

Impact Evaluation Concept Note

Business Women Connect:

Mobile Savings With and Without Business Training

Evidence from a Randomized Controlled Trial in Tanzania

December 15, 2015

Many women small-business owners living in low-income settings remain unbanked and generally rely on informal saving mechanisms. They also appear to lack the necessary business skills to expand their enterprises. Innovations in mobile savings products give women access to a convenient, safe and private platform for saving and making payments. Can access to mobile savings, by itself or combined with business training, increase women's savings and business investments, and ultimately their incomes? The ExxonMobil Foundation, TechnoServe, The Center for Global Development (CGD), and the World Bank's Gender Innovation Lab (GIL) will partner up to evaluate the impact of access to mobile savings products, with and without training on business skills for women small-business owners in urban Tanzania, using a rigorous randomized control trial approach.

1. Context

More than 60 percent of Tanzanian adults do not have a formal bank account and 30 percent do not possess a mobile phone, with women comprising a significant majority of both figures (Global Findex, 2014; Intermedia, 2015). The under-representation of women with access to financial tools poses one barrier to overall increased women's economic empowerment. Among financial tools, mobile solutions such as m-savings products in particular offer an opportunity to rebalance the financial inclusion and business performance gender gap. Mobile savings products give women the privacy and security needed to protect their money from the claims of others while offering the flexibility and ready-access necessary to increase business and household resilience to shocks, invest in their businesses, and earn higher returns.

Mobile financial products have increased rapidly in recent years with the proliferation of mobile money accounts in Sub-Saharan Africa playing a big role in helping 700 million more adults to be bank holders

worldwide (GSMA, 2015; World Bank, 2015)¹. These mobile products eliminate costly, time-intensive, and often risky trips to a likely distant financial institution branch location. Furthermore, for latent female customers, the mobile platform has the potential to circumvent some of the cultural barriers that currently impede their access to financial services. Regardless of the recent growth in financial access, too many poor people, especially women, remain unable to access income- and productivity- enhancing mobile financial products such as mobile credit and savings that are used for personal consumption or investment in business activities. Increasing access to these tools could be an important driver of economic growth, poverty reduction and higher household investment in health, nutrition and education.

The ExxonMobil Foundation, TechnoServe, The Center for Global Development (CGD) and the World Bank's Gender Innovation Lab (GIL) will partner together to measure the effects of access to mobile savings products, with and without training on financial literacy and business skills. Specifically, this study will comprise of two treatment groups with both groups assigned to a training on how to use the Vodacom mobile money (M-Pesa) and mobile savings (M-Pawa) products on their mobile phones. The second treatment group will be additionally assigned to receive a 12-week business training course. These two treatments allow us to measure the both the stand alone mobile savings intervention and examine the potential complementarities of the mobile savings intervention coupled with business training, against a comparison group of women not assigned

The partnership will explore the intervention's potential impact on women's business investment, ability to access credit, business income, and their resilience to financial shocks. Tanzania is selected for this project due to its mobile money penetration overall and for women in particular. In 2013 in Tanzania, 99 million mobile money transactions totaled US\$1.9 billion, and more than 17 percent of women reported using a mobile phone to receive money (Haas, 2014). Mobile money penetration correlates strongly with successful rollout and uptake of mobile savings products, making Tanzania a prime candidate for a gender-inclusive intervention.

This impact evaluation will use a rigorous randomized controlled trial approach to (i) measure the impact of promoting this mobile savings product on business outcomes such income, revenue, assets, and savings, and (ii) compare the results to those that also received the business training intervention.

2. Conceptual Framework

¹ There are currently 263 live mobile money products worldwide with 84 percent deployed since 2010. (GSMA Deployment Tracker, accessed November 13th, 2015)

This study will contribute to the savings, mobile finance, and business training literature as well as shed light on how these topics intersect with each other. Women are disadvantaged compared to men when it comes to investing in their businesses. Evidence from past evaluations point out that women are often unable to translate cash grants and savings into business investments (De Mel et al. 2009; Fiala 2014). It is possible that this is in part the result of social pressures such as the “kin tax” where the woman’s savings and income is used to support the needs of relatives and also her husband (Jakiela & Ozier, 2012)². However, recent evidence shows that when women receive payments through mobile phone, they may be able to invest a higher percentage of the funds into their businesses (Buvinic & Furst-Nichols, 2014).

Access to bank accounts is imperative for improving livelihoods. Those without access to bank accounts are more likely to not have enough money saved up to deal with financial emergencies (Dupas, Green, et al., 2012). When individuals are not able to pay for these emergencies, such as health or income shocks, they may have to cope by choosing expensive options like taking a high interest loan, selling off assets (Dupas & Robinson, 2013), taking their children out of school to work (Ferreira & Schady, 2009), or take on more dangerous jobs (Robinson & Yeh, 2011).

Moreover, access to savings shows promising results to women in particular. Dupas and Robinson (2013) conducted a study in rural Western Kenya where they offered to pay the initial registration fee for a savings account for 156 individuals. They found that 87 percent of the participants opened a savings account and of the 40 percent of business-women that actively used the savings accounts those women saw large increases in business investments, daily expenditures and average savings. A similar experiment in Nepal (Prina, 2015) also found that offering female business owners bank accounts with no fees resulted in 84 percent of the eligible participants opened an account with 80 percent actively using it. Monetary and non-monetary assets grew by 16 percent as did investments in both health (medicines) and education (textbooks and school uniforms).³

Mobile savings accounts have the potential to expand these benefits by overcoming some of the primary obstacles to savings: reducing the transaction costs associated with traveling to the bank (Burgess & Pande, 2005) and circumventing some of the intra-household disagreements regarding saving (Ashraf, 2009) by providing a private and secure method for saving. As documented in an M-Pesa study from Kenya

² This study in Western Kenya found that women invested less in their business when investment income was visible compared to when it was hidden. This was only found to be applicable to women only.

³ Additional studies on savings projects include a project offering direct deposit into savings accounts for farmers in Malawi (Brune, Gine, et al., 2015), a program offering access to free savings accounts in Chile (Kast & Pomeranz, 2014), and a program where bank agents use mobile phones to collect saving deposits from rural villages in Sri Lanka (De Mel, McIntosh, & Woodruff, 2013).

(Morawczynski, 2009), mobile money accounts are a key tool for consumption smoothing and increasing female autonomy in the household:

“some of the women accumulating secret savings in Kibera used the cash to purchase household items when their husbands “refused” to give them money...Some of the women also used the application to store their precautionary savings...The informant further explained that money stored in M-PESA was less likely to be stolen by her husband.”

The standalone introduction of mobile financial products to business women however might not be enough to increase their business income. A complementary obstacle to female entrepreneurial success might be the lack of managerial capital (Bruhn, et al., 2010; McKenzie & Woodruff, 2015). Adequate business literacy can help business owners making better management decisions, including those related to savings and investment. The existing evidence on the impacts of business training on business outcomes is however limited. Recent studies show that business training can improve business and accounting practices, but has only limited effects on business performance and sales (Karlan & Valdivia, 2011; Cole, et al., 2011; Bruhn & Zia, 2011).⁴ As pointed out by McKenzie & Woodruff (2013) most of this literature is statistically underpowered, and thus no definitive conclusions can be made. One exception though is Calderon et al. (2013) who show significant positive results following a randomized business training intervention in Mexico.

Our research will examine the impact of access to mobile savings, with and without business training. We will test whether supplementing mobile savings with business training is more effective than providing access to mobile savings alone.

3. The Intervention

A. Mobile Savings Promotion

The first of two interventions is the mobile savings promotion. This intervention invites 1,000 business women to a 90-minute training session that introduces them to the basics of using a mobile phone, signs the participants up for both a mobile money (M-Pesa) and mobile savings account (M-Pawa), and trains them on how to use those products. Additionally, the participants will receive sms messages throughout one year that encourage them to use their M-Pawa accounts.⁵ These trainings will be provided by trained Vodacom agents. The usage of the mobile money and mobile savings accounts will be tracked by the

⁵ Frequency and content of messages still to be determined.

participants' mobile phone registration number which Vodacom will be tracking. Vodacom will share the participants' usage data with the research team.

B. Mobile Savings Promotion and Business Training

The second intervention will begin the same way as the first intervention with the introduction to the mobile products with this intervention targeting 2,000 business women. However, these participants will also be invited to attend a business training program that provides two-hour trainings every week for three months. These trainings will cover topics on how to expand a business and improve profitability, personal and professional proficiency, finance and record keeping, entrepreneurship, and business planning. These participants will also have access to these trainers on request outside of the allotted class times. The business training classes will be taught by TechnoServe's trained instructors who will refer to a structured handbook provided to them.

C. M-Pawa Product Description

Vodacom released M-Pawa, a mobile savings product, in May 2014 that was modeled after the Kenyan Safaricom product M-Shwari (launched in November 2012). M-Pawa is a separate account on the M-Pesa mobile money platform where customers can transfer their funds from M-Pesa to their M-Pawa savings account to earn interest and receive a micro-loan one pre-conditions are met. The interest rate for savings under 200,00 TSH (USD \$94.00) is 2% paid out quarterly but ranges up to 5% as savings increase. Micro-loans are deposited directly in the customer's M-Pesa account and come with a 9% facilitation fee and a loan term of 30 days. The minimum loan size is 1,000 TSH (USD \$0.46) and maximum size is 500,000 TSH (USD \$231.00) but the loan size is subject to each customer's credit score. A customer's credit score is determined by a combination of M-Pesa activity, phone usage, airtime purchases, airtime loan usage, and M-Pawa savings amount.⁶ The average loan has been about \$6.00 USD (CGAP, 2015).

4. Experimental Design

Our main research questions are: (i) What are the impacts of promoting access among women business owners on business outcomes such income, revenue, and assets among women-owned businesses?; and (ii) Whether and how these impact vary if the promotion of mobile savings is supplemented with a 12 week business training program coupled with the mobile savings promotion intervention?

⁶ M-Pawa product description is available at Vodacom's M-Pawa FAQ page: <https://www.vodacom.co.tz/templates/framestorage/mpawa/?page=faq> (Accessed December 1st, 2015)

A. Sample Selection

TechnoServe will first identify local markets throughout the Dodoma and Mbeya regions of Tanzania and then recruit eligible participants for the intervention within those markets. It is anticipated that as much as 100 markets will be part of the study. TechnoServe will limit the eligible participants to be women that have their own business, own their own mobile phone, and importantly, to those that have not yet registered for the mobile savings product, M-Pawa.⁷ After the participants are identified, a baseline survey will be administered to them. Following the completion of the baseline, TechnoServe will conduct a lottery at each local market to randomly allocate one-fourth of the participant women to treatment group 1 (mobile savings only), one-half to treatment group 2 (mobile savings with business training), and one-fourth to control group (control group). The randomization will be stratified by markets, and within each market the incidence of pre-existing M-Pesa clients will be the same across the three experimental arms. The full sample will comprise a total of 4,000 business-women, with 1,000 in treatment group one, 2,000 in treatment two, and 1,000 women in the control group (Figure 1 outlines the design).

Randomizing at the group level (e.g. savings groups) was determined not to be practical as business-women often are members of multiple groups within the same market. Randomizing at the market level was also not feasible due to operational capacity constraints and funding limitations in identifying and treating a large number of markets.

B. Econometric Models

The study will estimate the effects of the mobile savings intervention, with and without business training, on total mobile savings, monthly business revenue, monthly expenditures, and an index of women's empowerment outcomes. Since actively saving on the mobile savings platform is voluntary, we will estimate intent-to-treat (ITT) effects. In practice, we will estimate the following specification:

$$y_{im} = \alpha_1 + \beta_1 T_{im}^1 + \beta_2 T_{im}^2 + \gamma X_{im} + \varepsilon_{im}$$

where y_{im} denotes a business outcome of interest for women i in market m , T_{im}^1 is dummy that equals 1 if the woman is assigned to treatment group 1 (mobile savings only), and T_{im}^2 is dummy that equals 1 if the woman is assigned to treatment group 2 (mobile savings and business training). X_{im} is a vector of stratification variables, including market dummies and a dummy indicating whether the woman was a pre-existing M-Pesa client. Standard errors will be clustered at the market level. The parameters of interest are

⁷ The more restrictions that are placed on the eligibility of the participants (firm size, industry, minimum revenues) the more homogeneous the sample will be, however it comes at the risk of sharply reducing the sample size in each market, and also reduces how much the results can be generalized to other populations.

β_1 , β_2 , and their difference, which respectively identify the standalone ITT effect of offering access to mobile savings, the combined effect of offering access to mobile savings and business training, respectively, and the differential effect of offering access to mobile savings with and without business training.

5. Data, Outcomes, and Power Calculations

A. Data and Outcomes

The main source of data for the impact evaluation will be a baseline, and two follow-up surveys. The participants will be interviewed between June (Dodoma) and July 2016 (Mbeya) for the baseline, one year later in June and July 2017 for the first follow up, and then again in September 2017 (endline). The first follow-up survey will be a long-form survey, whereas the second follow-up three months later will be significantly shorter to focus on outcomes with high variability such as revenues and profits. The survey will collect data on a number of key outcomes for this study, including: (i) self-reported savings behavior; (ii) business revenue and income; (iii) consumption and food security; (iv) asset accumulation; (v) access to finance; (vi) time-use; (vii) intrahousehold bargaining, psychological wellbeing, and violence; and (viii) business management practice and knowledge.

The secondary source of data will be the participants' M-Pesa and M-Pawa usage data as provided by Vodacom. This data will include the weekly average balance in each participants' M-Pesa and M-Pawa accounts throughout the course of the intervention, as well as the total number of weekly deposits and withdrawals per account.

B. Power Calculations

For the purposes of the power calculations we use data from the 2011 and 2012 World Bank's Virtual Business Incubator (VBI) Tanzania dataset as well as the 2008 and 2013 Tanzania LSMS dataset. In the VBI dataset we focus on current savings, annual income, and monthly revenue as the main outcomes of interest.⁸ These outcomes have high variability so the subsequent power calculations serve as an appropriate conservative benchmark for other outcomes that may have less variability.

Table 1 reports the results as well as the key statistics used for the power calculations on ITT effects. The calculations do not assume any clustering, since the interventions will be assigned at the individual level. The sample will comprise of 4,000 business-women in local markets throughout the Mbeya and Dodoma regions of Tanzania with 1,000 women in the control group, 1,000 in treatment group 1, and 2,000 in treatment group two. The power level is set at 85 percent to allow a minimum power level of 80 percent

⁸ We thank Marine Gassier for providing us with the Virtual Business Incubator (VBI) Tanzania dataset.

when factoring a potential attrition rate of 12.5 percent.⁹ Autocorrelation is set at 0.2 which is conservative compared to the literature average of 0.3 to 0.5 (McKenzie and Woodruff, 2013).¹⁰

Table 1 shows that we are powered to detect a 9.7 percent ITT increase in monthly revenues for those assigned to treatment 2 (mobile savings with business training) compared to the control group, and to detect a 11.3 percent ITT increase in monthly revenues for those assigned to treatment 1 (mobile savings only) compared to the control group. Assuming a take-up of savings of around 50 percent, these results imply that for active users we are powered to detect differences in monthly revenues of 20 percent between women in treatment group 1 and women in the control group, and of 22.6 percent between women in treatment group 2 and women in the control group.¹¹

C. Cost-Benefit Analysis

A cost-benefit analysis will be conducted to compare the cost effective differences between the stand alone mobile savings intervention and the mobile savings with business training intervention. TechnoServe will provide all cost amounts for their intervention operations. This includes fixed costs such as staff compensation, and office space expenses along with variable costs such as business training course expenses. Yearly costs will be calculated in terms of yearly per unit average costs and the yearly benefits being the ITT impact of the two interventions.

7. Risk Assessment and Mitigation

One risk to this study is the potential spillover effects between treated and control groups. Due to randomization at the individual level within local markets, treated individuals may speak about the training they have received to those in the control group. This spillover effect could be positive as the control groups become more aware of business training and mobile financial products through their peers in the market and thus they also have positive business outcomes. Or the spillover may be negative if the treated businesswomen increase their sales as a result of taking business away from the businesses in the

⁹ This attrition rate is acceptable within the literature as the average attrition in business training programs is 14 percent with lower attrition in African countries.

¹⁰ However, the smaller the microenterprises are the less autocorrelation is found for business outcomes such as profits and revenues, therefore 0.2 is a more reliable estimate of the autocorrelation between survey rounds (based on data from previous TechnoServe's mobile money interventions).

¹¹ A major factor in the power calculations is both the attendance rate of the training classes as well as the take-up rate of the mobile savings product. As the percentage of participants using the mobile savings product drops, the detectable effect necessary to find a significant result that is coming through active savings increases.

control group. This would violate the stable unit treatment value assumption (SUTVA), and the experimental estimate will no longer give the average impact of training for the sample population.

Recent empirical evidence (McKenzie & Puerto, 2015) testing spillovers in a randomized business training intervention Kenya has found insignificant negative spillover effects within study markets on business survival rates, profits, and sales of those assigned to control, which is corroborated by qualitative interviews. However, they notice that their point estimates for business outcomes are over-estimated when spillovers are not taken into account. In another recent randomized control trial of business training in Mexico, Calderon et al (2013) also find some statistically insignificant evidence of spillovers on business profits and accounting methods within study villages.

TechnoServe is currently examining the possibility of identifying additional 40-50 markets, and 800-1000 eligible women therein, which can serve as pure control markets. In case such markets are identified, the evaluation design will be slightly adjusted in order to permit the measurement of spillovers. Specifically, the full sample of markets will be randomly allocated into two groups. The first group of markets will be exposed to the same exact design described in this concept note. Specifically, eligible women within each market will be randomly allocated to a treatment group with mobile savings only, a treatment group with both mobile savings and business training, and a control group. The second group of markets will form a pure control group, and eligible women therein will not receive any intervention.

Another risk is low take-up of both the business training program and active use of the mobile savings product. Even if those assigned to treatment have a high take-up rate of M-Pawa they may convince others in the market to also become M-Pawa users via information dissemination thus lowering the effective take-up rate difference between those assigned to control and treatment. To mitigate this risk the sample will be restricted to those businesswomen that have expressed interest in additional savings products during the pre-test.

9. Deliverables, Timelines, and Milestones

A. Timeline

- Feb – May 2016: Pilot business training program and mobile savings promotion, and identify 4,000 eligible business women to participate in the intervention
- Feb – Mar 2016: Pilot Baseline survey
- Jun - Jul 2016: Baseline survey
- Jul 2016 – Aug 2017: Mobile savings promotion intervention (including sms messaging)

- Aug 2016 – Aug 2017: Business training program intervention (weekly trainings for 3 months) + mobile savings promotion intervention
- Jun 2017: Full follow-up survey
- September 2017: Short follow-up survey
- December 2017: Final impact evaluation report

B. Deliverables (estimated dates)

- Baseline survey instruments (Feb 2016)
- Baseline survey report (Aug 2016)
- Endline survey instruments (Mar 2017)
- Impact evaluation report (Nov 2017)

10. Research Team

The World Bank Gender Innovation Lab’s research team will be comprised by the principal investigator, Markus Goldstein, and co-investigators, Joao Montalvao, Gautam Bastian, and Spencer Dow MacColl.

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Figure 1: Sample size and Treatment arms

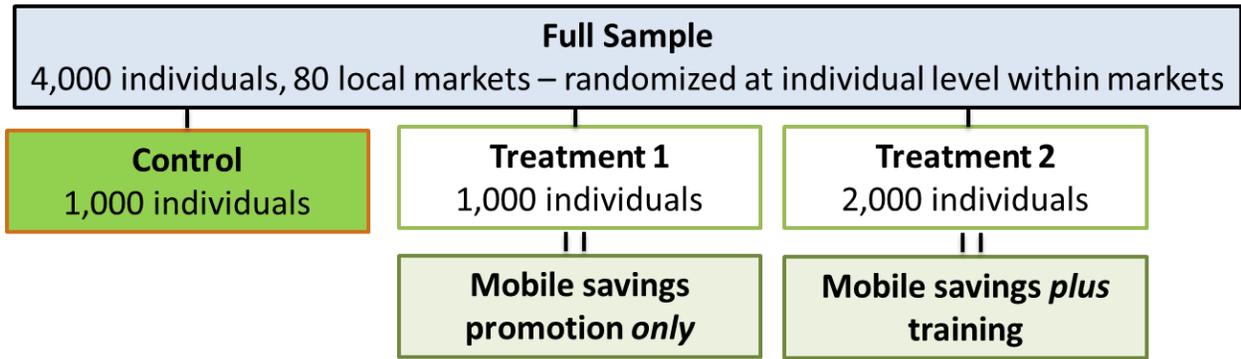


Figure 2: Theory of Change

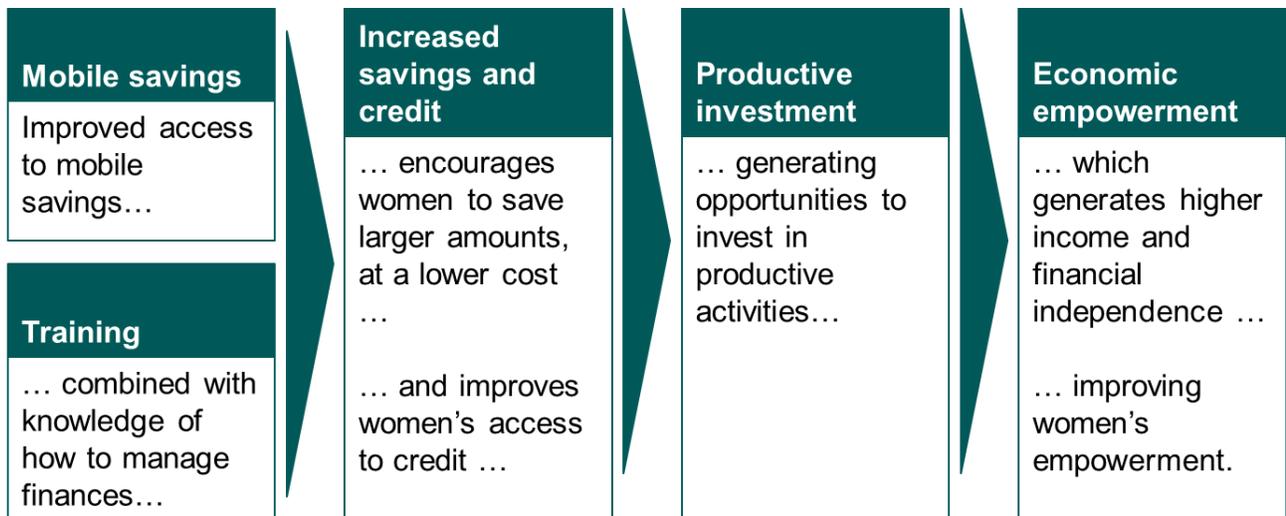


Table 1. Power Calculations. Minimum detectable effect sizes with 85% power and 5% significance level. Standardized effects reported in brackets.

	Monthly Revenue (1)	Annual Income (2)	Uses M-Pawa Accounts (3)
MDES between:			
Treatment 2 and Control (n=2,000 v. 1,000)	9.77% [.086]	9.07% [.086]	5.82
Treatment 1 and Control (n=1,000 v. 1,000)	11.29% [.10]	10.48% [.10]	6.75
Statistics for calculations			
Mean	413,855	1,464,598	
Standard deviation	466,228	1,531,254	
Autocorrelation	.20	.20	.20

Notes: Data is from the 2011 and 2013 waves of the World Bank's Virtual Business Incubator (VBI) survey in Tanzania. The sample consists of 838 women that are observed during both waves of data. Monthly revenue and current savings is in Tanzanian Shillings. Open M-Pawa Accounts is an indicator variable that equals value 1 if the individual opens and uses the M-Pawa mobile savings product. The value is a percentage point difference. The sample size is fixed with 1,000 participants in the control group, 1,000 participants in treatment 1, and 2,000 participants in treatment 2. The calculations assume individual-level randomization. It is further assumed that there will be one baseline survey and two follow-up surveys. Autocorrelation is determined by pairwise correlation between the 2011 and 2013 waves of the VBI Tanzania dataset.