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Savings Goal Calendars as Soft Commitment Devices: Evidence from Small Business Owners in Uganda

Antonia Grohmann* Tabea Lakemann† Helke Seitz‡

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Abstract

This study examines the effect of a soft commitment device in the form of a savings goal calendar on savings for small business owners in Kampala, Uganda. We run a randomized controlled trial (RCT) under which the treatment group receives a calendar designed to set savings goals and to make a plan to reach this goal. The control group is given a plain calendar. We find no average effect on savings, but show that present-biased individuals save more when given the calendar. Further examinations indicate that present-biased individuals are more likely to use the calendar, suggesting that, in line with theory, present-biased individuals have a demand.

Keywords: Soft Commitment, Savings, Time Preferences, Small Business Growth

JEL codes: O12, D14, D22, C93

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1 Introduction

A lack of savings prevents small businesses in developing countries from growing. When credit markets are imperfect, savings are often the only option for small business owners to collect enough funds to invest in their business.

Because of this importance of savings for the development and growth of small businesses, a substantial number of studies examine ways to increase savings. These often involve some form of commitment device that locks away money for a certain amount of time or until a certain amount is saved. These hard commitment devices are shown to effectively increase savings for low-income people in low-income settings (Ashraf et al., 2006). The accumulation of savings is especially challenging for individuals who are present-biased. This applies to a substantial number of people, whose preferences are time inconsistent, this leads to lower savings than intended by the current self. As suggested by the name, commitment devices can help sophisticated present-biased individuals, who are aware of their time-inconsistency, to commit to intentions formed by their current self (Thaler and Shefrin, 1981; Laibson, 1997).

Hard commitment devices have a negative side effect as they also lock away liquid funds, which is problematic in the event of an emergency. John (2020) shows, in her study on commitment in the Philippines, that the majority of participants defaults on their commitment savings contract, subsequently incurring a financial cost. This is crucial, as liquidity is key, especially for small-scale entrepreneurs, as formal insurance is essentially absent and savings act as an important form of insurance against shocks. At the same time, the take up of hard commitment devices is often low (Ashraf et al., 2006; Karlan et al., 2014), which means that the general increase in savings is low.

An alternative to such hard commitment devices are soft commitment devices. Here, not complying with commitments has psychological rather than financial consequences. Studies of saving behavior in low-income contexts show that soft commitment devices are effective without imposing the same high economic costs of hard commitment devices (Dupas and Robinson, 2013a). At the same time, they provide some flexibility in case of emergency (Karlan et al., 2014).

In this paper, we study the effect of a specific soft commitment device. We design a savings goal calendar wall poster intended to help small business owners achieve a business savings goal. Compared to most other commitment devices, this is a very short and light intervention. At the top of the calendar, business owners can note their savings goal and amount. On the calendar itself, business owners can mark the amount they wish to save on that specific day. At the bottom of the calendar, business owners are encouraged to think about potential obstacles to savings and action plans should these arise. The calendar is based on mental contrasting with implementation intentions (MCII), a concept developed

by Oettingen and Gollwitzer (2010) to influence behavior, and can be regarded as a soft commitment device. MCII is shown to effectively improve behavior in a number of different domains like engagement in physical activity, education, and labour market reactivation (Stadler et al., 2009; Duckworth et al., 2011, 2013; Berger et al., 2016). In order to test the effectiveness of the soft commitment device for present-biased individuals, we measure time preferences using an incentivized choice task experiment similar to Meier and Sprenger (2010) and Tanaka et al. (2010).

Soft commitment devices often induce certain behaviors by drawing on one of three things: mental accounting, goal setting, or personal planning. Mental accounting is shown to stop people from withdrawing funds if they are earmarked for a specific purpose (Thaler, 1999). Goal setting is effective in counteracting self-control problems (Koch and Nafziger, 2011; Clark et al., 2020). Lastly, personal plans are also argued to work as soft commitment devices as they help map out actions in detail and impose psychological costs if the plan is not followed (Beshears et al., 2016). The MCII strategy offers a combination of goal setting and a personal plan.

We study the impacts of the savings goal calendar treatment among the owners of small-scale businesses in Kampala, Uganda. These business owners are part of an established panel of entrepreneurs in Kampala. We randomly introduced the savings goal calendar in half of all businesses in our sample. The intervention took place in the business during work hours, where we introduced and explained the calendar to the business owner. The business owners formulated savings goals and thought about obstacles to achieving these savings goals. The wall poster was left with the business owner who could choose if and where to hang it. As each visit took no more than 10 minutes, the intervention was very light. The control group was given a plain calendar as a thank you for taking part in our survey and savings were not discussed.

Kampala, a major hub for small-scale entrepreneurs, is well-suited to study if and how soft commitment devices can improve savings behavior in low-income contexts. Only about 70% of our respondents report having a bank account. Even those who have a savings account tend to hold cash on a daily basis, which means that the temptation to spend daily earnings is strong. Hence, the need for commitment devices is great. At the same time, most businesses in our sample operate out of fixed locations, which makes a savings intervention like ours more feasible.

We find no average intention-to-treat effects of our savings goal calendar treatment for the full sample on a savings index as well as other saving-related outcomes. In line with theory that present-biased individuals benefit especially from commitment devices, we test the effect of the savings goal calendar on savings for present-biased individuals. We show that the calendar is effective at increasing savings for this group, although they save less on average.

We further explore a potential mechanism behind these results. We first examine the use of the

calendar, meaning goal commitment and the perceived usefulness of action plans. We find that only a small group of business owners either have the savings goal calendar present daily, i.e. they put the calendar on a wall in the business or at home, and, only a small proportion perceived the savings goal calendar as useful. However, for these respective groups, the intervention tends to increase savings. To see if differences in use of the calendar explain increased savings for present-biased individuals, we regress our indicator for present bias on calendar location and perceived usefulness of action plans. Results suggest that present-biased individuals are more likely to have the calendar in a visible place and to benefit from the action plan. Therefore, we argue that the savings goal calendar is more effective for present-biased individuals as they are more likely to use it. This is in line with theory suggesting that sophisticated, present-biased individuals demand commitment devices.

Our results provide important insights for the design of interventions aiming to improve savings for small businesses. First, it shows that even a light intervention using a soft commitment device can increase savings for present-biased individuals. Second, it shows that present-biased individuals are the sub-group that is most likely to use these commitment devices. A soft commitment device is effective when there is demand for it and when it is used in the intended manner; hence, the average impact without appropriate targeting may be limited. Consequently, such interventions could be a cheap and easy way to complement longer, more established finance trainings.

This paper contributes to two strands of literature. First, our paper adds to the literature on ways to help low-income groups increase their savings. Many of these papers examine the effect of a safe place to keep money. Dupas et al. (2018) find limited average effects on savings from providing access to bank accounts. However, they find large increases in savings for those who do open a bank account. Brune et al. (2016) find that providing savings accounts to farmers increases agricultural investments by a larger amount than is saved in these accounts. Cole et al. (2011) show that a subsidized bank account is more effective in increasing savings than a very short financial literacy training. Using an experiment in Ethiopia Avdeenko et al. (2019) show that smallholder farmers provided with a moneybox and a regular savings plan increase savings.

Second, our paper adds to the literature on soft commitment devices. The seminal paper by Thaler and Benartzi (2004) shows that large numbers of employees participate in the “save more tomorrow” initiative, which is designed to increase retirement savings rates, at times of pay rises. A substantial number of studies look at commitment devices to increase savings in developing countries. Savings groups that work through peer pressure and goal setting are shown to be very effective at increasing savings (Kast et al., 2018). Similarly, Dupas and Robinson (2013b) find that social pressure is an effective way to increase health savings. They further show that labelling funds for health spending increases savings. In their study, present-biased individuals only increase savings in the social pressure

setting, which is the strongest commitment device studied. Atkinson et al. (2013) run an experiment during which microfinance borrowers are prompted to either save an open amount or 10% when repaying their loan. They find increases in savings for both groups, with the group nudged to save 10% saving significantly more than the control group. A number of papers study soft commitment devices in other settings with a focus on who demands such commitment devices. Bisin and Hyndman (2020) find no average effect of deadline setting for tasks given to students. They attribute this to high levels of partial naiveté and overconfidence. Conversely, Himmler et al. (2019) find that a short pledge is effective in increasing exam participation and course completion within a given schedule. They find that the pledge is most effective for procrastinators. Duflo et al. (2011) argue that farmers with present bias underinvest in fertilizer and show that a small reduction in cost at the time just after harvest can increase fertilizer adoption.

Following this introduction, this paper comprises six additional sections. Section 2 describes the intervention and Section 3 describes the data. Section 4 shows effects for the average sample and present-biased individuals, while Section 5 sheds light on underlying mechanisms. Section 6 provides a sensitivity analysis and Section 7 concludes.

2 Experimental Design

This chapter outlines the sampling procedure in Section 2.1, the savings goal intervention in Section 2.2, followed by its implementation in Section 2.3.

2.1 Sampling

The study took place in Kampala, Uganda’s capital, where the intervention was implemented using an annual panel of micro and small enterprises collected between 2012 and 2018. The sample was first drawn by identifying 220 administrative zones with high business activity within Kampala. Out of these, 21 zones were randomly selected for a detailed door-to-door listing of all businesses. Based on a complete listing, businesses were randomly chosen to be part of the panel, taking business strata (services, retail, and manufacturing) into account. As the panel was ongoing for a number of years, some entrepreneurs had changed their business sector.

In April 2018, we collected baseline information and, immediately thereafter, conducted the intervention. Follow-up data were collected six-months later in October 2018. The randomization was based on 501 businesses interviewed in October 2017, with 249 assigned to the treatment group and 252 to the control group (taking into account industry strata and a previously conducted financial training). Out of these, 465 were interviewed and successfully treated in April 2018. In October 2018,

233 assigned to control and 226 assigned to treatment were contacted during the follow-up.

This sample is not just part of the panel study described above, but also provided the basis for a randomized controlled trial (RCT) that evaluated the effect of an innovative financial training in a previous wave (October 2017). For details of this training see Grohmann et al. (2020). Randomization of the savings goal calendar intervention was orthogonal to implementation of the financial training.

2.2 Savings Goal Calendar Intervention

We study the effect of a soft commitment device on savings. It is argued that setting a goal and forming a plan can act as a soft commitment device that imposes a psychological cost if the plan is not stuck to or the goal is not achieved (Bryan et al., 2010; Beshears et al., 2016). The soft commitment device studied in this paper is based on mental contrasting with implementation intentions (MCII). This strategy, developed by Oettingen and Gollwitzer (2010), combines two elements that play different roles in helping people to self-regulate behavior in order to achieve previously set goals. It is previously applied, for example, in the area of education (Duckworth et al., 2011, 2013).

The first part is mental contrasting, which involves participants forming a specific goal in their mind. In settings like education, a goal could be a certain (better) grade in a specific subject. In our setting, we focus on business savings goals. Forming a specific goal is argued to help participants to become more conscious of their goal and helps to focus commitment. Mental contrasting also involves a specific plan on how the desired goal can be reached. In the education setting, this could involve a certain amount of time spent studying every day. In our setting, this involves planning to save a certain amount on a specific day.

The second part of this strategy is implementation intentions. These involve the participants thinking about possible obstacles that could prevent them from reaching their savings goals and forming a plan of action in case such an obstacle arises in an “if . . . , then . . .” format. In the area of education, such an obstacle could be a friend calling asking to go out. The participants will form an implementation intention “If my friend calls asking to go out, then I will tell her that I am busy studying.” Similarly, in our setting, we ask participants to imagine potential obstacles that may prevent them from saving and forming an implementation intention in case such an obstacle arises.

2.3 Implementation

The treatment as well as a survey questionnaire were both administered in the participant’s business. The procedure was as follows: First, the enumerator and business owner jointly filled out the survey questionnaire; second, all respondents were asked for a business related savings goal as well as the amount they need to achieve their goal. The savings goal can be an item that the respondent wants to

buy for their business or to invest in; it should be achievable within the next weeks or next months. There are no significant differences between the treatment and control groups in terms of the type of savings goals or the savings goal amount (see Appendix Table A.1). Finally, depending on treatment status: the treatment group received a savings goal calendar (a calendar including MCII information) whereas the control group received a plain calendar only covering the next six months.

We designed a calendar aiming to increase business savings by forming a plan and sticking to that plan (shown in Appendix Figure A.1.A). At the top of the calendar, there is a space to fill in the individual savings goal as well as the amount the participant wants to save. To strengthen goal commitment, there is space to reflect on the best thing about reaching the savings goal. The middle part of the calendar is the savings plan toward reaching the goal: here the business owner and the enumerator discussed how much the participant wants to save on which day in order to achieve the savings goal. The enumerator and participant added up the total amount that the participant is planning to save over the six months period that is displayed on the calendar. There was no requirement to achieve the full savings goal within the six months period. The implementation intentions are at the bottom of the calendar. Here, the enumerator and business owner discuss the implementation intentions and fill in the “if . . . , then . . .” phrases printed below the calendar. As the total time of the intervention was approximately 10 minutes, it was very short.

The control group received a plain calendar, which was given to them “as a thank you for taking part in our survey” (shown in Appendix Figure A.1.B). They did not receive any instructions regarding savings goals or any other mention of savings.

3 Data

This section describes the main outcome variables in Section 3.1, the measurement of time preferences in Section 3.2, balancing in Section 3.3, and the empirical strategy in Section 3.4.

3.1 Outcome Variables

Our primary outcome variable is a *savings* index including the following variables: whether someone has any savings, which can be formal savings held in a bank account or with savings and credit cooperative (SACCOs), or informal savings, which can be held with a rotating savings and credit association (ROSCA), at home, with friends and neighbors, or in a mobile money account; the total savings amount; the savings amount that is specifically for the business; the frequency of savings and the savings toward a specific savings goal. We include both the index and the separate variables in our analysis.

3.2 Eliciting Time Preferences

We measure individual time preferences using incentivized choice experiments, an approach that is frequently used in the literature (e.g. Meier and Sprenger, 2010). Using this method, individuals are asked to make decisions over six price lists, which require deciding between smaller rewards in an earlier period t and larger rewards in a later period over two different time frames. While the price lists remain the same, a "near"-term time frame asks between lower amounts in t and higher amounts in $t+1$ month, while a "distant" time frame compares payoffs in 6 to 7 months (the time frames are shown in Appendix Figure A.2).

As an incentive for respondents to reveal their preferences, we provide a financial reward and pay out the individual choice of a randomly drawn panel and row combination. Following the individual choices, a random number generator automatically selects a panel and row for payout, which was presented to the respondent using a tablet device. The payments were made on the specified day using mobile money. To ensure that participants are not just choosing the amount to be paid out sooner because they do not trust that the money will be transferred, all amounts were transferred using mobile money by an employee at our partner institution.

We use the different time frames to measure *individual discount factors (IDF)* as well as indicators for *present bias* and *future bias*. We observe individual *IDFs* by pinpointing the amount where individuals switch from opting from a smaller, earlier payout to a larger, later payout. We further observe whether individuals' choices are dynamically inconsistent between the near-term and distant-term time frames and, hence, biased toward the future or present. An individual is defined to be present-biased if they are less patient when the smaller, earlier payment is received in the present, and future-biased if they are less patient when the smaller, earlier payment is received in the future. Therefore, we classify individuals as present-biased if $IDF_{near} < IDF_{distant}$, and as future-biased if $IDF_{near} > IDF_{distant}$. The average *IDF* of our estimation sample is 0.93, 14 percent are future-biased and 17 percent are present-biased. Our proportion of present-biased individuals is in the mid-range of proportions found in other studies implemented in development contexts like in the Philippines, Malawi, or Nigeria (Ashraf et al., 2006; Gine et al., 2016; Janssens et al., 2017; Cassidy and Fafchamps, 2020).

There are a number of different ways to measure time preferences. This elicitation method has a number of advantages, but also a number of disadvantages that may bias the results through different types of measurement problems (Frederick et al., 2002). One frequently discussed problem is the potential of results being influenced by the possibility of arbitrage in capital markets. This is not a concern for us, as most respondents do not have access to financial markets. Similar measures of time preferences can be linked to a large number of household behaviors and financial behavior by low

income individuals (Bauer et al., 2012).

3.3 Balancing

Table 1 provides pre-intervention characteristics assessed during the baseline survey along with p-values for differences between the control and the treatment group (Column (5)). As the entrepreneurs are randomly assigned to each group, we expect their characteristics to be similar at baseline. Although the randomization was well done using standard software, there are two imbalances regarding entrepreneurial characteristics in our baseline wave: At baseline, the control group is, on average, 1.8 years younger and has capital stocks that are on average 2 million UGX (about 500 USD) higher (Panel A). The savings index is balanced between both groups (Panel B), as are the variables comprising the index (see in Appendix Table A.2). A joint test on orthogonality yields a significant difference between treatment and control group. To take these imbalances into account, individual-level controls are included in our main analysis (following the example of (Crepon et al., 2015)). We present a robustness check without such variables in the Appendix (Panel A of Table A.3); however, results are not sensitive to the inclusion of control variables.

[INSERT TABLE 1 ABOUT HERE]

3.4 Empirical Strategy

We perform an analysis of covariance (ANCOVA) estimation in order to estimate the causal effect of our savings goal treatment (McKenzie, 2012). This compares outcomes for business owners randomly assigned to the treatment group (savings goal calendar) and to the control group (plain calendar).

We estimate the following equation to obtain unbiased estimates:

$$y_i = \alpha + \beta_1 \text{Savings Goal Calendar}_i + \theta y_{i(t-1)} + X_i' \gamma + \epsilon_i \quad (1)$$

where y_i is the outcome variable, $\text{Savings Goal Calendar}_i$, indicates assignment to receiving treatment, $y_{i(t-1)}$ is a pre-treatment measure of the outcome variable, and X_i is a vector of control variables. We include the strata used for randomization (industry controls and prior treatment assignment) as suggested by Bruhn and McKenzie (2009) and unbalanced baseline variables (age and capital stock). The parameter β_1 gives us the unbiased “intention-to-treat (ITT)” effect that is the effect of being assigned to receiving the savings goal calendar.

In our analysis, we are interested if the overall effect of the treatment on savings related outcomes is significantly different from zero (see Duflo et al. (2007)). Therefore, we aggregate variables belonging to this outcome family to a standardized index following Kling et al. (2007). The index z is the average

of all $i=1,\dots,I$ standardized variables belonging to a family of outcomes. Specifically, $z = \frac{1}{I} \sum_{i=1}^I z_i^*$ where $z_i^* = \frac{y_i - \mu_i}{\sigma_i}$, y_i is an outcome variable, while μ_i and σ_i are the mean and standard deviation of the respective outcome variable of the control group. We examine the general impact of our treatment (as captured by the indices) as well as the intention-to-treat effect on individual outcomes.

As we are studying the effects of a soft commitment device on savings, we expect it to be most effective for participants who are present-biased, i.e. people who are less patient in the present than in the future. To test this hypothesis, we perform a further regression analysis of heterogeneous effects for present-biased individuals. Hence, we introduce an interaction term between our treatment and being present-biased. In addition, we also control for individual discount rates and future bias (see Ashraf et al., 2006; Meier and Sprenger, 2010). To account for the treatment effect for present-biased individuals, we estimate the following equation:

$$y_i = \alpha + \beta_1 \text{Saving Goal Calendar}_i + \beta_2 \text{Saving Goal Calendar}_i * \text{Present Bias}_i + \beta_3 \text{Present Bias}_i + \beta_4 \text{Future Bias}_i + \beta_5 \text{IDF}_i + \theta y_{i(t-1)} + X_i' \gamma + \epsilon_i \quad (2)$$

where IDF_i is the individual discount factor, calculated based on the individual price list, each having a delay length of one month: $\text{IDF} = \frac{E}{F}$, where E is the earlier, smaller amount and F is the future, larger amount at which individuals switch from opting for the smaller earlier to the later larger amount.¹ Present Bias_i is equal to 1 if $\text{IDF}_{near} < \text{IDF}_{distant}$ (less patient if smaller, earlier amount is received in present) and Future Bias_i is equal 1 if $\text{IDF}_{near} > \text{IDF}_{distant}$.

4 Results

4.1 Intention-to-treat Effects

This section describes the causal treatment effect on savings outcomes based on equation (1). The effects of being assigned to receiving the savings goal calendar on savings related variables six months after the intervention are provided in Table 2. Besides controlling for industry strata, all estimations additionally control for unbalanced variables as discussed in Section 3.3, namely age and capital stock. Column (1) of Table 2 provides the effect on the overall savings index, which can be interpreted as the standardized mean difference between the treatment and control groups. Being assigned to the savings calendar treatment is associated with a savings index 0.031 standard deviation units lower than in the control group, although the effect is not statistically significant. Taking our sample size into consideration, our experiment has 80 percent power to precisely detect effect sizes as small as 0.25

¹ F is taken from the last point at which individuals prefer the earlier smaller amount.

standard deviation units (at $\alpha = 0.05$). Hence, we cannot reject impacts of the treatment below 0.25 standard deviation units. Columns (2) to (8) provide the estimated effects on individual components of the index. As can be seen, none of the variables are significantly influenced by the intervention.

[INSERT TABLE 2 ABOUT HERE]

Other variables were registered, for further results see Appendix B, for heterogeneity see Appendix Table A.4.

4.2 Effects on Present-Biased Individuals

The savings goal calendar is expected to be most appealing to people who are present-biased and sophisticated, as it is intended to act as a commitment device (Ashraf et al., 2006). These types of people are aware of their time-inconsistent preferences and, therefore, seek a way to commit to their previous good intentions. We are unable to measure sophistication here, but in order to examine whether the savings goal calendar has a stronger effect for present-biased individuals, we estimate equation (2) from Section 3.4. In addition to present bias, we also include measures for future bias and time discounting. Results are shown in Table 3. We use the same outcome variables as in Table 2.

[INSERT TABLE 3 ABOUT HERE]

As suggested by theory, individuals who are present-biased save significantly less. This is confirmed by our empirical findings showing a negative effect of present bias on savings amount related outcome variables. However, the interaction term between present bias and the calendar intervention is positive for all outcome variables and weakly significant for total savings. This suggests that present-biased treatment group entrepreneurs save more than present-biased control group entrepreneurs. Alternatively, one could say that the savings goal calendar mitigates the negative effect of being present-biased. From these regressions, we can also see that individuals with a higher discount rate, meaning that they are less patient, save less. This supports the validity of our measurement of time preferences. The effect of future bias is negative and clearly insignificant.

5 Mechanism

As shown previously, we do not find that the treatment increased savings for the sample on average, but find positive, weakly significant effects for present-biased individuals. To understand why the calendar seems to have little effect for many participants, we examine the mechanisms behind these results. Therefore, we analyze the usefulness of the savings goal calendar in general. Concretely, we examine

the two elements of mental contrasting with implementation intentions which serves as theoretical foundations of the savings goal calendar: mental contrasting, which aims to foster goal commitment; and implementation intentions, the formation of action plans to support goal pursuit. Therefore, we descriptively analyze both elements in Section 5.1. In a next step, we analyze how measures of each element relate to increases in savings in Section 5.2. In Section 5.3, we link these elements to present bias.

5.1 Descriptives on Goal Commitment and Action Plans

In this section, we present descriptive evidence on how participants perceived both MCII elements. The first element of the savings goal calendar focused on the commitment and striving for goals (mental contrasting). The second element emphasized action plans for implementation (implementation intentions). We test both elements using self-reported measures six months after treatment implementation.

Focusing on the first element of the intervention, we do not find evidence that the intervention specifically strengthened the commitment of the treatment group toward their savings goal. We use whether the respondent remembers the savings goal and amount, existence and location of the savings goal calendar as proxy measures for goal commitment. Even though the concrete savings goal and corresponding amount were written on top of the savings calendar, the treatment group is not more likely to remember this savings goal itself or the amount six months later, as shown descriptively in Table 4 (Panel A, Q1 and Q2). Around 59 percent in the treatment group and 57 percent in the control group correctly remember their specified savings goal, while 55 and 50 percent remember the correct amount, respectively.

[INSERT TABLE 4 ABOUT HERE]

One question is if the participants simply did not use the calendar. The suggestion was to post the savings goal calendar on a wall in the business, where respondents spend most of their time. Descriptives show that the treatment group is neither more likely to still have the calendar (Q3) nor more likely to have the savings goal calendar in a more visible place (Q4). Question 4 shows that around 70 percent of respondents, irrespective of treatment or control group, keep the calendar at home. Only 13-16 percent of both groups kept the calendar on a wall in the business, as recommended.

The second element of the treatment, the perceived usefulness of the action plans, shows rather modest results (Panel B of Table 4). We use information on whether the respondent follows the savings plan, perceived the savings plan as helpful and thinking about implementation plans as proxy measures for goal pursuit. This information can only be collected for the treatment group.

We find that almost half of our respondents state they never followed the savings plan (Q5), hardly found the savings plan helpful (Q6), or hardly found that thinking about strategies to overcome obstacles to saving was helpful (Q7). Overall, only between 14 and 21 percent provide very positive feedback about the usefulness of the action plans (Q5-Q7).

5.2 Goal Commitment and Action Plans Interacted with Treatment

In the following, we analyze how the estimated treatment effects vary with differences in goal commitment and perceived usefulness of actions plans. To begin with, we interact measures regarding commitment for the savings goal (Question 1 to Question 4 of Table 4) with the treatment indicator and analyze the effect on all savings outcomes. As shown in Table 5, the treatment effect varies with the location of the savings goal calendar (Q4). The treatment effect is strongest for those who are the most exposed to the savings goal calendar, i.e. when it is on the wall in the business. The coefficient on the interaction term between the treatment and having the calendar posted on the wall at the business 2,154,000 UGX (580 USD) for total savings, subsequently reducing to 1,677,000 UGX (450 USD) if the calendar is anywhere in the business, and turns negative if the calendar is at home. Hence, the marginal treatment effect for those having the calendar on the wall is 1,710,000 UGX (480 USD), which amounts to an economically meaningful increase in total savings of around 83 percent compared to the control mean (of 2,061,000 UGX, see Table 2).

The remaining analyses yield that there is no meaningful variation in treatment effects with respect to other measures of goal commitment such as remembering the savings goal, the goal amount, or still having the calendar.

[INSERT TABLE 5 ABOUT HERE]

Further, we analyze if savings outcomes are associated with measures of perceived usefulness of action plans. Again, this analysis is only possible for the treatment group. Table 6 shows that the self-reported usefulness of the action plans is positively, and mostly significantly, associated with all measures of saving except the frequency. This applies to all three measurements of usefulness. Hence, there is a strong and significant correlation between perceiving the calendar as useful and increased savings.

[INSERT TABLE 6 ABOUT HERE]

5.3 Association between Present Bias, Goal Commitment and Action Plans

We now bring together our previous result on the effectiveness of the intervention for present-biased individuals (Section 4.2) and the result regarding the effectiveness for respondents having the calendar

in the business and the perceived usefulness of action plans (Section 5.2). Concretely, we address whether present-biased individuals are more likely to use the calendar fully and, consequently, more likely to have the calendar on their business wall. We are also interested in learning if present-biased individuals are more likely to perceive the action plans as useful.

[INSERT TABLE 7 ABOUT HERE]

Table 7 shows to what extent present-biased preferences in the treatment group can explain the location of the calendar (Panel A) and the perceived usefulness of action plans (Panel B). From a theoretical perspective, present-biased individuals should have greater demand for the calendar as a commitment device and, thusly, should be more likely to use it. Panel A shows that being present bias is associated with having the calendar on the wall in the business or on the wall at home. A negative relationship is found between present-biased individuals and not having the calendar on the wall (either at the business or at home). While none of the relationships are significant at any conventional significance level, we take these positive coefficients as suggestive evidence. Hence, one potential mechanism why present-biased individuals benefit from the intervention is that they seek a commitment device and, thus, are more likely to follow the instructions and put the calendar on their business wall.

Panel B suggests a positive association between present bias and the tendency to follow the savings plan as well as, surprisingly, a negative association between the usefulness of the savings plans. The first result is in line with theory. The second result is not. One possible explanation is that present-biased individuals simply do not perceive the savings plan as useful.

6 Sensitivity Analysis

This section assesses the sensitivity of our main treatment effects by conducting several robustness analyses. A first set of sensitivity checks is found in Table 8. Column (1) of Table 8 provides our main results of Table 2 again for comparability reasons. We first show estimates without controls for unbalanced variables in Column (2), and estimates controlling for unbalanced formal and informal savings in Column (3). Finally, we restrict the sample to respondents who specify a concrete savings goal in Column (4). Comparing the main treatment effect on the savings index to the remaining columns in Table 8 shows that the estimated effects do not change much. We conclude from these results that our main intention-to-treat effects are robust.

[INSERT TABLE 8 ABOUT HERE]

The muted results in our main analysis naturally raise the question of implementation problems. Therefore, we analyze whether the presence of spillover effects can explain muted treatment effects. This scenario can occur if entrepreneurs assigned to receiving the savings goal calendar share information with assigned control group entrepreneurs. In case control group entrepreneurs similarly use the calendar to achieve their savings goal, this would result in the same savings increase compared to the treatment group. In this case, the true treatment effect would be underestimated and our estimate would be a lower bound estimate. To test whether spillovers affect the control group, we analyze whether the share of treated entrepreneurs in a certain radius affects the treatment effect using GPS information. Therefore, we interact the share of treated entrepreneurs in a 10 to 100 meter radius with the treatment indicator. As shown in Table 9, the coefficient of the share treated in the surroundings remains negative and varies in magnitude but never becomes significant. We take this as evidence against spillovers, specifically against the argument that the control group learns from the treatment group to use the calendar as savings commitment device.

[INSERT TABLE 9 ABOUT HERE]

7 Conclusion

Savings are crucial for micro and small enterprise owners in order to make sufficient investments into their business. While most of the existing literature focuses on physical access to savings devices and on hard commitment devices, this paper focuses on soft commitment devices. In doing so, we analyze the effect of a savings goal calendar that follows the concept of mental contrasting with implementation intentions (MCI), which is designed to foster self-regulated goal commitment. We designed the savings goal calendar as a soft commitment device for small business owners to increase their business related savings.

The intervention was implemented in Kampala, Uganda’s capital city, among micro and small enterprise owners. The treatment group received a savings goal calendar, where concrete savings goals and action plans in case of obstacles that would prevent respondents from savings were noted. The wall calendar was left with the owner, who could then choose if and where to hang it. The control group received a plain calendar covering the upcoming six months, with no savings goal information attached.

We find that the intervention does not lead to an average increase in savings. However, we find some evidence that the intervention positively affects savings for present-biased individuals. Examining the mechanism, we find that only a small proportion of participants use the calendar by hanging it on the wall or perceive the action plan as useful, both being associated with higher savings. We find

suggestive evidence that present-biased individuals are more likely to use the calendar in this manner. This sheds light on one potential explanation why present-biased individuals benefit from the savings goal calendar. In line with theory, this suggests a demand for commitment devices by present-biased individuals.

Although the evidence we find is largely suggestive, some policy lessons can be drawn from our results. A very light savings intervention in the form of a soft commitment device can be effective in increasing savings, but only for a specific group of individuals. These individuals could be pre-selected or specifically targeted if such an intervention were to be scaled up. Since this intervention is very light and inexpensive to implement, it can be added to other savings and finance interventions without great effort.

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Table 1: Pre-Intervention Summary Statistics

	Obs.	Full Sample mean (sd)	Control Group (C) mean (sd)	Treatment Group mean (sd)	Diff. from C [p-value]
	(1)	(2)	(3)	(4)	(5)
Panel A: Socio-economic Characteristics					
Age	458	39.01 (10.08)	38.13 (9.67)	39.92 (10.43)	-1.79 [0.06]
HH size	459	4.49 (2.40)	4.35 (2.40)	4.64 (2.40)	-0.29 [0.19]
Female	463	0.41 (0.49)	0.42 (0.50)	0.39 (0.49)	0.03 [0.45]
Higher education ^a	459	0.34 (0.47)	0.36 (0.48)	0.31 (0.46)	0.05 [0.24]
Own-account	464	0.51 (0.50)	0.48 (0.50)	0.54 (0.50)	-0.06 [0.23]
Capital stock ^b	465	4,096.82 (8,977.18)	5,098.76 (11,190.15)	3,064.25 (5,730.03)	2,034.51 [0.01]
Panel B: Outcome Indices					
Savings Index	404	-0.01 (0.97)	0.00 (1.00)	-0.02 (0.94)	0.02 [0.83]
Investment Index	443	-0.04 (0.92)	0.00 (1.00)	-0.07 (0.84)	0.07 [0.41]

Source: Survey on micro and small enterprises in Uganda, wave April 2018, own calculations.

Notes: The table provides summary statistics of baseline data and mean comparisons between the treatment group (savings goal calendar) and control group (plain calendar) in Column (5). Standard deviations are in parenthesis, p-values for differences of means appear in squared brackets. Detailed balancing information for variables belonging to the savings and investment indices are found in Appendix Table A.2.

^a Higher education is a dichotomous variable, where 1=upper secondary degree (A-level) and more, and 0=lower secondary degree (O-level) and less.

^b Capital stock is winsorized at the 99 percent level.

Table 2: Intention-to-Treat Effects on Savings Related Outcomes

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Saving Goal Calendar	-0.031 (0.088)	0.008 (0.028)	-219.762 (307.823)	7.243 (127.984)	-2.155 (37.078)	-3.753 (154.285)	0.004 (0.069)	-127.653 (139.166)
R ²	0.18	0.02	0.26	0.27	0.04	0.12	0.05	0.14
Mean (SD) of control group	0.00 1.00	0.92 0.27	2061.44 4559.71	1014.10 1555.19	312.81 370.92	746.38 1929.45	6.63 0.70	755.93 1689.29
Obs.	401.00	401.00	401.00	401.00	401.00	401.00	401.00	401.00
control for $y_{(t-1)}$	yes	yes	yes	yes	yes	yes	yes	yes
control for industry strata	yes	yes	yes	yes	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on savings related outcomes. The savings index provided in Column (1) comprises all variables in the remaining columns. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Present-biased Preferences and Intention-to-Treat Effects

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Savings Goal Calendar	-0.057 (0.097)	-0.005 (0.029)	-347.679 (351.579)	10.513 (144.880)	-15.371 (40.431)	-23.944 (175.333)	0.034 (0.077)	-164.649 (151.884)
SGC * Present-biased	0.25 (0.225)	0.097 (0.085)	998.547* (601.047)	59.632 (298.182)	84.198 (109.845)	286.345 (368.773)	-0.179 (0.212)	364.933 (373.815)
Present-biased	-0.380** (0.159)	-0.093 (0.062)	-1944.207*** (660.759)	-430.166* (232.240)	-12.271 (83.054)	-595.118** (292.480)	0.123 (0.131)	-477.439* (278.404)
Future-biased	-0.024 (0.168)	0.015 (0.038)	-409.776 (703.810)	-180.180 (242.227)	-34.547 (58.558)	-27.428 (327.769)	0.074 (0.155)	-87.328 (291.925)
IDF	-1.355*** (0.514)	-0.029 (0.098)	-6158.619** (2677.750)	-2086.614** (856.090)	-61.753 (205.460)	-2584.673** (1300.346)	0.15 (0.39)	-2070.006* (1102.249)
Obs.	400	400	400	400	400	400	400	400

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on savings related outcomes, while the treatment effect is interacted with an indicator for present-biased preferences. It is further controlled for future-biased preferences and individual discount factors (IDF). The savings index provided in Column (1) comprises all variables in the remaining columns. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Summary Statistics on Measures of MCH Elements

	Treatment Group		Control Group		p-value (5)
	N (1)	mean (2)	N (3)	mean (4)	
Panel A: Goal Commitment					
Q1: Mentions the same savings goal:					
Yes, remembers	218	0.59	220	0.57	0.76
Remembers wrongly	218	0.11	220	0.09	0.51
Does not remember	218	0.30	220	0.34	0.45
Q2: Remembers savings goal amount:					
Yes, remembers	218	0.50	221	0.55	0.32
Remembers wrongly	218	0.19	221	0.14	0.18
Does not remember	218	0.31	221	0.31	0.99
Q3: The last time we visited you, we gave you a calendar. Do you still have it?					
Yes	218	0.66	221	0.72	0.15
No	218	0.34	221	0.28	0.15
Q4: Where did you put the (savings goal or normal) calendar?					
On business wall	146	0.13	160	0.16	0.52
At business	146	0.16	160	0.13	0.42
On home wall	146	0.25	160	0.22	0.57
At home	146	0.47	160	0.50	0.55
Panel B: Goal Pursuit					
Q5: Did you follow the savings plan we wrote down?					
Never	213	0.46			
Rarely	213	0.17			
Sometimes	213	0.23			
Almost always	213	0.14			
Q6: Do you think making a savings plan helped to reach your savings goal?					
Hardly at all	213	0.45			
A little	213	0.16			
Some	213	0.18			
A lot	213	0.20			
Q7: Do you think it helped to think about "things that may stop you from saving" as we did on the calendar?					
Hardly at all	213	0.46			
A little	213	0.18			
Some	213	0.15			
A lot	213	0.21			

Source: Survey on micro and small enterprises in Uganda, wave October 2018, own calculations.

Notes: The table provides information on the implementation of the intervention. Panel A covers Questions (1) - (4), which reflect the commitment and striving for goals. Panel B covers Questions (5) - (7) on the helpfulness of implementation plans.

Table 5: Goal Commitment and Intention-to-Treat Effects

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Panel A: Q1								
Savings Goal Calendar	-0.074 (0.13)	0.049 (0.053)	-450.118 (441.677)	-10.708 (188.412)	7.976 (55.527)	-279.991 (258.106)	-0.022 (0.109)	-325.621* (174.896)
SGC * Mentions same savings goal	0.075 (0.171)	-0.073 (0.061)	416.668 (597.564)	19.879 (252.716)	-13.797 (73.547)	480.711 (333.544)	0.059 (0.148)	316.050 (258.348)
Mentions same savings goal	0.103 (0.124)	0.106** (0.042)	292.012 (509.522)	318.664* (176.327)	58.150 (51.972)	-355.968 (244.380)	-0.193* (0.104)	129.674 (193.053)
Obs.	396	396	396	396	396	396	396	396
Panel B: Q2								
Savings Goal Calendar	-0.044 (0.125)	0.003 (0.047)	-29.646 (447.554)	80.564 (177.330)	-12.255 (52.193)	-244.003 (231.999)	0.033 (0.098)	-35.124 (188.357)
SGC * Remembers savings goal amount	0.045 (0.178)	0.015 (0.055)	-263.554 (651.702)	-101.765 (258.547)	21.823 (76.035)	465.137 (345.078)	-0.064 (0.15)	-153.965 (273.952)
Remembers savings goal amount	0.12 (0.125)	0.053 (0.039)	666.534 (531.328)	297.914* (173.127)	42.627 (52.610)	-196.182 (237.998)	-0.110 (0.098)	258.771 (204.094)
Obs.	397	397	397	397	397	397	397	397
Panel C: Q3								
Savings Goal Calendar	0.096 (0.175)	0.045 (0.068)	-169.116 (722.469)	148.358 (209.289)	70.494 (58.321)	-72.190 (287.944)	0.021 (0.176)	-20.144 (283.703)
SGC * Still has calendar	-0.136 (0.197)	-0.041 (0.072)	18.228 (787.888)	-142.643 (258.044)	-85.262 (72.803)	112.186 (336.523)	-0.008 (0.192)	-130.340 (328.333)
Still has calendar	0.374*** (0.143)	0.106* (0.055)	380.673 (676.509)	433.212** (175.987)	194.545*** (52.855)	43.410 (272.999)	0.151 (0.15)	170.253 (261.211)
Obs.	397	397	397	397	397	397	397	397
Panel D: Q4								
Savings Goal Calendar	-0.140 (0.142)	-0.025 (0.034)	-444.152 (441.276)	-68.856 (229.195)	-12.952 (72.969)	77.028 (253.744)	-0.034 (0.083)	-168.696 (237.964)
SGC * Calendar on business wall	0.369 (0.265)	0.088 (0.096)	2154.328** (978.498)	941.389* (480.986)	-129.517 (128.234)	206.291 (340.152)	-0.181 (0.178)	448.608 (423.633)
SGC * Calendar at business	0.372 (0.288)	-0.016 (0.065)	1677.390* (971.229)	112.777 (433.512)	165.660 (120.164)	-254.712 (706.554)	0.379 (0.232)	-110.033 (401.618)
SGC * Calendar on wall at home	-0.066 (0.269)	0.081 (0.074)	-788.787 (973.459)	-215.471 (400.408)	-43.162 (113.504)	-271.302 (562.573)	0.048 (0.205)	-178.824 (475.519)
Calendar on business wall	-0.297* (0.172)	-0.099 (0.063)	-1067.475* (561.374)	-550.469** (259.992)	21.696 (93.970)	-117.366 (197.589)	0.044 (0.12)	-95.822 (250.907)
Calendar at business	-0.213 (0.179)	0.013 (0.019)	-868.736 (532.132)	-6.665 (286.365)	-180.231** (77.037)	516.198 (451.247)	-0.279 (0.196)	116.800 (346.415)
Calendar on wall at home	-0.020 (0.227)	-0.091 (0.056)	794.133 (892.463)	159.745 (310.695)	-48.392 (83.868)	595.380 (444.509)	-0.112 (0.117)	193.306 (391.255)
Obs.	287	287	287	287	287	287	287	287

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on savings related outcomes with the treatment indicator interacted with indicators for the association with the treatment. The indicators are defined as following:

Panel A: Mentions same savings goal = 1 if savings goal is what the person told in wave April 2018; 0 = saving goal is not what person told in wave April 2018; 0 = does not remember

Panel B: Remembers savings goal amount = 1 if savings goal amount is what the person told in wave April 2018; 0 = saving goal amount is not what person told in wave April 2018; 0 = does not remember

Panel C: Still has calendar = 1 if the respondent still has the calendar; = 0 does not have the calendar anymore.

Panel D: Calendar on business wall = 1 if the respondent put the calendar on the business wall; 0 = else; Calendar at business = 1 if the calendar is at the business but not on wall; 0 = else; Calendar on wall at home = 1 if calendar is on wall at home; 0 = else. The reference category is the calendar is at home but not on the wall.

The savings index provided in Column (1) comprises all variables in the remaining columns. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Action Plans and Intention-to-Treat Effects

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Panel A								
Following Savings Plan	0.126** (0.051)	-1.95e-18 (4.38e-18)	369.383*** (140.397)	167.039* (86.799)	43.549** (21.951)	184.310** (86.595)	-0.015 (0.059)	212.572** (84.592)
Obs.	191	191	191	191	191	191	191	191
Panel B								
Savings Plan Helpful	0.133*** (0.048)	-1.39e-19 (4.25e-18)	299.845** (125.443)	181.289** (83.297)	38.137* (20.888)	220.189** (100.946)	0.007 (0.045)	183.259*** (68.510)
Obs.	191	191	191	191	191	191	191	191
Panel C								
Thought about Action Plans	0.149*** (0.053)	-3.66e-18 (4.26e-18)	394.565** (163.896)	190.759** (78.842)	47.820** (22.627)	223.066** (93.929)	0.021 (0.048)	175.566** (81.786)
Obs.	191	191	191	191	191	191	191	191

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows effects of implementation intentions on savings-related outcomes, while Panel A estimates the effect of *Following the Savings Plan*, Panel B estimates the effect of *Whether the Savings Plan was Helpful* and Panel C of whether *The respondent thought about implementation plans* on savings outcomes.

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Effect of Present Bias on Calendar Location

	(1)	(2)	(3)	(4)
Panel A: Location of the Calendar				
Dependent Variable: Indicator Calendar on business wall				
Present bias	0.011 (0.076)	0.025 (0.074)	0.033 (0.08)	0.042 (0.079)
IDF	-0.101 (0.275)	-0.101 (0.319)	-0.269 (0.361)	-0.301 (0.36)
Future bias	0.115 (0.109)	0.097 (0.107)	0.063 (0.105)	0.068 (0.103)
Obs.	136	135	135	135
Dependent Variable: Indicator Calendar at business (not on wall)				
Present bias	0.004 (0.074)	-0.013 (0.08)	-0.043 (0.09)	-0.039 (0.091)
IDF	0.271 (0.189)	0.286* (0.16)	0.201 (0.215)	0.229 (0.231)
Future bias	-0.007 (0.094)	-0.006 (0.09)	-0.036 (0.094)	-0.021 (0.1)
Obs.	136	135	135	135
Dependent Variable: Indicator Calendar on wall at home				
Present bias	0.202 (0.131)	0.178 (0.138)	0.214 (0.134)	0.205 (0.137)
IDF	-0.027 (0.438)	0.026 (0.478)	0.114 (0.393)	0.119 (0.407)
Future bias	-0.116 (0.115)	-0.113 (0.112)	-0.079 (0.107)	-0.093 (0.108)
Obs.	136	135	135	135
Dependent Variable: Indicator Calendar at home (not on wall)				
Present bias	-0.217 (0.136)	-0.190 (0.141)	-0.204 (0.15)	-0.208 (0.153)
IDF	-0.142 (0.478)	-0.211 (0.565)	-0.047 (0.605)	-0.047 (0.617)
Future bias	0.007 (0.153)	0.021 (0.155)	0.052 (0.163)	0.046 (0.168)
Obs.	136	135	135	135
Panel B: Action Plans				
Dependent Variable: Following Savings Plan				
Present bias	0.028 (0.283)	0.178 (0.263)	0.175 (0.278)	0.207 (0.283)
IDF	-1.315 (0.917)	-0.906 (0.843)	-1.146 (0.96)	-1.145 (0.99)
Future bias	-0.167 (0.272)	-0.176 (0.257)	-0.225 (0.264)	-0.212 (0.28)
Obs.	192	190	190	190
Dependent Variable: Savings Plan Helpful				
Present bias	-0.175 (0.276)	-0.048 (0.282)	-0.056 (0.297)	-0.059 (0.303)
IDF	-1.644** (0.827)	-1.295 (0.847)	-1.619* (0.919)	-1.618* (0.922)
Future bias	-0.242 (0.289)	-0.249 (0.287)	-0.307 (0.295)	-0.304 (0.306)
Obs.	192	190	190	190
Dependent Variable: Thought about Action Plans				
Present bias	-0.164 (0.299)	-0.074 (0.297)	-0.039 (0.29)	-0.025 (0.291)
IDF	-1.961** (0.896)	-1.740* (0.973)	-1.717* (0.899)	-1.710* (0.885)
Future bias	-0.390 (0.272)	-0.406 (0.276)	-0.376 (0.274)	-0.348 (0.282)
Obs.	192	190	190	190
Control for				
Present bias	✓	✓	✓	✓
Socio-economic Characteristics		✓	✓	✓
Firm Characteristics			✓	✓
Previous Treatment				✓

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows estimates of the effect of present-biased preferences on the location of the calendar (Panel A) and on the implementation intentions of the intervention (Panel B). All estimations control for individual discount factors (*IDF*) and an indicator for future bias. * $p < 0.1$, Standard errors in parentheses. ** $p < 0.05$, *** $p < 0.01$.

Table 8: Sensitivity Analyses: Savings Index

	Savings			
	Index (1)	Index (2)	Index (3)	Index (4)
Savings Goal Calendar	-0.031 (0.088)	-0.069 (0.086)	-0.013 (0.086)	-0.067 (0.086)
Obs.	401	404	401	394
Sensitivity checks				
No control for unbalanced variables		✓		
Additionally controlling for unbalanced savings variables			✓	
Sample restriction to those with savings goal				✓

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The main estimation result is presented in Column (1) and the remaining columns provide the following sensitivity analyses:

Column (2): no control for unbalanced variables of previous treatments

Column (3): control for unbalanced savings variables

Column (4): restricting sample to those having a concrete savings goal

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Main Effects Saving Goal Calendar: Savings

	Savings Index (1)	Savings Index (2)	Savings Index (3)	Savings Index (4)
Panel A: Spillover Effects: 10m radius				
Savings Goal Calendar	-0.054 (0.089)			
Savings Goal Calendar * Share treated in 10m radius	18.607 (17.032)			
Share treated in 10m radius	-6.178 (10.254)			
Obs.	401			
Panel B: Spillover Effects: 25m radius				
Savings Goal Calendar		-0.064 (0.099)		
Savings Goal Calendar * Share treated in 25m radius		4.332 (4.872)		
Share treated in 25m radius		-3.781 (3.008)		
Obs.		401		
Panel C: Spillover Effects: 75m radius				
Savings Goal Calendar			0.054 (0.116)	
Savings Goal Calendar * Share treated in 75m radius			-2.778 (2.303)	
Share treated in 75m radius			-0.542 (1.430)	
Obs.			401	
Panel D: Spillover Effects: 100m radius				
Savings Goal Calendar				0.072 (0.124)
Savings Goal Calendar * Share treated in 100m radius				-2.488 (2.033)
Share treated in 100m radius				-0.306 (1.302)
Obs.				401

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the results of a spillover analysis, where we interact the treatment indicator with the share of treated in a certain radius: 10m (Panel A), 25m (Panel B), 75m (Panel C), 100 (Panel D). Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix to

“The Impact of a Savings Goal Calendar Treatment in Uganda”

by Antonia Grohmann, Tabea Lakemann, and Helke Seitz

Appendix A: Figure A.1 - A.4

Supplementary figures and tables for the main text

Appendix B: Tables B.1 - B.6

Supplementary tables for secondary outcomes

Appendix A

Figure A.1: Intervention

A. Treatment Group: Savings Goal Calendar

B. Control Group: Calendar

Achieving my Business Saving Goal

UGX _____

- My business savings goal is: _____
- Best thing of reaching my saving goal: _____
- My Savings Plan – When do I plan to save which amount:

April 2018							May 2018						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30						29	30	31				
Sum:							Sum:						

Calendar

April 2018 – September 2018

April 2018							May 2018							June 2018							July 2018							August 2018							September 2018									
Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31														
29	30						29	30	31					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Sum:							Sum:							Sum:							Sum:							Sum:							Sum:									

- Things that may stop me from saving as I planned:
 - _____
 - _____
 - _____
- How to deal with these?:
 - If _____, then _____
 - If _____, then _____
 - If _____, then _____

Notes: The figure shows the calendar received by the Treatment Group (Figure A, left) and Control Group (Figure B, right).

Figure A.2: Elicitation of individual time preferences

Game 2

Panel 1							
Row	Option A		Respondents Choice		Option B		
1	10 000	tomorrow			11 500	in 1 month	
2	10 000	tomorrow			13 000	in 1 month	
3	10 000	tomorrow			15 000	in 1 month	
4	10 000	tomorrow			17 500	in 1 month	
5	10 000	tomorrow			20 000	in 1 month	
6	10 000	tomorrow			22 500	in 1 month	

Panel 2							
Row	Option A		Respondents Choice		Option B		
1	10 000	tomorrow			11 500	in 6 month	
2	10 000	tomorrow			13 000	in 6 month	
3	10 000	tomorrow			15 000	in 6 month	
4	10 000	tomorrow			17 500	in 6 month	
5	10 000	tomorrow			20 000	in 6 month	
6	10 000	tomorrow			22 500	in 6 month	
7	11 000	tomorrow			30 000	in 6 month	

Panel 3							
Row	Option A		Respondents Choice		Option B		
1	10 000	in 6 month			11 500	in 7 month	
2	10 000	in 6 month			13 000	in 7 month	
3	10 000	in 6 month			15 000	in 7 month	
4	10 000	in 6 month			17 500	in 7 month	
5	10 000	in 6 month			20 000	in 7 month	
6	10 000	in 6 month			22 500	in 7 month	

Notes: The figure shows choice sets in three different panels to elicit individual time preferences. In each row of each panel, the respondent must choose between a sooner, smaller amount (Option A), or a larger, later amount (Option B).

Table A.1: Savings Goals

	All (1)	Treatment Group (2)	Control Group (3)	p-value (4)
Panel A: Savings Goals by Category				
Stock	149	74	75	0.90
Equipment	213	101	112	0.47
Premises	40	18	22	0.58
Investment	14	8	6	0.55
New firm	32	22	10	0.02
No goal	17	6	11	0.24
Panel B: Savings Goal Amounts				
Business Goal Amount	5.009	5.027	4.992	0.97

Source: Survey on micro and small enterprises in Uganda, wave April 2018, own calculations.

Notes: The table provides summary statistics on the respondents' savings goals (Panel A) and the associated amounts (Panel B). Panel A provides the number of savings goals by the following categories: Stock (raw materials and finished goods), equipment (business equipment that is used during production process or provision of services (e.g. machines, furniture)), premises (investments related to buying land, plots, premises or renovation), investments (related to the present firm), new firm (investments related to starting another or additional business), and lastly, respondents that do not have a savings goal. Panel B provides the amount in UGX associated with the savings goals by the control and treatment group.

Table A.2: Pre-Intervention Summary Statistics on Savings

	Obs. (1)	Full Sample mean (sd) (2)	Control Group (C) mean (sd) (3)	Treatment Group mean (sd) (4)	Diff. from C [p-value] (5)
Any Savings	465	0.89 (0.31)	0.89 (0.31)	0.89 (0.32)	0.01 [0.79]
Total Savings	465	1,465.68 (2,574.31)	1,520.85 (2,857.04)	1,408.82 (2,251.00)	112.03 [0.64]
Formal Savings	465	951.47 (1,592.32)	997.43 (1,713.44)	904.11 (1,459.27)	93.31 [0.53]
Informal Savings	465	328.14 (563.50)	284.86 (430.48)	372.74 (671.77)	-87.88 [0.09]
Business	465	511.62 (1,573.50)	540.81 (1,735.79)	481.53 (1,389.74)	59.29 [0.69]
Frequency	443	1.65 (1.01)	1.67 (1.08)	1.62 (0.95)	0.04 [0.66]
Savings Goal	443	528.52 (1,163.58)	487.02 (1,181.42)	571.35 (1,146.02)	-84.33 [0.45]

Source: Survey on micro and small enterprises in Uganda, wave October 2017, own calculations.

Notes: The table provides summary statistics of baseline data and mean comparisons between treatment group (savings goal calendar) and control group (plain calendar) in Column (5)). Standard deviations are in parenthesis, p-values for differences of means appear in squared brackets.

Table A.3: Intention-to-Treat Effects on Savings Related Outcomes

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Panel A: Unconditional								
Savings Goal Calendar	-0.069 (0.086)	0.005 (0.026)	-356.971 (323.333)	-71.124 (128.217)	-6.930 (37.263)	-51.914 (166.234)	-.008 (0.072)	-155.559 (140.584)
Obs.	404	404	404	404	404	404	404	404
Panel B: Control for age, capital stock								
Savings Goal Calendar	-.028 (0.087)	0.008 (0.028)	-216.094 (307.458)	6.123 (127.848)	0.686 (37.168)	-8.972 (152.940)	0.004 (0.068)	-119.480 (138.388)
Obs.	401	401	401	401	401	401	401	401
Panel C: Control for age, capital stock, savings								
Savings Goal Calendar	-.013 (0.086)	0.003 (0.028)	-209.290 (302.433)	11.953 (128.527)	-6.349 (36.749)	34.005 (147.456)	0.01 (0.071)	-78.190 (132.529)
Obs.	401	401	401	401	401	401	401	401

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on savings related outcomes. The savings index provided in Column (1) comprises all variables in the remaining columns. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Heterogeneity Socio-Economic Characteristics: Savings

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)	Business Savings (6)	Frequency Savings (7)	Savings Toward Goal (8)
Panel A								
Savings Goal Calendar	-0.97 (0.13)	0.016 (0.038)	-522.521 (481.977)	-55.122 (173.470)	-5.951 (49.549)	-118.301 (247.294)	0.048 (0.097)	-226.481 (210.017)
SGC * Female	0.149 (0.168)	-0.018 (0.056)	690.602 (563.480)	133.185 (255.640)	13.985 (74.199)	193.735 (291.129)	-0.095 (0.141)	208.968 (271.946)
Obs.	401	401	401	401	401	401	401	401
Panel B								
Savings Goal Calendar	-0.094 (0.1)	0.027 (0.033)	-317.433 (342.472)	-100.782 (147.816)	-19.282 (42.878)	26.502 (191.253)	-0.113 (0.074)	-241.675 (170.570)
SGC * Higher educated	0.181 (0.194)	-0.058 (0.059)	301.744 (767.704)	331.698 (281.960)	50.631 (83.352)	-92.821 (373.883)	0.332** (0.141)	344.010 (301.465)
Obs.	401	401	401	401	401	401	401	401
Panel C								
Savings Goal Calendar	0.01 (0.101)	0.024 (0.041)	-198.572 (313.240)	-27.376 (160.565)	48.869 (53.548)	-21.679 (184.758)	0.026 (0.068)	-219.199 (176.861)
SGC * Married	-0.072 (0.171)	-0.029 (0.055)	-38.249 (667.458)	61.408 (249.492)	-90.209 (73.555)	32.476 (327.486)	-0.039 (0.134)	162.918 (291.634)
Obs.	401	401	401	401	401	401	401	401
Panel D								
Savings Goal Calendar	0.082 (0.136)	0.013 (0.066)	49.894 (529.028)	106.413 (344.241)	49.974 (75.107)	217.338 (316.996)	0.012 (0.139)	-141.903 (225.113)
SGC * Financial literacy	-0.132 (0.17)	-0.006 (0.072)	-313.400 (680.238)	-114.782 (371.651)	-60.895 (85.462)	-258.637 (372.996)	-0.009 (0.161)	19.550 (272.888)
Obs.	401	401	401	401	401	401	401	401
Panel E								
Savings Goal Calendar	-0.035 (0.084)	0.015 (0.033)	-157.900 (242.707)	-52.508 (127.197)	9.999 (44.185)	74.660 (142.302)	-0.100 (0.075)	-79.911 (100.433)
SGC * Sales	0.002 (0.194)	-0.012 (0.059)	-210.959 (695.150)	103.731 (280.988)	-29.516 (75.888)	-223.120 (344.452)	0.26* (0.152)	-140.425 (322.322)
Obs.	401	401	401	401	401	401	401	401
Panel F								
Savings Goal Calendar	0.126 (0.137)	-0.004 (0.046)	698.586 (497.882)	255.609 (223.093)	21.860 (67.180)	159.725 (291.518)	-0.033 (0.097)	286.307 (226.297)
SGC * Business experience	-0.014 (0.011)	0.001 (0.004)	-83.179** (41.380)	-22.538 (15.878)	-2.180 (4.933)	-14.619 (27.769)	0.003 (0.009)	-37.063* (19.865)
Obs.	401	401	401	401	401	401	401	401
Panel G								
Savings Goal Calendar	0.055 (0.133)	-0.025 (0.046)	395.690 (479.578)	185.173 (225.237)	1.265 (65.823)	95.250 (278.138)	-0.014 (0.101)	188.581 (210.542)
SGC * Firm age	-0.007 (0.011)	0.003 (0.004)	-53.077 (40.320)	-15.451 (15.748)	-0.284 (4.695)	-7.568 (26.383)	0.002 (0.01)	-26.328 (18.934)
Obs.	401	401	401	401	401	401	401	401
Panel H								
Savings Goal Calendar	0.044 (0.101)	0.043 (0.043)	140.684 (267.331)	17.928 (126.340)	-18.441 (48.823)	159.537 (181.645)	-0.032 (0.094)	-47.633 (100.925)
SGC * Profit	-0.176 (0.168)	-0.064 (0.053)	-764.070 (603.238)	-91.559 (242.188)	19.290 (73.833)	-352.996 (323.056)	0.069 (0.143)	-210.630 (262.308)
Obs.	400	400	400	400	400	400	400	400
Panel I								
Savings Goal Calendar	-0.091 (0.124)	0.017 (0.042)	-237.878 (401.299)	-36.606 (163.713)	-69.442 (47.276)	4.298 (211.502)	0.041 (0.105)	-99.613 (184.278)
SGC * Service sector	-0.227 (0.253)	-0.002 (0.086)	31.308 (671.700)	-266.725 (435.527)	-27.559 (112.100)	-361.955 (298.490)	-0.430 (0.277)	-278.909 (356.143)
SGC * Retail sector	0.221 (0.192)	-0.025 (0.059)	108.678 (773.416)	153.435 (274.721)	166.676** (84.491)	152.410 (370.594)	0.042 (0.144)	34.593 (334.185)
SGC * Other sector	0.281 (0.627)	0.008 (0.055)	-729.850 (2520.246)	656.784 (1136.355)	380.451 (240.329)	-595.310 (1361.999)	-0.058 (0.294)	-223.568 (1260.137)
Obs.	401	401	401	401	401	401	401	401

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.

Notes: The table presents a heterogeneity analysis, with the treatment being interacted with an indicator for: whether the business owner is a women (Panel A), more than A-level education (Panel B), being married (Panel C), financial literacy level above sample median (Panel D), sales above sample median (Panel E), continuous measure of business experience (Panel F), continuous measure of firm age (Panel G), profit above sample median (Panel H), industry sector (Panel I). Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix B

Table B.1: Variable Definitions of Secondary Outcomes

Variable	Survey Question
Investment	
New Investment (yes/no)	Bought new investment in $t+1$
New Investment Amount	Amount of new investment bought in $t+1$
Inventory Amount	Inventory Amount
Planned Investment (yes/no)	Planning of new investment
Planned Investment Amount	Amount of planned new investment
Planned hiring (yes/no)	Planned hiring of employees
Planned hiring Number	Number of new employees planned to hire
Costs	
Costs Raw Materials	Please consider now your total expenditures for ALL raw materials: How much did you spend on raw materials in the last four weeks?
Costs Finished Goods	Please consider your total expenditures for ALL the finished goods you sell without transformations: How much did you spend on finished goods in the last four weeks?
Covers expenditures using	How do you usually cover your expenditures for raw materials and finished goods?
... savings	Own savings/profits?
... loans	Loan from suppliers [goods on credit]
... advance payments	Advance payments of customers
Other expenditures	What are the other expenditures of your business over the past twelve months?
Borrowing	
Applied for Formal Loan	Have you applied for a loan/credit at a formal financial institution? [e.g. from a bank, microfinance institution, SACCO]
Applied for Informal Loan	Have you applied for an informal loan/credit from any other source? [e.g. friends, relatives, business partners, moneylenders]
Loan Amount	Formal or informal credit amount
Perceptions	
Reached Goal	Did you reach your saving goal amount? Meaning, did you save the whole amount you wanted to save?
Bought Goal	Did you actually buy what was for your saving goal?
Business Practices and Financial Awareness	
Financial record keeping	Do you keep financial records in your business?
Thought about...	
... investing in business	How much have you thought about investing in your business?
... how to grow business	How much have you thought about how you can grow your business?
Setting aside money	How often do you set money aside for your business but it gets used for household/private expenses?
Budget Plan	How often do you make a household budget?
Spend money	How often do you spend your money according to your budget?
Pressure sharing money	I feel pressure to share extra business income with other household members.

Table B.2: Intention-to-Treat Effects on Investment Related Outcomes

	New Investment (yes/no) (1)	New Investment Amount (2)	Inventory Amount (3)	New Products (yes/no) (4)	Planned Investment (yes/no) (5)	Planned Investment Amount (6)	Planned hiring (yes/no) (7)	Planned hiring Number (8)
Savings Goal Calendar	0.024 (0.046)	32.311 (54.307)	1536.572** (759.879)	-0.018 (0.028)	-0.030 (0.042)	1199.651 (951.888)	0.033 (0.037)	0.074 (0.072)
Obs.	439	439	439	439	401	439	400	438

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on investment related outcomes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3: Intention-to-Treat Effects on Cost Related Outcomes

	Costs Raw Materials Amount (1)	Costs Finished Goods Amount (2)	Covers expenditures using ... savings (yes/no) (3)	loans (yes/no) (4)	advance payments (yes/no) (5)	Other expenditures Amount (6)
Savings Goal Calendar	-46.849 (428.364)	1096.567 (1471.894)	-0.002 (0.009)	0.031 (0.047)	0.0006 (0.043)	18.205 (63.112)
Obs.	397	400	400	400	400	401

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on cost related outcomes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.4: Intention-to-Treat Effects on Borrowing Related Outcomes

	Applied for Formal Loan (yes/no) (1)	Applied for Informal Loan (yes/no) (2)	Loan Amount (3)
Savings Goal Calendar	0.057* (0.03)	0.007 (0.032)	261.446 (228.395)
Obs.	401	400	401

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on borrowing related outcomes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.5: Intention-to-Treat Effects on Perceptions Related Outcomes

	Reached Goal (1)	Bought Goal (2)
Savings Goal Calendar	-0.076* (0.045)	-0.083* (0.045)
Obs.	397	397

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on outcomes related to perceptions. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.6: Intention-to-Treat Effects on Business Practices and Financial Awareness Related Outcomes

	Thought about...						
	Financial Record keeping (yes/no) (1)	... investing in business amount (2)	...how to grow business (yes/no) (3)	Setting aside money amount (4)	Budget plan (yes/no) (5)	Spend money (6)	Pressure sharing money (7)
Savings Goal Calendar	0.018 (0.039)	0.027 (0.049)	0.024 (0.043)	0.04 (0.084)	0.044 (0.113)	0.106 (0.09)	-.006 (0.141)
Obs.	401	401	401	401	400	199	401

Source: Survey on micro and small enterprises in Uganda, waves April and October 2018, own calculations.

Notes: The table shows the 6-months follow-up intention-to-treat effects on business practices and financial awareness related outcomes. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.