H1. Smartphone + digital literacy → ability to enact preferences

Our second hypothesis focuses on the benefits of increasing husbands' acceptance of the digital rights of their wives (and women more generally). We anticipated that the husbands' attendance at the mobile phone distribution and training—the Couples condition—would lead to the largest shifts in favor of their wives' control of mobile technology through two channels. The first is through beliefs about how women use smartphones and fears that they may use them in a way that harms households' or husbands' reputations. Attending trainings should shift husbands' beliefs here by a) providing information about the many financially beneficial and non-threatening use cases of a smartphone; b) demonstrating, through women's questions and engagement in the trainings, the different non-threatening and financially beneficial use cases in which women are interested; and c) developing common knowledge in group trainings about these use cases. The second is via beliefs that there will be social costs for husbands who

do not allow women to control the use of the phone. We hope to shift these beliefs by asking husbands present at the trainings to agree that their wives will retain control of the phones. We expect that making these agreements will be followed because it will help construct a shared understanding that women have an equal right to own phones and it is socially unacceptable for husbands to appropriate their wives' handsets. Moreover, because agreements are made in the presence of others, there will be an expectation of community-level enforcement. Overall, we expect that shifting husbands' beliefs will give women stronger property rights over the phones and increase its impact on their DFS use and uptake—above and beyond the technical efficacy intervention—and it will ensure that when others in the household use the phone they are more likely to do so for productive purposes.

H2. Smartphone + digital literacy + husbands' support for women's digital rights → ability to enact preferences + stronger property rights over smartphone

About nine months after the intervention in April 2022, we conducted in-person surveys with 94% of participants to measure midline effects on a range of pre-registered outcomes: phone ownership; mobile money use and financial inclusion; individual income and savings; household consumption; and intra-household cooperation.

We found that both the Individual and Couples conditions were effective in increasing women's mobile phone ownership and technical efficacy through greater mobile connectivity (e.g., access to the internet and social media), use of digital financial services, and financial inclusion based on a series of self-reported survey questions and two behavioral measures: of phone ownership (whether the participant had a handset on their person during the midline) and realized financial inclusion (based on whether participants, when offered a small payment at the end of the midline survey, chose 3000 Malawi Kwacha in mobile money or 1500 Malawi Kwacha in cash, and whether the MM payment was sent to one's own wallet). As expected, the smartphone intervention increased women's mobile phone ownership—with 62% in Individuals, 58% in Couples, 18% in Cash, and 11% in Control having a phone in their possession at the midline.[3] The smartphone intervention also resulted in higher levels of realized financial inclusion—whether or not a woman has access to her own mobile money account that she uses to send and receive payments and store money. Those in Individuals and Couples were, respectively, 27 and 32 percentage points (pp) more likely to accept MM payment and have sent to their wallet than Control and Cash. (Cash group was essentially same as Control). These gains in technical efficacy, however, had mixed effects on economic well-being, at least in the short-run, and varied by smartphone treatment regimen: whereas Couples experienced significant increases in household consumption compared to Control, Individuals realized larger gains in weekly income. Overall, the smartphone interventions significantly shifted how

[3] As we discuss below, self-reported measures of owning a phone are higher across all groups. This is likely a function of social desirability bias but also handset sharing—in which the participant owns the phone but someone else was using it at the time we interviewed participants at the midline survey. This discrepancy, between self-reported phone ownership and revealed phone ownership, was highest in the Couples condition.

women conceive of mobile technology—appreciating its benefits for improving one's livelihood and and access to financial services—but most predominantly continue to value the technology for its social benefits (e.g., to maintain social ties and stay in touch with family and friends).

In contrast to the smartphone intervention, the cash grants led to a distinct economic pathway. Cash transfer recipients tended not to invest in mobile technology. Instead, and consistent with previous cash transfer studies, participants used their grants to buy food but also as capital to support micro-enterprise, leading to more market trading and a large source of income from sale of cooked goods, cash crops, and business. After nine months, the cash transfers produced more consistent and robust economic gains than the smartphones. Compared to Control, members of the Cash group had significantly higher individual savings, household consumption, and loan support— potentially supporting their micro-enterprise.

We interpret the contrasting outcomes generated by the cash grants and smartphones as reflecting the differential impact of capital and technology on household economic growth. While cash grant participants were able to readily use the lump-sum transfers to overcome financial constraints that keep low-income individuals from starting micro-enterprises and securing additional credit, the technological benefits accruing from smartphone ownership—digital financial services, access to the internet, online social networking, and use of the handset to communicate with customers and clients—appear to have led to more incremental gains, at least after nine months. Whether, over time, these technological advantages generate increasing returns leading to more substantial economic gains will be evaluated after endline data collection planned for early 2024 (or more than 32 months after treatment).

In terms of women's digital rights, we observe that the Individual treatment proved just as effective as the Couples condition in mobile phone retention and use, after nine months. Given the costs and logistical challenges of ensuring couples' participation in the mobile phone programs, this is an important policy finding. But we feel it is premature to draw strong conclusions on hypothesis 2 until we collect another round of data collection, in which we will not only re-survey participants but also plan to interview participants' spouses to more directly ascertain support for women's mobile phone use. At midline, we did observe that those in the smartphone groups became more attuned to social resistance to women's digital rights, based on a set of questions asking participants the degree to which men and women support women's phone ownership and spouses' respect women's property and phone rights. This is important as it underscores the value of normative change, not only for supporting technological access, but also for sustaining handset retention and use. At midline, program participants did not place much credence in community-level enforcement to protect women's property rights. Instead, participants in the smartphone and cash groups were more likely to look for help from an NGO—and GENET specifically which conducted the training programs—if a woman's spouse tried to take an item that belongs to her. Thus rather than inculcating self-enforcement among community members, the trainings administered by a Blantyre-based NGO (GENET) may have increased reliance on this external entity.

Our paper contributes to several different strands of literature. First, we contribute to the nascent but growing scholarship on mobile technology's effects on economic well-being. To the best of our knowledge,

our study is among the first to compare the effects of a smartphone intervention with a similarly valued cash intervention, where a smartphone can be used not just for mobile money, but also for accessing the internet and internet-based applications. Roessler et al. (2021), in their mobile phone experiment in Tanzania, find smartphones generated significant consumption gains, which were operationalized through women's control and use of the handsets after a longer treatment period (13 months vs 9 months in our current paper). We improve on their study in several ways: 1.) institute a cash treatment the equivalent value of the smartphone (rather than a feature phone, as was the case in the Tanzania study); 2.) a simpler design that improves clarity of interpretation; and 3.) compares the efficacy of individual versus couples training.[4]

Second, we shed light on the different economic pathways spurred by mobile technology versus unconditional cash grants. Whereas smartphones enabled greater mobile connectivity, mobile money use, and financial inclusion, it did not in the short-run seem to catalyze entrepreneurial activity to the same degree as the cash grants. This latter finding is in line with Haushofer and Shapiro (2016) and McKenzie (2017), who find recipients tend to convert cash transfers into financial capital to support micro-enterprises that they otherwise would not be able to start. Additionally, we find that cash transfers and smartphones are more likely to help mitigate short term scarcity and shocks. This is in line with previous findings from (Batista and Vicente, 2018; Aiken et al., 2023; Berry, DizonRoss and Jagnani, 2020; Jack and Habyarimana, 2018; Lipscomb and Schechter, 2018), where rural households who receive such transfers or are in possession of mobile money accounts find it far easier to cope with weather shocks and experience a reduction in the episodes of hunger experienced by families in treated locations, as well as improved access to medicines and school supplies, particularly two years after mobile money became available.

We find an increase in realized financial inclusion through a behavioral mobile money measure among our smartphone arms, thus contributing to the growing literature on the economic and social impact of the use of digital financial services in emerging economies. Access to mobile money in lowincome countries is found to increase remittances (Jack, Ray and Suri, 2013; Batista and Vicente, 2020; Lee et al., 2021); boost household consumption (Munyegera and Matsumoto, 2016; Lee et al., 2021); enable risk sharing and smoothing consumption in response to shocks (Batista and Vicente, 2020; Riley, 2018; Abiona and Koppensteiner, 2022; Ahmed and Cowan, 2021) and induce more efficient allocation of labour (Chiara, Valentina and Luca, 2019; Lee et al., 2021). Welfare gains from mobile money are found to be especially strong for female-headed households (Suri and Jack, 2016*a*) and for women microfinance recipients who

[4] In the Tanzania study, the largest household consumption gains were concentrated among women participants who still possessed the smartphone at endline and reported using the handset jointly with their husbands—motivating the Couples training in our Malawi study. Midline results in the Malawi study provide a degree of validation of the Couples training, as it led to a significant increase in household consumption over the control group. Interestingly, however, the strongest income effects were in the individuals and not the couples treatment. This points to a potential trade-off between between the Couples and Individuals treatments—whereas the former delivered stronger household gains, the latter delivered stronger individual gains. The patterns are by no means conclusive and may just be noise. This requires additional investigation at endline.

control their own mobile money accounts (Riley, 2019). One key finding is the benefits accruing to female-headed households and women via greater discretion and privacy mobile money affords (Riley, 2022; Suri and Jack, 2016*b*). However, mobile money uptake and use is highly conditional on mobile phone ownership (Roessler et al., 2021), which remains uneven between men and women in many low-income countries, especially in the case of smartphones. Yet, this part of the causal chain—mobile phone adoption and retention—has generally been understudied, despite its importance as the primary gateway to the digital economy for billions of end-users. Beyond our previous study in Tanzania (Roessler et al., 2021), there have been no RCTs on mobile phone ownership and its effects on livelihoods and access to information, which our paper helps to shed light on.

Finally, our study provides some initial insights into norms around women's technology use and property rights. We find perceptions of increasing resistance to women's phone use, similar to Alozie and Akpan-Obong (2017), which finds evidence that education, traditionalism, and domesticity are barriers for women's access to ICTs in six countries in Sub Saharan Africa. While household bargaining, which is deeply rooted in prevailing social, economic and cultural structures, is difficult to change, it may be possible to strengthen women's control of smartphones by shifting their and, perhaps as importantly, their husbands' beliefs about women's phone use and ownership. As argued by Barboni et al. (2018), one of the main issues preventing families from letting women keep the phones are worries about what others believe women will do with the phones and whether they will be exposed to ideas and opportunities that threaten their perceived loyalty to their husbands. It may be possible to shift these beliefs through collective, community-level discussion of the appropriateness and fairness of women owning phones and collective agreements that they should be allowed to do so. Field et al. (2021), for example, find that providing women with individual bank accounts and trainings on their use lead them to become more accepting of female work and induced their husbands to perceive fewer costs to having a wife who works. Furthermore, changing community level beliefs (i.e., norms) may also lead to community-level informal enforcement of women's property rights surrounding the phone. At midline, we observed that participants tended to look outside of their immediate villages—likely to the NGO that provided the trainings in the first place—for enforcement of women's property rights.

2 Background and Methods

In this section, we outline the details of our experimental design, including recruitment of participants, blocking and assignment to treatment. Study participants were recruited by our Malawibased partners, the Girls Empowerment Network [5] and the Institute of Public Opinion and Research [6]. GENET Malawi is an NGO based in Blantyre, Malawi, whose mission is to advance the rights, status, health, and overall well-

[5] (GENET, https://www.facebook.com/GENETMalawi/)

[6] (IPOR, http://www.ipormw.org)

being of marginalized girls and young women since 2008. GENET works with schools, churches, and other community-based organizations to form networks of girls and young women. It has, therefore, a substantial network of women in the Blantyre area. IPOR is a research organization that has been engaged in social science research, surveys, and public opinion polls across the country since 2013.

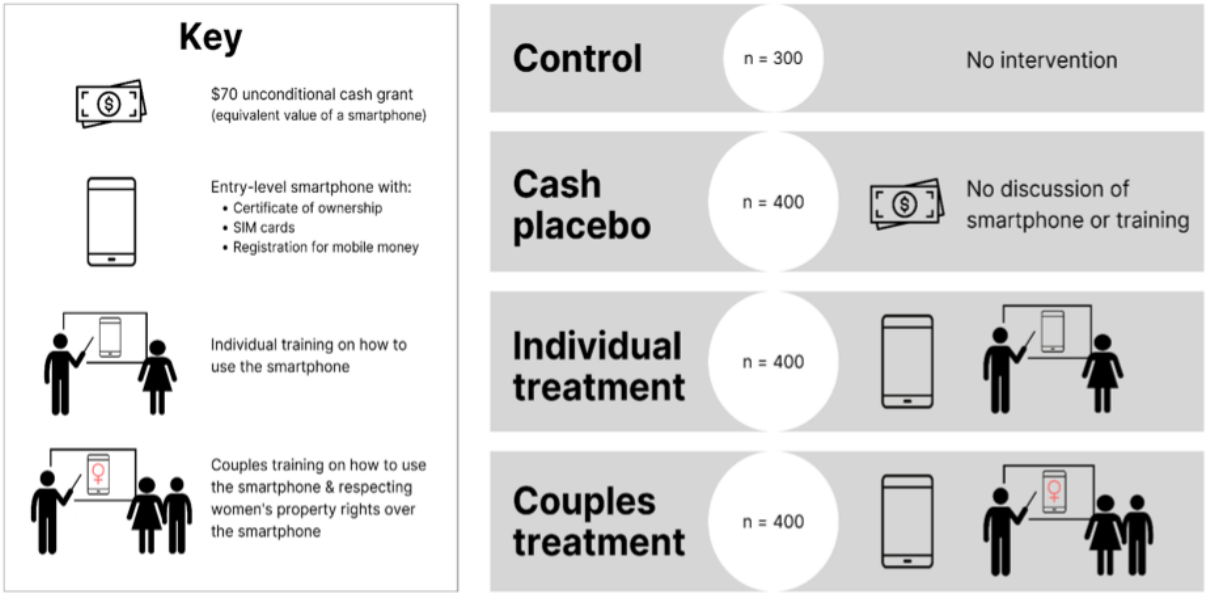
To recruit participants, we employed data from the Malawi 2018 Census and the Fourth Integrated Household Survey (2016-2017) to identify areas with a large percentage of low-income households (as measured through indicators on phone ownership, food security, and home construction) and high population density. Twenty such areas were identified, with one-third from urban areas and two-thirds from rural parts of the district. The aim was to recruit between 50-150 women from each area (depending on population size) into the study. GENET and IPOR, which regularly do such programming in Malawi, engaged with local leaders and local government for assistance in identifying low-income married women in the areas in which recruitment took place. Local officials provided a list of the contact phone numbers of the eligible households.

Our target study sample size was 1,500, but we recruited 2,466 women for screening. Once we had the contact numbers of eligible participants, IPOR conducted a screening phone survey in which participant consent for the survey was first obtained. After the consent, participants were asked a series of five questions about the village they were from, age, marital status, husband co- residence, household assets, including personal mobile phone ownership, and familiarity with COVID-19. Participants that were over the age of 18, married, and did not personally own a mobile phone were eligible for the study and enumerators continued on with the full baseline survey that covered a broad range of socio-economic background variables, mobile phone use indicators, individual economic livelihoods, household livelihoods, and household decision- making. For those not eligible for the study, enumerators thanked them for participating and stated that this concluded the survey questions.

It is important to note that our target individuals for the study sample were women in households that have one or no phone for two adult-income earners. (Only 30% of participants reported a mobile phone in the household at baseline.) With the addition of a smartphone at intervention, some treatment couples will have two phones.

The study team first employed focus groups to refine the intervention in terms of phone distribution, phone training, and couples training on cooperative use. We also conducted a pilot study with 3 individual women and 3 couples to test and enhance the couples' training program. Figure 1 presents a summary of the intervention.

Figure 1: Details of the Intervention



3 Midline Data Collection and Descriptive Statistics

Our sample size at baseline was 1501 women with 400 participants assigned to the Couples smartphone group, 400 participants in Individual smartphone group, 400 participants in the Cash treatment and 300 participants in the Control.

Table A.1 reports the results from OLS regressions of baseline covariates on assignment to each treatment conditions, to check for statistical balance. Across all baseline covariates, mean levels in the Cash, Individual and Couples conditions are not statistically different from Control (the reference category).

In the midline survey, nine months after the original intervention, we were able to track 1,414 participants, or 94% of the sample.[7] In addition to attrition, we also check whether missingness in responses on our main outcomes are correlated with treatment. Generally they are not, as reported in Table A.2. One exception is on monthly consumption, in which those in the smartphone conditions are less likely to say they don't know on consumption baskets—and thus more likely to report their consumption. One possibility is that smartphones aided participants in tracking expenses or generally aided household accounting.

Figure 2 shows average phone ownership across treatment conditions, nine months after the initial intervention. As expected, we see large effects on phone ownership for both the Couples and Individual smartphone groups. Members of these groups are over 60 percentage points more likely than the Control to report owning a phone; moreover, many were still in possession of the itel smartphone provided during

[7] This included 95% of the Couples; 93.8% of the Individual group; 95.5% in the Cash, and 92.3% in the Control group.

distribution. We also find that in the Individual and Couples treatments, participants were more than 40 percentage points more likely than the Control group to have a phone on their person as observed by the enumerator. These effects show that recipients tended to keep the smartphones they received, rather than selling them or giving them away—at least after nine months.

Figure 2: Individual Phone Ownership at Midline after 9 Months

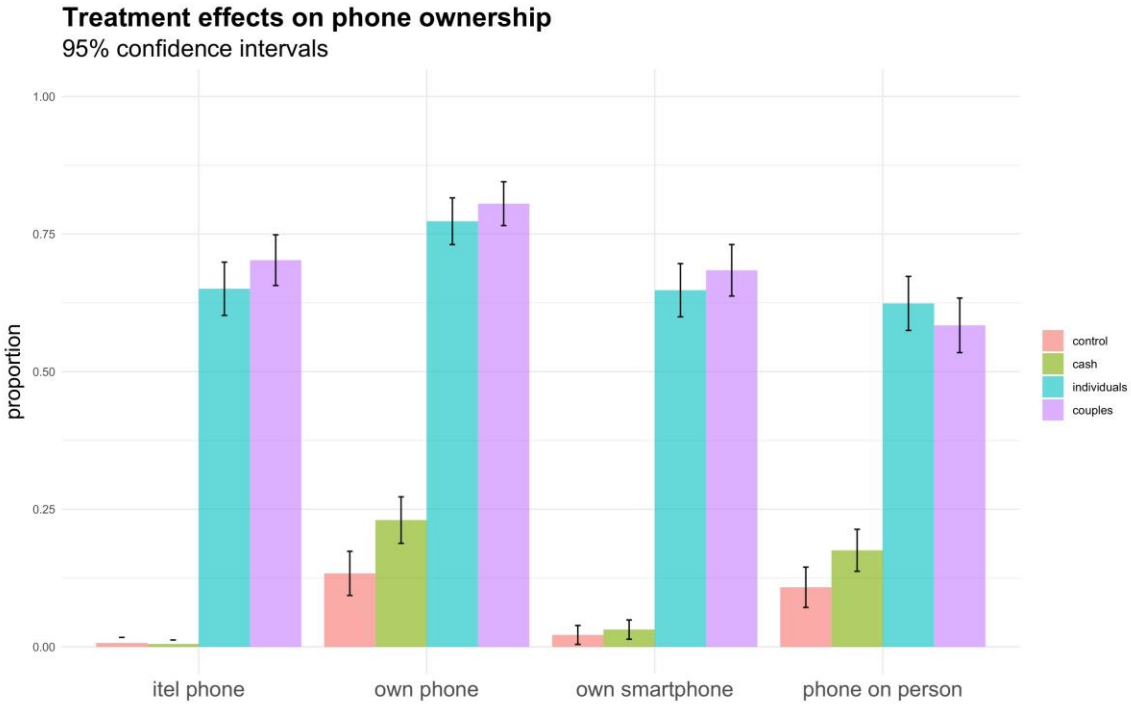


Figure 3: Self-Reported and Revealed Mobile Phone Ownership after 9 Months

	Do you personally own a phone? Yes	Do you have the phone with you now? Yes	Participant shows they are in possession of a phone
Control	13.4%	11.6%	10.8%
Cash	23.0%	18.6%	17.5%
Individuals	77.3%	66.4%	62.4%
Couples	80.5%	63.7%	58.4%

At the same time, we also observe a noticeable discrepancy among those in the smartphone conditions who report owning a phone at midline (75-80%), report they have the phone with them (63-66%), and actually are in possession of the handset (58-62%). (See Figure 3). Part of the discrepancy is

likely due in part to social desirability bias (i.e., participants chagrined they no longer have a mobile phone having received one nine months ago), but also could reflect handset sharing—in which the participant feels ownership of the phone but also allows others to use it.[8]

In asking participants in an open-ended question why they think it is important for women to have their own phones, most emphasize the value of maintaining social connections and communicating with friends and family. (See Figure 4). This is pretty consistent across all conditions—with a noticeable uptick in the smartphone conditions on staying in touch with friends. But we also observe a shift in perceptions about the technology's value for other use cases among those in Couples and especially Individual conditions. (See Figure 5)—pointing to an informational deficit on the economic value of the technology that begins to change with use.

In line with this last point, few in the Cash group reported using their cash grant to buy a mobile phone. Whereas some 53% of cash participants reported using the grant to invest in business capital, only 7% reported using it to buy a mobile phone—despite none owning even a basic phone at the outset of the study. Other more common uses of the cash grant were food (50%), home improvements (31%), and school for self or children (18%). Consistent with the Cash participants' self-reporting of using the grant for business capital, we observe that members of the Cash group are more likely to report market trading and to derive a larger source of their income from sale of cooked goods, cash crops, and business.

Figure 4: Perceived value of smartphones: Social and news

[8] One indication this is not just social desirability bias is that most (around 80%) who said they owned a phone but did not end up having a phone in their possession admitted they did not have the phone with them during the line of questioning (compare column 3 with column 2 in Figure 3), while around 20% insisted they had the phone on them up until we asked them to show us the handset (compare column 4 with column 3 in Figure 3).

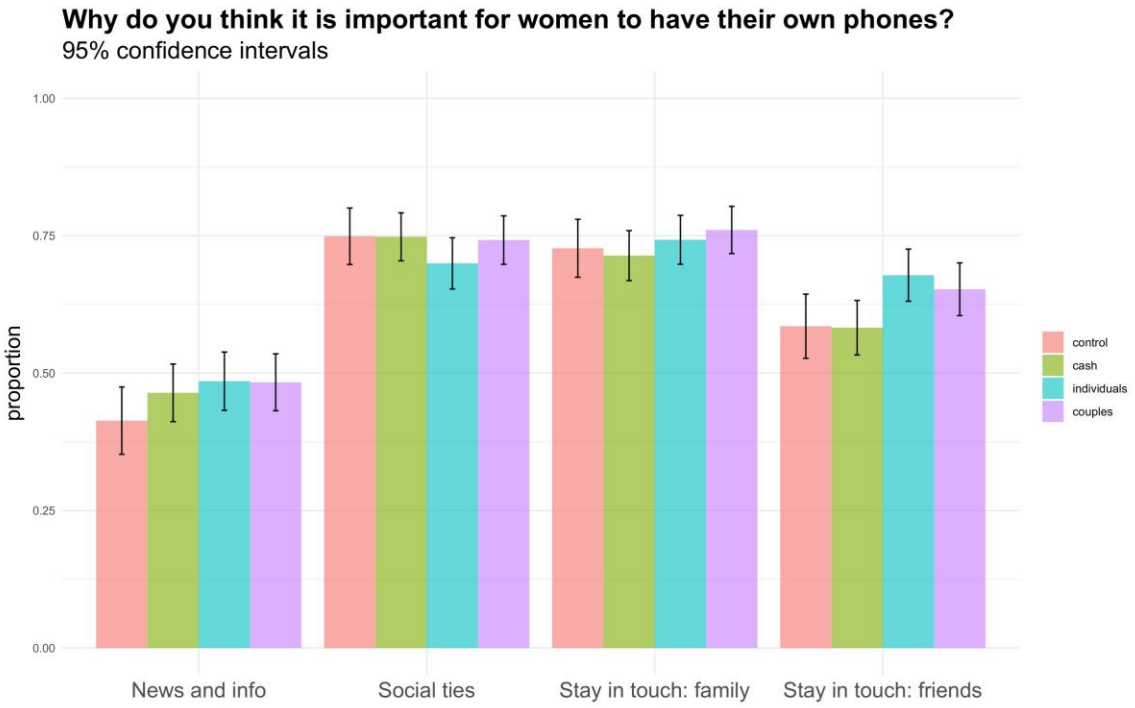
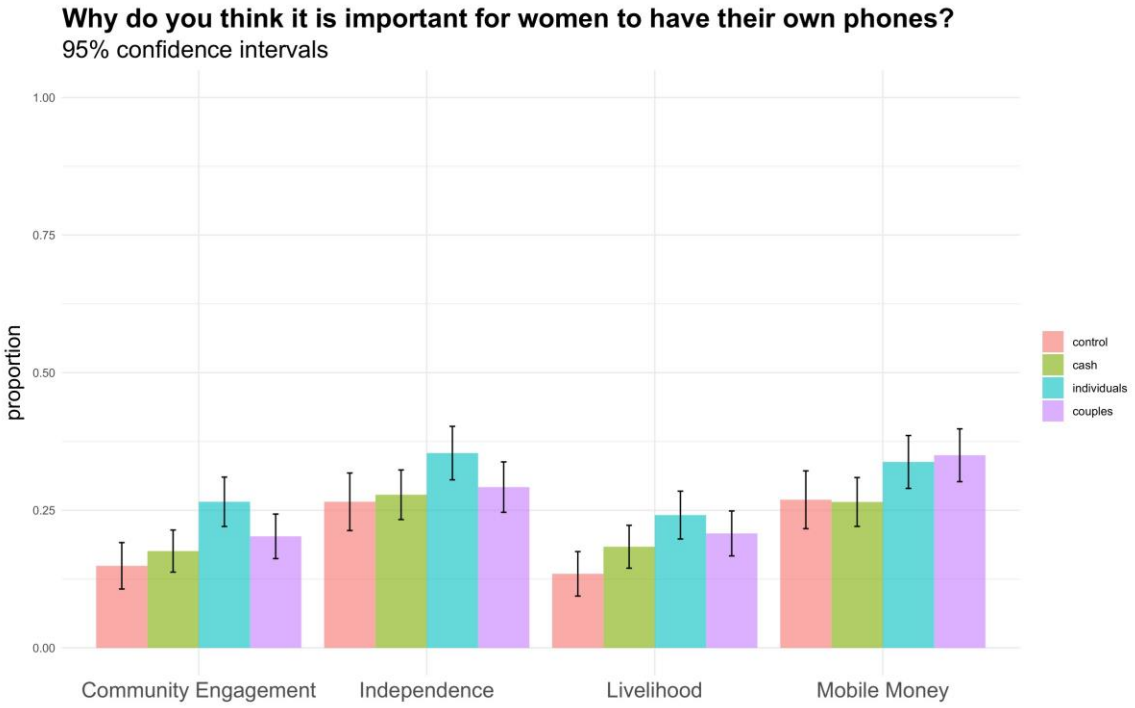


Figure 5: Perceived value of smartphones: Economic opportunities, community engagement, and autonomy



4 Empirical Strategy

We now turn to systematically assessing the effects of the treatments on our outcomes of interest. Our primary specification is the following:

$$Y = \beta_0 + \beta_1 Treatment + \gamma X + \epsilon \quad (1)$$

where β_1 is the coefficient indicating the treatment effect of the Couples, Individuals, or Cash treatments relative to the Control group. X is a vector of baseline characteristics including, but not limited to, age, age-squared, household size, monthly household income and blocking strata (education, location, and household phone ownership).

Following our pre-analysis plan, we use treatment assignment to estimate intention-to-treat (ITT) effects. To improve precision in estimation, we include the blocking strata (education, village development committee catchment area, and household phone ownership) using block-wise difference-in-means, baseline measures for each index (if available), and key covariates (baseline measures of previous phone use, household size, age, age squared, income, education and mobile money use) in our analyses. We use robust standard errors at the individual level, the unit of randomization.

One key set of pre-registered outcomes aim to capture the effects on individuals' technical efficacy to use digital financial services.[9] Lack of mobile phone ownership is one of the key barriers to mobile money use.[10] We employ both survey and behavioral measures of mobile money. Survey measures include questions about participant possession of a mobile money account, how often one uses mobile money to save money, and number of mobile money transfers personally sent and received in past month.

To supplement the self-reported indicators, we also administered a pre-registered behavioral measure of mobile money use. At the end of the midline, participants were offered a small payment to be paid on the spot: either 1500 Malawi Kwacha (US $1.87) if they chose payment in cash or 3000 Malawi Kwacha (US $3.75) if they chose payment via mobile money. We then recorded which mode participants chose; and, if they chose mobile money, whose account the money was transferred to. Our expectation was that if a participant was both fluent in the use of mobile money and possessed their own mobile money account, they would opt for mobile money to be sent to their own digital wallet. We thus consider this a useful measure of an individual's realized financial inclusion—whether or not a woman has access to her own transaction account that she uses to send and receive payments and store money.

Table A.1 in the appendix presents detailed descriptive statistics of our mobile money variables.

[9] Survey questions cover: whether the participant has a MM account; personal use of mobile money to save; mobile money preferred financial instrument; strength of preference for mobile money; frequency of mobile money use; count of mobile money services used; mobile loans taken out over past year; times sent mobile money in past month; and times received mobile money in past month.

[10] See survey data and policy reports by GSMA's Connected Women program that extensively addressees this problems.

We collate these individual indicators to create a composite index of mobile money use, employing inverse covariance weighting following Anderson (2008) and code from Samii (2016). Each standardized index has a mean of 0 and a standard deviation of 1. This method drops missing values.

To test potential effects on individual and household economic well-being, we collected data on individual and household savings, outstanding loans, individual income, and household consumption. The consumption module was adapted from Suri and Jack (2016*b*). It includes survey questions on recent spending across 15 different baskets, covering common items such as food, fuel, transportation, water, and electricity, as well as community functions and investment in education and healthcare. As these individual items are discrete and cover a wide range of expenditures, we expect their sum to be relatively insensitive to social desirability bias.

The final set of measures cover different dimensions of empowerment: social connectedness, access to information, household bargaining, intimate partner violence and norms of gender equality. We use inverse covariance weighting to construct indexes for these survey-based measures.

5 Results

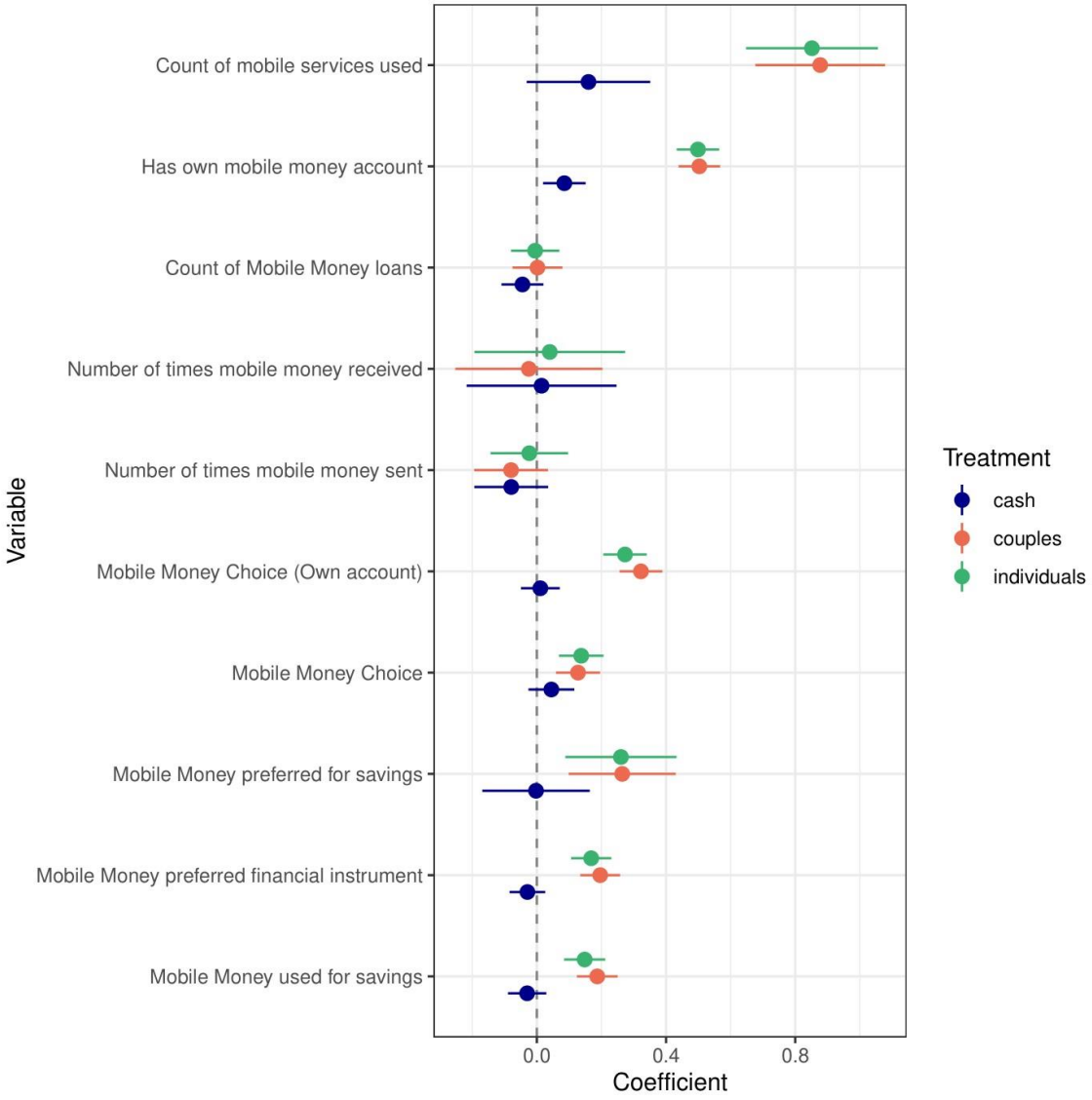
5.1 Uptake and use of mobile money

Figure 6 reports the results from both the survey and behavioral measures of mobile money . As expected, smartphone ownership increases mobile money capabilities, measured through an increase in number of mobile services used and mobile money accounts being the preferred instrument for savings. In the behavioral test, those assigned to the Couples and Individual conditions chose mobile money and had it sent to their accounts at a rate of 49% and 45%, respectively, compared to a control mean of 15%. In contrast, despite the sizable cash grant provided to the Cash group, we observe no statistically significant difference between Cash and Control on realized financial inclusion. This points to the importance of mobile technology and appropriate training for individual uptake and use of digital financial services vis-à-vis lump-sum transfers.

One important caveat, however, is that actual receipt of mobile money transfers, as reported by participants in our midline survey, was quite low. Overall, 85% reported not personally receiving any mobile money transfers over the previous month; even fewer actually sent transfers. This suggests that, despite their advances in mobile money technical efficacy, smartphone recipients were not actually sending and receiving more remittances. The actual use of technologies for digital financial inclusion may depend on the technologies and capabilities available to others in one's personal network.

The main barriers to more frequent mobile money use, as reported by participants at midline, was lack of awareness (24%), mobile network not being available (15%) and no mobile money agent in the vicinity (11%)

Figure 6: Treatment Effects on Uptake and Use of Mobile Money

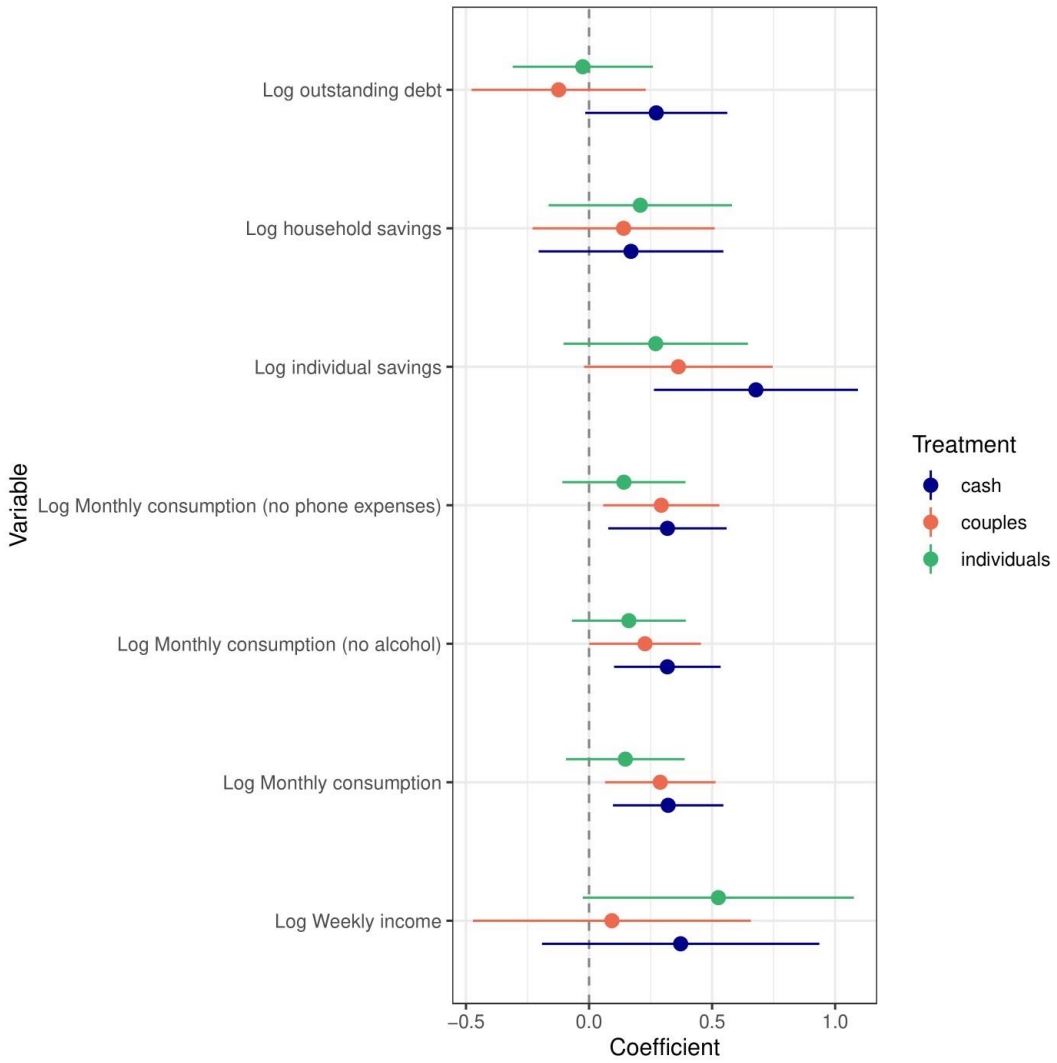


.

5.2 Economic well-being and household consumption

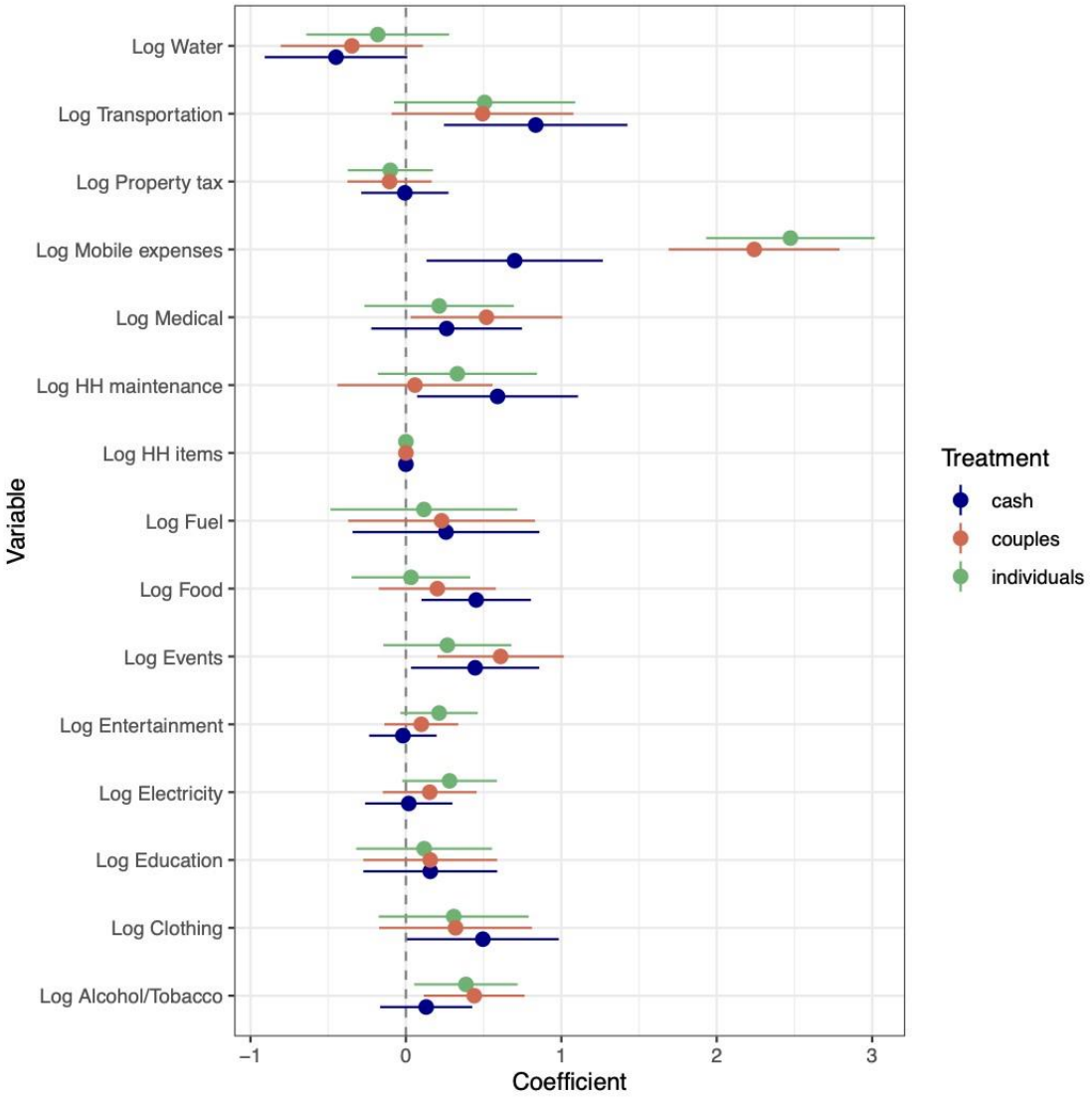
Figure 7 reports results on individual and household economic well-being. Broadly, we see an increase in log monthly consumption among the Cash and Couples conditions. We disaggregate these effects in Figure 8. The Cash recipients exhibit consumption increases across a number of different categories, including transportation, household maintenance, and food.

Figure 7: Treatment Effects on Consumption, Savings and Outstanding Loans



In contrast, after nine months, the consumption effects among the smartphone groups occur in a narrower range of categories. As expected, the smartphone groups are spending more on mobile expenses, such as airtime—pointing to the value they see in investing in mobile connectivity (which again contrasts with participants in the Cash group who forwent buying mobile phones altogether). The Couples group is also spending more on community events and healthcare. Spending on the former, such as weddings, funerals and other ceremonies and community activities, may be a function of smartphone recipients' greater social connectedness. We also see positive effects on transportation (but imprecisely measured), which may suggest phones increase physical mobility. We observed similar treatment effects on community events, healthcare, transportation, and mobile connectivity in Tanzania (Roessler et al., 2021), suggesting a certain consistency across different settings.

Figure 8: Household Spending across Different Baskets



Overall, however, the most robust economic gains were in the Cash group. In addition to a significant increase in household consumption, we also detect that Cash participants had significantly higher individual savings (but not household savings)—pointing to the likelihood that the women participants maintained control of the cash transfer rather than the household per se. (As noted, most report using the cash grant for business capital). Finally, Cash participants were more likely to have outstanding loans—but given their individual savings—this seems like "good" debt that they were taking on to support their micro-enterprise. In line with this, we do observe that those in the Cash groups became more active in village banking (i.e., village savings and loans groups), from where they reported receiving loans.

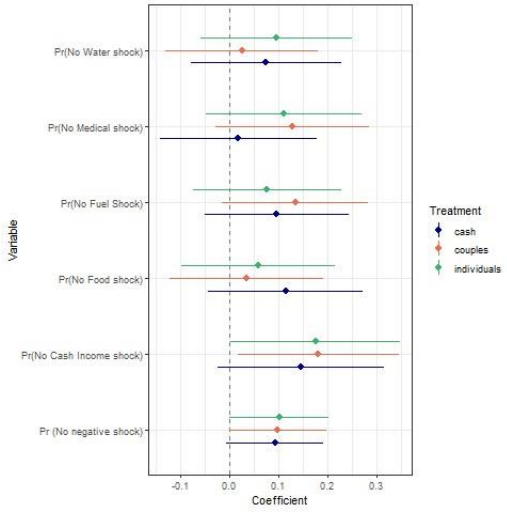
5.3 Likelihood of Insulation from Scarcity

Cash transfers have been shown to increase access to and hence reduce scarcity related to medicines and food (Batista and Vicente, 2020). In addition to demonstrating the treatment effects of cash transfers on

different consumption categories, we also compare the effect of smartphones vis a vis cash transfers on self reported experiences of scarcity.

Figure 9 shows that all three treatment groups show an increased likelihood of not experiencing scarcity, as measured by a composite index which consists of probability of not going without water, food, medical help, fuel and income received as cash, as compared to the control group. However, smartphone groups are more likely to not have experienced lack of medical help and lack of access to their cash income as compared to cash groups. This indicates that smartphones may be more effective at negating certain types of scarcity than cash transfers. Despite more robust economic gains from cash, phones also seem to be effective at reducing short term scarcity.

Figure 9: Treatment Effects on Probability of Experiencing Scarcity

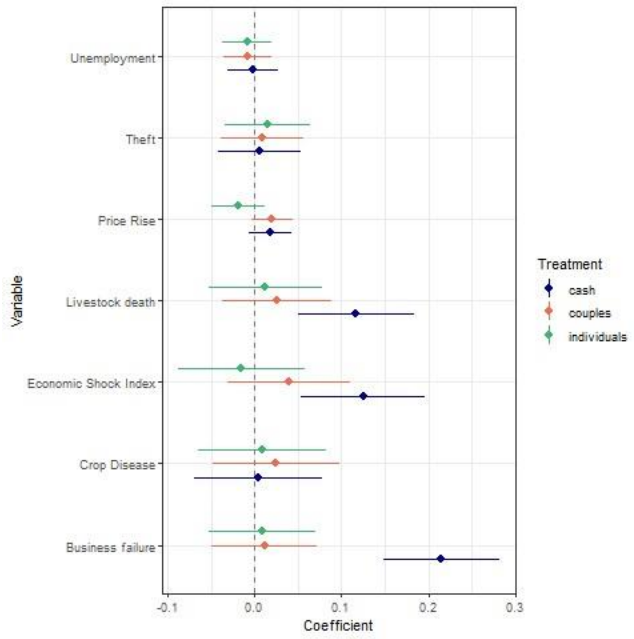


5.4 Likelihood of Reporting Negative Shocks

In this section, we look at the effects of our treatment on the likelihood of participants reporting that they were likely to have experienced a negative shock. We analyze two different set of shocks: economic shocks and health shocks.

Figure 10 shows that on average, cash groups are more likely to report being affected by economic shocks, as compared to smartphone and control groups. Moreover, the cash group is more likely to experience big shocks, such as livestock deaths and business failures. This may be indicative of increased risk appetite in response to receiving cash transfers, as seen in other contexts, such as (Haushofer and Shapiro, 2016) and (Abiona and Koppensteiner, 2022).

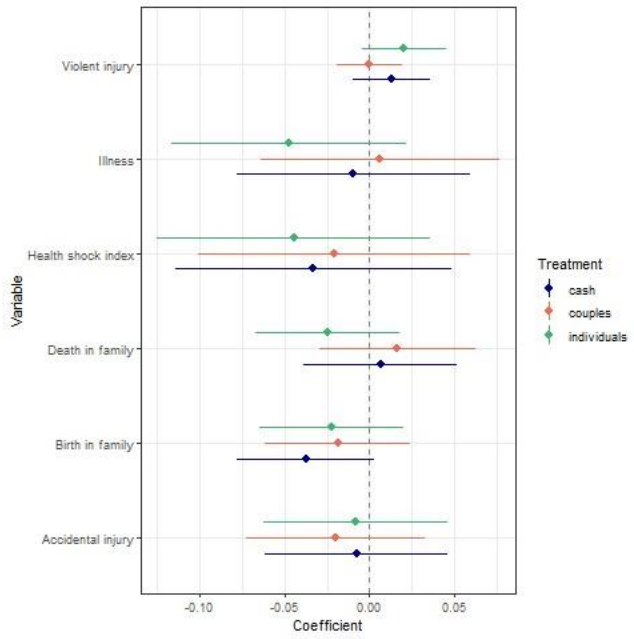
Figure 10: Treatment Effects on Economic Shocks



In addition, we interact the incidence of experiencing a drought (which is a natural disaster) with our treatment assignment and look at the effect of this interaction on total consumption and subsets of consumption expenditure which exclude alcohol and phone expenses respectively. We report these results in Table 6 and find that both cash groups and smartphone groups continue to experience greater consumption in the face of a random shock, which show that both cash transfers and smartphones may be effective at mitigating weather shocks. However, the channels through which these effects operate is an avenue for future research. It is possible that while those who receive cash transfers directly increase consumption, whereas those who own smartphones experience increased consumption through to surplus savings in mobile money accounts or received warnings about droughts earlier through their phones and could hence take preventive steps.

The effect of the treatment on health shocks, on the other hand, is mixed. Overall, we do not find evidence for smartphones or cash in mitigating health shocks.

Figure 11: Treatment Effects on Health Shocks



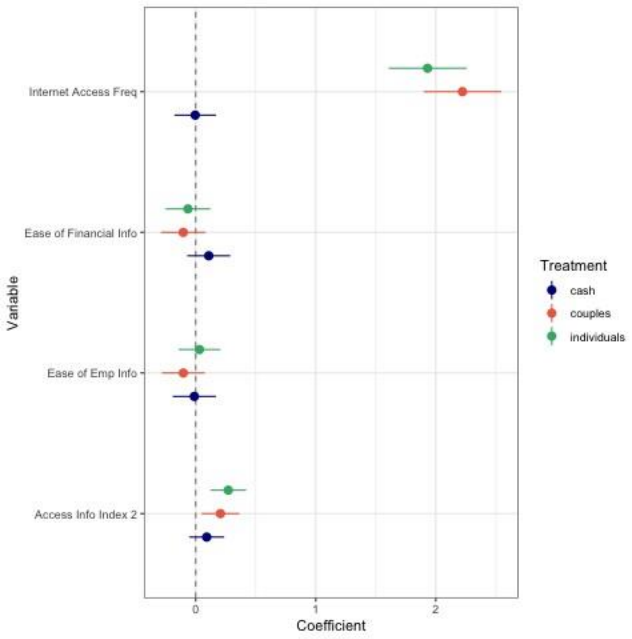
6 Additional Effects

In this section, we explore different channels in which smartphones may lead to economic and social change.

6.1 Access to information and use of social media

Participants in both the Individual and Couples treatment report an increase in access to information, but this is driven by using the Internet. Access to information is measured using an index comprising the following variables: a.) ease of obtaining info to find job or work; b.) ease of obtaining financial info for job or business; and c.) frequency of internet access. Both Individual and Couples arms access the internet more frequently relative to those in the Control, with the Couples arm accessing the internet more often than Individuals. WhatsApp is the primary reason participants use the internet. At least 50% in smartphone conditions have used WhatsApp, with 32% using at least once a week. The primary use case is sending messages and photos and videos to friends and family; only 4% report using the social media platform for communicating with customers. Next to WhatsApp (33.5%), use of Facebook is most common reason for using internet (17%) followed by getting access to news (11%). Our findings are in line with Alozie and Akpan-Obong (2017), which emphasizes how 'ownership of smartphones is very strongly linked to both use and frequency of use of the internet', which implies increased access to information and possibly enhancing economic well-being.

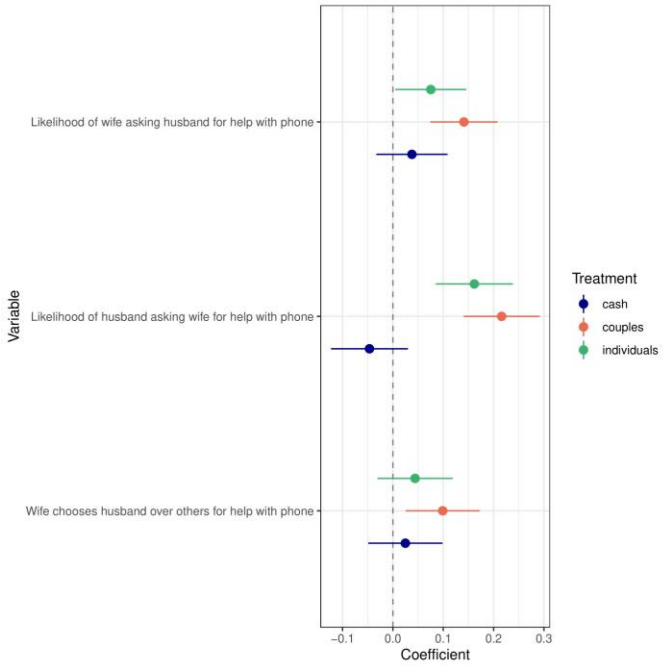
Figure 12: Treatment Effects on Access to Information



6.2 Intra-household cooperation around mobile tech and community support for women's digital rights

One of the primary motivations for the Couples training treatment was to catalyze cooperative mobile phone use—in which participants and their spouses lean on each other to increase their digital literacy. We observe some evidence of this—in which the participant stated being willing to ask her husband for help with the phone, and even stronger effects of husbands turning to participants for help with tech. The Couples training did seem to exert more robust effects on cooperative smartphone use, but the Individual training was not too far behind. See Figure 13.

Figure 13: Treatment Effects on Cooperative Use of Phone



Despite this cooperative use within the household, we also find that those in the smartphone conditions reported at midline they were more likely to perceive social resistance in the community to women's digital rights. These results are based on a series of questions that asked participants about their perceptions of the community's support for women's digital rights and respect for women's property rights. We expect that these assessments were forged based on a combination of participants' own experience and what they observe in the community. Perceived resistance is slightly higher in Couples' treatment. It is impossible to disentangle whether this reflects participants in the Couples group experiencing greater threats to their digital rights in their household (suggesting a backfiring effect of the Couples training as spouses felt emboldened to try to exert greater control over the handset) or if Couples' participants are just more attuned to violations to women's digital rights given their greater awareness. This represents an important line of inquiry in the next round of data collection. As mentioned, surveying both participants and their spouses is indispensable to better understanding these dynamics and addressing our second hypothesis. Figures 14 and 15 report participants' perceptions of household and community support for women's digital rights and stigma around women's mobile phone use.

Figure 14: Treatment Effects on Phone and Property Ownership Norms Perceived by Study Participants

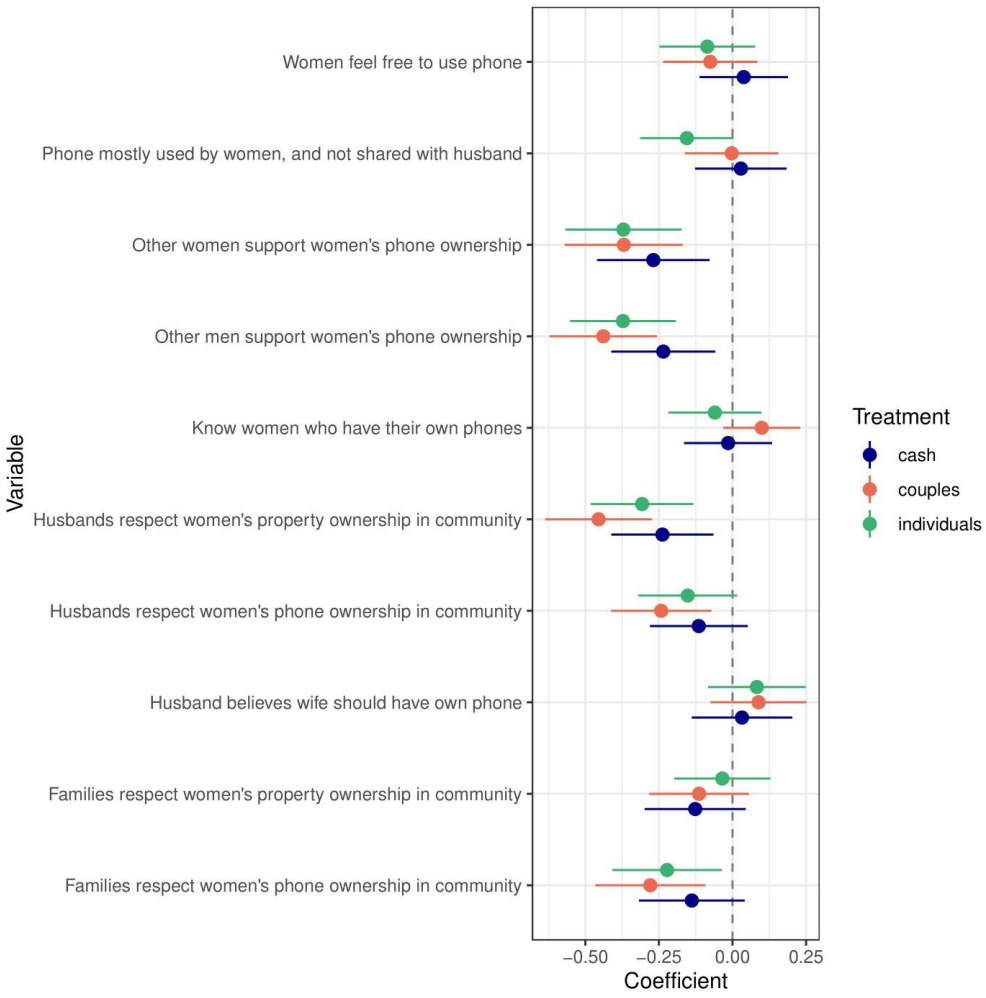
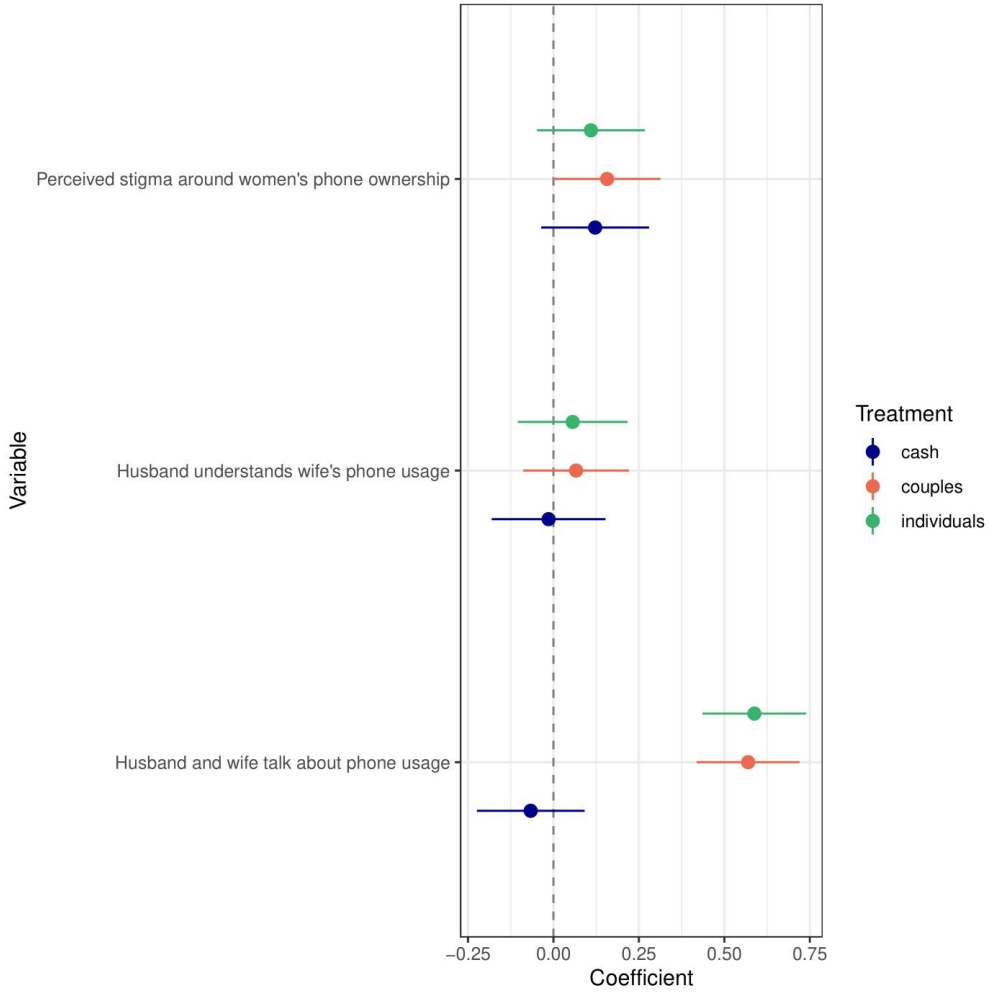


Figure 15: Treatment Effects on Stigma related to Phone Ownership



6.3 Women's Influence, Control over Economic Resources and Experience of Violence

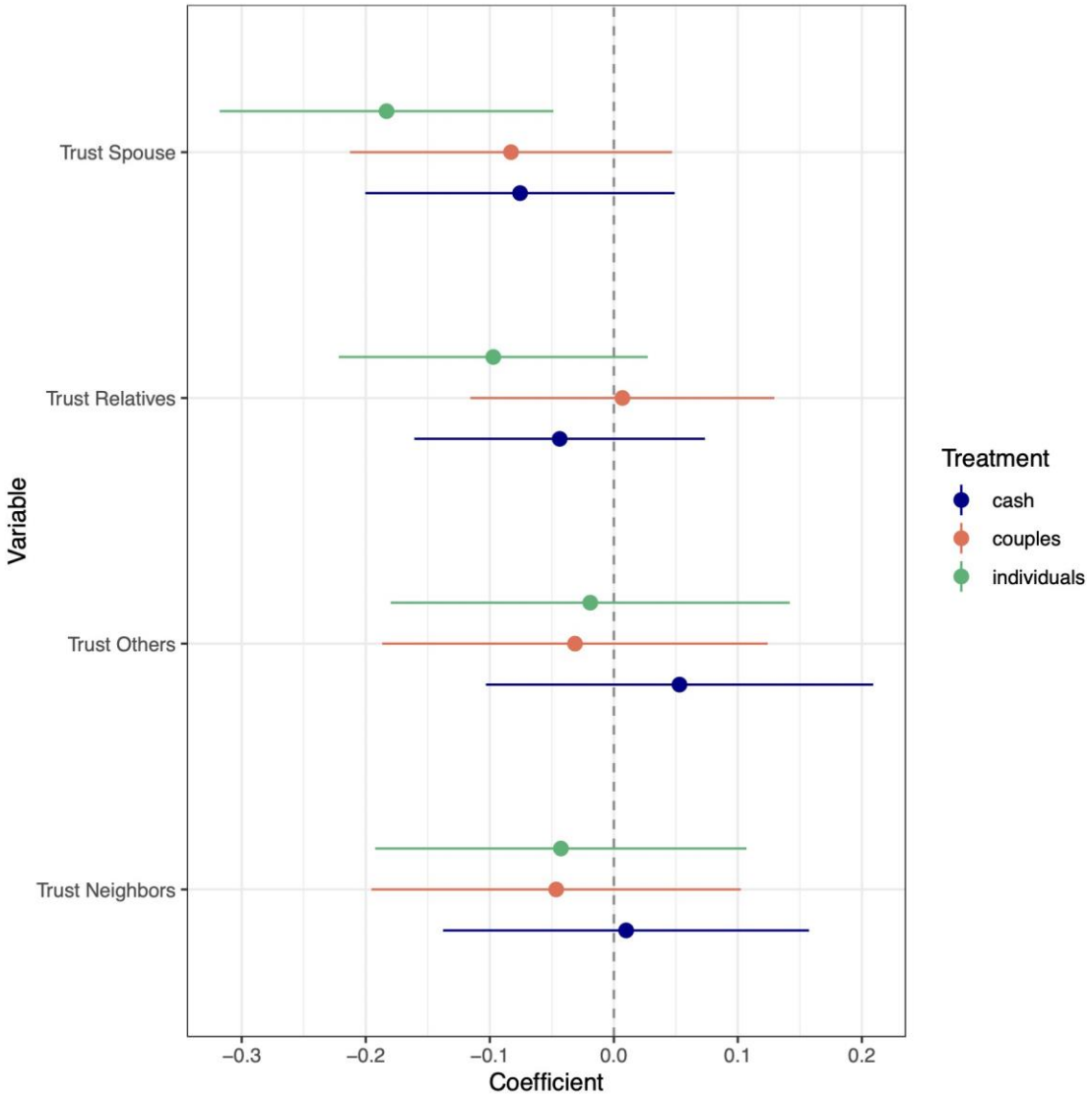
Monetary interventions, such as cash and mobile money transfers, when targeted at women are found to have mixed effects on strengthening female household bargaining and reducing intimate partner violence (Kabeer, 2014; Blattman et al., 2016; Haushofer and Shapiro, 2016; McKenzie, 2017; Bulte and Lensink, 2021). These mixed results point to countervailing effects: targeted interventions at once strengthen women's bargaining power, reducing actual violence, but also increase men's use of threats and coercion to extract rents from their partners (Dervisevic, Perova and Sahay, 2022). Such interventions, while strengthening women's economic rights, could have mixed effects on their social and psychological well being Buller et al. (2018).

In addition to testing the impact of phones on beliefs around women's property rights and gender norms, we also measure the impact of phone ownership and cash transfers on measures of influence, control over economic resources and various forms of violence. We measure influence over several dimensions such as the woman having a say in household decision making, influence over expenditure on health, food and education, having a say on how agricultural land and household finances are used and

distributed. Control over economic resources is defined as the extent to which a woman has control over her own income, as well as the total income earned by her and her spouse. We do not find evidence of women's phone ownership on women's control over economic resources and influence within the household (Table 11, 12) .

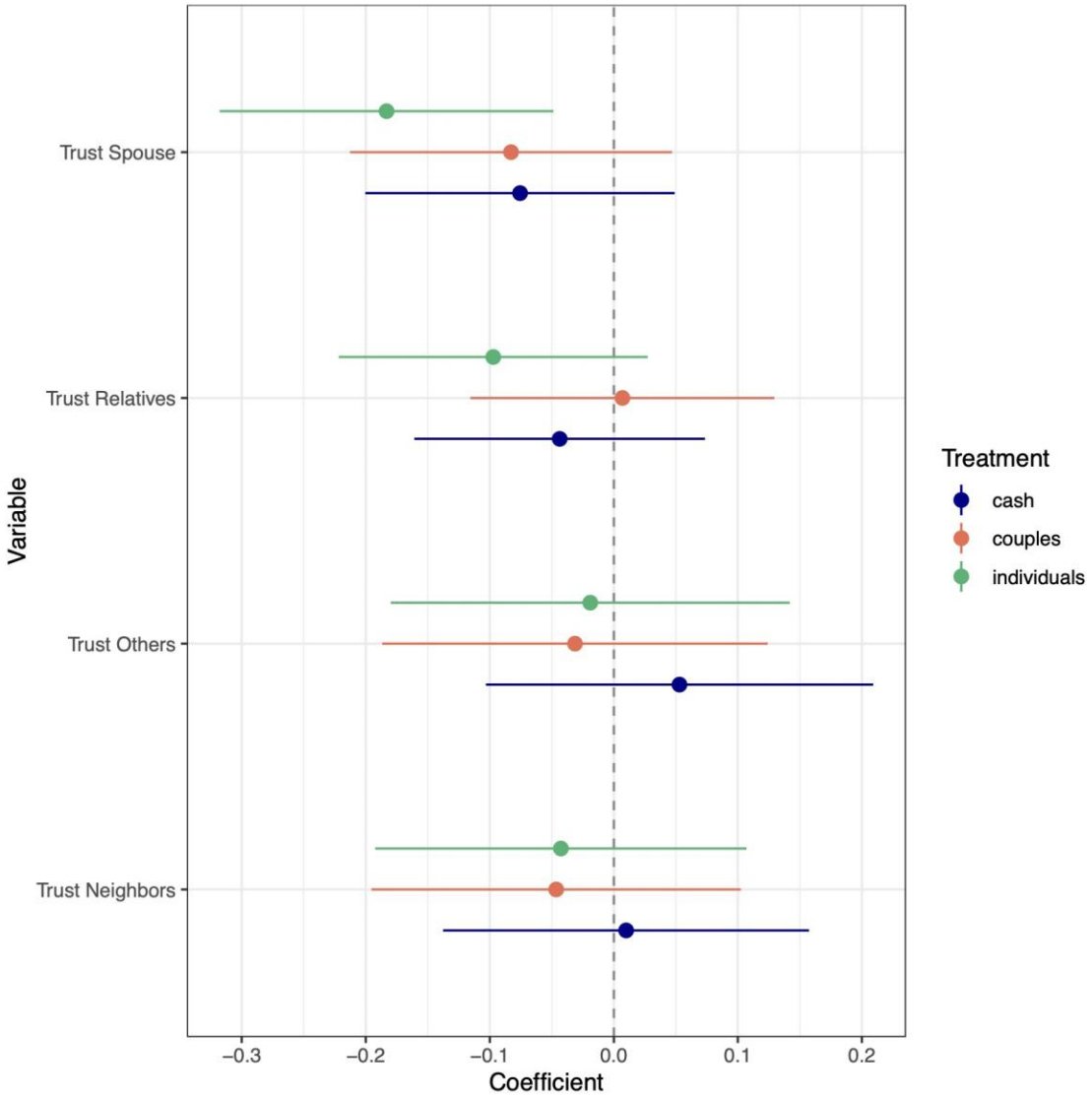
Our definition of intimate partner violence (IPV) includes emotional IPV and physical IPV. Individual components of each of these measures is outlined in Tables 13 and 14. In line with Roessler et al. (2021), we do not find any effects on women experiencing violence perpetrated by their spouses, both emotional and physical. It is possible that the null effects we see on the intimate partner violence is because women are fearful of answering the questions truthfully or may be exhibiting social desirability bias. It is also possible that women's rights are negatively affected in more subtle ways. Therefore, we ask respondents how much they trust their relatives, spouses and neighbors. We find significantly reduced spousal trust among the individuals' treatment condition, compared to the control group (Figure 16 and Table 15).

Figure 16: Treatment Effects on Women's Trust in Various Groups



In addition, women tend to report facing humiliation and threats from outsiders (Figure 17 and Table 16). We also ask if respondents feel free to go out as they wish, and find that women in the couples' treatment condition are more likely to experience less autonomy when making decisions regarding movement outside the home, as compared to the control and cash effects (Table 15).

Figure 17: Treatment Effects on Women's Likelihood of Facing External Threats



This implies that as women's economic power increases due to the use of digital technology, its use could also potentially cause suspicion and resentment among both spouses and members of the community, suggesting that norms around women's property rights may be sticky in the short run. At endline, by interviewing the husbands, we will be able to shed more light on this hypothesis.

6.4 Social Connectedness

We also measure the impact of our treatment conditions on study participants' social networks, and their frequency of contact with their social network. Table 10 displays the results from this regression, which are mixed. Overall, we do not find any significant effect of the smartphone conditions on a pre-registered measure of social connectedness, except Couples and Individual treatment groups finding it easier to stay in touch with those who live far away.

7 Conclusion and Future Research

Overall, our results indicate that increasing women's smartphone ownership significantly increases mobile connectivity, financial inclusion, and intra-household cooperation in mobile technology, albeit with mixed broader economic gains, at least in the short term. After nine months, the cash transfers produced more consistent and robust economic benefits than phone groups. Compared to Control, members of the Cash group had significantly higher individual savings, household consumption, and outstanding loans—potentially supporting their micro-enterprise.

The contrasting outcomes observed between cash grants and smartphones point to the differential impact of capital and technology on household economic growth. While cash grant participants were able to readily use the lump-sum transfers to overcome financial constraints that keep low-income individuals from starting micro-enterprises and securing additional credit, the technological benefits accruing from smartphone ownership—digital financial services, access to the internet, online social networking, and use of the handset to communicate with customers and clients—appear to have led to more incremental gains.

Our study also sheds light on community support for women's digital rights. One main takeaway is that smartphone recipients' experienced heightened awareness of social resistance to women's digital rights.

In order to examine the longer-run effects of our treatment conditions, we plan to collect additional data collection in early 2024, or 32 months after the intervention. In addition to re-surveying our study participants, we endeavor to interview their spouses. By interviewing participants and their spouses, it will help us better understand within-household effects of the smartphone distributions and how they affect income-generating activities of each member in the couple. If smartphones are used cooperatively (as we have some evidence of), the technology may bring increasing returns to the household as a whole. Interviewing participants' husbands will also better understand the normative effects of the different trainings on support for women's digital rights.

As specified in hypothesis 2, we expect that shifting husbands' beliefs will give women stronger property rights over the phone and increase its impact on their DFS use and uptake—above and beyond the technical efficacy intervention—and it will ensure that when others in the household use the phone they are more likely to do so for productive purposes. At midline, one key takeaway is that the Individual training proved just as effective as the Couples training. We find no difference between Individual and Couples training on mobile phone retention, mobile connectivity, financial inclusion, and mobile money use. However, the Couples training may have led to more phone sharing. One potential indication of this is that those in the Couples training is more likely to report personally owning a phone but not being in possession of the handset at the time of the midline survey. At the same time, this could also reflect appropriability and weaker property rights.

It will be imperative to better understand the mechanism underpinning this pattern at the endline survey. At midline we did not probe participants about what happened to their project phones and how much they used it vis-a-vis their spouses so as not to affect their behavior in the remainder of the study.

Interviewing participants' spouses during the endline will be integral to fully evaluate hypothesis 2. At the midline, we only have data on participants' perceptions of their community and the degree to which men and women and spouses support, in general, women's phone ownership and property rights. At endline we plan to more directly test hypothesis 2 with more direct line of questioning about participants' husbands' respect for their property rights.

References

Abiona, Olukorede, and Martin Foureaux Koppensteiner. 2022. "Financial Inclusion, Shocks, and Poverty: Evidence from the Expansion of Mobile Money in Tanzania." *Journal of Human Resources*, 57(2): 435–464.

Ahmed, Haseeb, and Benjamin Cowan. 2021. "Mobile money and healthcare use: Evidence from East Africa." *World Development*, 141(C).

Aiken, Emily, Suzanne Bellue, Joshua E Blumenstock, Dean Karlan, and Christopher Udry. 2023. "Estimating Impact with Surveys versus Digital Traces: Evidence from Randomized Cash Transfers in Togo."

Alozie, Nicholas O., and Patience Akpan-Obong. 2017. "The Digital Gender Divide: Confronting Obstacles to Women's Development in Africa." *Development Policy Review*, 35(2): 137– 160.

Anderson, Michael L. 2008. "Multiple inference and gender differences in the effects of early intervention: A reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American statistical Association*, 103(484): 1481–1495.

Barboni, Giorgia, Erica Field, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore. 2018. "A Tough Call."

Batista, Catia, and Pedro C Vicente. 2018. "Is mobile money changing rural Africa? Evidence from a field experiment." *The Review of Economics and Statistics*, 1–29.

Batista, Catia, and Pedro C. Vicente. 2020. "Adopting Mobile Money: Evidence from an Experiment in Rural Africa." *AEA Papers and Proceedings*, 110: 594–98.

Berry, James, Rebecca Dizon-Ross, and Maulik Jagnani. 2020. "Not playing favorites: An experiment on parental fairness preferences." National Bureau of Economic Research.

Blattman, Christopher, Eric P Green, Julian Jamison, M Christian Lehmann, and Jeannie Annan. 2016. "The returns to microenterprise support among the ultrapoor: A field experiment in postwar Uganda." *American economic journal: Applied economics*, 8(2): 35–64.

Buller, Ana Maria, Amber Peterman, Meghna Ranganathan, Alexandra Bleile, Melissa Hidrobo, and Lori Heise. 2018. "A mixed-method review of cash transfers and intimate partner violence in low-and middle-income countries." *The World Bank Research Observer*, 33(2): 218– 258.

Bulte, Erwin, and Robert Lensink. 2021. "Empowerment and intimate partner violence: Domestic abuse when household income is uncertain." *Review of Development Economics*, 25(1): 148– 162.

Chiara, De Gasperin, Rotondi Valentina, and Stanca Luca. 2019. “Mobile Money and the Labor Market: Evidence from Developing Countries.” University of Milano-Bicocca, Department of Economics Working Papers 403.

Dervisevic, Ervin, Elizaveta Perova, and Abhilasha Sahay. 2022. “Conditional cash transfers and gender-based violence: does the type of violence matter?”

Field, Erica, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore. 2021. “On Her Own Account: How Strengthening Women’s Financial Control Impacts Labor Supply and Gender Norms.” *American Economic Review*, 111(7): 2342–75.

Haushofer, Johannes, and Jeremy Shapiro. 2016. “The Short-term Impact of Unconditional Cash Transfers to the Poor: Experimental Evidence from Kenya*.” *The Quarterly Journal of Economics*, 131(4): 1973–2042.

Jack, William, Adam Ray, and Tavneet Suri. 2013. “Transaction Networks: Evidence from Mobile Money in Kenya.” *American Economic Review*, 103(3): 356–61.

Jack, William, and James Habyarimana. 2018. “High hopes: Experimental evidence on saving and the transition to high school in Kenya.”

Kabeer, Naila. 2014. *Gender & social protection strategies in the informal economy.* Routledge.

Lee, Jean N., Jonathan Morduch, Saravana Ravindran, Abu Shonchoy, and Hassan Zaman. 2021. “Poverty and Migration in the Digital Age: Experimental Evidence on Mobile Banking in Bangladesh.” *American Economic Journal: Applied Economics*, 13(1): 38–71.

Lipscomb, Molly, and Laura Schechter. 2018. “Subsidies versus mental accounting nudges: Harnessing mobile payment systems to improve sanitation.” *Journal of development economics*, 135: 235–254.

McKenzie, David. 2017. “Identifying and Spurring High-Growth Entrepreneurship: Experimental Evidence from a Business Plan Competition.” *American Economic Review*, 107(8): 2278–2307.

Munyegera, Ggombe Kasim, and Tomoya Matsumoto. 2016. “Mobile Money, Remittances, and Household Welfare: Panel Evidence from Rural Uganda.” *World Development*, 79: 127–137.

Riley, Emma. 2018. “Mobile money and risk sharing against village shocks.” *Journal of Development Economics*, 135(C): 43–58.

Riley, Emma. 2019. “Hiding loans in the household using mobile money: Experimental evidence on microenterprise investment in Uganda.”

Riley, Emma. 2022. “Resisting Social Pressure in the Household Using Mobile Money: Experimental Evidence on Microenterprise Investment in Uganda.” Centre for the Study of African Economies, University of Oxford CSAE Working Paper Series 2022-04.

Roessler, Philip, Peter Carroll, Flora Myamba, Cornel Jahari, Blandina Kilama, and Daniel Nielson. 2021. “The economic impact of mobile phone ownership: Results from a randomized controlled trial in Tanzania.”

Samii, Cyrus. 2016. “Causal Empiricism in Quantitative Research.” *The Journal of Politics*, 78(3): 941–955.

Suri, Tavneet, and William Jack. 2016*a*. “The long-run poverty and gender impacts of mobile money.” *Science*, 354(6317): 1288–1292.

Suri, Tavneet, and William Jack. 2016*b*. “The long-run poverty and gender impacts of mobile money.” *Science*, 354(6317): 1288–1292.

8 Tables

Table 1: Effects of different treatment groups relative to control: Consumption, Savings and Debt

	Weekly Income	Monthly Consumption	Monthly consumption (no alcohol)	Monthly consumption (no phone expenses)	Ind savings	HH savings	Outstanding debt
Individuals	0.525+	0.147	0.162	0.142	0.271	0.208	-0.026
	(0.281)	(0.123)	(0.118)	(0.128)	(0.191)	(0.190)	(0.145)
Couples	0.093	0.289*	0.227*	0.294*	0.363+	0.140	-0.123
	(0.288)	(0.114)	(0.116)	(0.120)	(0.195)	(0.189)	(0.180)
Cash	0.372	0.321**	0.318**	0.318**	0.678**	0.170	0.273+
	(0.287)	(0.114)	(0.110)	(0.123)	(0.211)	(0.191)	(0.147)
Control	5.559***	9.716***	9.722***	9.656***	0.660***	0.614***	9.071***
	(0.215)	(0.097)	(0.094)	(0.103)	(0.137)	(0.141)	(0.118)
N	1333	1238	1285	1260	1402	1393	1244
R2	0.097	0.147	0.137	0.143	0.096	0.087	0.157
R2 Adj.	0.040	0.089	0.081	0.086	0.042	0.032	0.039
AIC	26720.3	30362.8	31483.1	30800.3	26439.8	25953.2	15105.9
BIC	27141.1	30777.6	31900.9	31216.6	26864.7	26377.5	15467.8
RMSE	5130.33	47976.06	47489.34	46125.67	2842.93	2536.34	26462.30

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All dependent variables are log values. All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table2:Effectsofdifferenttreatmentgroupsrelativetocontrol:MobileMoneyUsage

	Mobile Money used for savings	Mobile Money pre-ferred finan-cial instru-ment	Mobile Money pre-ferred for savings	Mobile Money Choice	Mobile Money Choice (Own ac-count)	Number of times mobile money sent	Number of times mobile money re-ceived	Count ofMo-bile Money loans	Has own mobile money ac-count	Count ofmo-bile ser-vices used
Individuals	0.148***	0.168***	0.260**	0.137***	0.273***	-0.023	0.040	-0.005	0.499***	0.852***
	(0.032)	(0.032)	(0.088)	(0.035)	(0.034)	(0.061)	(0.119)	(0.038)	(0.034)	(0.104)
Couples	0.187***	0.196***	0.264**	0.127***	0.322***	-0.080	-0.025	0.002	0.503***	0.877***
	(0.032)	(0.031)	(0.085)	(0.035)	(0.034)	(0.058)	(0.116)	(0.039)	(0.033)	(0.102)
Cash	-0.030	-0.029	-0.003	0.045	0.011	-0.079	0.014	-0.045	0.085*	0.160
	(0.030)	(0.028)	(0.085)	(0.036)	(0.031)	(0.058)	(0.118)	(0.033)	(0.034)	(0.097)
Control	0.252***	0.203***	3.230***	0.557***	0.170***	0.170**	0.269*	0.051	0.230***	0.508***
N	1413	1413	1413	1413	1413	1413	1413	1413	1413	1413
R2	0.283	0.246	0.173	0.211	0.225	0.202	0.152	0.091	0.342	0.306
R2Adj.	0.238	0.199	0.122	0.162	0.177	0.152	0.099	0.035	0.300	0.263
AIC	1585.5	1546.7	4316.2	1772.4	1686.3	2001.8	3781.6	1079.3	1628.8	4838.9
BIC	2032.1	1993.2	4762.8	2219.0	2132.9	2448.4	4228.2	1525.8	2075.3	5285.5
RMSE	0.40	0.39	1.05	0.43	0.41	0.46	0.87	0.33	0.41	1.26

Notes: +p<0.1,*p<0.05,**p<0.01,***p<0.001

Allmodelsincludeheteroskedasticity-consistent(HC2)standarderrors.FollowingLin(2013)wealsoincludeinteractionsbetweenthetreatmentindicator andthefollowingpre-registeredmean-centeredbaselinecovariates:blockindicators,baselineconsumption,age,agesquared,householdsize,andmonthly householdincome.

Table 3: Effects of different treatment groups relative to control: Likelihood of Insulation from Scarcity

	Pr (No scarcity)	Pr(No food scarcity)	Pr(No cash income scarcity)	Pr(No fuel scarcity)	Pr(No medical supplies scarcity)	Pr(No water scarcity)
Phone (individuals)	0.102*	0.059	0.175*	0.077	0.111	0.096
	(0.051)	(0.079)	(0.088)	(0.077)	(0.080)	(0.078)
Phone (couples)	0.099*	0.035	0.181*	0.134+	0.128	0.026
	(0.050)	(0.080)	(0.083)	(0.076)	(0.080)	(0.079)
Cash	0.093+	0.115	0.146+	0.097	0.019	0.075
	(0.050)	(0.080)	(0.086)	(0.075)	(0.081)	(0.078)
Intercept (Control)	-0.006	0.000	-0.009	-0.012	-0.011	-0.002
N	1403	1406	1408	1408	1408	1405
R2	0.082	0.096	0.090	0.118	0.073	0.052
R2 Adj.	0.025	0.039	0.033	0.062	0.015	-0.008
AIC	2722.2	4028.9	4327.9	3903.3	4094.7	4018.2
BIC	3168.1	4475.0	4774.2	4349.5	4540.9	4464.2
RMSE	0.60	0.95	1.06	0.91	0.98	0.95

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 4: Effects of different treatment groups relative to control: Likelihood of Reporting Negative Economic Shock

	Unemployed B failure	Livestock death	Crop Dis-ease	Theft	Price Rise	Economic Shock Index
Phone (individuals)	-0.009	0.009	0.013	0.009	0.015	-0.019	-0.015
	(0.014)	(0.031)	(0.033)	(0.038)	(0.025)	(0.015)	(0.037)
Phone (couples)	-0.008	0.011	0.026	0.025	0.009	0.020	0.040
	(0.014)	(0.031)	(0.032)	(0.037)	(0.024)	(0.012)	(0.036)
Cash	-0.001	0.215***	0.117***	0.004	0.006	0.018	0.125***
	(0.015)	(0.034)	(0.034)	(0.037)	(0.024)	(0.012)	(0.036)
Intercept (Control)	0.035**	0.184***	0.213***	0.557***	0.096***	0.967***	0.008

N	1406	1406	1404	1408	1408	1408	1402
R2	0.064	0.128	0.113	0.138	0.060	0.078	0.110
R2 Adj.	0.005	0.074	0.057	0.084	0.001	0.021	0.054
AIC	-911.8	1601.3	1651.9	1978.8	716.8	-937.1	1788.5
BIC	-465.6	2047.5	2097.9	2425.1	1163.0	-490.8	2234.4
RMSE	0.16	0.40	0.41	0.46	0.29	0.16	0.43

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 5: Effects of different treatment groups relative to control: Likelihood of Reporting Negative Health Shock

	Health shock index	Birth	Death	Illness	Accidental injury	Violent injury
Phone (individuals)	-0.045	-0.023	-0.025	-0.048	-0.008	0.020
	(0.041)	(0.022)	(0.022)	(0.035)	(0.028)	(0.013)
Phone (couples)	-0.021	-0.019	0.016	0.006	-0.020	0.000
	(0.041)	(0.022)	(0.023)	(0.036)	(0.027)	(0.010)
Cash	-0.033	-0.038+	0.006	-0.010	-0.008	0.013
	(0.041)	(0.021)	(0.023)	(0.035)	(0.027)	(0.012)
Intercept (Control)	0.003	0.087***	0.083***	0.309***	0.140***	0.015*
N	1406	1408	1408	1406	1408	1408
R2	0.062	0.062	0.052	0.098	0.056	0.053
R2 Adj.	0.003	0.004	-0.007	0.041	-0.003	-0.006
AIC	2065.0	166.8	465.0	1803.9	1034.8	-1188.3
BIC	2511.1	613.1	911.2	2250.0	1481.0	-742.1
RMSE	0.47	0.24	0.27	0.43	0.33	0.15

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 6: Effects on consumption: treatment interacted with drought shock

Phone (individuals)	0.149	0.163	0.142
	(0.123)	(0.118)	(0.127)
Phone (couples)	0.294*	0.232*	0.296*
	(0.114)	(0.115)	(0.120)
Cash	0.363***	0.360***	0.358**
	(0.110)	(0.106)	(0.118)
Drought shock	-0.225	-0.221	-0.102
	(0.245)	(0.228)	(0.270)
Cash X Drought Shock	-0.014	-0.027	-0.093
	(0.269)	(0.253)	(0.292)
Individuals X Drought Shock	0.046	0.027	-0.045
	(0.283)	(0.267)	(0.306)
Couples X Drought Shock	0.316	0.38	0.193
	(0.288)	(0.291)	(0.316)
Intercept (Control)	9.712***	9.718***	9.654***
N	1237	1284	1259
R2	0.155	0.146	0.150
R2 Adj.	0.094	0.087	0.090
AIC	30347.4	31467.7	30785.0
BIC	30782.6	31906.1	31221.7
RMSE	47995.44	47507.82	46143.98

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 7: Effects of different treatment groups relative to control: Access to Information

	Access Info Index	Ease of Emp Info	Ease of Financial Info	Internet Access Freq
Phone (individuals)	0.271***	0.031	-0.064	1.931***
	(0.076)	(0.088)	(0.095)	(0.166)
Phone (couples)	0.206*	-0.103	-0.104	2.222***
	(0.080)	(0.091)	(0.095)	(0.165)
Cash	0.092	-0.011	0.109	-0.004
	(0.074)	(0.092)	(0.091)	(0.088)
Intercept (Control)	-0.021	0.000	-0.028	0.009
	(0.059)	(0.068)	(0.073)	(0.066)
Num.Obs.	904	1104	1033	1371
R2	0.107	0.078	0.104	0.304
R2 Adj.	0.017	0.006	0.026	0.259
AIC	2176.6	3272.6	2963.9	6204.1
BIC	2585.1	3678.1	3383.8	6648.0
RMSE	0.73	0.99	0.94	2.19

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 8: Effects of different treatment groups relative to control: Norms around Women's Phone and Property Ownership

	Know women	Phone not shared	Free to use phone	Hus support phone	Men support phone	Women support phone	Hus respects phone	Hus respects property	Fam respect phone	Fam respect women's property
Phone (individuals)	-0.060	-0.155	-0.086	0.083	-0.372	-0.371	-0.152	-0.307	-0.222	-0.035
	(0.080)	(0.081)+	(0.083)	(0.085)	(0.092)***	(0.101)***	(0.086)+	(0.089)***	(0.095)*	(0.083)
Phone (couples)	0.099	-0.003	-0.076	0.089	-0.439	-0.369	-0.242	-0.455	-0.279	-0.114
	(0.067)	(0.081)	(0.082)	(0.083)	(0.093)***	(0.102)***	(0.087)**	(0.092)***	(0.095)**	(0.086)
Cash	-0.015	0.029	0.038	0.032	-0.235	-0.269	-0.115	-0.238	-0.138	-0.127
	(0.076)	(0.079)	(0.076)	(0.087)	(0.090)**	(0.098)**	(0.085)	(0.088)**	(0.092)	(0.087)
Control	0.010	0.017	0.030	-0.006	-0.008	0.000	0.010	0.000	-0.006	0.003
N	1413	1413	1269	1255	1323	1368	1359	1345	1356	1363
R2	0.073	0.094	0.075	0.070	0.125	0.082	0.106	0.116	0.111	0.084
R2 Adj.	0.018	0.037	0.010	0.004	0.066	0.023	0.047	0.061	0.053	0.025
AIC	3982.7	4043.8	3706.5	3386.1	4258.6	4967.9	4126.0	4375.6	4418.9	4185.7
BIC	4408.2	4490.3	4143.9	3822.5	4699.5	5411.7	4569.2	4797.1	4862.0	4629.2
RMSE	0.94	0.95	0.97	0.87	1.13	1.40	1.04	1.16	1.16	1.06

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income. The outcome variables here are the whether the participant knows other women who owns phones, whether the participant shares the phone with other women, whether the participant is free to use the phone, whether husband supports wife's phone ownership, whether men in the community support women's phone ownership, whether women in the community support other women's phone ownership, whether other families support other women's property ownership, whether the participant is free to use the phone, whether husband supports wife's property ownership, whether men in the community support women's property ownership whether women in the community support other women's property ownership and whether other families support other women's property ownership

Table 9: Effects of different treatment groups relative to control: Women's perceived stigma of phone usage and ownership

	Perceived stigma around women's phone ownership	Husband understands wife's phone usage	Husband and wife talk about phone usage
Phone (individuals)	0.110	0.056	0.588***
	(0.080)	(0.082)	(0.077)
Phone (couples)	0.157*	0.066	0.570***
	(0.080)	(0.079)	(0.077)
Cash	0.122	-0.014	-0.067
	(0.080)	(0.085)	(0.080)
Control	-0.012	0.038	0.064
	(0.060)	(0.066)	(0.060)
N	1357	1194	1283
R2	0.082	0.079	0.205
R2 Adj.	0.025	0.010	0.150
AIC	3928.6	3219.0	3521.2
BIC	4350.8	3651.3	3959.6
RMSE	0.97	0.87	0.89

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 10: Effects of different treatment groups relative to control: Social Connectedness

	Lack of companionship (reverse coded)	Stay in touch with those far away	Social connect count	Social contact score	People to talk to	Non relatives in network	Certainty of contact helping	Certainty of network helping financially
Received phone	0.058	0.308**	-0.082	0.232***	0.098	0.000	-0.076	0.049
	(0.069)	(0.098)	(0.071)	(0.069)	(0.072)	(0.074)	(0.072)	(0.070)
Control	0.002	0.086	0.010	0.002	-0.020	0.015	0.013	0.019
	(0.060)	(0.087)	(0.060)	(0.061)	(0.063)	(0.064)	(0.060)	(0.061)
N	1025	488	1031	1018	1027	1017	1031	1031
R2	0.064	0.185	0.047	0.062	0.073	0.052	0.076	0.077
R2 Adj.	0.027	0.110	0.008	0.022	0.035	0.012	0.038	0.038
AIC	2808.9	1258.8	2993.0	2751.7	2898.7	2958.9	3079.8	2873.1
BIC	3011.2	1439.0	3205.4	2963.5	3110.9	3170.7	3292.1	3085.4
RMSE	0.92	0.80	0.99	0.90	0.95	0.99	1.03	0.93

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 11: Effects of different treatment groups relative to control: Control Over Economic Resources

	Control Index	Joint Control of Income	Personal Control of Income
Phone (individuals)	-0.015	-0.064	0.034
	(0.066)	(0.082)	(0.082)
Phone (couples)	-0.019	-0.073	0.036
	(0.066)	(0.082)	(0.083)
Cash	-0.012	-0.036	0.009
	(0.068)	(0.082)	(0.085)
Intercept (Control)	0.015	0.022	0.006
	(0.052)	(0.064)	(0.063)
Num.Obs.	1279	1290	1285

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 12: Effects of different treatment groups relative to control: Extent of Influence over Household Activities

	Influence Index	HH decisions	Food Exp	Edu Exp	Health Exp	Land Use	HH Finances
Phone (individuals)	-0.028	-0.065	-0.060	0.035	0.018	-0.018	-0.024
	(0.062)	(0.081)	(0.078)	(0.085)	(0.079)	(0.082)	(0.079)
Phone (couples)	-0.013	0.001	-0.045	-0.020	0.005	-0.025	0.018
	(0.060)	(0.082)	(0.078)	(0.084)	(0.077)	(0.081)	(0.076)
Cash	-0.041	-0.060	-0.052	-0.037	0.002	-0.018	-0.022
	(0.060)	(0.083)	(0.078)	(0.082)	(0.077)	(0.082)	(0.078)
Intercept (Control)	0.014	0.026	0.012	-0.009	-0.011	0.014	0.012
Num.Obs.	1156	1296	1381	1268	1371	1360	1370

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 13: Effects of different treatment groups relative to control: Emotional IPV Incidence

	Emotional IPV Index	Humiliated by Partner	Threatened by Partner
Phone (individuals)	-0.031	-0.077	-0.004
	(0.076)	(0.096)	(0.084)
Phone (couples)	0.058	0.040	0.071
	(0.064)	(0.081)	(0.075)
Cash	0.031	-0.042	0.071
	(0.067)	(0.090)	(0.075)
Intercept (Control)	-0.002	-0.014	0.003
	(0.052)	(0.066)	(0.062)
Num.Obs.	1295	1296	1295

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 14: Effects of different treatment groups relative to control: Physical IPV Incidence

	Physical IPV Index	Physical Harm Caused by Partner	Count of IPV Events
Phone (individuals)	-0.059	-0.146	0.004
	(0.058)	(0.105)	(0.087)
Phone (couples)	-0.038	0.004	-0.061
	(0.052)	(0.074)	(0.083)
Cash	-0.069	-0.061	-0.076
	(0.053)	(0.087)	(0.08)
Intercept (Control)	0.007	0.015	0.001
Num.Obs.	1296	1296	1299

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 15: Effects of different treatment groups relative to control: Women's Trust in Various Groups and Autonomy

	Trust Spouse	Trust Relatives	Trust Others	Trust Neighbors	Free to Go out of House
Phone (individuals)	-0.097	-0.183**	-0.043	-0.019	-0.082
	(0.063)	(0.069)	(0.076)	(0.082)	(0.079)
Phone (couples)	0.007	-0.083	-0.047	-0.031	-0.161*
	(0.062)	(0.066)	(0.076)	(0.079)	(0.080)
Cash	-0.044	-0.076	0.010	0.053	-0.001
	(0.06)	(0.064)	(0.075)	(0.08)	(0.083)
Intercept (Control)	0.037	0.045	0.021	0.032	-0.002
Num.Obs.	1407	1377	1408	1407	1398

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 16: Effects of different treatment groups relative to control: External Threats Faced by Women

	External Threat Index	Someone other than partner humiliated	Someone other than partner threatened	Someone other than partner caused physical harm
Phone (individuals)	0.103	0.052	0.100	0.113
	(0.075)	(0.085)	(0.079)	(0.082)
Phone (couples)	0.134+	0.134+	0.160*	0.134+
	(0.075)	(0.081)	(0.076)	(0.082)
Cash	0.124	0.118	0.150+	0.126
	(0.076)	(0.083)	(0.077)	(0.083)
Intercept (Control)	-0.023	-0.022	-0.022	-0.024
Num.Obs.	1396	1398	1398	1396

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Table 17: Effects of different treatment groups relative to control: Prosocial Attitudes

	Like having neighbor of diff religion	Like having neighbor of diff ethnicity	Like having neighbor of diff political affiliation	Likely to support interethnic marriage	Likely to be friends with other ethnic groups	Likely to do business with other ethnic groups	Likely to have feelings of national unity
Received phone	0.031	0.046	0.113	0.046	0.001	-0.008	-0.067
	(0.063)	(0.062)	(0.079)	(0.067)	(0.039)	(0.041)	(0.089)
Control	3.875***	3.846***	3.501***	3.890***	1.256***	1.242***	2.386***
	(0.053)	(0.051)	(0.068)	(0.058)	(0.034)	(0.036)	(0.076)
N	1027	1027	1027	1027	1025	1024	1009
R2	0.175	0.186	0.167	0.172	0.091	0.081	0.074
R2 Adj.	0.140	0.152	0.133	0.137	0.053	0.042	0.034
AIC	2755.9	2781.9	3204.7	2751.9	1766.4	1801.4	3356.1
BIC	2968.1	2994.1	3416.8	2964.0	1978.5	2013.4	3567.5
RMSE	0.89	0.90	1.10	0.89	0.55	0.56	1.22

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.

Appendix A Descriptives

A.1 Summary Statistics at Midline

	(1)				
	count	mean	sd	min	max
Has phone	1413	0.51	0.50	0	1
Has smartphone	1413	0.37	0.48	0	1
Has smartphone on person	1413	0.39	0.49	0	1
Mobile money preferred saving instrument	1413	0.33	0.47	0	1
Mobile money preferred financial instrument	1413	0.29	0.45	0	1
Count of mobile money loans	1413	0.03	0.35	0	7
Mobile money used for savings	1413	3.36	1.15	1	5
Mobile money use frequency	1413	1.01	1.19	0	5
Count of mobile money services used	1413	1.01	1.52	0	10
Has own mobile money account	1413	0.52	0.50	0	1
Number of times mobile money sent	1413	0.12	0.52	0	7
Number of times mobile money received	1413	0.27	0.94	0	21
Mobile money choice	1413	0.64	0.48	0	1
Mobile Money choice (own account)	1413	0.33	0.47	0	1
Mobile money index	1413	0.06	0.46	-.5182455	6.797055
Monthly consumption	1413	70608.92	91684.12	0	600000
Monthly consumption (excluding alcohol)	1413	65901.66	85571.85	0	560000
Monthly consumption (excluding mobile)	1413	65901.66	85571.85	0	560000
N	1413				

Appendix B Robustness Checks

A.1 Covariate Balance

	(1)	(2)	(3)	(4)	(5)	(6)
	Age	Education	HH Size	Monthly Income	MM Account	Monthly Consumption
Cash	0.435	0.007	0.200	-402.5	0.016	4775.0
	(0.724)	(0.040)	(0.145)	(423.6)	(0.025)	(7606.7)
Couples	0.466	-0.009	0.154	-57.86	-0.002	7292.0
	(0.720)	(0.040)	(0.138)	(522.6)	(0.0241)	(7898.3)
Individuals	-0.328	-0.001	0.106	-86.55	0.048	8655.7
	(0.733)	(0.040)	(0.139)	(479.6)	(0.026)	(8169.1)
Joint test p-value	0.61	0.63	0.70	0.51	0.63	0.44
Control Mean	32.52	0.509	5.159	3536.3	0.105	59568.4
Observations	1413	1413	1413	1413	1413	1413

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.2 Impact of Missingness in Midline Survey on Main Outcomes

Table 18: Effects of missingness in different treatment conditions on main outcomes

	Log Weekly inc.	Mon consum	Mon consum (no alcohol)	Mon consum (no phone expenses)	Log indiv sav	Log HH sav	Log out debt	MM Index	MM Ind Std	MM Choice	MM Choice (Own account)
Individuals	-0.007	-0.04+	-0.06*	-0.023	-0.002	0.001	-0.001	0.003	0.005	0.037	0.041
	(0.011)	(0.027)	(0.023)	(0.025)	(0.008)	(0.009)	(0.040)	(0.007)	(0.007)	(0.046)	(0.048)
Couples	-0.007	-0.06*	-0.05*	-0.033	-0.007	-0.011	-0.033	0.024	0.013	0.056	0.007
	(0.011)	(0.026)	(0.023)	(0.024)	(0.007)	(0.008)	(0.040)	(0.023)	(0.042)	(0.078)	(0.01)
Cash	0.004	-0.004	-0.008	0.008	-0.007	-0.001	-0.034	0.013	0.021	0.013	0.031
	(0.012)	(0.028)	(0.025)	(0.026)	(0.006)	(0.009)	(0.040)	(0.002)	(0.003)	(0.003)	(0.004)
N.	1359	1413	1413	1413	1410	1409	1409	1413	1413	1413	1413
R2	0.066	0.063	0.075	0.060	0.061	0.077	0.066				
R2 Adj.	0.008	0.008	0.020	0.004	0.005	0.022	0.011				
AIC	27267.9	34650.8	34661.8	34559.2	26585.3	26274.2	32825.3	1992.0	4522.5	3547.3	2612.5
BIC	27690.2	35076.3	35087.3	34984.7	27010.7	26699.5	33250.6	2438.5	4969.1	3993.8	3059.0
RMSE	5186.36	48298.37	48487.60	46758.04	2838.49	2558.73	26160.24	0.46	1.13	0.80	0.57

Notes: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

All models include heteroskedasticity-consistent (HC2) standard errors. Following Lin (2013) we also include interactions between the treatment indicator and the following pre-registered mean-centered baseline covariates: block indicators, baseline consumption, age, age squared, household size, and monthly household income.