

## Short-Term Impacts of Improved Access to Mobile Savings, with and without Business Training: Experimental Evidence from Tanzania\*

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January 2018

**Abstract:** This paper presents short-term results from an experiment randomizing the promotion and registration of a mobile savings account among women microentrepreneurs in Tanzania, with and without business training. Six months post-intervention, the results show that women save substantially more through the mobile account, and that the business training bolstered this effect. Women also obtain more microloans through the mobile account, an additional service provided by the product. The business training further led to an increase in the business practices of the women. These results are accompanied by improvements in women’s empowerment and subjective well-being.

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\* We thank all those at TechnoServe Tanzania, Vodacom Tanzania, Center for Global Development, Africa Gender Innovation Lab, and Savannas Forever for collaborative efforts in this project. We are grateful to ExxonMobil Foundation for financial support. The views presented in this paper are the authors’ and do not represent those of the World Bank or its member countries, or ExxonMobil Foundation. All errors remain our own.

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## 1. Introduction

Savings can help microentrepreneurs expand their businesses, by enabling them to finance lumpy investments and absorb unexpected shocks. However, microentrepreneurs in the developing world often do not have access to a safe and secure way to save. Existing evidence suggests that the returns to promoting access to savings among microentrepreneurs can be highest for women [e.g. Dupas and Robinson 2007], possibly because of social pressures they face to share their incomes with kin and neighbors. Innovations in mobile money technologies can give women access to a convenient, safe, and private savings platform, which can lead to better financial independence. In a recent study in Kenya, Suri and Jack [2016] show that the long-term positive effects of mobile money services on poverty reduction are especially pronounced in female-headed households and overall in women more so than men.

In this paper we evaluate a policy intervention promoting access to a new mobile savings technology among women microentrepreneurs in Tanzania. Additionally, we examine whether usage of the mobile savings account can be enhanced by the provision of complementary business training. In theory, this could happen for three reasons. First, better microentrepreneurs could understand more fully the role of savings for business expansion. Many business skills trainings, including the one we study, have specific modules focused on the link between savings and business expansion. Second, the expected return from investing in the firm could be higher for better microentrepreneurs. To the extent that savings enable microentrepreneurs to finance investments, better microentrepreneurs could thus be more willing to save. Third, all else equal, businesses managed by better microentrepreneurs could generate higher profits, thus increasing the ability to save.

We collaborate with TechnoServe to evaluate the Business Women Connect (BWC) program in Tanzania using a randomized control trial. The BWC program has two interventions. The first intervention (M-Pawa intervention) is a training session on M-Pawa and registration with the product. M-Pawa is a mobile finance product designed by Vodacom that allows customers to save money on an interest-bearing mobile savings account. It also enables users to access microloans conditional on good savings performance. The second intervention (Business Training intervention) is an intensive business skills training. We randomly assign a sample of 4,000 women microentrepreneurs to a control group of 1,000 women, a treatment group of 1,000 women invited to participate in the Mobile Savings intervention, and a treatment group of 2,000 women invited to participate in both the Mobile Savings and Business Training interventions.

This paper focus on short-term impacts of the two interventions, 6 months after the end of the business training. We focus on first-stage outcomes in the causal chain, namely savings, credit, and business practices. Our results show large positive impacts of both treatments on savings in the M-Pawa account. These impacts are significantly higher when the Mobile Savings intervention is complemented with the Business Training intervention. Despite credit not being the main focus of the interventions, we also find positive impacts on access to M-Pawa loans. There is however some evidence that the interventions crowded out alternative types of savings and credit. The Business Training intervention also significantly increased the business practices on record keeping, financial planning, marketing, and buying and stock control of the women.

Our analysis contributes to two strands of literature: on savings and on the effectiveness of business training. On savings, Karlan [2013] reviews the existing evidence showing promising results on the impacts of expanding savings access on female empowerment [Ashraf et al. 2010], health outcomes [Dupas and Robinson 2013b], business outcomes [Dupas and Robinson 2013a], and agricultural outcomes [Brune *et al.* 2013]. On business training, the available evidence is more nuanced. Previous work shows that business training can improve business and accounting practices, but has only limited effects on business performance and sales [Karlan and Valdivia 2011, Cole *et al.* 2011, Bruhn and Zia 2011]. However, most of this literature is statistically underpowered and thus no definitive conclusions can be made [McKenzie and Woodruff 2013]. Two exceptions are Calderon *et al.* [2015] and McKenzie and Porto [2017], who show significant positive results following a randomized business training intervention in Mexico and Kenya.

The rest of the paper is organized as follows. Section 2 describes the interventions, the research design, and the data. Section 3 presents the results.

## **2. Interventions, Design and Data**

### **2.1. Interventions**

The Business Women Connect (BWC) program was designed by TechnoServe to improve the business performance of women microentrepreneurs by providing them with improved access to savings through mobile money and business training. We work with TechnoServe to evaluate the BWC program in Tanzania using a randomized control trial. The implementation of the intervention was tailored to evaluate the effectiveness of access to mobile savings with and without business training.

The BWC program comprised two interventions. The first intervention (M-Pawa intervention) is a 2.5-hour training session on the uses and benefits of Vodacom’s M-Pawa savings account, along with the general concept of savings and its benefits, and registration with the product. M-Pawa is an interest-bearing mobile money savings account connected to the M-Pesa mobile money platform.<sup>1</sup> After a few months, users also become eligible for instant short-term microloans.<sup>2</sup> The M-Pawa intervention thus seeks to simultaneously relax savings and credit constraints.<sup>3</sup>

The second intervention (Business Training intervention) is a twelve 2.5-hour weekly face-to-face training sessions on business skills. The training focused on different business skills, including business expansion and profitability, finance and record-keeping, entrepreneurship and business planning, and personal and professional efficacy. The training used activity based learning and videos. Participants were also given a business skills manual and received a certificate of completion recognized by local governments. Participants were also given access to an innovative interactive mobile learning platform, which reinforces the business skills training messages.

## **2.2. Research Design**

TechnoServe located and screened more than 9,000 women microentrepreneurs, mostly market and street vendors, operating their businesses around the Mbeya and Dodoma urban and peri-urban regions. Of these, 4,000 women were selected to participate in the study based on basic eligibility criteria and willingness to participate in the program, with about 22% of the participants operating their businesses throughout 24 market areas in Dodoma, and 78% operating their businesses throughout 76 markets in Mbeya.<sup>4</sup>

After the baseline survey was completed, we randomly assigned the 4,000 women (the unit of randomization) across two treatment groups and a control group. The first treatment group (T1) of 1,000 women was invited to participate in the M-Pawa intervention. The second treatment group (T2) of 2,000

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<sup>1</sup> The interest rate for M-Pawa savings under 200,000 TSH is 2% paid out quarterly, but it can go up to 5% as savings increase.

<sup>2</sup> The M-Pawa microloans come with a 9% facilitation fee and a loan term of 30 days. The minimum loan size is 1,000 TSH and maximum size is 500,000 TSH, 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.

<sup>3</sup> The M-Pawa intervention also allowed participants to set personal savings goal on a USSD mobile learning platform with an option to receive weekly saving reminders. Participants also received regular motivational “push” messages about savings via Arifu. As such, the M-Pawa intervention also aimed to relax behavioral constraints hindering savings. The M-Pawa intervention is thus a bundled intervention aimed at relaxing financial constraints of women microentrepreneurs.

<sup>4</sup> The eligibility criteria to be part of the study were: owning a business, a mobile phone, and a functional Vodacom SIM, being able to pass a basic literacy test, being interested and available to participate in a 12-week long business training program, and accepting the fact that not everyone that signed up would be able to attend the training due to shortage of funds.

women was invited to participate in the M-Pawa intervention and the Business Skills intervention. The control group of 1,000 receives no intervention for the duration of the evaluation. The randomization was stratified by (i) market area, (ii) whether the respondent currently saves money on her mobile phone (through M-Pesa), (iii) whether the respondent has above-median monthly sales, and (iv) whether the respondent is above the median business practices score.

### **2.3. Program Take-Up**

The take-up rate for the M-Pawa intervention was 70%. Among women that participated in the M-Pawa intervention, approximately 90% activated an M-Pawa account, and 74% set a savings goal, of whom 81% chose to receive customized savings reminders. The take-up rate for the Business Training intervention was 55%, which is consistent with other business training interventions [McKenzie and Woodruff 2013]. Conditional on attending the first training session, almost three-fourths of the women completed the 12 training sessions.

### **2.4. Data**

All women in our sample were first surveyed in June-July 2016 for the baseline. The midline survey took place in June-July 2017. An endline survey is planned to take place in Jan-Feb 2018. Each survey covers topics related to (i) savings and credit behaviors, (ii) business practices, labor, capital, sales and profits, (iii) business and household shocks, (iv) consumption, (v) empowerment, and (vi) subjective wellbeing. In addition to the survey data, we also have access to administrative data on M-Pesa and M-Pawa transactions made available by Vodacom. This data includes daily transactions, namely all transfers in and out of the M-Pawa savings account, and all microloan disbursements and repayments. We obtained consent from all respondents to collect these records from Vodacom.

Appendix Table A1 presents summary statistics on characteristics of the businesses in our sample at baseline, by treatment status. We see that the sample is balanced across the three experimental groups. The average woman is 37 years old, has 9 years of education and 3 children. About 60% of the women are married. Only 11% of the firms have employees. The mean firm earns 165,934 TZS per month in profits, 561,676 TZS per month in sales, has capital stock of TZS 397,903, have saved TZS 260,126 in the past 12 months. About 46% of the firms have received a loan from any source (formal or informal) in the past 12 months. The average firm implements just under half of the 26 business practices in the McKenzie and Woodruff [2015] index.

Appendix Table A2 reports survey attrition rates at midline, by treatment status. Overall, despite the high degree of geographic mobility of women in our sample we were able to track 90.5% of the sample at midline. We see that attrition rates are similar across the three groups.

## 2.5 Estimation

Since participation in the M-Pawa intervention and in the business training are voluntary, we focus on intent-to-treat (ITT) impacts. We estimate the following OLS ANCOVA specification:

$$y_{i1} = \alpha + \beta T_i^1 + \gamma T_i^2 + \delta y_{i0} + \delta X_{i0} + \varepsilon_{it} \quad (1)$$

where  $y_{i1}$  is an outcome of interest for woman  $i$  measured at midline,  $T_i^1$  is an indicator for being assigned to the Mobile Savings only intervention,  $T_i^2$  is an indicator for being assigned to both the Mobile Savings and Business Training interventions,  $y_{i0}$  is the outcome measured at baseline (if available), and  $X_{i0}$  is a vector of randomization strata dummy variables. Since the randomization was at the individual level, standard errors are robust but not clustered. The parameters of interest are  $\beta$ , measuring the standalone ITT treatments impact of the M-Pawa intervention, and  $\gamma$ , measuring the combined ITT treatment impact of the M-Pawa and Business Training interventions. Their difference,  $\gamma - \beta$ , measures the marginal impact of the Business Training intervention over and above the M-Pawa intervention.

## 3. Results

### 3.1. Impacts on Savings

We first present descriptive evidence on the usage of the M-Pawa savings account across the three experimental arms using administrative data made available by Vodacom. Figure 1 plots total weekly M-Pawa transactions for the first 58 weeks after the beginning of the M-Pawa intervention, and the 20 weeks preceding it. Figure 1.A focusses on deposits, and Column 2 on withdrawals. The first row of graphs uses data from the control group, the second row of graphs from the M-Pawa treatment group, and the third row of graphs from the M-Pawa + Business Training treatment group. The vertical red lines in each of the 6 graphs mark the beginning of the M-Pawa intervention. Three key patterns emerge from this figure: (i) the M-Pawa intervention had a substantial impact on the total volumes transacted, (ii) the business training enhanced these impacts, and (iii) the amounts withdrawn follow closely the amounts deposited. We now investigate these patterns more rigorously.

Table 1 presents ITT treatment impacts on M-Pawa savings during the first 58 weeks. Column 1 shows the mean (and standard deviation) of the outcome in control communities, to benchmark the magnitude of the impact. Column 2 shows the number of women in the sample used for the estimation. Columns 3 and 4 report the treatment impacts for the M-Pawa treatment (T1) and for the M-Pawa + Business Training treatment (T2), respectively. Column 5 reports p-values on the null that the impact of T2 is equal to the impact of T1.

Panel A focusses on extensive margin outcomes. We find that the M-Pawa intervention positively impacts transactions probabilities, increasing the probability of a woman making at least one deposit and one withdrawal during this period by 39 and 32 percentage points. These impacts are large in terms of magnitude considering that the deposit and withdrawal probabilities in the control group remain at 21% and 16%. The magnitudes of these impacts are very similar among women also invited to the Business Training intervention.

Panel B focus on total number of transactions. We see that the M-Pawa intervention significantly increases usage of the savings account: women assigned to the M-Pawa intervention increase the number of deposits and withdrawals made during this period by 5.3 and 3.7 (control means are 1.4 and 1.6). These effects are 28% and 42% higher among women also assigned to the Business Training intervention ( $p = .045$  and  $= .008$ ).

Panel C focus on total effect margin outcomes. We find that the total amounts transacted also increase: women assigned to the M-Pawa intervention increase total amounts deposited and withdrawn by 73,571 TZS and 69,021 TZS (control means are 36,021 TZS and 33,233 TZS). These effects are 85% and 88% higher among women also assigned to the Business Training intervention ( $p = .003$ ,  $= .003$ ).

A concern with these findings is that M-Pawa savings could have crowded out other types of savings. To assess this concern the survey questionnaire asked respondents to report whether, where, and how much they have saved in the past 12 months. Tables 2 and 3 present treatment impacts on savings across the different savings alternatives reported by the women. On the intensive margin, Table 2 shows evidence of crowding out: relative to the control group, women in the M-Pawa treatment arm are 3.8pp less likely to save at home, 4.0pp less likely to save in a bank, and 1.4pp less likely to save through a microfinance institution. Overall, these effects translate into a significant 4.6pp reduction in the likelihood that women save in any alternative savings form. On the total effect margin, Table 4 shows that in terms of total amounts saved, there are both positive and negative impacts, though statistically insignificant.

### **3.2. Impacts on Credit**

Table 4 presents treatment impacts on M-Pawa loans during the first 52 weeks using administrative data made available by Vodacom. We find that women invited to participate in the M-Pawa intervention borrow at significantly higher rates than women in the control group: the M-Pawa intervention increases the probability of receiving a loan by 14pp (control mean is 16%), the average number of loans received by 0.39 (control mean is 0.62), and the average total amount borrowed by TZS 4,594 (control mean is 9,603 TZS). These effects are higher though not statistically different among women also assigned to the Business Training intervention.

These microloans are being repaid at fairly consistent rates: the M-Pawa intervention increased the probability of loan repayment by 11pp (control mean is 17%), the average number of loan repayments by 0.72 (control mean is 1.36), and the average total amount repaid by 3,730 TZS (control mean is 10,040 TZS). Again, women also assigned to the Business Training intervention have higher but not statistically different effects on repayments.

Tables 5 and 6 examines whether M-Pawa loans crowded out other types of credit. As we did for savings, the survey questionnaire asked respondents to report whether, where, and how much they have borrowed in the past 12 months. On the intensive margin, we see in Table 5 find that overall women assigned to the M-Pawa + Business Training treatment arm are 3.2pp less likely to have borrowed from other sources, mostly driven by a reduction in microfinance loans. On the total effect margin, Table 6 shows that the two treatments increased the total amount borrowed from alternative, though these effects are not statistically significant.

### **3.3. Impacts on Business Practices**

Table 7 shows the treatment impacts on business practices. We used the tool developed by McKenzie and Woodruff [2015] to measuring business practices. This tool comprises 26 questions measuring practices of the firm on four dimensions: (i) marketing, (ii) record keeping, (iii) buying and stock control, and (iv) financial planning. Column 1 shows that the Business Training intervention increased business practices: women assigned to the M-Pawa and Business Training treatment increase the proportion of practices used by 6.7pp, corresponding to a 17% increase over the control group. Columns 2-5 shows that the business training increases business practices on each of its four dimensions. The largest impacts are for record keeping and financial planning practices, which increase by 32% and 25% relative to the control



group. The M-Pawa intervention in isolation had no impact on business practices. Appending Table A3 reports treatments impacts for each of the 26 practices.

### **3.4. Impacts on Empowerment**

Panel A of Table 8 shows the treatment impacts on women’s empowerment. The dependent variable in the first row is an empowerment index, constructed by adding answers to five questions capturing women’s say over decisions around finances: (i) how money from their businesses is usually spent, (ii) make a major household expenditure (such as bicycle, television, or sofa), (iii) make a minor household expenditure (such as food for daily consumption, soap for household), (iv) make their own personal expenditures (such as own clothing and footwear, or hair products, cosmetics, etc.), and (v) make expenditures related to their children (such as education and clothing expenditures). Possible answers to each of these questions were on a scale from 1 (“I alone decide and do not consult anyone else”) to 5 (“Only other persons make the decision”). We see that women’s empowerment is improved by the M-Pawa intervention.

The remaining rows examine treatment impacts on each of the five decision-making variables used to construct the score. At baseline, 53% of married women reported that they alone decide how to spend money earned from their business, but most share decision-making power with their husbands on household related decisions: only 13%, 38%, and 34% report being the sole decision-maker on major household expenditures, minor household expenditures, and expenditures on children. This contrasts with 85% of married women being the sole decision makers about their own personal expenditures. We see that the overall positive impact of the M-Pawa intervention on women’s empowerment is mostly driven by increases in women’s say over how to spend money earned from their businesses, and on major household and children expenditures. The finding that women have greater control over their business incomes is consistent with the idea that mobile savings provide access to a safe and private savings platform, which can lead to better financial independence in face of social pressures that women might face to share their incomes with family and friends. We find no significant evidence that these impacts on empowerment were affected by the Business Training intervention.

### **3.5. Impacts on Well-Being**

Panel B of Table 8 shows the treatments impacts on subjective well-being. The dependent variable in the first row is a life satisfaction index, which adds two dummy variables indicating whether the woman

reports being very happy with her life overall, and whether she believes that her life has improved in the past 12 months. Women in the sample report a high level of life satisfaction: 38% of the women in the control group reported that they are very happy, and 51% reported that their lives were improving. We find that the M-Pawa intervention further raised women's satisfaction with their lives. The remaining rows show that women invited to participate in the M-Pawa intervention are 5.0pp and 4.8pp more likely to report being very happy and that their lives have improved, corresponding to a 13% and 10% increase relative to the control group. The business training further improved the belief that life has improved, but such difference is just shy of the 10% significance level ( $p = .105$ ).

#### **4. Conclusion**

We evaluate a policy intervention in urban Tanzania attempting to relax financial and managerial constraints that women microentrepreneurs face by providing them improved access to a mobile savings account, with and without business training. Our findings indicate that within six months, improved access to the mobile savings account increased the amount of savings and transactions on the platform, and that these impacts were enhanced by the business training intervention. Women also obtain more microloans through the mobile account, an additional service provided by the product. The business training also improved the business practices of the women. Moving forward, the next step in the analysis will analyze longer terms impacts of these interventions: in particular, we will examine whether the short-term impacts reported in this paper persist over time, and if so whether these translate into improved business performance. To do so, we will explore data from a new round of survey data and continue to analyze M-Pawa administrative data.

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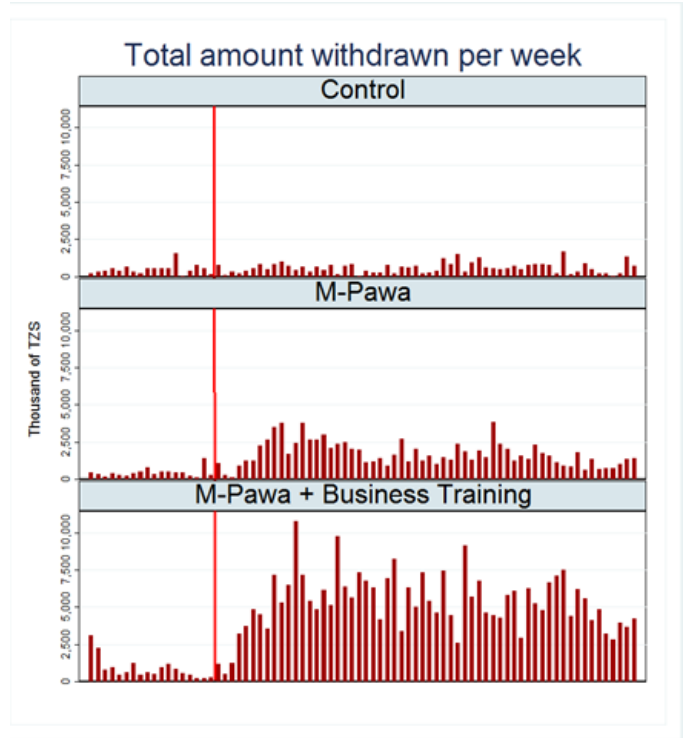
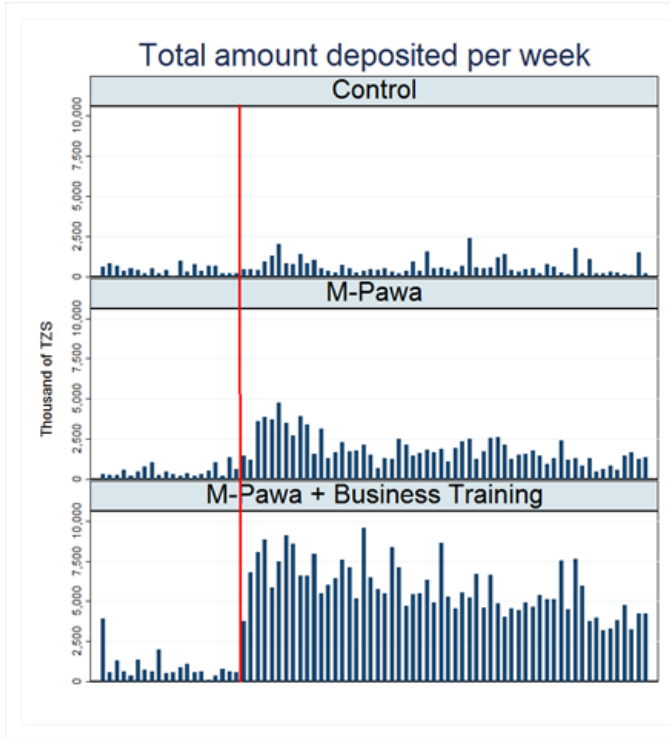
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Figure 1: M-Pawa weekly deposits and withdrawals (Vodacom Administrative Data)

Figure 1.A: Deposits

Figure 2.A: Withdrawals



**Table 1: Impacts on M-Pawa Savings Behavior**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, First 58 Weeks	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Panel A: Extensive margin</b>					
Ever made a deposit [yes=1]	.210 {.408}	3,934	.392*** (.020)	.395*** (.017)	[.851]
Ever made a withdrawal [yes=1]	.163 {.370}	3,934	.324*** (.019)	.350*** (.016)	[.188]
<b>Panel B: Number of transactions</b>					
Total number of deposits	1.39 {4.88}	3,934	5.32*** (.630)	6.80*** (.426)	[.045]
Total number of withdrawals	1.56 {7.68}	3,934	3.73*** (.515)	5.31*** (.430)	[.008]
<b>Panel C: Total effect margin</b>					
Total amount deposited [TZS]	36,021 {261,569}	3,934	73,571*** (14,817)	136,231*** (18,105)	[.003]
Total amount withdrawn [TZS]	33,233 {217,340}	3,934	69,021*** (14,137)	130,097*** (17,482)	[.003]
Transformed total amount deposited [IHS]	2.04 {4.15}	3,934	3.41*** (.208)	4.06*** (.176)	[.002]
Transformed total amount withdrawn [IHS]	1.71 {4.01}	3,934	2.96*** (.209)	3.69*** (.175)	[.001]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. Data is over the 58 weeks after the start of the M-Pawa intervention (“midline”), and the 19 weeks preceding the preceding it (“baseline”). All data comes from Vodacom administrative records. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline (over the 58 weeks after the start of the M-Pawa intervention) on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline (over 19 weeks after the start of the M-Pawa intervention), and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). All monetary amounts are reported in TZS (in January 2016, a USD 1 was worth about TZS 2,150). The transformed amounts are obtained by using the inverse hyperbolic sine transformation.

**Table 2: Impacts on Savings Behavior Beyond M-Pawa: Extensive Margin**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Midline Levels	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Savings in the past 12 months:</b>					
<b>Saves at home [yes=1]</b>	.407 {.491}	3,542	-.038* (.022)	-.036* (.019)	[.892]
<b>Saves with Michezo groups [yes=1]</b>	.485 {.500}	3,575	.025 (.023)	.013 (.020)	[.548]
<b>Saves with VICOBA/SACCOs [yes=1]</b>	.176 {.381}	3,607	.004 (.017)	.015 (.015)	[.816]
<b>Saves in private banks [yes=1]</b>	.175 {.380}	3,609	-.040** (.017)	-.039*** (.015)	[.946]
<b>Saves in MFIs [yes=1]</b>	.036 {.186}	3,620	-.014* (.008)	-.021*** (.007)	[.208]
<b>Saves in other forms [yes=1]</b>	.074 {.261}	3,624	-.009 (.012)	-.008 (.010)	[.925]
<b>Saves in any form beyond M-Pawa [yes=1]</b>	.861 {.346}	3,531	-.046*** (.017)	-.039*** (.015)	[.660]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). Other savings instruments include family and friends, and Tigo Pesa.

**Table 3: Impacts on Savings Behavior Beyond M-Pawa: Total Margin**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Midline Levels	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Savings in the past 12 months:</b>					
<b>Saving at home [TZS]</b>	236,183 {521,472}	3,542	-13,087 (24,166)	-23,180 (20,588)	[.628]
<b>Saving with Michezo groups [TZS]</b>	362,967 {671,674}	3,575	38,100 (31,341)	5,139 (26,354)	[.230]
<b>Saving with VICOBA/SACCOS [TZS]</b>	102,778 {295,223}	3,607	14,281 (14,242)	17,301 (12,126)	[.816]
<b>Saving in private banks [TZS]</b>	234,800 {822,929}	3,609	-54,224 (35,869)	-44,060 (31,824)	[.726]
<b>Saving in MFIs [TZS]</b>	3,680 {20,906}	3,620	-976 (946)	-1,842** (790)	[.243]
<b>Savings in other instruments beyond M-Pawa [TZS]</b>	31,838 {145,138}	3,624	-4,319 (6,492)	-3,364 (5,790)	[.861]
<b>Savings in all instruments beyond M-Pawa [TZS]</b>	1,023,541 {1,582,318}	3,531	-39,035 (71,298)	-52,575 (61,144)	[.821]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). Other savings forms include family and friends, and Tigo Pesa. All monetary amounts are winsorized at the 99th percentile and reported in TZS (in January 2016, USD 1 was worth about TZS 2,150). The transformed amounts are obtained by using the inverse hyperbolic sine transformation.

**Table 4: Impacts on M-Pawa Credit Behavior**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, First 58 Weeks	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Panel A: Extensive margin</b>					
Ever received a loan [yes=1]	.157 {.364}	3,934	.140*** (.018)	.164*** (.015)	[.182]
Ever made a loan repayment [yes=1]	.168 {.374}	3,934	.112*** (.017)	.113*** (.014)	[.948]
<b>Panel B: Number of transactions</b>					
Number of loans received	.623 {2.28}	3,934	.391*** (.098)	.560*** (.084)	[.078]
Number of loan repayments	1.36 {8.37}	3,934	.722** (.361)	.968*** (.296)	[.444]
<b>Panel C: Total effect margin</b>					
Total amount received [TZS]	9,603 {56,477}	3,934	4,594** (1,800)	7,629*** (1,789)	[.148]
Total amount repaid [TZS]	10,040 {60,452}	3,934	3,730* (1,975)	6,020*** (1,846)	[.294]
Transformed total amount received [IHS]	1.66 {3.88}	3,934	1.46*** (.187)	1.76*** (.155)	[.108]
Transformed total amount repaid [IHS]	1.68 {3.82}	3,934	1.17*** (.171)	1.25*** (.145)	[.620]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. Data is over the 58 weeks after the start of the M-Pawa intervention (“midline”), and the 19 weeks preceding the preceding it (“baseline”). All data comes from Vodacom administrative records. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline (over the 58 weeks after the start of the M-Pawa intervention) on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline (over 19 weeks after the start of the M-Pawa intervention), and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). All monetary amounts are reported in TZS (in January 2016, USD 1 was worth about TZS 2,150). The transformed amounts are obtained by using the inverse hyperbolic sine transformation.



**Table 5: Impacts on Credit Behavior Beyond M-Pawa: Extensive Margin**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Midline Levels	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Loans in the past 12 months:</b>					
Loans from Michezo groups [yes=1]	.148 {.356}	3,624	-.007 (.016)	-.021 (.014)	[.315]
Loans from VICOBA/SACCOs [yes=1]	.120 {.326}	3,624	-.007 (.014)	.005 (.012)	[.293]
Loans from MFIs [yes=1]	.118 {.323}	3,624	-.001 (.013)	-.025** (.011)	[.029]
Loans from other sources [yes=1]	.074 {.261}	3,624	.022* (.013)	.004 (.011)	[.119]
Loans from any source beyond M-Pawa [yes=1]	.433 {.496}	3,624	-.009 (.022)	-.032* (.019)	[.228]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). Other loan sources include private banks, family and friends, informal money lenders, NGOs, and Airtel Timiza.

## Table 6: Impacts on Credit Behavior Beyond M-Pawa: Total Margin

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Midline Levels	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Loans in the past 12 months:</b>					
Loans from Mchezo groups [TZS]	33,462 {112,472}	3,624	619 (5,324)	-110 (4,636)	[.879]
Loans from VICOBA/SACCOs [TZS]	70,357 {252,174}	3,624	-1,711 (10,469)	6,040 (8,906)	[.393]
Loans from MFIs [TZS]	111,706 {351,911}	3,624	-7,937 (13,985)	-20,667 (12,662)	[.282]
Loans from other sources [TZS]	44,479 {246,729}	3,624	21,387* (12,222)	8,322 (9,903)	[.264]
Loans from any source beyond M-Pawa [TZS]	279,084 {572,314}	3,624	10,317 (23,594)	2,467 (20,723)	[.715]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). Other loan sources include private banks, family and friends, informal money lenders, NGOs, and Airtel Timiza. All monetary amounts are winsorized at the 99th percentile and reported in TZS (in January 2016, USD 1 was worth about TZS 2,150). The transformed amounts are obtained by using the inverse hyperbolic sine transformation.

**Table 7: Impacts on Business Practices**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Baseline Levels	(2) Sample size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of equality: T1 = T2
<b>Marketing Score</b>	.533 {.261}	3,543	.006 (.013)	.040*** (.011)	[.002]
<b>Buying and Stock Score</b>	.686 {.320}	3,543	.013 (.013)	.021* (.011)	[.467]
<b>Record-Keeping Score</b>	.389 {.302}	3,543	.004 (.013)	.124*** (.012)	[.000]
<b>Financial Planning Score</b>	.191 {.177}	3,543	.007 (.008)	.048*** (.007)	[.000]
<b>Business Practices Score</b>	.401 {.181}	3,543	.008 (.008)	.067*** (.007)	[.000]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). The marketing score is defined as the proportion of 7 business practices in marketing used by the firm. The buying and stock score is defined as the proportion of 3 business practices in buying and stock-keeping used by the firm. The record-keeping score is defined as the proportion of 8 business practices in costing and record keeping used by the firm. The financial planning score is defined as the proportion of 8 business practices in financial planning used by the firm. The business practices score is defined as the proportion of all these 26 business practices used by the firm. Appendix Table A3 details each of these practices.

**Table 8: Impacts on Empowerment and Wellbeing**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Baseline Levels	(2) Sample size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of equality: T1 = T2
<b>Panel A: Empowerment</b>					
Empowerment index [score=0-20]	14.3 {3.32}	2,336	.349** (.157)	.314** (.133)	[.798]
Say over how business money is spent [score=0-4]	3.31 {.883}	2,360	.119** (.046)	.093** (.040)	[.505]
Say over major household expenditures [score=0-4]	2.21 {.985}	2,360	.086 (.056)	.104** (.047)	[.714]
Say over minor household expenditures [score=0-4]	2.90 {1.05}	2,360	.046 (.056)	.007 (.049)	[.424]
Say over personal expenditures [score=0-4]	3.57 {.833}	2,360	.015 (.036)	.016 (.031)	[.966]
Say over children expenditures [score=0-4]	2.34 {.940}	2,336	.093* (.056)	.079* (.047)	[.774]
<b>Panel B: Wellbeing</b>					
Life satisfaction index [score=0-2]	.897 {.754}	3,624	.098*** (.033)	.112*** (.029)	[.618]
Very happy [yes=1]	.387 {.415}	3,624	.050** (.022)	.032* (.019)	[.367]
Life is improving [Yes=1]	.510 {.500}	3,624	.048** (.023)	.080*** (.020)	[.105]

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, \* at 10%. All data comes from the baseline and midline surveys. In Columns 3 and 4, the intent-to-treat estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the outcome of interest measured at midline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent was assigned to the M-Pawa intervention and the business training intervention (T2), the outcome measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the standalone impact of the M-Pawa intervention is equal to the total impact of the M-Pawa intervention and the business training intervention (T1=T2). In Panel A the sample is restricted to married women only. All five decision-making variables in Panel A are categorical variables based on the following scale “0 - Only my husband makes the decision”, “1 - I have input, but my husband makes the final decision”, “2 - Decided with equal consideration between myself and my husband”, “3 - I primarily decide but consult with my husband”, and “4 - I alone decide”. The empowerment index in Panel A is the cumulative score aggregating the responses to the five decision-making questions. The life satisfaction index in Panel B is the cumulative score aggregating two dummy variables indicating whether the woman reports being very happy with her life overall, and whether she believes that her life has improved in the past 12 months.

**Table A1: Balance at Baseline**  
Means, standard deviations in parentheses, p-values in brackets

	(1) Control	(2) Sample Size	(3) Control	(4) T1: M-Pawa	(5) T2: M-Pawa + Business Training	Tests of Equality:			
						(6) T1=C	(7) T2=C	(8) T1=T2	(9) T1=T2=C
<b>Panel A: Owner Characteristics</b>									
Age	36.7 (9.45)	4,003	36.7 (9.11)	36.1 (9.28)	36.9 (9.69)	[.175]	[.516]	[.030]	[.094]
Years of education	7.94 (2.21)	4,003	7.92 (2.21)	7.98 (2.25)	7.94 (2.19)	[.502]	[.820]	[.583]	[.784]
Married [yes=1]	.631 (.483)	4,003	.641 (.480)	.623 (.485)	.630 (.483)	[.404]	[.531]	[.736]	[.695]
Household size	4.83 (2.00)	4,003	4.95 (2.08)	4.80 (1.98)	4.78 (1.96)	[.086]	[.030]	[.833]	[.083]
<b>Panel B: Firm Characteristics</b>									
Acquired/started one year ago or less [yes=1]	.154 (.361)	4,003	.157 (.364)	.156 (.363)	.151 (.358)	[.951]	[.673]	[.725]	[.892]
Monthly sales [TZS]	561,676 (777,846)	4,003	580,029 (834,984)	555,251 (729,623)	555,709 (771,812)	[.480]	[.441]	[.987]	[.713]
Monthly profits [TZS]	165,934 (181,988)	4,003	167,875 (187,184)	165,638 (174,275)	165,111 (183,207)	[.782]	[.701]	[.939]	[.927]
Capital stock [TZS]	397,903 (779,081)	4,003	424,598 (829,027)	400,868 (750,111)	383,065 (767,452)	[.502]	[.185]	[.543]	[.408]
Number of employees	.197 (.678)	4,003	.194 (.658)	.216 (.772)	.188 (.637)	[.493]	[.830]	[.332]	[.624]
Owner's average weekly hours worked at business	58.7 (24.6)	4,003	57.6 (24.4)	59.5 (24.3)	58.8 (24.8)	[.079]	[.202]	[.461]	[.203]
Business practices score	.396 (.181)	4,003	.401 (.178)	.400 (.186)	.392 (.179)	[.888]	[.201]	[.280]	[.346]
Total saving in past 12 months [TZS]	260,126 (420,564)	4,003	267,936 (439,124)	247,915 (386,170)	262,327 (427,594)	[.279]	[.739]	[.353]	[.507]
Received at least one loan in past 12 months [yes=1]	.456 (.498)	4,003	.448 (.497)	.461 (.499)	.457 (.498)	[.560]	[.614]	[.866]	[.826]

**Notes:** The p-values in Columns 6-9 on the differences are estimated from an OLS regression of the corresponding outcome measured at baseline on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent as assigned to the M-Pawa intervention combined with business training (T2). All monetary amounts are winsorized at the 99th percentile and reported in TZS (in January 2016, USD 1 was worth about TZS 2,150). Capital stock is the value in TZS of all business assets (utensils, hand tools, machinery, equipment, vehicles and other properties) owned or rented by the business owner. The business practices score is defined as the proportion of 26 different business practices used by the firm, encompassing marketing, stock keeping, record-keeping and financial planning practices [McKenzie and Woodruff 2016].

## Table A2: Survey Attrition

Means, standard deviations in parentheses, p-values in brackets

	(1) Full Sample	(2) Sample size	(3) Control	(4) T1: M-Pawa	(5) T2: M-Pawa + Business Training	Tests of Equality:		
						(6) T1 = C	(7) T2 = C	(8) T1=T2=C
Respondent not interviewed at midline [yes=1]	.095 (.293)	4,003	.104 (.305)	.093 (.290)	.091 (.288)	[.409]	[.264]	[.527]

**Notes:** The p-values in Columns 6-8 on the differences are estimated from an OLS regression of a dummy for whether the respondent was not interviewed at midline a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent as assigned to the M-Pawa intervention combined with business training (T2).

**Table A3: Treatment Effects on Business Practices**

OLS ITT estimates, standard errors in parentheses, p-values in brackets, standard deviations in curly brackets

	(1) Control, Baseline Levels	(2) Sample Size	(3) T1: M-Pawa	(4) T2: M-Pawa + Business Training	(5) Tests of Equality: T1 = T2
<b>Panel A: Marketing</b>					
Visited competitor's business to see prices	.681 {.468}	3,543	-.015 (.023)	.036* (.020)	[.009]
Visited competitor's business to see products	.673 {.472}	3,543	-.009 (.023)	.034* (.020)	[.032]
Asked existing customers what other products they should offer	.719 {.460}	3,543	-.004 (.022)	.055*** (.019)	[.002]
Talked with former customer to see why stopped buying	.526 {.500}	3,543	.007 (.023)	.040** (.020)	[.099]
Asked supplier what products selling well	.561 {.498}	3,543	-.007 (.023)	.024 (.020)	[.125]
Used a special offer to attract customers	.519 {.500}	3,543	.066*** (.023)	.071*** (.020)	[.815]
Have done advertising in last 6 months	.048 {.195}	3,543	-.006 (.011)	.017 (.010)	[.026]
<b>Panel B: Buying and Stock Control</b>					
Negotiate for lower price	.651 {.473}	3,543	.004 (.021)	.012 (.018)	[.624]
Compare alternative suppliers	.688 {.463}	3,543	.035* (.021)	.052*** (.018)	[.336]
Don't run out of stock frequently	.717 {.450}	3,543	.0008 (.011)	-.0005 (.010)	[.893]
<b>Panel C: Costing and Record Keeping</b>					
Keep written records	.325 {.470}	3,543	.028 (.020)	.214*** (.018)	[.000]
Record every purchase and sale	.276 {.450}	3,543	.004 (.020)	.180*** (.018)	[.000]
Can use records to know cash on hand	.279 {.447}	3,543	.026 (.020)	.195*** (.018)	[.000]
Use records to know whether sales of product increase	.276 {.449}	3,543	.027 (.020)	.195*** (.018)	[.000]
Worked out cost of each main product	.658 {.473}	3,543	-.061*** (.021)	.030* (.018)	[.000]
Know which goods make most profit per item	.913 {.293}	3,543	-.007 (.012)	.004 (.011)	[.300]
Have a written budget for monthly expenses	.144 {.342}	3,543	.013 (.015)	.065*** (.013)	[.000]
Have records that could document ability to pay to bank	.241 {.422}	3,543	.010 (.021)	.087*** (.018)	[.000]
<b>Panel D: Financial Planning</b>					
Review financial performance monthly	.402 {.486}	3,543	.013 (.023)	.106*** (.020)	[.000]
Have sales target for next year	.526 {.500}	3,543	.020 (.023)	.060*** (.020)	[.042]
Compare sales goal to target monthly	.296 {.447}	3,543	.030 (.020)	.076*** (.018)	[.011]
Have a budget of costs for next year	.113 {.314}	3,543	-.013 (.012)	.022* (.011)	[.002]
Prepare profit and loss statement	.137 {.340}	3,543	-.017 (.017)	.068*** (.015)	[.000]
Prepare cashflow statement	.018 {.127}	3,543	.0006 (.004)	.002 (.004)	[.666]
Prepare balance sheet	.001 {.022}	3,543	.001 (.001)	.002* (.001)	[.706]
Prepare income and expenditure statement	.038 {.202}	3,543	.017 (.011)	.038*** (.010)	[.047]

**Notes:** \*\*\* (\*\*\*) (\*) indicates significance at the 1% (5%) (10%) level. Intent-to-treat (ITT) estimates are reported based on an ANCOVA specification estimated using OLS. This regresses the corresponding outcome measured at follow up on a constant, a dummy for whether the respondent was assigned to the M-Pawa intervention (T1), a dummy for whether the respondent as assigned to the M-Pawa intervention combined with business training (T2), the outcome of interest measured at baseline, and a set of strata fixed effects. Column 5 reports p-values on the null that the impact of M-Pawa alone is equal to the impact of M-Pawa and business training combined (T1=T2). All 26 outcomes are dummy variables capturing specific business practices [McKenzie and Woodruff 2015].

