THE CENTER FOR AFRICAN DEVELOPMENT

WORKING PAPER, NO. 1, AUGUST 2015

MOBILE PHONE OWNERSHIP AS A CATALYST FOR DEVELOPMENT

FINDINGS FROM A PILOT STUDY IN TANZANIA

Philip Roessler
Assistant Professor
College of William and Mary
Director, Center for African Development at W&M
proessler@wm.edu

Flora Myamba
Director of Research in Social Protection
REPOA
flora@repoa.or.tz

Daniel Nielson
Professor
Brigham Young University
Co-Founder & Principal Investigator, AidData
dan_nielson@byu.edu

AUGUST 2015

SUMMARY

The hand-held mobile phone represents one of the most important technological advances over the last quarter-of-a-century. As a low-cost device that enables instant communication over vast distances by text or voice as well as money transfers, the mobile phone holds immense potential, especially for those who traditionally face high costs and steep barriers to long-distance communication, access to information, and secure banking. Despite the exponential spread of mobile phones and their increasing adoption in mobile for development (M4D) initiatives, such as financial inclusion, improved health and real-time citizen feedback, there have been few randomized controlled trials (RCT) that rigorously assess the effects of mobile phone ownership. We are undertaking one of the first RCTs in this field focusing on women in low-income countries; women in Tanzania and other low-income countries are significantly less likely to own mobile phones than men. Our research seeks to better understand the consequences of this gender gap and how it can be overcome.

This briefing reports results from phase 1 of an RCT on the impact of mobile phone ownership on women in Tanzania. Working with Kidogo Kidogo, a social venture created to help close the mobile gender gap by providing low-income women with cost-free mobile handsets, we employed a wait-list experimental design (in which half of the participants received a phone, sim card and starter credit at the beginning of the study and the other received package at the end) to assess the short-term effects of mobile phone ownership among female small business owners living around Dar es Salaam.

Despite the low statistical power of round 1 (N=54) and a short treatment period (roughly two months between July and September 2014), the random assignment of Kidogo Kidogo's phone packages to women who did not own a phone significantly increased beneficiaries' mobile connectivity and led to improvements in their access to market information, overall business operations and their subjective welfare. No negative effects were seen in terms of the recipients' family relations or personal security. Null effects were seen on standard measures of political engagement and self-efficacy, though this may be attributable to the short treatment period and high baseline levels of efficacy.

One striking implication of this small study is it highlights the difference between *ownership*—in which one individually owns a phone—and *access*—in which one must borrow or share a phone. Due to the exponential worldwide increase in mobile phone penetration rates, nearly anyone can access this technology. In fact, at baseline nearly all reported being regular (although not daily) mobile phone users, despite not owning a device. But this access was constrained—to use a phone the women had to turn to family or friends to borrow a device. The strong treatment effects in the experiment show that these constraints matter; it denies women the right to use the phone as much as they want and significantly inhibits their effectiveness as traders and small-business owners.

Overall the study points to the merits of conducting a larger follow-up study among women in rural areas with a longer treatment period to further evaluate the effectiveness of Kidogo Kidogo's cost-free phone distribution program as a vehicle for improving mobile phone connectivity and welfare among women. We also feel it would be valuable to include a placebo or second treatment arm as well to include more behavioral outcomes in the next phase to more rigorously determine that treatment effects are due to the information and communication properties of the phone rather than, say, due to desirability bias induced by offering participants a valuable good.

The rest of the briefing is as follows. In the next section, we briefly describe the motivation for the study. We then describe the design and results from round 1 undertaken in July-September 2014.

MOTIVATION

One of the most important technological advances over the last quarter-of-a-century has been the hand-held mobile phone. This device has revolutionized not just communication but also banking, citizen engagement, and access to information for people worldwide. As fast as this technological revolution is spreading, mobile phone ownership is far from universal. Critical disparities exist, and one of the most significant is the gender gap. According to existing research, women are 21 percent less likely to own a mobile phone than men in a low or middle-income country.[1] Rooted not only in financial factors (e.g., cost of the handset) but also social and cultural ones (e.g., lack of family permission),[2] this differential access is important in that it potentially reinforces or even worsens gender inequality—a significant barrier to economic development.[3] Women without low-cost access to information and communication are denied the agency and voice that come from mobile phone technology.[4]

---

[1] GSMA Development Fund, Cherie Blair Foundation for Women, and Vital Wave Consulting. "Women and Mobile: A Global Opportunity." 2011. Available at http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_Women_and_Mobile-A_Global_Opportunity.pdf

[2] See USAID. "Connecting to Opportunity: A Survey of Afghan Women's Access to Mobile Technology." 2013. Available at http://www.usaid.gov/sites/default/files/documents/1871/survey_afghan_women_mobile.pdf

[3] Gates, Melinda French. "Putting Women and Girls at the Center of Development." *Science* 345, no. 6202 (2014): 1273-75. World Bank. World Bank Development Report 2012: Gender Equality and Development. Washington, D.C.: World Bank Publications, 2012.

[4] Klugman, Jeni, Lucia Hanmer, Sarah Twigg, Tazeen Hasan, and Jennifer McCleary-Sills. *Voice and Agency: Empowering Women and Girls for Shared Prosperity*. Washington, D.C.: World Bank Publications, 2014.

One social enterprise working to close this mobile gender gap is Kidogo Kidogo. Operating under the assumption that the high up-front cost of mobile phones (starting at $16 to $22 USD for a basic handset) is the main financial barrier to ownership and that pay-as-you go credit and battery recharging can be done as can be afforded, Kidogo Kidogo provides women in Tanzania cost-free mobile phone handsets. The cost of mobile phone distribution is underwritten through the sale of smartphone cases (iPhone 4/4S, iPhone 5/5S, iPhone 6, and Samsung Galaxy S5) retailed online and in stores in the U.S. and Tanzania. Kidogo Kidogo has also partnered with one of the largest mobile network operators in Tanzania, Tigo, which through its corporate social responsibility team is providing a free SIM card and free monthly package with minutes and SMS for all women receiving Kidogo Kidogo handsets. Kidogo Kidogo is, as far as we know, the only social venture worldwide to provide women with cost-free mobile phones as a means to address the gender gap.

RESULTS FROM THE FIRST IMPACT EVALUATION IN DAR ES SALAAM

With funding from the Institute for the Theory and Practice of International Relations (ITPIR) at the College of William and Mary in Virginia, USA, our research team from REPOA, a Tanzanian research institute focusing on poverty reduction, the College of William and Mary, and Brigham Young University in collaboration with Kidogo Kidogo carried out an impact evaluation based on the distribution of phones to a small sample of 62 women (of whom 54, or 86%, completed the study) who lived around Dar es Salaam.

Working through Kidogo Kidogo's established partnership with FINCA, a global, nonprofit microfinance institution serving low-income entrepreneurs in developing countries, we recruited 62 female FINCA clients from three FINCA branch areas around Dar es Salaam—Magomeni, Kibiti, and Tegeta. The primary criterion for recruitment was the women at the time of the baseline survey did not own mobile phones (though they may have owned one in the past). Participants were recruited by local FINCA officers who informed the women that researchers from REPOA, W&M and BYU were interested in conducting a survey on the clients' views on women's issues and in exchange for their participation each woman would receive a mobile phone, Tigo sim card, start-up credit of 5000 TSH, and training on how to use the mobile phone and value-added services, such as mobile money.

The phones were all donated by Kidogo Kidogo and distributed through a wait-list design, in which half of the participants received the mobile phone package after the baseline survey was conducted at the end of June or early July 2014 and the rest of the women received the phone package after the endline survey in early September 2014. The initial distribution of the mobile phone packages was undertaken via random assignment. To ensure balance between the *treatment group* (those who initially received the phones) and the *control group* (those who initially did not receive the phones), we ensured equal distribution (block randomization) across three dimensions: 1.) one's village banking group; 2.) level of reported income; and 3.) whether one reported having a phone in the household.

Table 1 reports the average values across a number of key variables for the treatment and control groups. On average, the women in the treatment and control groups are very similar in terms of age, education, marital status, religion, total number of household assets (such as, refrigerator, television, car), ease of borrowing a mobile phone, and levels of self-reliance. Overall the participants of the

study were relatively well-off in terms of baseline levels of education, wealth, phone access, and levels of empowerment.

Table 1: Baseline summary statistics and randomization balance

Variable	Control Group	Treatment Group
Number of women who completed study	29	25
Average Age	44	40
Average Years of schooling	8	7.4
Proportion Married	59%	54%
Proportion Muslim	79%	81%
Average Asset Index (out of 10)	3.8	3.8
Average Difficulty of Borrowing Phone (out of 4)	2.4	2.3
Average Feeling of Self-Reliance (out of 5)	4.2	4.2

After two months we then followed up with 86% of the original participants (54 women). Of the 8 participants who dropped out of the study: three women refused phones after the baseline survey out of concern that the phone distribution was part of a recruiting tool for the Freemasons—a concern other Tanzanians have expressed in the past during a phone distribution carried out by the NGO, Twaweza, as part of a nationwide phone-based survey they organized. We are devising strategies to combat this popular myth in future distributions. Four other respondents were inaccessible at the end of the study despite repeated efforts to find them. On key covariates, the women who drop out look very similar to those who complete the study.

KEY FINDINGS ACROSS THE TREATMENT AND CONTROL GROUP[5]

1.) Effect of mobile phone distribution on mobile phone use and uptake

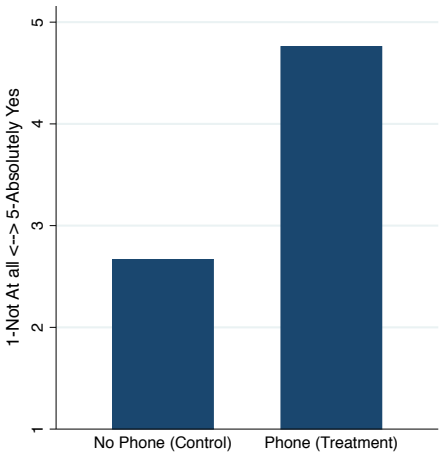
The overriding motivation for Kidogo Kidogo's mobile phone distribution program is to increase women's mobile phone connectivity and to help to reduce the gender gap in mobile phone ownership.

[5] Note about results reported: Because we block randomized by village group, income and number of phones in the household, it is important to control for our blocking strategy when analyzing the results. While the graphs report the raw difference in means results between control and treatment groups, we have also conducted regression analyses that include our block variables as controls and cluster standard errors by village banking group. Each result highlighted as statistically significant holds up under this more rigorous analysis.

At baseline all women in the study expressed interest in owning a mobile phone but nearly all reported the singular reason they did not currently own one was the financial cost.[6] (Other factors, such as financial cost for airtime or charging, family pressure or gender norms, or concerns about using mobile phone technology were very rarely reported as obstacles to ownership).

At baseline, women reported on average using a mobile phone several days a week to once a week (See Figure 2). About 30% reported borrowing their husband's phone; 33% reported borrowing from another family member (e.g., son, daughter, mother, or sister); and 30% reported borrowing a friend's or neighbor's phone. At baseline women, on average, reported that borrowing someone else's phone was 'somewhat easy' to 'not very easy.'

Figure 1.
Able to Use Mobile Phone as Much as Want To



At endline, however, we see significant change in how participants from the control and treatment group describe their mobile connectivity and ability to use a phone as much as they would like (See Figure 1). Figure 2 illustrates the change in frequency of phone use of those in treatment group compared to control group—those in treatment group go from using their mobile phone less than several days a week to almost all using their phones every day.

In follow up with the treatment group, 88% reported using their phones many times a day and virtually none of the respondents said that financial cost of air time or charging were obstacles to phone use.

All phone recipients registered for Tigo Pesa and one-third reported using the service at least once a week. As is seen in Figure 3, at endline two times as many women in the treatment group reported using mobile money as a financial instrument. But this also suggests that though all signed up for Tigo Pesa, only half have become regular users of a mobile money service.

[6] It is important to note that at baseline 89% of women reported having owned a phone in the past but that 40% reported that the phone stopped working, 25% reported the phone being stolen, and 25% reported the phone being lost. This points to the volatility of ownership and the importance of mobile phone durability as a key condition of ownership. It also suggests that the high up-front costs of phone may prevent women from replacing a broken, lost or stolen phone.

Figure 2.
Frequency of Phone Use

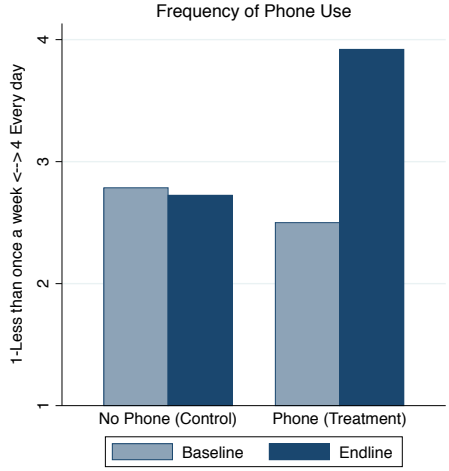
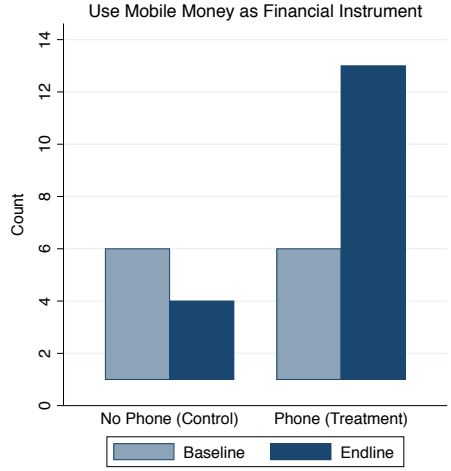


Figure 3.
Use Mobile Money as Financial Instrument



Beyond using mobile money, a number of women reported using other accessories on their phone:

- 74% said they use the flashlight many times a day
- 47% said they use the calculator once a week or more
- though the radio on the phones were rarely used (85% reported never using the radio)

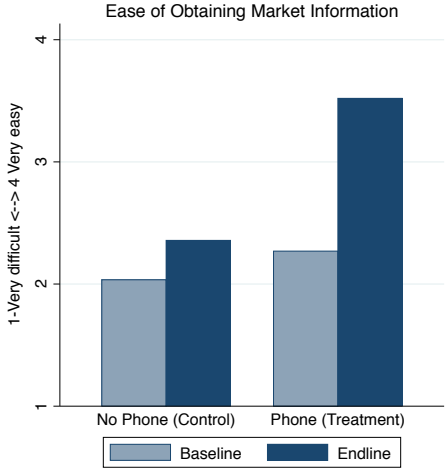
2.) Effect of mobile phone distribution on business operations

The women involved in the study were primarily market traders (selling produce, cooked food, clothes, dried goods, and other items) and business owners. At baseline most expressed an interest in gaining ownership of a phone for three primary reasons:

- 85% to stay in touch with friends and family;
- 79% to improve business operations;
- 45% to send and receive money

Overall we see strong treatment effects of the phone distribution on women's business operations. As illustrated in Figure 4 at baseline, on average, most participants reported that it was somewhat difficult to find reliable financial information, such as prices of goods and services, that are essential for their business activities. At endline, however, those in the treatment group report much less severe informational constraints and find it significantly easier to obtain market information.

Figure 4.
Ease of Obtaining Market Information



Perhaps one reason that women in the treatment group report lower information problems is they have to rely less on word of mouth and traveling themselves to obtain market information. We find exactly this. As illustrated in Figure 5 (next page), women in treatment seem to shift to the use of mobile phones to acquire information on prices goods or services.

Figure 5.
Method of Acquiring Market Information

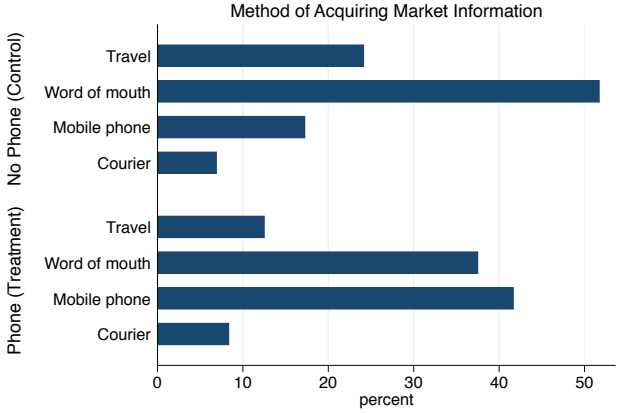
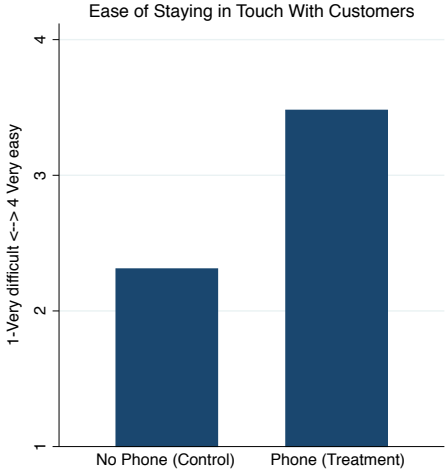


Figure 6.
Ease of Staying in Touch With Customers



In addition to better access to market information, we find that women in the treatment group find it less difficult to stay in touch with their customers, have experienced an increase in their customer bases in the previous month, and have communicated with more customers by phone in previous week as reported in Figures 6, 7 and 8.

Overall does this better market information and customer communication lead to improved business operations? The results are suggestive but not conclusive. Over the past month women in the treatment group do report better revenue than normal and better business operations than the control group but the difference is not significant. Moreover, there is no real difference in terms of respondents reported income in previous month. This may be due to the short treatment period; a longer-term study is necessary to see if better market information and customer communication that arises from mobile phone ownership may have cumulative effects on revenue and income.

Figure 7.
Change in Customer Base Compared to Previous Year

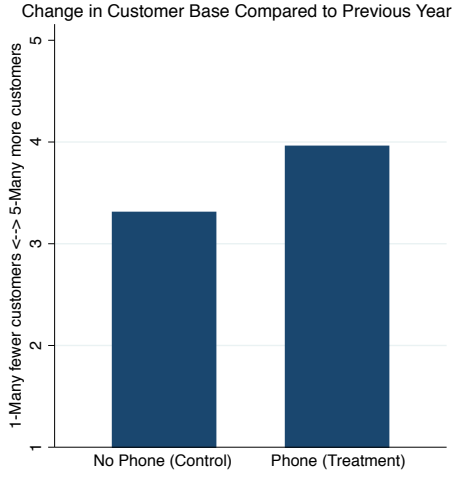
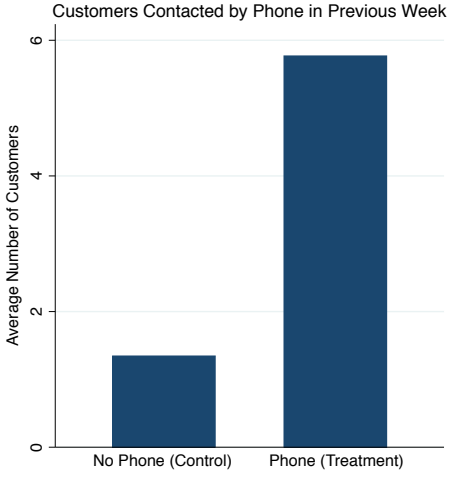


Figure 8.
Customers Contacted by Phone in Previous Week



3.) Effect of mobile phone distribution on social connections and women's welfare

In this section we report results on the effect of the phone on the recipients' social connections and general well-being. In the short treatment period no effects were observed on the participants' feelings of isolation or lack of companionship. Across both groups women reported low levels of isolation and high levels of companionship. But there is a discernible (and statistically significant) difference in women's self-reported ability to stay in touch with those who live far away from them as reported in Figure 9. Women in the treatment group, on average, reported talking to around five people outside of their village in the past week compared to around four people in the control group.

Figure 9.
Stay in Touch with Those Outside Village

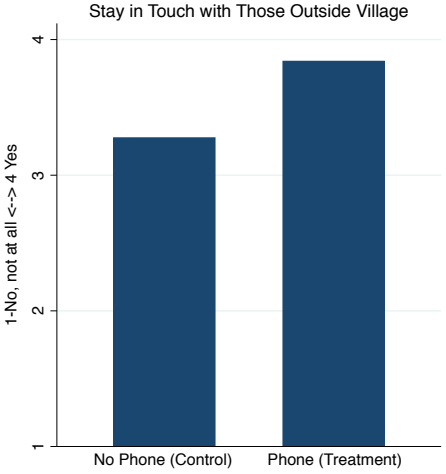


Figure 10.
Living Conditions Compared to One Year Ago

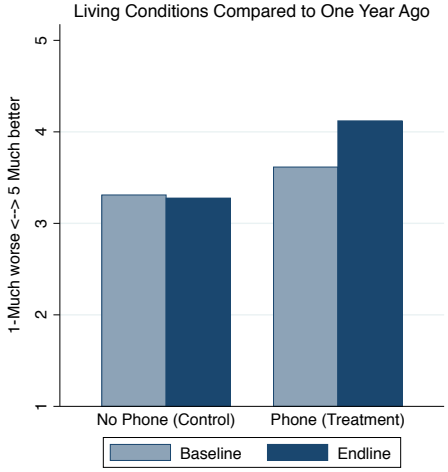


Figure 10 reports how women assess their overall living conditions compared to one year ago. Those who received mobile phones are more likely to assess their living conditions as much better than a year ago compared to the control group, who, on average, state no change.

4.) Effect of mobile phone distribution on recipient's personal security

One potential concern is that the distribution of mobile phones to women in a patriarchal society may challenge existing power structures and increase domestic conflict. It is worth noting that at baseline nearly every woman reported that cultural factors (i.e., the appropriateness of women to own phones) and family pressure did *NOT account* for their lack of mobile phone ownership. (As reported above, all emphasized the importance of financial barriers).

Nonetheless, to check the effect of Kidogo Kidogo's mobile phone distribution program on women's personal security and vulnerability to intimate partner violence, we included a module on these subjects, drawing standard questions from the USAID-funded Demographic and Health Surveys, which are regularly conducted in Tanzania and other developing countries.[7] At baseline respondents reported very low levels of intimate partner violence. The same was true at endline: respondents both in the control and treatment groups reported very low levels of intimate partner violence

[7] http://dhsprogram.com/

Among those who received the phones, we asked them whether owning a mobile phone affected their relationship with their spouse. Most (78%) said it had no effect, *while 17% said it had a positive effect*. Only one person reported the phone having a negative effect on the relationship with their spouse.

It is worth remembering that this study was primarily conducted among women who report high-levels of economic independence and as discussed in the next section high-levels of empowerment.

5.) Effect of mobile phone distribution on political engagement and individual empowerment

Two sets of questions assessed the effects of the phone distribution on participants' political engagement and individual empowerment.

On political engagement, we asked about an individuals' involvement or interest in various political activities over the past two months (the length of the treatment period), including: organization of a community meeting; participation in a demonstration; attendance of an election rally; contact a government official; wrote or signed a petition; feel the government is responsive on women's issues. No discernible effects were found of the phone distribution on participants' political engagement during the short treatment period.

On individual empowerment, we asked about an individuals' sense of individual efficacy and ability to: achieve most of the goals they set for themselves; have enough time to work toward their goals; make others see the importance of their goals; overcome challenges they face; provide for themselves and their families; support other women find a job or affected by domestic violence. No treatment effects were seen. Overall at baseline and endline most of the participants reported moderate-to-high levels of individual efficacy and empowerment.