The Effect of Personalized Feedback on Small Enterprises' Finances in Uganda

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Abstract

This study examines the effect of two different finance trainings on business outcomes. The first training is based on a "rule-of-thumb" approach, teaching simple financial rules. The content of the second training is exactly the same but additionally provides personalized feedback on past financial performance and practices of the entrepreneur. Running a small intervention targeting 500 small and micro entrepreneurs in Kampala (Uganda), we find that the additional personalized feedback significantly improves overall savings by 0.279 standard deviation units. Analysing the specific feedbacks provided we find that not all feedbacks work in the same way to change behavior in the desired direction.

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1 Introduction

Small entrepreneurs form an important part of the economy in developing countries. It is estimated that the majority of the work force is either self-employed or works in small businesses. Despite this importance of small entrepreneurs for the economy it becomes obvious by just visiting such shops, and is known from studies, that small entrepreneurs lack capital (e.g., Banerjee and Duflo (2014); McKenzie and Woodruff (2008); De Mel et al. (2008)) and knowledge (e.g., Bruhn and Zia (2013); Bruhn et al. (2010); Bloom et al. (2010)) in order to upgrade their business.

Accordingly, there are several initiatives providing business trainings of various kinds. The evidence on the impact of these trainings is encouraging overall (McKenzie and Woodruff, 2013) as they mostly generate statistically significant effects. However, the effect size are often rather modest and thus question the usefulness of business trainings. At the same time, there are very successful trainings from which others can learn (Campos et al., 2017; Drexler et al., 2014).

Given this state of the literature it is our motivation to contribute towards an improvement in the effectiveness of business trainings for small enterprises. Research today has focused on rather standardized financial trainings where the same content is delivered to each participant. While it is known that individual counseling is more successful than a general and standardized training of a group of entrepreneurs (Carpena et al., 2019), counseling is of course very costly. Hence, we are interested in testing a new form of training that is in between a conventional standardized training of a group and an individual one-to-one counseling.

Our intervention introduces elements of *feedback* as part of a standard training and by this allows the information transferred to vary for each participant. We personalize the training by providing respondents individual feedback about their past financial behavior, which introduces aspects of counseling. Several studies find supportive evidence that feedback can be effective, as shown in the areas of energy conservation (Karlin et al., 2015) or problem drinking (Riper et al., 2009). Based on this extant literature on feedback interventions and their psychological underpinnings we

embed personalized feedback in a standardized training framework. Feedback has long been regarded in psychology as an effective way to change behavior. Inspired by this, introducing personalized feedback may stimulate the entrepreneurs' attention and involvement and thus improve the effectiveness of a training intervention. However as argued by Kluger and Denisi (1997) not all feedback improves all behavior and not always in the desired direction. We therefore test which feedback works in our setting.

In order to assess the effects of the provision of feedback in addition to a finance training, we conduct a randomized controlled trial (RCT) in Kampala, the capital city of Uganda. We rely on a survey study with about 500 micro and small businesses who are randomly sampled based on several stratification criteria, such as area and industry (details are provided in Section 3 below). This sample is divided into three groups: we have one group which receives a finance training only, the other treatment group receives the finance training *plus* feedback and a control group. To rule out that effects may be driven through contact and time spent with our training staff, the control group receives a health training which is unrelated to the content of the finance training. Regarding the training groups, we have to consider two limitations of our study, i.e. the relatively small sample plus the constrained resources which allow for roughly a half hour training. Therefore, our finance training is based on lessons learned from the "rule-of-thumb" approach as introduced by Drexler et al. (2014). This training delivers the content in an easy and understandable way and has shown relatively high effectiveness. Thus we get an ambitious benchmark for the second treatment group which receives additional feedback: this is the finance training from the other treatment plus an add-on, i.e. additionally provided feedback information about the situation of the entrepreneur and her small business.

The finance training covers six main topics: the first part is about an increase of investment in order to expand the business in the longer run. Second, and related to this is the discussion of additional savings as the easiest way to increase investments. Then sources of profits are discussed and, fourth, diversification of business in order

to reduce riskiness. Fifth, it covers business practices related to separating finances between business and household and, lastly, keeping financial records. We follow the principle of keeping trainings easy and understandable and follow the findings of a rule-of-thumb training by Drexler et al. (2014). Therefore, each topic of the training contains concrete financial rules. To be more concrete, the savings topic includes for example rules as "make a savings plan to reach your savings goal" or "start saving now" etc. In addition to these rules, the feedback add-on uses information from the baseline survey and informs, for example, that "your savings goal is: to invest in my current business" or "you already saved XY to reach your saving goal". Thus the feedback relates the abstract rules more concrete to the specific entrepreneur and reminds him of earlier plans and actions. The overall treatments are intensive because they are delivered in face-to-face meetings at the entrepreneur's business. However, they are easy to take part in as the presentation of treatment information takes on average just 28 minutes and 32 minutes, respectively.

We find that both financial trainings generate several desired changes in behavior. The strongest effect of the twelve combinations (two treatments times six outcomes) is for the additional feedback on savings: the effect is 0.279 SDs strong and also highly statistically significant. Also most other coefficients are larger than the benchmark of 0.08 cited, thus proving the effectiveness of this training. We further study which type of feedback may be relevant under which circumstances. We here focus on feedback that is relevant to savings behavior. We find that giving people feedback on whether they have a savings goal, has a positive effect on savings: Hence affirmative feedback has positive effects. We further show that people that are given feedback on how long it will take them to reach their savings goal have a larger increase in savings than if they are far away from their savings goal than if they are close. Both these findings are in line with feedback intervention theory (Kluger and Denisi, 1997).

This paper is embedded in a larger literature on trainings of small businesses. Many of these trainings focus on financial concepts as we do. Typically, they suc-

ceed but the degree of success differs and overall there seems room for improvement. Several classroom training interventions find effects on business knowledge or business practices, but muted or no effects on key business performance measures like revenues or profits (Gine and Mansuri, 2014; Bruhn and Zia, 2013; Karlan and Valdivia, 2011; Bjorvatn, 2010). A classroom training is the most general way to provide information. The training content is standardized and not adjusted to the particularities of specific firms. Interventions that take into account individual challenges of firms are those providing consulting services, where the content is tailored to the businesses' needs. Karlan et al. (2015) provide consulting service to tailors in Ghana and find immediate changes in business practices and increases in investment. A more promising consulting intervention was conducted among Mexican enterprises by Bruhn et al. (2018). They find effects on productivity in the short run and employment in the long run.

A rule-of-thumb approach is among the promising avenues to follow. Our innovation is to combine this training approach with a personalized feedback and our evidence suggests that this may be a promising way to go. However, this requires that information about the treatment groups is available or will be collected in advance.

This paper is structured into five more sections: Section 2 describes the experimental setting and Section 3 the data. Results are presented in Section 4 and Section 5 explores on the underlying mechanism of the effectiveness of feedback. Section 6 concludes.

2 Experimental Setting

In this section we describe the implementation of our intervention which consists of three treatment arms (Section 2.1) and our empirical strategy (Section 2.2).

2.1 Experimental Design

To foster financial knowledge among micro and small enterprises, we develop a *finance training*. The training covers the following topics: (i) investment strategies, (ii) savings, (iii) profits, (iv) risk diversification, (v) separating household and business finances and (vi) record keeping. A detailed curriculum of the content of each topic can be found in Column (2) in Appendix Table A.1. Regarding the design and delivery method of the finance training we build on findings by Drexler et al. (2014). They provide evidence that a training with focus on ease of understanding by providing simple rules of financial decision making ("rule-of-thumbs") performs better than a training that focuses on the comprehensiveness of the material. Hence, we develop a training that is easy to understand and simple. The training content is delivered in a compact way without delivering too many details or extensive exercises. Each content is summarized and depicted by easy memorizable statements, framed as simple heuristics or routines for financial decision making ("rule-of-thumbs"). To ensure that the content of our training is in line with the national financial inclusion strategy, our rule-of-thumbs are in accordance with the core messages regarding financial literacy by the Bank of Uganda (Central Bank).[1]

The other treatment group in addition to the finance training receives personalized *feedback*. This additional component crucially marks the difference between both treatment groups. This treatment group receives feedback regarding the past financial performance of the business and the business owners financial behavior. This adds a personalized element to the training. To illustrate the trainings: while as part of the first treatment arm the finance training marks the importance of having a savings goal and starting to save towards that goal (depicted as rule-of-thumb messages) the second treatment arm in addition provides feedback about whether the business owner actually has a savings goal and if so, how much the business owner already saved towards it. Hence, whenever our data allow, the sec-

[1] See: https://www.bou.or.ug/opencms/bou/bou-downloads/Financial_Inclusion/Core-Messages-Financial-Literacy_August-2013.pdf, last checked on August 17th, 2018.

ond treatment group receives personalized feedback which is directly related to a rule-of-thumb message that was delivered as part of the finance training. The control group receives health and safety information in a comparable amount of time to avoid estimation bias from Hawthorne-type effects.

The information provided for the finance training, personalized feedback and the control group are delivered and taught in face-to-face sessions with local instructors. All instructors have a university degree and are experienced with field surveys. Prior to treatment implementation the instructors completed an intensive five-day training and an additional two-day pilot. During the personal meetings between instructor and respondent in the business, the training contents are delivered using a presentation on tablet PCs. After the presentation, each respondent receives a booklet which includes a detailed description of the contents that are presented. The booklet also includes the rule-of-thumb messages or in addition the personalized feedback information. To ensure that all respondents could follow the contents of the training, the presentation and booklet are either in English or Luganda depending on the preferences and skills of the business owner. Even though our information intervention was delivered in personal face-to-face meetings the implementation costs per business amount to only around $ 17 for the finance training and another $ 8 for the additional feedback.

The presentation of all types of trainings takes between 20 and 32 minutes.[2] The training duration to not significantly differ between both treatment groups any conventional significance level. To encourage respondents to actively listen to the presentation and to foster interaction between instructor and respondent we include several pedagogical tools such as a presentation, a booklet and individual exercises. We design a presentation and a detailed booklet to deliver the training content. Besides written explanations of training contents, we include pictures and figures to illustrate concepts. The individual exercises include reflections about business investments and household budget. These reflections are noted down in the booklet.

[2]On average, 20 minutes are spent to deliver information to the control group, 28 minutes are spent for the finance training and 32 minutes for the finance training plus feedback group.

Another exercise is a discussion on the advantages and disadvantages of savings and borrowing for investments.

Our intervention was implemented in late 2017. Prior to implementation, we piloted all three trainings on a local market in July 2017 in Kampala. Baseline information was collected among 503 MSEs beginning of September. Of these, 166 were assigned to the finance training, 168 to receive the additional feedback and 169 to the control group. The intervention was implemented during another round of business visits immediately after the baseline survey. The endline data was collected six months after treatment implementation.

Power calculations show that significant treatment effects cannot be expected in this setting from conventional training approaches. Our experiment has 80 percent power to precisely detect (at α=0.05) effect sizes as small as 0.2667 standard deviation (SD) units. This calculated minimum detectable effect size is not negligible. According to a meta study by Kaiser (2017), the average effect of financial education on financial behavior is 0.08.

Our follow-up information was collected six months later in April 2018. Out of 492 treated businesses owner, we re-interviewed 460 entrepreneurs. Attrition varied in the sample between 7 percent (finance training), 8 percent (personalized feedback) and 11 percent (control group). To rule out that attrition is differential between our treatment arms, we regress a binary attrition variable on both treatment indicators. Attrition is not significantly associated with either of the treatment groups (see Table A.2).

2.2 Empirical Strategy

We estimate causal treatment effects by comparing both treatment groups (finance training and finance training *plus* feedback) to our control group. The relationship between both trainings and the outcome measures is estimated using an analysis of covariance (ANCOVA) estimation (McKenzie, 2012). As entrepreneurs were randomly assigned to one of the treatments, we estimate the following equation to get

unbiased estimates:

$$y_{i,t} = \alpha + \beta_1 \textit{Finance Training}_{i,t} + \beta_2 \textit{Finance Training plus Feedback}_{i,t} + \theta y_{i(t-1)} + \epsilon_{i,t} \tag{1}$$

where $y_{i,t}$ is the outcome variable, $\textit{Finance Training}_{i,t}$ indicates being assigned to the first treatment group, $\textit{Finance Training plus Feedback}_{i,t}$ is an indicator for being assigned to the group who receives feedback in addition to the finance training and $y_{i(t-1)}$ is the pre-treatment measure of the outcome variable. The parameters β_1 and β_2 give the "intention-to-treat (ITT)" effect, which is the effect of being assigned to one of the trainings. In case $y_{i,t}$ is binary we estimate a linear probability model. While individuals in all treatment arms were free to participate in information intervention which was part of a short survey, the non-compliance rate in our setting is very low. This is potentially driven by the fact that we offered participants a small financial incentive as a token of appreciation for their time, and that the intervention was shortly after they participated in our baseline survey might have strengthened the confidence in our research team. Only one individual by mistake received health and safety information instead of the finance training. Hence, due to the low non-compliance rate, our estimated ITT effect is likely of similar magnitude as the "treatment-on-the-treated (TOT)" effect.

In our analysis, we are interested in the overall effectiveness of each training. Hence, we test whether the effect of finance training or additional feedback on families of related outcomes is significantly different from zero (Duflo et al., 2007). We aggregate these variables to a standardized index following (Kling et al., 2007). The index z is the average of all i=1,...I standardized variables belonging to a family of outcomes. Specifically, $z = \sum_{i=1}^{I} z_i^*$ where $z_i^* = \frac{y_i - \mu_i}{\sigma_i}$, where y_i is an outcome variable, and μ_i and σ_i are the mean and standard deviation of the respective outcome variable of the control group.

3 Data

This section describes the sampling process of our study and the major differences between the different industry sectors represented in the sample (Section 3.1), the outcome variables (Section 3.2) and baseline data (Section 3.3).

3.1 Sample

Our intervention is conducted among a sample of micro and small enterprises (MSEs) in Kampala, Uganda. As part of the sampling process, 220 administrative areas (zones) with predominant business activity were identified. Subsequently, 21 zones were randomly selected for a door-to-door screening. Based on this a sample of 450 enterprises were drawn in 2012. The annual sample was expanded to around 500 MSEs in 2015. The sample contains 200 enterprises in each the retail and the manufacturing sectors and 50 enterprises in the services sector. The three industry sectors covered in the sample have quite distinct characteristics.[3] Table 1 shows descriptive differences between the industry sectors at our baseline of the intervention in 2017.

[Insert Table 1 about here]

The share of female owned enterprises is highest in the services sector (60 percent). This is not surprising as most of these businesses operate in the field of hairdressing and beauty which are mostly owned by women. The sectors are also quite heterogeneous with respect to the educational level of the entrepreneur. While the overall share of entrepreneurs with upper secondary degree and higher (high skilled) is 34 percent in the overall sample, this share is 15 percentage points lower among businesses in the services sector and 8 percentage points higher in the retail sector. The average capital stock is highest in the manufacturing sector, whereas the average amount in inventory is highest in the retail sector (whereby 89 percent is stock in finished goods and 11 percent in raw materials). Accompanied with high

[3]There are some businesses which change their industry sector to one which is different from manufacturing, retail and services sector. These are 17 businesses. Due to this low number, the descriptives are neglected for this group.

levels of capital stock and inventory in these groups, the number of sales in both groups outnumber the sales of the services sector by far.

3.2 Outcome Variables

In the following analysis we present treatment effects for variables which are related to investments, savings, profit, risk diversification, separation of finances and record keeping.

Among the *investment* related outcomes are variables which reflect the physical capital and the inventories. We use the variable whether the respondent has any new physical capital and the total value of physical capital purchased since the last interview wave. By physical capital we mean capital invested in tools, machines, furniture or other items which are used in the production process. Further, we use the amount of the current stock of inventory, which are either raw materials or finished goods. We use several outcomes related to *savings*. We use an indicator whether someone has any savings and the total amount of savings held on any savings device. Further, we divide savings into formal savings (held on bank accounts or with savings and credit cooperatives (SACCOs)) and informal savings (held with a rotating savings and credit association (ROSCA), money collector, at home, with friends or neighbours, and on a mobile money account).

We use several variables related to the *profit* of the firm. A survey question that directly asks for the firms' profit in the last four weeks as suggested by De Mel et al. (2009) is included. In addition, we use the value added which is calculated as revenues minus costs. For the calculation of value added we directly ask the entrepreneur for the total revenues (sales) and costs in the last month. The intervention includes a training module on business investment and growth strategies. To prevent that entrepreneurs blindly invest, we include a section on *risk diversification*. We use two proxy variables to measure risk diversification. First, we included the number of investments in business equipment since the last interview. Secondly, we included a measure for the number of different categories in which goods have been purchased

(the potential categories are machines, tools, furniture or other equipment).

We estimate the effect of training on several statements related to *separating finances between business and household*. The answer category of each statement is based on a four point Likert scale ranking from 1="never", 2="rarely", 3="sometimes" to 4="almost always". For the analysis, an indicator variable is used whereby the value of 1 comprises the answer categories "sometimes and almost always" and the value 0 comprises of "never and rarely". The first two statements refer to whether the respondent keeps accounts and cash separate between the business and household. Another two questions refer to whether money or goods which are taken from the business for household purposes are paid back. We use a question whether the respondent makes a household budget. Lastly, we use a statement which asks how often money which is set aside for the business is used for the household. For this item, the indicator is reversed so that lower answer categories are associated with improved behavior (Table A.3 provides an overview on the exact statements). Lastly, we use an item that captures whether the entrepreneur *keeps records* of financial transactions.

3.3 Descriptive Statistics

Table 2 provides pre-intervention characteristics for the baseline survey by treatment status along with p-values for differences between the control and both treatment groups (Columns (5) and (7)). As the entrepreneurs were randomly assigned to each group, we expect them to be similar at baseline. The p-values indicate, that there are no significant differences between the groups regarding entrepreneurial, business characteristics or the indices aggregated over families of outcomes. In addition, we test for joint orthogonality by running a linear regression of treatment indicators on entrepreneurial and business characteristics. The F-statistic in the last row of Table 2 indicates that the null hypothesis that all variables as a whole are significant cannot be rejected.

[Insert Table 2 about here]

Panel (A) provides socio-economic background characteristics of the entrepreneurs in our sample. The table shows that respondents are on average 38 years old; share a household with 4 other persons; 40 percent of the businesses are run by a women and 34 percent are high skilled; meaning they have a upper secondary school degree (A-level) or higher; they operate in 50 percent of the cases without employees as own-account workers (Panel B). The average business operates with capital that is on the one hand invested in physical capital (5,195,000 UGX, approx. 1,400 USD).[4] This is capital invested in machines, tools, furniture or other equipment used in production. On the other hand the businesses have capital invested in inventory which comprises of raw materials used in production and finished goods which are ready for sale to customers (3,935,000 UGX, approx. 1,000 USD). The average monthly sales are of around 7,170,000 UGX, which after taking into account all costs yields to self-reported profits of 718,000 UGX (approx. 100 USD). The accumulated savings are almost twice the monthly profits and average investments conducted in the last 12 months are around 12 percent of the total capital stock.

4 Results

This section describes the causal treatment effects on different families of outcome variables. While Section 4.1 summarizes the effects on aggregated outcomes measured as indices, Section 4.2 sheds light on the effect of the single components belonging to each outcome family with economically meaningful results and Section 4.3.

4.1 Main Treatment Effects

We show the effects of the *finance training* and the *finance training plus feedback* on business outcomes. The reported results, i.e. average intent-to-treat (ITT) effects and respective standard errors are reported in Table 3 for all six different families

[4] To account for enumeration errors, financial outcomes used in our analysis are winsorized at the 99th percentile, see Campos et al. (2017); Karlan et al. (2015); Blattman et al. (2014); Bruhn et al. (2018) who apply the same approach.

of business outcomes: investment, savings, profits, risk diversification, separation of finances, and lastly an indicator for record keeping. While results on these outcomes are shown in columns (1) to (6), column (7) shows the result on the index of all other six outcome indices. The presented coefficients can be interpreted as the standardized mean difference compared to the control group. For example, the additional feedback training increases the investment index by 0.170 standard deviation units of the control group.

[Insert Table 3 about here]

Overall we find that the coefficients of both types of trainings are positive, indicating that business outcomes develop in the intended direction due to the training intervention. The only exception is the separation of finances index, where the estimated coefficient of the additional feedback training has a negative sign. However, this coefficient is close to zero and not significant. Beyond the expected coefficient signs we find that their sizes are indeed quite large given the short training intervention of about half an hour.

Given the mentioned limited statistical power of our study we form an index of all six indices (henceforth overall index) to test whether the treatments do have an effect overall, and indeed, this is the case: The effect size of the additional feedback is 0.258 SD units and highly significant, while the effect of the finance training only is also sizeable 0.178 SD units and marginally significant. To probe these estimates, we conduct a robustness analysis with regard to the construction of the overall index. The results are discussed in Section 4.3.

We look at the effects on the six outcome families presented in Columns (1) to (6) in Table 3. The results show, that the first four outcomes have been affected quite consistently by an effect size of 0.08 and more (with just one exception in eight cases). In remarkable contrast to these positive results, the effect of the treatments on "separating finances" (into business and private purposes) and "record keeping" are negligible with one exception, i.e. the finance-treatment on separating finance. This is a bit surprising as generally such elements of business practices have larger

effects due to financial education (Kaiser (2017)). The reason for this difference across outcomes may be either a decline in attention over the training, as the order of columns in Table 3 repeats the order during trainings; however, there is no statistically significant decline in coefficients across the six outcomes. An alternative interpretation may be that the outcomes of separating finances and record keeping need more time for a successful training, in particular some exercises may be necessary.

Turning to the four outcome families with more encouraging results, we find a significant effect of the additional feedback on the savings index. This ITT effect is large with 0.279, i.e. more than one fourth of a standard deviation for the control group. For the investment, profit, and risk diversification index we find medium to large effect sizes ranging between 0.170 and 0.217 standard deviation units. As the estimated minimum detectable effect (MDE) size is 0.26, we are not powered to detect effect sizes below. Hence, we cannot rule out a non-zero effect of the additional feedback on these indices.

Coefficients are smaller when we turn to the finance training. Still, three coefficients are around 0.1 and only the coefficient regarding "profits" is really small with 0.027. Finally, we want to mention that also an index of financial literacy has been measured in both waves, i.e. before and after the treatments. However, as the training does not teach anything regarding financial literacy, it does not seem to be surprising that we do not find effects.

4.2 Treatment Effects on Single Components

In this section we present the causal effect of each training on the components that belong to one family of outcome measures. We cover the first four outcomes from Table 3, because the outcomes of business practices were not affected by either treatments. In the order of presentation from above, we start with the effects on investment variables.

Investment. The investment index is made up of three variables, i.e. the decision to

purchase physical capital, the amount invested in physical capital since the baseline survey (without land and vehicles) and the change in inventory amount. Based on the fact of investments in physical capital of 66 percent of the control group, the treatments increase this ratio by about 2-3 percent, i.e. not by very much (see Table 4, column 2). This effect is not significant. While also investment amounts do not change to a statistically significant degree, the effects seem to be economically important: the additional feedback leads to 17 percent higher physical capital and to even more than 22 percent higher inventories, the respective numbers for the finance training are 0 and 22.6 percent.

[Insert Table 4 about here]

Savings. The effects on the components belonging to the savings index are reported in Table 5. We find no evidence, that any of the trainings changed the extensive margin, meaning the number of business owners who save (Column (2)). However, we find that the assignment to additional feedback significantly increases the overall savings (column (3)). This group increased their savings by 381,000 UGX (100 USD), which is around 32 percent of the savings of the control group. Distinguishing between the effect of training on formal and informal savings (columns (4) and (5)) shows that the magnitude of the overall increase in total savings (column (3)) is driven by both forms of savings, although only the effect on informal savings is significant. As with investments, the effects of the finance trainings are smaller and do not indicate significant changes in our relatively small sample.

[Insert Table 5 about here]

Profits. Further, we look at profits and their potential components and find that the additional feedback has a significant effect on the change in sales. Table 6 shows that the additional feedback training has positive effects on profits, value added, sales and costs. However, only the effect on sales is significant. While the average sales of the control group are 4,653,000 (1,226 USD), the sales of the additional feedback training are of 46 percent larger. Surprisingly, the average treatment effect of the

finance training group on sales is negative, which leads to a significant difference between the effects of both treatment groups. Overall, the finance training do not have much impact on the profit variables.

[Insert Table 6 about here]

Risk diversification. Table 7 shows the effect of both trainings on two items related to risk diversification. All four coefficients are positive and quite sizable. In particular, we find that the additional feedback significantly increases the number physical capital items the business owner invests in.

[Insert Table 7 about here]

4.3 Robustness Analysis

This section summarizes the findings of a robustness analysis on the overall index as presented in Table 3, column (7). The alternative summary indices are found in Appendix Table A.4. For better comparison, Column (1) shows again the overall index (from Table 3, Column (7)). In Column 2 of Table A.4, we provide an alternative summary measure which is an average index over all 20 (standardized) variables used as outcome variables in this analysis. Compared to the overall index, the effect of the additional feedback is similar in magnitude and significance. The effect of the finance training, however, reduces slightly in magnitude and significance. Both average indices in Columns (1) and (2) simply weight each component of the index equally. An alternative option is to assign weights to each variable. Hence, we construct alternative summary indices using the method of principal components analyses (PCA) to determine the weight of each single variable (Filmer and Pritchett, 2001). Typically, a PCA is used to reduce the numbers of correlated variables to a smaller number of "dimensions". Column (3) shows estimates when the indices are aggregated using PCA. While PCA was initially constructed for variables that are multivariate normal distributed, Column (4) reports a PCA index that allows for ordinal variables and does not rely on a multivariate normal distribution (Kolenikov

and Angeles, 2004). Our results underpin the overall effectiveness of our intervention. The effect of the additional feedback on aggregated indices is relatively robust to the specification of the index.

5 Why is the Provision of Feedback Effective?

Our results show that providing additional feedback as part of a finance training has encouraging effects in magnitude on several crucial business outcomes. Very promising is the statistical increase of the savings index, we find that the finance training in combination with feedback increases the savings index by 0.279 SD units. In contrast, the effect size of the finance training is only 28% of the combined effect. This raises the question of the potential underlying mechanism of providing feedback which results in changes in the savings behaviour. Hence, in the following we provide an explorative analyses on the mechanism at play[5].

5.1 Underlying Mechanism of Providing Feedback

We use feedback intervention theory (FIT) to embed our empirical findings in a psychological framework. FIT relates the provision of feedback to changes in individual behaviour (Kluger and DeNisi, 1996). According to FIT, comparisons between a standard and a feedback result in a discrepancy. As a result of this gap, one possible coping mechanism is that individuals increase their effort and are motivated to attain the standard.

In the following we link the provision of feedback as part of our intervention to feedback intervention theory. The provision of rule-of-thumb information serves as an equivalent to a standard in FIT theory. We are interested in elaborating whether providing additional feedback indeed motivates people to adjust their behaviour as postulated by FIT. The additional feedback that is communicated can serve to motivate people to adjust their behaviour according to the financial heuristics taught as part of the training. To investigate on this and to distinguish between effects from

[5]This chapter is of explorative nature only and has not been part of our pre-analysis plan.

the finance training only and additional feedback, we interact each specific feedback (SF) with an indicator for assignment to each treatment arm. In order to test these predications we estimate the following specification:

$$\begin{aligned} y_{i,t} = \alpha &+ \beta_1 \textit{Finance Training}_{i,t} + \beta_2 \textit{Finance Training plus Feedback}_{i,t} \\ &+ \beta_3 \textit{Finance Training * SF }_{i,t} + \beta_4 \textit{Finance Training plus Feedback * SF}_{i,t} \\ &+ \beta_5 SF_{i,t} + \theta y_{i(t-1)} + \epsilon_{i,t} \end{aligned} \tag{2}$$

We are particularly interested in comparing parameters β_3 and β_4 of the equation above to find supportive evidence whether specific feedback works as postulated by FIT theory. β_4 indicates how the specific feedback that is provided, and hence the discrepancy that is revealed, affect the outcome variables. The parameter β_3 serves as a counterfactual. This is the effect of respondents who receive the finance training only and the discrepancy is not unveiled to them. Hence, if additional feedback enhances individuals behavior as postulated by FIT, this would be reflected by a positive and significant β_4 parameter.

5.2 Evaluation of Savings Related Feedback

Our main estimation results have shown that our additional feedback training is particularly effective regarding savings-related outcome variables. Therefore, we focus in this analysis on each single feedback that relates to savings outcomes. These feedbacks focus on potential savings goals of the respondent. In the following, we will discuss the findings on two savings goal related feedbacks in more detail.[6] The first feedback relates to whether the respondent has a concrete savings goal. The second feedback are the number of months the respondent has to wait until the savings goal is reached, this feedback is called 'distance to savings goal (in months)'. The 'distance to savings goal (in months)' is calculated by using information on the total savings amount needed to reach the savings goal, and the frequency and amount of

[6]For completeness, estimation results for each single individual feedback related to savings outcomes are provided in Appendix Table A.5 .

savings.

[Insert Table 8 about here]

The main estimation results can be found in Table 8. Panel A includes the interaction between treatment assignment and whether the respondent has a savings goal (Savings goal (yes/no)). Focusing on the effect whether the respondent has a savings goal during the baseline survey shows a significant marginal increase of the outcome variables. This marginal effect increases significantly for individuals who receive feedback in addition to the finance training which can be seen by the positive interaction effect. In contrast to this, the interaction between having a savings goal and pure finance training shows no additional effects. This results is in line with FIT, as this theory suggests that positive feedback in a certain domain focus attention on a certain goal or project. Negative feedback (you do not have a savings goal), on the other hand, can shift attention towards a different goal. This shift in focus, in our case, can lead to an lower savings for people that received negative feedback.

Panel B includes the interaction between treatment assignment and the time (in months) the respondent has to wait until the savings goal is reached (Distance to savings goal (in months)). The negative coefficient of 'Distance to savings goal' reflects that the further away individuals are from reaching their savings goal, the more months they have left, the lower is the effect on the outcome variables. However, those individuals who receive feedback have an additional positive effect. In sum, the marginal effect of distance to savings goal turns positive for those who receive feedback. This is also in line with FIT as this theory argues that a large gap between a feedback and a standard can have a motivational effect for the individual. This would explain why feedback is more effective for people that have long time left until they reach their savings goal.

In general, the results in Table 8 show that the provision of feedback can have different effects on respondents behavior. Regarding the feedback whether the respondent has a savings goal (Panel A), feedback enhances the behavior of individuals

who are already in line with the standard. The estimation results have shown that for those who already have a concrete savings goal, feedback can serve as a boost. In contrast, Panel B has shown that feedback also works for those individuals who have a larger discrepancy. Hence, feedback can work for those individuals are are least in line with the a standard.

The full evaluation of each single feedback can be found in Appendix Table A.5. Out of a total of seven feedbacks, we find support of FIT theory in five cases. In two cases (Panel D and E) we lack evidence to validate FIT.

5.3 For Whom does FIT Work?

As many interventions have strong effects for specific subgroups, this paragraph investigates whether the proposed FIT theory provides heterogeneous effects with respect to gender and educational level. Table 9 shows heterogeneous effects for the specific feedback whether someone has a savings goal (*Savings goal (yes/no)*) and for the months left to reach the savings goal (*Distance to savings goal (in months)*) on the savings index. Appendix Tables A.7 and A.8 show heterogeneous effects for the remaining savings outcome variables. For reasons of comparison, Column (1) includes the overall sample effects as previously reported in Table 8. The remaining columns show the estimates for the subsample of females (Column (2)), males (Column (3)), lower educated (primary education) (Column (4)) and higher educated (O-level, A-level and university educated) (Column (5)).

[Insert Table 9 about here]

Regarding heterogeneous effects by gender, what can be inferred from Table 9 is that the main effects are driven by male sample. Regarding the effects by educational level, feedback about the distance to the savings goal in months is consistently stronger in the sample of higher educated people. In contrast to this, this finding does not hold for the feedback of whether someone has a savings goal.

6 Conclusion

Finance trainings are a standard tool in upgrading small entrepreneurs as their deficits in financial understanding are obvious and clearly limit the development of their businesses. In order to best use scarce training resources various proposals on training design have been made, among which a "rule-of-thumb" training approach seems to deliver. Another way to improve the effectiveness of financial education is counseling, providing basically an individualized training. While this also works well, it is obviously costly. Thus we here follow an approach in between conventional class size training and fully individualized training where we give respondents feedback on their behaviour and performance.

This treatment proceeds as follows: we design a training that covers the topics of investment strategies, savings, profits, risk diversification, separating business and record keeping. The length is about half an hour and so very cost effective. Trainers visit entrepreneurs at their business, teach them and afterwards leave a small booklet which contains the training content. This is a pure finance training with "rule-of-thumb" elements as studied by Drexler et al. (2014). This is the workplace training and is provided to one treatment group. Another treatment group receives the same finance training but with one additional component which is feedback, i.e. personalized information from the baseline on how the individual entrepreneurs behave and the firm financially performs.

We find that finance training succeeds as expected but that finance training *plus* feedback has a surprisingly large additional impact. Simplifying results it seems fair to say that the add-on does not change the structure of impacts across outcomes but that it mainly amplifies the effectiveness. Specifically, the additional feedback effect on the savings index is 0.279 SD units and 0.258 SD units on the overall index. In contrast, the magnitude of the effect size of the finance training amounts to only 29 percent (for the savings index) and 68 percent (for the overall index) of the training plus feedback, respectively. These effects are not driven by more input as the finance training needs on average 28 minutes and the feedback add-

on only another 4 minutes, i.e. 14 percent longer, while the effect on the overall index is 45 percent larger. However, the short length of our intervention compared to related studies underpins that our feedback intervention is very promising. The time spend on training of comparable studies ranges between 15 (rule-of-thumb training provided by Drexler et al. (2014)) and 36 hours (personal initiative training provided by Campos et al. (2017)).

This raises the question of where do these large effects come from? First of all, it is known that financial education trainings work in general, that a "rule-of-thumb" approach tentatively works even better and that savings are typically the most successful outcome area. All this is confirmed by our study, so that neither effect size nor structure of effects is surprising. However, the size effect of the additional feedback is a new result. Obviously this information supports a change in behavior. We show that feedback is effective in changing behavior on average, but our analysis of individual feedbacks also shows that the effectiveness of the feedback given is dependent on the feedback type. Our results are therefore in line with FIT (Kluger and Desiri, 1997). Some feedbacks can have a motivational effect and so change behaviours in the desired direction. Other (negative) feedbacks on the other hand can lead to a shift in attention towards a different goal and so lead to the opposite of the desired effect.

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Tables and Figures

Table 1: Pre-Intervention Descriptive Statistics of Industry Sectors

	All		Services Sector		Manufacturing Sector		Retail Sector	
	n	mean	n	mean	n	mean	n	mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	460	0.40	53	0.60	225	0.31	165	0.46
High skilled	460	0.34	53	0.19	225	0.29	165	0.42
Capital stock	458	5195.53	53	2613.72	224	8033.18	164	2109.68
Inventory	460	3935.41	53	1389.94	225	1723.42	165	7249.16
Sales	459	7179.37	53	1824.92	225	7791.31	164	7774.15

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: The table shows baseline descriptive statistics for the services sector, manufacturing and retail sector.

Table 2: Pre-Intervention Descriptive Statistics

	Obs.	Full Sample mean (sd)	Control (C) mean (sd)	Finance Training mean (sd)	Finance Training Diff. from C [p-value]	Personalized Feedback mean (sd)	Personalized Feedback Diff. from C [p-value]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Entrepreneur Characteristics							
Age	455	37.57	37.80	37.13	-0.67	37.78	-0.02
		(9.98)	(9.97)	(9.70)	[0.55]	(10.32)	[0.99]
HH size	460	4.38	4.50	4.23	-0.27	4.42	-0.07
		(2.36)	(2.26)	(2.41)	[0.32]	(2.42)	[0.79]
Female	460	0.40	0.42	0.39	-0.03	0.40	-0.03
		(0.49)	(0.50)	(0.49)	[0.56]	(0.49)	[0.66]
High skilled	460	0.34	0.31	0.37	0.05	0.34	0.03
		(0.47)	(0.46)	(0.48)	[0.32]	(0.48)	[0.60]
Own-account	458	0.50	0.49	0.50	0.02	0.50	0.01
		(0.50)	(0.50)	(0.50)	[0.77]	(0.50)	[0.86]
Capital stock	458	5,195.53	3,976.03	4,709.12	733.09	6,917.54	2,941.51
		(20,964.71)	(11,257.80)	(10,859.18)	[0.56]	(32,950.72)	[0.30]
Inventory	460	3,935.41	3,161.66	4,253.80	1,092.14	4,374.39	1,212.73
		(9,111.99)	(6,731.71)	(10,762.94)	[0.29]	(9,326.52)	[0.20]
Sales	459	7,179.37	5,593.36	8,417.63	2,824.27	7,471.73	1,878.37
		(15,596.33)	(8,701.98)	(19,815.10)	[0.11]	(15,942.95)	[0.21]
Profit	451	718.38	596.71	787.83	191.11	766.33	169.62
		(1,114.19)	(987.22)	(1,208.25)	[0.13]	(1,128.40)	[0.17]
Saving	460	1,316.99	1,248.86	1,418.35	169.49	1,280.88	32.02
		(2,643.26)	(2,588.04)	(2,923.83)	[0.59]	(2,398.86)	[0.91]
Investment	460	640.85	597.18	674.85	77.67	649.29	52.11
		(2,099.80)	(1,973.92)	(2,283.09)	[0.75]	(2,037.37)	[0.82]
B. Business Outcomes Indices							
Investment index	460	0.05	0.00	0.11	0.11	0.05	0.05
		(1.13)	(1.00)	(1.17)	[0.37]	(1.22)	[0.69]
Saving index	460	0.07	0.00	0.15	0.15	0.06	0.06
		(1.03)	(1.00)	(1.14)	[0.22]	(0.94)	[0.57]
Profit index	441	0.07	0.00	0.17	0.17	0.03	0.03
		(1.31)	(1.00)	(1.73)	[0.29]	(1.08)	[0.78]
Separation index	446	-0.05	0.00	-0.04	-0.04	-0.11	-0.11
		(1.04)	(1.00)	(0.99)	[0.72]	(1.12)	[0.38]
Diversification index	460	0.00	0.00	0.02	0.02	-0.03	-0.03
		(0.99)	(1.00)	(0.96)	[0.88]	(1.01)	[0.81]
Record keeping	460	0.31	0.34	0.32	-0.02	0.27	-0.07
		(0.46)	(0.48)	(0.47)	[0.66]	(0.45)	[0.19]
F-statistic joint orthogonality					1.28		0.81

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard deviations are in parenthesis, p-values for differences of means appear in square brackets. The table provides summary statistics of baseline data and mean comparisons between finance training and control group (Column (5)) and personalized feedback and control group (Column (7)).

Table 3: Main Treatment Effects

	Investment Index	Savings Index	Profits Index	Risk Diversification Index	Separating Finances Index	Record keeping	Overall Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Finance Training	0.117	0.080	0.027	0.099	0.127	0.032	0.178*
	(0.124)	(0.121)	(0.108)	(0.114)	(0.103)	(0.051)	(0.107)
Finance Training + Feedback	0.170	0.279**	0.217	0.197	-.028	0.019	0.258**
	(0.114)	(0.115)	(0.141)	(0.121)	(0.113)	(0.05)	(0.117)
Obs.	460	460	441	460	446	460	429
Diff. trainings = 0 (p-value)	0.69	0.14	0.22	0.42	0.13	0.78	0.49
R^2	0.14	0.18	0.31	0.06	0.06	0.19	0.21
Mean (SD) of	0.00	0.00	0.00	0.00	0.00	0.34	0.00
control group	1.00	1.00	1.00	1.00	1.00	0.47	1.00
Observations	460.00	460.00	441.00	460.00	446.00	460.00	429.00
Control for $y_{(t-1)}$	yes	yes	yes	yes	yes	yes	yes
Control for industry strata	yes	yes	yes	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Detailed treatment effects on variables belonging to the "investment index" can be found in Table 4, on "savings index" in Table 5, on "profits index" in Table 6, on "risk diversification index " in Table 7 and on "separating finances index" in Table A.6.

Table 4: Investment

	Investment Index	Investment yes/no	Investment Amount	Inventory Amount
	(1)	(2)	(3)	(4)
Finance Training	0.117	0.037	-10.646	905.266
	(0.124)	(0.057)	(93.257)	(940.642)
Finance Training + Feedback	0.170	0.015	75.554	937.746
	(0.114)	(0.056)	(102.994)	(859.862)
Obs.	460	460	460	460
Diff. trainings = 0 (p-value)	0.69	0.70	0.39	0.98
R^2	0.14	0.02	0.09	0.35
Mean (SD) of	0.00	0.57	267.65	3278.84
control group	1.00	0.50	906.08	7552.10
Observations	460.00	460.00	460.00	460.00
Control for $y_{(t-1)}$	yes	yes	yes	yes
Control for industry strata	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Savings

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)
Finance Training	0.080	-.010	237.160	279.123	27.393
	(0.121)	(0.036)	(241.787)	(250.938)	(54.969)
Finance Training + Feedback	0.279**	0.023	381.796*	262.798	162.008***
	(0.115)	(0.034)	(220.381)	(211.544)	(56.485)
Obs.	460	460	460	460	460
Diff. trainings = 0 (p-value)	0.14	0.33	0.58	0.95	0.05
R^2	0.18	0.05	0.22	0.23	0.11
Mean (SD) of	0.00	0.88	1195.49	953.60	254.47
control group	1.00	0.33	2145.50	2121.08	335.76
Observations	460.00	460.00	460.00	460.00	460.00
Control for $y_{(t-1)}$	yes	yes	yes	yes	yes
Control for industry strata	yes	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Profits

	Profit Index (1)	Profit (2)	Value added (3)	Sales (4)	Costs (5)
Finance Training	0.027	119.600	-281.833	-170.905	-42.370
	(0.108)	(91.587)	(638.359)	(737.082)	(770.022)
Finance Training + Feedback	0.217	26.285	489.389	2141.606*	844.071
	(0.141)	(81.195)	(439.134)	(1246.624)	(863.891)
Obs.	441	441	441	441	441
Diff. trainings =0 (p-value)	0.22	0.30	0.19	0.08	0.31
R^2	0.31	0.16	0.03	0.31	0.44
Mean (SD) of	0.00	507.86	625.44	4638.66	3969.22
control group	1.00	737.68	4423.19	7623.48	8069.58
Observations	441.00	441.00	441.00	441.00	441.00
Control for $y_{(t-1)}$	yes	yes	yes	yes	yes
Control for industry strata	yes	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Diversication

	Diversification Index (1)	Number Investments (2)	Number Investment Categories
Finance Training	0.099	0.118	0.091
	(0.114)	(0.171)	(0.092)
Finance Training + Feedback	0.197	0.308*	0.137
	(0.121)	(0.185)	(0.098)
Obs.	460	460	460
Diff. trainings = 0 (p-value)	0.42	0.29	0.64
R^2	0.06	0.08	0.04
Mean (SD) of	0.00	1.17	0.76
control group	1.00	1.56	0.79
Observations	460.00	460.00	460.00
Control for $y_{(t-1)}$	yes	yes	yes
Control for industry strata	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Effect of Specific Feedbacks on Savings Outcomes

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)
Panel A: *Specific Feedback on:* Savings goal (yes=1/no=0)					
Finance Training	-.115	-.011	-227.004	-285.349	-9.515
	(0.155)	(0.026)	(297.917)	(299.804)	(29.022)
Finance Training + Feedback	-.226	-.019	-582.874	-648.684*	-9.173
	(0.15)	(0.024)	(362.411)	(382.478)	(32.775)
Finance Training * Savings goal (yes/no)	0.21	0.007	488.455	593.775	39.229
	(0.201)	(0.039)	(399.264)	(417.582)	(67.407)
Finance Training + Feedback* Savings goal (yes/no)	0.51***	0.035	993.125**	940.892**	175.858**
	(0.191)	(0.036)	(437.334)	(454.373)	(72.496)
Savings goal (yes/no)	1.308***	0.903***	777.565***	525.025***	205.662***
	(0.118)	(0.033)	(177.420)	(181.388)	(39.479)
Obs.	460	460	460	460	460
Panel B: *Specific Feedback on:* Distance to savings goal (in months)					
Finance Training	0.032	-.017	216.558	238.349	-12.745
	(0.144)	(0.037)	(289.394)	(278.465)	(72.183)
Finance Training + Feedback	0.142	-.012	127.308	16.261	140.683**
	(0.129)	(0.034)	(244.904)	(225.204)	(67.610)
Finance Training * Distance to savings goal (in months)	-.0001	-.00005	-.266	-.315	0.071
	(0.0002)	(0.0001)	(0.302)	(0.252)	(0.108)
Finance Training + Feedback * Distance to savings goal (in months)	0.0002***	0.00004*	0.433***	0.436***	-.002
	(0.00003)	(0.00002)	(0.056)	(0.049)	(0.015)
Distance to savings goal (in months)	-.00008***	-.00004*	-.106**	-.084**	-.024**
	(0.00002)	(0.00002)	(0.049)	(0.042)	(0.01)
Obs.	379	379	379	379	379

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Heterogeneity Analysis: Effect of Specific Feedbacks on Savings Index

	All	Female	Male	Lower Educated	Higher Educated
	(1)	(2)	(3)	(4)	(5)
Panel A: Panel A: *Specific Feedback on:* Savings goal (yes=1/no=0)					
Finance Training	-.115	-.122	-.159	-.046	-.309
	(0.155)	(0.178)	(0.264)	(0.218)	(0.189)
Finance Training + Feedback	-.226	-.201	-.322	-.174	-.190
	(0.15)	(0.175)	(0.269)	(0.28)	(0.142)
Finance Training * Savings goal (yes/no)	0.21	0.167	0.289	0.284	0.334
	(0.201)	(0.254)	(0.321)	(0.265)	(0.272)
Finance Training + Feedback* Savings goal (yes/no)	0.51***	0.246	0.767**	0.599*	0.377*
	(0.191)	(0.207)	(0.321)	(0.352)	(0.209)
Savings goal (yes/no)	1.308***	1.250***	1.347***	1.025***	1.451***
	(0.118)	(0.159)	(0.16)	(0.216)	(0.128)
Obs.	460	186	272	183	272
Panel B: *Specific Feedback on:* Distance to savings goal (in months)					
Finance Training	0.032	0.109	-.045	0.096	0.031
	(0.144)	(0.22)	(0.199)	(0.166)	(0.207)
Finance Training + Feedback	0.142	0.022	0.285	0.34	0.024
	(0.129)	(0.159)	(0.195)	(0.229)	(0.166)
Finance Training * Distance to savings goal (in months)	-.0001	-.0003	0.0002	-.0003	-.0001
	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0002)
Finance Training + Feedback * Distance to savings goal (in months)	0.0002***	-.0003	0.0002***	0.00006	0.0002***
	(0.00003)	(0.0003)	(0.00003)	(0.0009)	(0.00003)
Distance to savings goal (in months)	-.00008***	-3.67e-06	-.0001***	0.00008	-.0001***
	(0.00002)	(0.00007)	(0.00002)	(0.00008)	(0.00002)
Obs.	379	154	223	142	232

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A Supplementary Tables and Figures

Table A.1: Overview Finance Training

Topic	**Content**
(1)	(2)
Investment strategies	What are investments and why are they important
	Types and purposes of investments
	Growth planning
Savings	Importance of savings goals
	Spending decisions and long-term savings
Profits	Calculation of profits
	Difference between sales and profits
Risk diversification	Why diversify
	Diversification strategies
Separating business and household finances	Why separate money between business and household
	Paying a fixed salary
	Repaying money taken out of the business for household
	Paying for goods take out of the household
	Household budget making
Record keeping	Record keeping

Notes: The table provides an overview on the topics of the business training (Column (1)) and the specific content that is taught (Column (2)).

Table A.2: Sample Attrition

	Businesses not interviewed during endline	
	(1)	(2)
Finance Training	-.018	-.018
	(0.03)	(0.03)
Finance Training + Feedback	-.030	-.032
	(0.029)	(0.029)
Const.	0.09***	0.035
	(0.022)	(0.024)
Observations	497	497
Control for industry		✓

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. Standard errors clustered at firm level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Statements on Separating Finances between Household and Business

	Question	Indicator=1
(1)	"How often do you keep the accounts or books for your business and home separate?"	1= sometimes/almost always
(2)	"How often do you keep cash for your business and home physically separated?"	1= sometimes/almost always
(3)	"How often do you set money aside for your business but is gets used for household/private expenses?"	1= never/rarely
(4)	"If you take money out of your business (apart from the salary you take out) to pay household/private expenses, how often do you put it back?"	1= sometimes/almost always
(5)	"If you take goods out of your business for your household/relatives/friends, does someone (you/relatives/friends) pay for it?"	1= sometimes/almost always
(6)	"Writing down what you plan to do with your money for your family and household means you make a household budget. How often do you do that?"	1= sometimes/almost always

Note: This table provides all statements which are used as outcome variables in the "separating finances index".

Table A.4: Effect on Aggregates

	Average over all Indices	Average over all Variables	Principal component continuous	Principal component ordinal
	(1)	(2)	(3)	(4)
Finance Training	0.178*	0.152	0.092	0.06
	(0.106)	(0.094)	(0.106)	(0.071)
Finance Training + Feedback	0.258**	0.255**	0.217*	0.156**
	(0.117)	(0.108)	(0.116)	(0.079)
Obs.	429	429	429	429

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Effect of Savings Feedback on Savings Outcomes

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)
Panel A: *Specific Feedback on:* Savings goal (yes=1/no=0)					
Finance Training	-.115	-.011	-227.004	-285.349	-9.515
	(0.155)	(0.026)	(297.917)	(299.804)	(29.022)
Finance Training + Feedback	-.226	-.019	-582.874	-648.684*	-9.173
	(0.15)	(0.024)	(362.411)	(382.478)	(32.775)
Finance Training * Savings goal (yes/no)	0.21	0.007	488.455	593.775	39.229
	(0.201)	(0.039)	(399.264)	(417.582)	(67.407)
Finance Training + Feedback* Savings goal (yes/no)	0.51***	0.035	993.125**	940.892**	175.858**
	(0.191)	(0.036)	(437.334)	(454.373)	(72.496)
Savings goal (yes/no)	1.308***	0.903***	777.565***	525.025***	205.662***
	(0.118)	(0.033)	(177.420)	(181.388)	(39.479)
Obs.	460	460	460	460	460
Panel B: *Specific Feedback on:* Distance to savings goal (in months)					
Finance Training	0.032	-.017	216.558	238.349	-12.745
	(0.144)	(0.037)	(289.394)	(278.465)	(72.183)
Finance Training + Feedback	0.142	-.012	127.308	16.261	140.683**
	(0.129)	(0.034)	(244.904)	(225.204)	(67.610)
Finance Training * Distance to savings goal (in months)	-.0001	-.00005	-.266	-.315	0.071
	(0.0002)	(0.0001)	(0.302)	(0.252)	(0.108)
Finance Training + Feedback * Distance to savings goal (in months)	0.0002***	0.00004*	0.433***	0.436***	-.002
	(0.00003)	(0.00002)	(0.056)	(0.049)	(0.015)
Distance to savings goal (in months)	-.00008***	-.00004*	-.106**	-.084**	-.024**
	(0.00002)	(0.00002)	(0.049)	(0.042)	(0.01)
Obs.	379	379	379	379	379
Panel C: *Specific Feedback on:* Savings goal amount					
Business Training	0.037	0.003	166.435	174.659	-1.112
	(0.134)	(0.037)	(257.636)	(241.357)	(67.137)
Business Training + Feedback	0.257**	0.028	288.065	157.139	169.836***
	(0.128)	(0.034)	(240.592)	(225.513)	(65.004)
Business Training * Savings goal amount	2.23e-09	2.26e-10	3.48e-06	2.90e-06	8.20e-07
	(3.11e-09)	(1.96e-10)	(8.26e-06)	(8.83e-06)	(5.25e-07)
Business Training + Feedback * Savings goal amount	1.14e-09**	2.20e-11	4.10e-06***	4.49e-06***	-2.62e-07***
	(4.90e-10)	(8.74e-11)	(1.29e-06)	(1.50e-06)	(8.96e-08)
Savings goal amount	1.09e-10	-2.13e-12	1.49e-07	9.96e-08	7.73e-08
	(1.49e-10)	(8.31e-11)	(2.05e-07)	(1.82e-07)	(6.85e-08)
Obs.	396	396	396	396	396
Panel D: *Specific Feedback on:* Amount saved up					
Business Training	0.1	0.006	281.351	272.460	19.402
	(0.134)	(0.036)	(270.716)	(258.873)	(63.606)
Business Training + Feedback	0.147	0.016	1.611	-197.579	176.744**
	(0.137)	(0.037)	(266.441)	(261.509)	(70.977)
Business Training * Amount saved up	-5.64e-09***	7.16e-10	-1.00e-05**	-1.00e-05*	-1.91e-06
	(1.75e-09)	(5.13e-10)	(6.56e-06)	(8.25e-06)	(1.21e-06)
Business Training + Feedback * Amount saved up	1.06e-07	9.74e-09**	0.0003	0.0004*	-1.00e-05
	(6.62e-08)	(4.32e-09)	(0.0002)	(0.0002)	(1.00e-05)
Amount saved up	8.78e-10	1.26e-10	1.55e-06	1.59e-06	3.83e-07
	(9.12e-10)	(3.05e-10)	(2.06e-06)	(1.79e-06)	(4.48e-07)
Obs.	396	396	396	396	396
Panel E: *Specific Feedback on:* Frequency of savings (1=weekly, 2=monthly, ..., 7=once a year)					
Business Training	-.008	-.025	-136.981	-223.354	84.509
	(0.252)	(0.062)	(527.599)	(523.302)	(122.623)
Business Training + Feedback	0.257	0.057	96.169	-60.084	215.714**
	(0.189)	(0.061)	(354.104)	(332.638)	(89.346)
Business Training * Frequency of savings (1=high, 7=low)	0.054	0.021	227.940	282.589	-45.258
	(0.117)	(0.027)	(298.575)	(298.307)	(42.239)
Business Training + Feedback * Frequency of savings (1=high, 7=low)	0.019	-.017	194.619	220.284	-35.556
	(0.085)	(0.034)	(157.771)	(152.778)	(33.485)
Frequency of savings (1=high, 7=low)	-.060	0.005	-179.931**	-146.703**	-30.711**
	(0.041)	(0.022)	(71.848)	(66.114)	(14.617)
Obs.	396	396	396	396	396

Table continued from previous page

	Savings Index (1)	Savings (yes/no) (2)	Savings Total (3)	Savings Formal (4)	Savings Informal (5)
Panel F: *Specific Feedback on:* Monthly savings amount					
Business Training	0.113	0.01	316.376	282.843	13.319
	(0.132)	(0.036)	(260.632)	(244.838)	(65.379)
Business Training + Feedback	0.251*	0.024	489.149	384.712	89.401
	(0.15)	(0.037)	(299.318)	(298.648)	(78.057)
Business Training * Monthly savings amount	-1.17e-07	-1.53e-08	-.0003	-.0002	-1.00e-05
	(1.59e-07)	(3.72e-08)	(0.0004)	(0.0004)	(0.00005)
Business Training + Feedback * Monthly savings amount	1.51e-07	3.69e-09	-.0002	-.0003	0.0002
	(3.00e-07)	(5.01e-08)	(0.0005)	(0.0004)	(0.0002)
Monthly savings amount	1.89e-07***	-2.60e-09	0.0005***	0.0003*	0.00004***
	(3.23e-08)	(1.00e-08)	(0.00009)	(0.0002)	(6.56e-06)
Obs.	393	393	393	393	393
Panel G: *Specific Feedback on:* Distance to savings goal (in 1000 UGX)					
Business Training	0.008	-.010	133.166	144.598	-6.592
	(0.136)	(0.036)	(264.772)	(248.914)	(67.734)
Business Training + Feedback	0.242*	0.014	293.901	166.342	167.011**
	(0.13)	(0.034)	(246.905)	(232.818)	(66.404)
Business Training * Distance to savings goal (in 1000 UGX)	3.06e-06	2.12e-07	0.005	0.005	0.001*
	(3.70e-06)	(2.02e-07)	(0.01)	(0.01)	(0.0006)
Business Training + Feedback * Distance to savings goal (in 1000 UGX)	1.13e-06**	3.68e-08	0.004***	0.004***	-.0003***
	(4.64e-07)	(9.80e-08)	(0.001)	(0.001)	(0.00009)
Distance to savings goal (in 1000 UGX)	7.18e-08	-2.00e-08	0.0001	0.00007	0.00007
	(1.66e-07)	(9.45e-08)	(0.0002)	(0.0002)	(0.00008)
Obs.	386	386	386	386	386

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. Standard errors clustered at firm level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6: Separating Finances

	Separating Finances Index	Separating of Accounts	Cash	Question Business Money used for hh	Put money back if from business	Paying for goods taken from business	Budget Making
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Finance Training	-.028	0.002	0.005	-.087	0.005	-.003	0.02
	(0.113)	(0.058)	(0.052)	(0.054)	(0.052)	(0.055)	(0.058)
Finance Training plus Feedback	0.127	0.031	0.033	-.023	0.082*	0.041	0.05
	(0.103)	(0.057)	(0.05)	(0.055)	(0.049)	(0.054)	(0.057)
Obs.	446	446	446	446	446	446	446
Diff. trainings = 0 (p-value)	0.13	0.61	0.58	0.23	0.12	0.42	0.60
R^2	0.06	0.03	0.05	0.02	0.02	0.01	0.03
Mean (SD) of	0.00	0.56	0.72	0.37	0.72	0.67	0.54
control group	1.00	0.50	0.45	0.48	0.45	0.47	0.50
Observations	446.00	446.00	446.00	446.00	446.00	446.00	446.00
Control for $y_{(t-1)}$	yes	yes	yes	yes	yes	yes	yes
Control for industry strata	yes	yes	yes	yes	yes	yes	yes

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. An overview of all exact statements used as outcome variables in Columns (1)-(7) can be found in Table A.3.

Table A.7: Heterogeneity Analysis: Effect of Specific Feedback of Savings goal (yes/no) on Savings Outcomes

	All	Female	Male	Lower Educated	Higher Educated
	(1)	(2)	(3)	(4)	(5)
Panel A: *Dependent Variable:* Savings Index					
Finance Training	-.115	-.122	-.159	-.046	-.309
	(0.155)	(0.178)	(0.264)	(0.218)	(0.189)
Finance Training + Feedback	-.226	-.201	-.322	-.174	-.190
	(0.15)	(0.175)	(0.269)	(0.28)	(0.142)
Finance Training * Savings goal (yes/no)	0.21	0.167	0.289	0.284	0.334
	(0.201)	(0.254)	(0.321)	(0.265)	(0.272)
Finance Training + Feedback* Savings goal (yes/no)	0.51***	0.246	0.767**	0.599*	0.377*
	(0.191)	(0.207)	(0.321)	(0.352)	(0.209)
Savings goal (yes/no)	1.308***	1.250***	1.347***	1.025***	1.451***
	(0.118)	(0.159)	(0.16)	(0.216)	(0.128)
Obs.	460	186	272	183	272
Panel B: *Dependent Variable:* Any Savings (yes/no)					
Finance Training	-.011	-.021	-.016	0.01	-.031
	(0.026)	(0.057)	(0.047)	(0.06)	(0.035)
Finance Training + Feedback	-.019	-.043	-.016	-.077	0.003
	(0.024)	(0.061)	(0.038)	(0.069)	(0.03)
Finance Training * Savings goal (yes/no)	0.007	-.041	0.051	0.024	0.004
	(0.039)	(0.077)	(0.062)	(0.07)	(0.055)
Finance Training + Feedback* Savings goal (yes/no)	0.035	0.0003	0.071	0.096	0.014
	(0.036)	(0.069)	(0.054)	(0.081)	(0.053)
Savings goal (yes/no)	0.903***	0.937***	0.842***	0.878***	0.907***
	(0.033)	(0.06)	(0.053)	(0.072)	(0.045)
Obs.	460	186	272	183	272
Panel C: *Dependent Variable:* Total Savings					
Finance Training	-227.004	-107.002	-514.477	54.540	-582.442
	(297.917)	(225.864)	(555.222)	(126.473)	(422.420)
Finance Training + Feedback	-582.874	-443.851	-1163.924*	-52.657	-518.301
	(362.411)	(349.700)	(660.052)	(201.657)	(377.758)
Finance Training * Savings goal (yes/no)	488.455	486.127	711.184	280.352	806.679
	(399.264)	(423.700)	(665.796)	(344.849)	(557.623)
Finance Training + Feedback* Savings goal (yes/no)	993.125**	507.595	1786.203**	690.419	712.503
	(437.334)	(405.300)	(756.547)	(480.932)	(471.925)
Savings goal (yes/no)	777.565***	372.912	967.215***	325.336	1133.892***
	(177.420)	(252.818)	(255.309)	(243.367)	(248.885)
Obs.	460	186	272	183	272
Panel D: *Dependent Variable:* Savings Formal					
Finance Training	-285.349	-86.284	-521.324	32.488	-492.348
	(299.804)	(225.232)	(539.957)	(128.270)	(372.052)
Finance Training + Feedback	-648.684*	-500.818	-1200.145*	38.385	-440.858
	(382.478)	(389.130)	(716.180)	(184.223)	(326.756)
Finance Training * Savings goal (yes/no)	593.775	465.748	809.337	417.971	708.965
	(417.582)	(383.699)	(688.562)	(421.455)	(499.102)
Finance Training + Feedback* Savings goal (yes/no)	940.892**	519.221	1690.237**	373.945	534.077
	(454.373)	(436.438)	(825.521)	(426.874)	(425.831)
Savings goal (yes/no)	525.025***	196.655	712.106***	198.492	946.259***
	(181.388)	(243.313)	(243.731)	(231.392)	(239.654)
Obs.	460	186	272	183	272
Panel E: *Dependent Variable:* Savings Informal					
Finance Training	-9.515	-39.993	7.619	-8.643	-56.520
	(29.022)	(43.141)	(51.615)	(30.189)	(67.475)
Finance Training + Feedback	-9.173	-30.424	25.306	-18.432	8.747
	(32.775)	(48.857)	(58.728)	(47.491)	(49.786)
Finance Training * Savings goal (yes/no)	39.229	71.630	16.287	77.289	64.330
	(67.407)	(83.529)	(110.446)	(60.898)	(130.469)
Finance Training + Feedback* Savings goal (yes/no)	175.858**	126.146	190.130	271.062**	111.883
	(72.496)	(87.027)	(116.668)	(105.630)	(97.463)
Savings goal (yes/no)	205.662***	168.902***	243.504***	168.628***	212.504***
	(39.479)	(54.238)	(63.545)	(45.881)	(62.341)
Obs.	460	186	272	183	272

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8: Heterogeneity Analysis: Effect of Specific Feedback of Distance to Savings Goal (in months) on Savings Outcomes

	All	Female	Male	Lower educated	Higher educated
	(1)	(2)	(3)	(4)	(5)
Panel A: *Dependent Variable:* Savings Index (yes/no)					
Finance Training	0.032	0.109	-.045	0.096	0.031
	(0.144)	(0.22)	(0.199)	(0.166)	(0.207)
Finance Training + Feedback	0.142	0.022	0.285	0.34	0.024
	(0.129)	(0.159)	(0.195)	(0.229)	(0.166)
Finance Training * Distance to savings goal (in months)	-.0001	-.0003	0.0002	-.0003	-.0001
	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0002)
Finance Training + Feedback * Distance to savings goal (in months)	0.0002***	-.0003	0.0002***	0.00006	0.0002***
	(0.00003)	(0.0003)	(0.00003)	(0.0009)	(0.00003)
Distance to savings goal (in months)	-.00008***	-3.67e-06	-.0001***	0.00008	-.0001***
	(0.00002)	(0.00007)	(0.00002)	(0.00008)	(0.00002)
Obs.	379	154	223	142	232
Panel B: *Dependent Variable:* Any Savings					
Finance Training	-.017	-.017	-.016	0.017	-.027
	(0.037)	(0.06)	(0.048)	(0.052)	(0.049)
Finance Training + Feedback	-.012	-.012	0.027	0.022	-.007
	(0.034)	(0.062)	(0.042)	(0.056)	(0.047)
Finance Training * Distance to savings goal (in months)	-.00005	-.0002	0.0001***	-.0004**	0.00005
	(0.0001)	(0.0002)	(0.00005)	(0.0002)	(0.00006)
Finance Training + Feedback * Distance to savings goal (in months)	0.00004*	-.0002	0.00005***	-.0003	0.00005**
	(0.00002)	(0.0002)	(0.00002)	(0.0003)	(0.00002)
Distance to savings goal (in months)	-.00004*	0.00003	-.00005***	0.00006**	-.00005**
	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00002)
Obs.	379	154	223	142	232
Panel C: *Dependent Variable:* Total Savings					
Finance Training	216.558	442.608	15.583	194.384	289.435
	(289.394)	(431.192)	(398.592)	(360.299)	(420.389)
Finance Training + Feedback	127.308	-35.620	253.690	457.410	-203.066
	(244.904)	(265.794)	(388.919)	(455.282)	(309.805)
Finance Training * Distance to savings goal (in months)	-.266	-.286	0.042	0.083	-.585*
	(0.302)	(0.334)	(0.754)	(0.589)	(0.336)
Finance Training + Feedback * Distance to savings goal (in months)	0.433***	0.226	0.421***	1.682	0.451***
	(0.056)	(0.482)	(0.064)	(1.903)	(0.061)
Distance to savings goal (in months)	-.106**	-.157	-.106**	-.068	-.131**
	(0.049)	(0.131)	(0.053)	(0.157)	(0.054)
Obs.	379	154	223	142	232
Panel D: *Dependent Variable:* Savings Formal					
Finance Training	238.349	479.694	53.444	196.715	299.978
	(278.465)	(370.681)	(392.305)	(326.988)	(408.544)
Finance Training + Feedback	16.261	-40.480	97.069	276.535	-314.671
	(225.204)	(250.439)	(355.090)	(405.736)	(291.928)
Finance Training * Distance to savings goal (in months)	-.315	-.406	0.043	0.084	-.561*
	(0.252)	(0.289)	(0.589)	(0.403)	(0.295)
Finance Training + Feedback * Distance to savings goal (in months)	0.436***	0.27	0.427***	1.821	0.458***
	(0.049)	(0.462)	(0.058)	(1.919)	(0.055)
Distance to savings goal (in months)	-.084**	-.142	-.084*	-.081	-.114**
	(0.042)	(0.142)	(0.048)	(0.134)	(0.049)
Obs.	379	154	223	142	232
Panel E: *Dependent Variable:* Savings Informal					
Finance Training	-12.745	11.305	-45.633	4.502	-17.682
	(72.183)	(93.354)	(106.515)	(67.960)	(107.427)
Finance Training + Feedback	140.683**	83.405	204.228*	213.085**	112.763
	(67.610)	(71.353)	(107.487)	(99.481)	(92.475)
Finance Training * Distance to savings goal (in months)	0.071	0.06	0.138	0.131	0.026
	(0.108)	(0.115)	(0.242)	(0.263)	(0.138)
Finance Training + Feedback * Distance to savings goal (in months)	-.002	-.122	-.011	-.101	-.001
	(0.015)	(0.079)	(0.018)	(0.285)	(0.018)
Distance to savings goal (in months)	-.024**	-.040	-.023*	0.005	-.026**
	(0.01)	(0.025)	(0.012)	(0.06)	(0.013)
Obs.	379	154	223	142	232

Source: Survey on micro and small enterprises in Uganda, waves 2017-2018, own calculations.
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.