Entrepreneurship in Development: Four Essays on Microfinance and Business Training

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Contents

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Introduction

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Micro and small scale entrepreneurs in developing countries face a number of challenges and constraints. One obvious constraint is access to finance, as most banks have regarded the poor as "unbankable", due to high transaction costs and lack of collateral. This view was challenged by Mohammad Yunus and other microcredit pioneers. They believed it was possible to provide small loans to even the poorest of the poor, and still obtain high repayment rates. Their solution was to replace traditional collateral with joint liability loan groups, where group members are held jointly responsible for loans of each other. By doing so, physical collateral was replaced by social collateral and peer pressure. The transaction costs were then reduced to a minimum, as group members themselves performed the credit screening (Ghatak and Guinnane, 1999).

Today around 200 million people worldwide are members of microfinance institutions. In 2006, the Nobel Peace Prize was awarded jointly to Muhammad Yunus and Grameen Bank *"for their efforts to create economic and social development from below."*

All the optimism about microcredit, however, has not been accompanied by conclusive scientific evidence showing positive impacts. Early impact studies such as Khandker (1998) were optimistic, but less credible due to questionable econometric identification strategies. It was not until recently, that the results from the first large scale randomized field trials measuring the impact of access to credit were released.

Banerjee et al. (2010) used a randomized field trial and examined the impact of access to microcredit in the slums of Hyderabad, India. They concluded that there was

> *..no effect of access to microcredit on average monthly expenditure per capita, but expenditure on durable goods increased in treated areas and the number of new businesses increased by one third.* (page 1).

Furthermore, Karlan and Zinman (2010), measuring the impact of microcredit among marginal borrowers in Manila in the Philippines, similarly conclude that:

> *The canonical case for microcredit-- that access increases profits, business scale, and household consumption-- is not supported on average.* (page 1).

Karlan and Zinman (2010), however, found evidence that suggests access to capital may have positive impacts on males and high-income entrepreneurs; though these groups are normally not targeted by microfinance institutions.

Other studies have pointed out that microcredit arrangements have many weaknesses. For instance, the poor may become trapped in spirals of increasing debts, and that they merely use the loans as consumption loans, without any impact on business growth and development (Dichter and Harper (2007) and Bateman (2010)). The concept of group loans as such has also been attacked. Studies have argued that bad group dynamics may destroy rather than create social capital; which may result in high exit rates and lower social impacts (Pagura, 2003, Dichter and Harper, 2007). Still, few would disagree that well functioning financial services for the poor is important.

Perhaps as a result of increasingly critical views of microcredit, other constraints to entrepreneurial growth in developing countries have gradually received more attention. In addition to other financial constraints, like access to savings and insurance, lack of human capital may be a major constraint for business growth. For instance, without managerial skills, small scale entrepreneurs may lose managerial control when their businesses grow above a certain threshold. Without basic cost accounting skills, loans may be spent on projects with low returns. Other constraints to business growth, such as access to finance, regulations, taxes, corruption or low quality of workers, may also be more problematic if the entrepreneur lacks basic business knowledge and information.

The belief in human capital interventions targeting small scale entrepreneurs is not uncontroversial:

> *….rather than waste our time teaching them new skills, we try to make maximum use of their existing skills. Giving the poor access to credit allows them to immediately put into practice the skills they already know.*
> Mohammad Yunus (1999), *Banker to the Poor*, page 140.

In fact, the only experimental study published so far on business training among poor entrepreneurs is not optimistic. Karlan and Valdivia (forthcoming), studying female members of loan groups in Peru, found only modest impact on business practices, and no significant effects on sales or profits. However, a few recent working papers and unpublished manuscripts, such as Drexler et al. (2010) and Gine and Mansuri (2011), suggest that there may be beneficial impacts of providing micro and small scale entrepreneurs with basic business skills. This leaves it an open question whether financial or human capital constraints are the most binding ones.

When we look at female entrepreneurs in particular, it is far from clear what their most binding constraints are. A reoccurring finding both from the studies on financial and human capital, is that it's much harder to raise female profits than male. For instance, in addition to Karlan and Valdivias (forthcoming) rather pessimistic study of business training for female entrepreneurs, both de Mel et al. (2009) and Fafchamps et al. (2010) found that the impact of business grants are lower for females than for males. These findings indicate that other constraints may be even more important than lack of financial or human capital for female entrepreneurs.

A particular concern is that females engage in industries where the scope for utilizing additional financial or human capital is lower when compared to men. Often, females do business in saturated low productivity industries with limited growth potential, such as small scale restaurants, hairdressing, and other services. Men are more often involved in small scale manufacturing and retail industries. However, it is not obvious which sectors are more dynamic. Nevertheless, the gender biases often remains even when controlling for industry, scale of business and other background characteristics, pointing at other explanations as well.

Females in developing countries also face a number of social and cultural barriers in their entrepreneurial activities. For instance Field et al. (2010) found that religion may decide how much impact business training has on female entrepreneurs.

Females not only face severe constraints as entrepreneurs, they are often discriminated against in the labor market, thereby forcing females into self-employment out of necessity (Emran et al., 2007). On average, the discrimination of females may therefore lead to other types of

female entrepreneurs than male entrepreneurs, and we may therefore also expect different impacts of financial or human capital interventions.

Furthermore, research has also shown that there exist deeper underlying differences in preferences between males and females, which may work together with cultural and social aspects, like the finding that males are more eager to compete and take risk (Croson and Gneezy, 2009).

Such differences in preferences could, for instance, mean that males are more eager than females to invest loans in risky and high yielding projects, and that males are more eager to implement new business ideas and knowledge from business training.

My thesis adds to our understanding of constraints to entrepreneurship by investigating the role of human and financial capital for business growth by using data from a field experiment in Dar es Salaam, Tanzania. The thesis also improves our knowledge of the gender biases outlined above - particularly by investigating the role of gender and gender composition on group dynamics. Bellow follows short summaries of each chapter.

1. Human and financial capital for micro-enterprise development: Evidence from a field and lab experiment

The first chapter is co-authored with Kjetil Bjorvatn and Bertil Tungodden. We look at which is the most the binding constraint for microenterprise development; human or financial capital?

To answer this question, we present the first field experiment that jointly investigates these two constraints, by giving poor entrepreneurs, all members of the microfinance institution (MFI) PRIDE Tanzania, treatments in the form of either business training or a business grant, or both. To compare welfare effects, the size of the business grant was set approximately equal to the marginal cost of providing training. To measure treatment effects, we use a novel combination of survey data and data from a lab experiment, and investigate the impacts of our treatments on business results, business practices, business skills and mind-set. Males and females have increased their knowledge identically, but otherwise the training has had stronger effects with most parameters, for male entrepreneurs. This may indicate that there are

other barriers than business knowledge that are more severe for females. In addition, we find no effect of the business grant for either males or females.

The results suggest that human capital may be the more binding constraint for poor microentrepreneurs, but also point to the need for more comprehensive measures to promote development among female entrepreneurs.

2. Business training in Tanzania: From research driven experiment to local implementation

In this chapter, coauthored with Kjetil Bjorvatn, Kartika Sari Juniwaty and Bertil Tungodden, we raise an important, but often forgotten issue in field experiments; namely to which extent it is possible to scale up the evaluated intervention.

Field experiments are typically implemented under strict supervision of the research group in charge of the study. However, when scaling up the intervention, the implementation relies on the supervision of the local organization. But it is not obvious that successful implementation in the field trial can be replicated locally. The present study explicitly addresses this challenge by analyzing the local version of the business training program presented in chapter one.

We look at two questions that are important for PRIDE: (1) can they successfully implement business training on their own, and (2) do they want to? First, to evaluate whether PRIDE is able to provide training, we compare the attendance at the training sessions offered by the professional trainers with the sessions offered by the credit officers from PRIDE, with a high attendance indicating high quality.

Second, if business training leads to massive exit from the institution, as trained clients for instance qualify for less expensive loans in ordinary banks, the institution may not benefit from offering such a program. We therefore compare exit rates among trained and non-trained clients.

We find that business training was successfully implemented in one of two branches, and we conclude that the institutional environment is crucial for the implementation of such training programs. Furthermore, we do not find any differences in exit rates between trained and control clients. In addition, we find that it should be possible to charge a participation fee that covers most of the cost of such a program. We therefore conclude that it should be in the

interest of PRIDE to scale up the training program, both to preserve financial sustainability and improve social impact.

3. Measuring spillover effects from business training: Evidence from a field experiment among microentrepreneurs

An often neglected issue in field experiments is the issue of spillover effects from treated to non-treated subjects. If such effects are important, a simple comparison between treatment and control may either over- or underestimate treatment impacts.

In this chapter, I measure spillover effects from trained clients to their non-trained loan group fellows. To identify such effects, I compare clients with trained group members with clients with non-trained group members.

I find evidence of spillover effects for male entrepreneurs on several loan group related outcomes. These include increased loan balances, more loan usage on investments, and increased satisfaction with PRIDE. However, I do not find any evidence of increased knowledge, or any changes of business practices, among male group members of trained clients.

On average, there are no spillover effects among females. But, for one particular group of females, I find strong effects on business knowledge; namely females in loan groups with only females. This result may indicate that the learning environment in gender mixed groups is inferior to female-only groups.

4. Group composition and group dynamics: Evidence from a lab experiment with microfinance clients

Chapter one reveals severe gender differences in the impact of business training, and chapter three shows that knowledge spillovers may depend on the gender composition in the loan group. This chapter, coauthored with Kartika Sari Juniwaty and Linda Helgesson Sekei, use a lab experiment to study how gender composition affect group dynamics.

We focus on three dimensions of group dynamics; i) group's ability to solve problems in practice, ii) group's willingness to accept risk, and iii) group's behavior in a public good problem involving the possibility of free-riding.

We find that gender composition is of fundamental importance in understanding group dynamics. Female groups outperform male and mixed groups in problem solving, even though males at the individual level outperform females. Similarly, we find that female groups take more risk than male and mixed groups. Finally, we do not find any differences between female, male and mixed groups in the public good game.

Our findings are very consistent with the findings in chapter three; that there may only be knowledge spillovers in female loan groups. These findings indicate that females are more able to cooperate in groups than males, and that males disturb the dynamics of female groups.

Furthermore, the results may also shed light on why microfinance is dominated by females, as the loan group may be a rare arena where females can cooperate on their own without male interference.

Finally, it may also shed light on why many studies similar to that in chapter one, fail to find any impact on females. Most social contexts involves males in one or another way, which may constrain females from utilizing their skills and capacity.

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Chapter 1

Human and financial capital for microenterprise development: Evidence from a field and lab experiment

Human and financial capital for microenterprise development: Evidence from a field and lab experiment

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Abstract

Which is the most binding constraint to microenterprise development, human capital or financial capital? To answer this question, we present the first field experiment that jointly investigates these two constraints for poor microentrepreneurs, by introducing separate treatments of business training and a business grant. We combine survey data and data from a lab experiment to investigate treatment effects on business results, business practices, business skills and mind-set. Our study demonstrates a strong effect of business training on male entrepreneurs, while the effect on female entrepreneurs is much more muted. There is no effect of the business grant for either males or females. The results suggest that human capital may be the more important constraint for poor microentrepreneurs, but also point to the need for more comprehensive measures to promote development among female entrepreneurs.

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1. Introduction

Microentrepreneurs in developing countries face a number of constraints on business growth. Lack of access to capital has received a lot of attention amongst donors and practitioners, as witnessed by the rise of the microfinance movement. But while there is a lot of optimism about the power of finance for small scale business development, research demonstrates that success cannot be taken for granted (Karlan and Morduch, 2009). Field experiments on the impact of financial capital, in the form of business grants (de Mel *et al*., 2008) and microfinance (Banerjee *et al*., 2009), demonstrate that the growth effect of finance may critically depend on dimensions such as the entrepreneur's educational background, business skills, and mind-set.

Moreover, the literature challenges the popular notion that microfinance is a particularly powerful tool for business growth when given to female entrepreneurs. de Mel *et al*. (2009a) find on average no effects of business grants given to female entrepreneurs, and conclude that: "The experience with the grants does indicate that permanently raising the income of women running small microenterprises may be more difficult than raising the income of men in a similar position (p. 24)."

Partly as a result of the mixed evidence on the importance of financial capital, focus is shifting toward other constraints on microenterprise development, and in particular lack of human capital. Intuitively, returns to microfinance for entrepreneurs with low human capital, particularly in the form of weak business skills, can be expected to be modest. However, the message from the only published field experiment on business training to microfinance clients is not very optimistic (Karlan and Valdivia, forthcoming). While training is shown to have some impact on business practices, they find no robust effects on business profits and sales.[1]

The present study is, to our knowledge, the first field experiment that jointly investigates the financial and human capital constraints for poor microentrepreneurs. In collaboration with the largest microfinance institution in Tanzania, Promotion of Rural Initiatives and Development Enterprise (PRIDE), we introduced separate treatments offering business training and a

[1] Bruhn et al. (2010) focus on the importance of managerial capital, and also cite unpublished work on different forms of business training showing more positive results than reported in Karlan and Valdivia (2010). Drexler et al. (2010) find positive effects of a simple "rule-of-thumb" training program on business practices, but relatively weak effects on business outcomes.

business grant of similar size to the cost of training, which allows us to investigate the relative importance of the human and financial capital constraints for microenterprise development.

To study in more detail the mechanisms of change initiated by the different treatments, we also use the novel hybrid approach of combining the field experiment with a lab experiment where individuals make incentivized choices (Jakiela *et al*., 2010).[2] This design allows us to study the causal impact of the training on the microentrepreneurs' business knowledge (book keeping, marketing, investment analysis) and mind-set (willingness to compete, confidence, risk- and time preferences). It also provides us with a better understanding of how male and female entrepreneurs differ in their business knowledge and mind-set, which may shed some light on why policy interventions targeting microentrepreneurs in developing countries may have less impact on the business performance of female entrepreneurs.

The present paper also adds to the literature on microfinance and entrepreneurship by focusing on Africa. Most research until now has addressed the situation in either Asia or Latin America, reflecting the longer history and larger outreach of microfinance in these regions. However, microfinance is on the rise in Sub-Saharan Africa, and it is clearly of first order importance to understand how the various initiatives may contribute to growth and poverty alleviation in the poorest region of the world.[3]

The paper offers three main findings. First, we show that the human capital intervention causes a substantial increase in the profits of male entrepreneurs, while the effect on female entrepreneurs is much more muted. The financial capital intervention has no impact on business performance. This provides evidence of the human capital constraint being of fundamental importance for microenterprise development and more binding than the financial capital constraint. Second, we show that the human capital intervention works through increased sales among male entrepreneurs, whereas we do not see any changes in profit margins. This suggests that the impact of training goes through an expansion effect, and we demonstrate that trained males to a greater extent than trained females have implemented new business practices conducive to business growth. Third, we show that the human capital

[2] Deaton (2010) underscores the importance of investigating mechanisms in randomized controlled trials, and points to the merger between behavioral economics and development economics as a promising line of research. See also Falk and Heckman (2009).

[3] See for instance the report "Sub-Saharan Africa 2009: Microfinance analysis and benchmarking report," by the Microfinance Information Exchange (MIX) and Consultative Group to Assist the Poor (CGAP), available at www.themix.org.

intervention has improved the business knowledge of both female and male entrepreneurs, and has also caused a change in their mind-set. On important dimensions, such as attitude to risk and self-confidence, the training has contributed to closing the gender gap, but the lab experiment reveals that even among the trained entrepreneurs, females are less willing to compete than males. We argue that this difference in mind-set, together with all the external constraints facing female entrepreneurs, may explain why a human capital intervention works very differently for male and female entrepreneurs.

The remainder of the paper is organized as follows. Section 2 gives a description of the context in which the interventions were carried out, based on baseline data on the entrepreneurs and their businesses. Section 3 describes the intervention and provides data on the treatment-control balance. Section 4 discusses data and estimation methods, and Section 5 reports treatment effects on the performance of the businesses. Section 6 and Section 7 discuss mechanisms that may explain these treatment effects. Section 8 concludes.

2. The context: Findings from baseline

The participants in the present study were all members of PRIDE, the largest microfinance institution in Tanzania, at the time of the baseline survey.[4] PRIDE has 70 000 clients, the majority of whom are females, in 48 branches all over the country. They employ a modified Grameen Bank model, where group members are jointly responsible for each other's loans. To become a member of PRIDE, one must have an operating business and join a self-selected solidarity group of five members (called an enterprise group). We conducted our study in two branches of PRIDE in Dar es Salaam, namely Magomeni and Buguruni. These branches are located in different parts of the city and each of them has approximately 7500 clients.

Table 1 provides a description of the entrepreneurs in our sample, based on the baseline data collected in June-July 2008. The average entrepreneur is about 38 years old and has completed eight years of schooling. They run small businesses, typically hiring only one worker, and only around 20% of the businesses are registered by the government. The majority of the entrepreneurs keep some kind of business records. Commerce is the most common sector, involving around 70% of the entrepreneurs, while 38%of the entrepreneurs

[4] For further details on the organization, see www.pride-tz.org.

have a business in the service sector, and 15% in the manufacturing sector.[5] Kiosks and small market stalls are typical businesses in commerce, small restaurants and repair shops are common in services, whereas furniture and brick making are examples of manufacturing businesses in the sample. There is a balance between males and females in commerce, while female entrepreneurs dominate in services and males in manufacturing.

Average monthly profits in 2008 were 568 497 Tanzanian Shillings (TZS), equivalent to approximately 480 USD, and average sales were 2 489 228 TZS. We observe that male entrepreneurs operate on a larger scale than females, with around 50% higher sales, 20% higher profits, and 35% higher investments. The female entrepreneurs, on the other hand, have a somewhat higher profit margin, 24.6% versus 20.4%. There are no significant gender differences in the business practices with respect to record keeping and marketing, but the male entrepreneurs have a higher score on a baseline test of business skills. Females, on the other hand, have somewhat more education, measured as number of completed years of schooling.

3. The interventions and randomization procedure

3.1 The interventions

The interventions were designed as randomized field experiments, and took place during 2008 and 2009. Business training was offered on a weekly basis from August 2008 to January 2009, and the business grant was given to a subset of the participants, trained and untrained, in March 2009.

The business training course consisted of 21 sessions, each lasting 45 minutes, starting directly after the clients' weekly loan meetings at the PRIDE premises. The course was developed by the Entrepreneurship Centre at the University of Dar Es Salaam (UDEC) and tailored to microentrepreneurs, with the aim of unleashing entrepreneurship and creating business growth. The course was piloted extensively in the spring of 2008, with trial sessions offered to microcredit clients in a PRIDE branch in Dar es Salaam not part of our study, to credit officers in PRIDE working on a daily basis with the entrepreneurs, and to local researchers working on microenterprise development in Tanzania. The final training program

[5] Many entrepreneurs have more than one business, and may hence be involved in more than one sector.

covered a range of topics particularly relevant for microentrepreneurs in Tanzania, including "Entrepreneurship and Entrepreneurial character", "Improving customer service", "Managing people in your business" and "Marketing strategies". A full list of topics is given in Appendix B. The lectures, which were given by UDEC staff in Kiswahili, were practically oriented, and topics were often illustrated by the use of case studies and role play. Frequently, the clients were given homework to prepare for the next class. There was neither a course fee nor any seating allowances.

A graduation ceremony was held at the end of January 2009, where clients who had attended ten or more sessions were awarded a diploma. The diploma and the threshold were announced at an early stage in order to motivate clients to attend the sessions. The attendance was monitored closely by teachers and credit officers, and absent clients were contacted either at the branch or by phone. The average attendance rate at a session was 70%, while 83% of the clients qualified for a diploma, see also Figure 1A in Appendix A. Entry control was strictly enforced, and only those assigned to training were allowed to enter the classroom.

The business grant was offered to a subsample of the participants, both trained and non-trained, six weeks after the graduation ceremony. It was approximately equal to the average cost per participant of providing the business training, 100 000 TZS. To most entrepreneurs this is a substantial grant, corresponding to around 50% of average investments in the businesses in 2008 (see Table 1). The grant was given in cash and framed to improve the entrepreneur's business. The recipients of the grant were asked to keep records of how they spent the money. A copy of the letter accompanying the business grant is provided in Appendix B.

3.2 Selection and randomization procedure

In the randomization procedure, we exploit the fact that loan groups are randomly assigned to loan meeting days and hours according to availability of time slots at the branches, and therefore are independent of the characteristics of the entrepreneurs. For the business course, we randomly chose Tuesday (Magomeni) and Thursday (Buguruni) for training, and Monday (Magomeni) and Wednesday (Buguruni) for non-training. In this way, no training took place on days when members of the non-training group attended their weekly loan meeting.

We only considered clients with PRIDE loans between 500 000 TZS and 1 000 000 TZS, which at the time of the baseline represented the second and third steps on the loan-ladder in the group lending program. This was motivated by the fact that there are very high dropout rates among clients with smaller loans, and also that we wanted to avoid a too heterogeneous target group for the lectures. For logistical reasons, we also only considered loan groups with loan meetings at 09:00, 10:00, 12:00 and 13:00. Applying this eligibility rule, 565 clients were eligible for training (the 'training group'), and 576 clients were eligible for non-training (the 'non-training group'). Out of the 1164 eligible clients, we interviewed 644 clients on the basis of accessibility, balanced between the training group (319) and the non-training group (325). Clients were interviewed at their business location. The objective of the baseline survey was framed as "to identify strategies to improve the functioning of microcredit institutions in Tanzania". Hence, clients were not informed about the prospective business training course.

After the business training was completed in January 2009, we randomly selected a subset of 252 clients to receive a business grant of 100 000 TZS, balanced between the training group (126) and the non-training group (126). All clients in our sample with loan-group meetings at 12:00 as well as those meeting at 09:00 on Wednesdays and Thursdays were offered a business grant.[6]

Table 2 shows that most baseline characteristics of the entrepreneur are not significantly correlated with the treatment status, indicating that our selection procedures created balanced treatment groups.

[6] An additional ten males were offered a grant in order to improve the gender balance. The males were randomly selected among the members in our sample with loan meeting later than 09:00 on Wednesdays and Thursdays. The grant was collected by 247 out of the 252 entrepreneurs. We were not able to track down and interview the five entrepreneurs who did not collect the business grant in our follow-up survey in 2009.

4. Data and estimation methods

4.1 Data issue

Data stem from the baseline survey conducted in June - July 2008, a post-intervention follow-up survey conducted in June - August 2009, and a lab experiment conducted in March 2009, after the training, but before the business grant was offered. In the follow-up survey, we reached 530 of the 644 clients; of these, 526 were still actively doing business.[7] A randomly selected subset of the sample, 126 entrepreneurs from the training group and 126 entrepreneurs from the non-training group, were invited to take part in the lab experiment; of these, 211 attended the lab, 107 from the training group and 104 from the non-training group.[8] In line with previous studies in this field (de Mel *et al*., 2008, 2009a; Karlan and Valdivia, forthcoming), the main source of information in the follow-up survey is self-reported data from the entrepreneurs. This raises the concern that respondents may exaggerate key outcome variables such as profits in order to impress the enumerator, or underreport true business results out of fear that the information will be spread to tax authorities. In order to deal with these issues, we asked about average monthly profits in two different ways, stated and calculated. The former is based on the entrepreneur's own estimate of operating profits on a normal business day. The latter is based on a more interactive process between the enumerator and the entrepreneur, to the extent possible by making use of business records, where the operating profits are calculated by subtracting the different categories of operating costs from income.

Figure 1 provides a histogram of the difference between monthly stated and calculated profits in our sample. We observe that the two measures of profits closely overlap, the average difference corresponding to only 3.9% of stated profit (25 410 TZS). However, as shown in Table 3, column (1), in the sample of 526 clients who were active entrepreneurs at the time of the follow-up survey, there is a statistically significant positive relation between training status and the difference between stated and calculated profits for male entrepreneurs. This may reflect a tendency of exaggerating profits among trained male entrepreneurs, or of

[7] In Appendix A, Table A1, we report the upper and lower bounds for our main estimates, taking into account the level of attrition in the sample.

[8] The reported reasons for not attending the lab were that clients had exited PRIDE, illness, travelling, attending a funeral, and taking care of pressing family matters. Table A2 in Appendix A shows that we also had a balanced sample of clients in the lab. The detailed instructions for the lab experiment are provided in Appendix B.

underreporting profits among non-trained male entrepreneurs. There is no statistically significant effect for female entrepreneurs or of the business grant.

In order to deal with this potential bias in our analysis, we trim the sample by removing entrepreneurs with the largest discrepancy between stated and calculated profit. As shown in Table 3, column (3), if we remove 6% of the sample (32 entrepreneurs), there is no statistically significant relationship between training treatment status and the discrepancy between stated and calculated profits. The remainder of our discussion of the follow-up survey is based on this trimmed sample of 494 entrepreneurs, but our main results are not sensitive to this trimming.[9] As we show in Appendix A, Tables A5-A7, we find similar effects for the whole sample of 526 clients and for samples based on other trimming rules.

We focus on stated profits in the following discussion, since this is in line with what has been done in the related literature. In particular, de Mel *et al*. (2009b) argue that self-reported profits give a more precise estimate of true profits than calculated profits. In Appendix A, Tables A8-A9, however, we show that our main results are robust to using calculated profits, or to considering stated profits and calculated profits as defining a range for the true profits.

4.2 Intention to treat estimator

We estimate the basic intention to treat estimators (ITT) for each individual outcome Y_i. Gender turns out to be a crucial dimension in our analysis, and we therefore include the interaction term to capture differences in the impact of training between males and females. We have also studied possible interaction effects between gender and the business grant and between training and the business grant, but do not find any statistically significant patterns. Thus, in the following, we focus on estimations of the following specification:

$$Y_i = \alpha + \beta_1 Training_i + \beta_2 Grant_i + \beta_3 Female_i + \beta_4 (Training_i * Female_i) + \beta_5 Y_{i-1} + \beta_6 X_i + \varepsilon_i .$$

Training and *Grant* are dummy variables taking the value one if client *i* has been offered training and business grant, respectively. *Female* is a dummy taking the value one if the client is female; the interaction term between training and female is given by *Training*Female*; Y_{i-1}

[9] In Appendix A, Table A3 reports the baseline data for the trimmed sample, and Table A4 shows that we also have balanced treatment groups in this case.

is the lagged dependent variable (measured in the baseline survey); X_i is a vector of the covariates, including baseline characteristics of the entrepreneurs and their businesses.

The ITT-estimators of the training are thus given by β_1 for male entrepreneurs and $(\beta_1 + \beta_4)$ for female entrepreneurs (in the tables we refer to the latter as *Sum Female*), β_2 is the ITT-estimator of the effect of a business grant, and β_4 captures the degree to which the impact of the training is different for males and females.

For the business outcome regressions, we report the estimated treatment effect both with and without the vector of covariates, X_i. Given that *Training* and *Grant* are uncorrelated with unobserved explanatory factors, there is no need to include a covariate matrix to get unbiased ITT estimates, but including control variables makes the estimation more precise.[10]

4.3 Average treatment effect on the treated

The intention to treat estimator does not take into account the fact that not all participants attended the lectures. In particular, 17% of the clients did not qualify to receive a diploma at the end of the course, most of whom only attended a few lectures. It is therefore interesting also to consider the impact on the clients who actually completed the course, and we do so by reporting the average treatment effect on the treated (ATET) for the main outcome variables.

We instrument whether a client completed the course (and received a diploma) by his or her treatment status.[11] To estimate ATET, there must only be one-sided non-compliance (Bloom, 1984), which in our case is satisfied since no one from the control group participated in the training. In addition, the instrument should only operate through one single known causal channel (Angrist and Pischke, 2009), which means that spillover effects from compliers to non-compliers in the training group or to clients in the non-training group should be ruled out. In the follow-up study, only 3% of the clients responded that they knew a client that attended a loan meeting in their branch on the other day that was included in this study, which means that we can rule out spillover effects from compliers to the non-training group. Moreover, Berge (2011) studies in detail possible spillover effects within loan groups from the training

[10] We include standard controls suggested by the literature as well as variables where our treatment-control balance shows a statistically significant difference at a five percent level. See Angrist & Pischke (2009) for a comprehensive discussion of control variables in experiments.

[11] We obtain similar ATET-estimates if we instrument whether a client attended any lectures at all by his or her treatment status.

program, but finds no evidence of spillover effects on the main outcome variables. We can therefore also rule out spillover effects from compliers to non-compliers within the training group. Finally, we have to assume that the non-compliers did not benefit directly from the course, which seems rather uncontroversial given that they only attended a few lectures (and 25% of the non-compliers no lectures at all). In sum, we thus argue that ATET gives us the estimated effect of the training on the clients that actually completed the course.

5. Results on business performance

In this section we study the extent to which the interventions have improved the performance of the entrepreneurs in terms of profits, and whether this has worked through increasing the profit margin or the sales of the businesses.

Table 4A shows that training had a statistically significant effect on the businesses of males, increasing profits by around 20-30%, whereas we do not find any evidence of the training improving the profits of the businesses of females. We observe that the interaction term between training and female is statistically significant, which shows that the there was a systematic difference between males and females in how the training impacted their businesses. As expected, the ATET estimates for the impact on male clients are higher than the ITT estimates, reflecting the assumption that the impact of the training worked through the subset of clients completing the course. Finally, we report the OLS estimates, showing the difference in profits between clients who received training (the compliers) and clients who did not receive training (the non-compliers and the clients in the non-training group). The OLS estimates are slightly higher than the ATET estimates for the male clients, illustrating that there was a small selection effect working through unobserved characteristics, where male clients benefitting more from the training or with more promising businesses were more likely to complete the course.

In contrast, we do not find any evidence of the business grant increasing the profits of the clients' businesses. As shown in Table 4A, both for males and females, the business grant coefficient is not statistically significant for any of the specifications.

An entrepreneur can increase profits by making the business more cost efficient, and thereby increase the profit margin (defined as profits divided by sales), and by expanding the

business, and thereby increase sales. Table 4B reports how the training and the business grant have impacted the profit margins and sales. Interestingly, neither for males nor for females do we find an impact from the training on the profit margin. Thus, the increase in profits for male entrepreneurs has taken place through an increase in sales at the same level as profits, estimated to be around 20-30%. In contrast, trained females have not increased their sales, and, again, we observe that the interaction term between training and female is statistically significant. Finally, as with profits, we do not observe any impact from the business grant on the profit margin or sales.

These findings leave us with two puzzles. Why does the human capital intervention only affect the business performance of male entrepreneurs? And: Why does the financial capital intervention not have any effect at all? To gain a firmer understanding of these questions, we investigate in the following two sections the effects of the training and the business grant on business practices and entrepreneurial characteristics.

6. Changes in business practices

Tables 5A-5C provide an overview of how the interventions changed the business practices of the entrepreneurs, where we focus on the ITT estimates.[12] Overall, we observe that the training had a larger impact on the business practices of male entrepreneurs than of female entrepreneurs, and that the business grant did not have any marked impact on business practices. Both of these findings are consistent with the observed effects on the business performance.

If the entrepreneurs were credit constrained in their businesses, we would have expected the business grant to have an impact on investments, and possibly also on other financial dimensions. In Table 5A, we observe that the business grant did not cause any statistically significant changes in the financial dimensions, which suggests that these entrepreneurs are not primarily constrained by financial capital. From Table 5C, we observe that the business grant did reduce the involvement in commerce for male entrepreneurs, which may reflect that some of them used the business grant to invest in equipment that enabled them to operate in the manufacturing or service sector. This may not necessarily have been a profitable move,

[12] The ATET-estimates provide the same picture, only strengthening the effects from training on the various business practices.

however, since we observe both from the baseline survey and from the follow-up survey that entrepreneurs operating in the commerce sector have significantly higher profits than other entrepreneurs. The fact that the business grant did not change other business practices like employee relations and marketing, as shown in Tables 5B-5C, is in line with what we should expect, since this intervention did not target these dimensions.

In contrast, the training initiated important changes in business practices, both among males and females. In particular, from Tables 5B-5C, we observe that the training made the entrepreneurs more active in their employee relations, marketing, and record keeping, which are topics that were covered in depth in the lectures. We suggest that some of these changes may also shed light on why we only find an increase in profits and sales among trained male entrepreneurs. In particular, we observe from Table 5B that the training had a strong effect on the willingness of trained males to fire employees, whereas we do not see any such change for females. The profitability of improving employee management, for instance by the shedding of unproductive workers, has been shown in other studies of microfinance clients (Karlan and Zinman, 2009). The importance and difficulty of finding trustworthy workers were also highlighted by our entrepreneurs in the follow-up survey (to which we return in the following section). A number of clients reported that the employees had been stealing from them, and others that they were unable to expand because they could not find skilled workers. Thus, the fact that the trained male entrepreneurs were active in firing workers suggests that the training enabled them to improve the quality of their employees, and thereby also placed them in a better position to increase their sales and hence profits.

The training also led to increased use of bonuses, where we find a statistically significant effect among females. However, this is arguably a softer strategy of employee management than the firing of workers. Furthermore, we observe that the estimated coefficient on the marketing index is higher for trained males than for trained females (even though the interaction term between training and female is not significant in this case), which provides suggestive evidence of the trained male entrepreneurs pursuing more aggressively a business strategy conducive to expansion and increased sales. Finally, we note that there is a significant treatment effect on trained males' involvement in commerce, which was the sector with the highest profits and sales both in the baseline survey and in the follow-up survey, whereas we do not see a similar expansion of commercial activity among females.

Our findings thus suggest that more active employee management, increased marketing, and a move into commerce were important drivers of the business expansion for male entrepreneurs. A fundamental question still remains, why did not the female entrepreneurs adopt the same set of strategies for their businesses?

7. Exploring the mechanisms: Gender and entrepreneurship

The identification of new profitable business practices requires knowledge and understanding of how to best operate a business, whereas the decision to implement new business ideas requires the opportunities to do so and a mind-set that is conducive to business growth. In this way, differences in the effect of training on male and female entrepreneurs could stem from gender differences in business knowledge, mind-set, and external constraints. In this section we provide further discussion of how each of these dimensions sheds light on our findings, using evidence from both the surveys and the lab-experiment.

7.1 Business knowledge

Business knowledge was studied in the lab through a set of incentivized questions on best practice in business, covering topics such as customer care, employee management, time management, and definitions of sales, profits, variable costs and working capital.[13] In the follow-up survey, we asked a separate set of non-incentivized questions on the profit concept. We measure a client's business knowledge by the number of correct answers he or she had in these tests. As shown in Table 6A, column (1) and column (2), we obtain somewhat different results from the lab and the follow-up survey, but in none of the specifications do we find a statistically significant difference in the impact of the training on males and females. Focusing on column (3), which reports the overall performance of the lab sample on both tests, we observe that the training has increased the business knowledge of both male and female entrepreneurs.

In the follow-up survey we also invited the entrepreneurs to take part in a business plan competition. They were asked: "Suppose you were given 100 000 TZS as a business grant to invest in your business. How would you spend this money most profitably? Explain your choices." They were informed that the plans would later be evaluated, and that the three best

[13] For further discussion of the lab-test on business knowledge, see Bjorvatn and Tungodden (2010).

plans would each be awarded a prize of 100 000 TZS.[14] Column (4) in Table 6A shows that the training has significantly improved the ability of females to formulate business plans, whereas we do not see a similar effect for males. Possibly, the stronger effect of training on females is due to their lower initial skills, as reflected in males scoring significantly better in the non-training group.

In sum, we conclude that the observed difference in impact from training on business practices and business performance cannot be explained by females not benefitting in business knowledge from the course. If anything, our results point to training having a larger impact on the business knowledge of females, possibly due to their lower initial level of knowledge.

7.2 Mind-set

The lab experiment also investigated different mind-set variables. Willingness to compete and confidence were measured based on a set of questions on five different topics that were unrelated to the training (sports, maths, politics, health, and geography). In the first round, the clients were paid a fixed amount of 250 TZS for each correct answer, and, as expected, the training and the non-training group performed equally well (25.9 versus 25.3 correct answers; t-test of equality, p=0.581). Before the second round, the participants were asked about their expectations about own performance ("Are you better than, equal to, or worse than a typical microcredit client in answering questions on topic X"), which gave us a measure of confidence, and then, for each of the five topics, they had to choose whether to compete or not. If they decided to compete and performed better than the average microcredit client, they were paid 750 TZS per correct answer; if they performed worse, on the other hand, they were paid nothing. Alternatively, they could decide to work for the fixed rate of 250 TZS. The

[14] Roughly speaking, the plans can be divided into two categories; those that were justified (42%) and those that were not, including a few cases where the entrepreneurs were unable to come up with any business plan at all (58%). An example of a justified plan is the following: "She would buy sealed boxes to sell the food that she delivers. This way she will attract more customers, the food will look more expensive and professional. She would also buy shoes for her employees. That way, they would look more professional." An example of an unjustified plan is the following: "She would invest the money in her fish business, to buy more stock of the same fish." Our main results are also robust to more nuanced evaluations of the business plans, e.g. using a scale 1-4.

number of times they entered the competition gave us a measure of their willingness to compete.

Risk preferences were measured by the number of times the participant chose a risky alternative when a safe alternative was available. The participants were presented with four situations where they could choose between a risky alternative with two equally likely outcomes, 6000 TZS or nothing, and a safe alternative. The value of the safe alternative varied across situations, taking the values 1000 TZS, 1500 TZS, 2000 TZS and 2500 TZS.

Time preferences were measured at the end of the experiment. The participants were given the choice of whether to pick up their participation fee one week after the lab, at which point they would receive 15 000 TZS, three weeks after the lab and receive 20 000 TZS, or five weeks after the lab and be given 25 000 TZS. Hence, by waiting four weeks their participation fee would increase by 67%. We here report their time preference by a dummy, which takes the value one if the participant chose the five-week option.[15]

Table 6B summarizes the findings for the mind-set variables from the lab experiment. We observe that the training has had an impact on the mind-set of the entrepreneurs. It increased the confidence of the female entrepreneurs, and it made the male entrepreneurs more risk averse. Interestingly, this contributed to eliminating gender differences: in the training group, there are no statistically significant differences between females and males when it comes to confidence and risk preferences (t-tests of equality, $p=0.643$ and $p=0.289$), whereas the males are much more confident and risk-willing than the females in the non-training group (t-tests of equality, $p<0.001$ and $p=0.001$). There is no significant gender difference or treatment effect on time preferences. Finally, in the lab, we do not see any impact of the training on the willingness to compete. But here we observe a stark difference between males and females both in the training group and in the non-training group; females are much less willing to compete than males (t-tests of equality, $p=0.049$ and $p=0.013$). The observation that females are less inclined to compete is in line with the literature on gender and competitiveness (Niederle and Vesterlund, 2007, Croson and Gneezy, 2009, Fletschner *et al*. 2010).

[15] In Appendix A, Table A10, we show that our results on risk- and time preferences are robust to adopting the approach of Benjamin et al. (2010), who use interval regressions where the dependent variables are the minimum risk premium that the client requires to choose the risky alternative and the log of the minimum continuously compounded weekly interest rate that the participant requires to choose the delayed payment.

In the follow-up survey, we also asked some general mind-set questions on what the entrepreneurs considered as obstacles to business growth, and also whether they preferred to do the same kind of business as their neighbor. The last question was motivated by a concern expressed both by the management of PRIDE and by researchers at UDEC, namely that too many microentrepreneurs were involved in copycatting the businesses of their neighbors. In the words of Donath Olomi, former Director of UDEC "One of the most debilitating constraints is limited awareness and capacity of existing and potential business operators, in terms of exposure, values, knowledge and skills. The result is that most simply duplicate what their neighbors are doing and do not appreciate the importance of innovation, quality, credibility, and customer care" (Olomi, 2007, page 16). From Table 8, we observe that the training has changed the entrepreneurs' perceptions of business obstacles. Fewer trained male entrepreneurs consider the quality of workers and bureaucratic barriers to be serious obstacles to business growth, and fewer trained female entrepreneurs consider demand to be a serious obstacle to business growth. In the training group, we find statistically significant differences between males and females with respect to their views on quality of workers and bureaucratic barriers (t-test of equality, $p=0.064$ and $p=0.007$). We do not see any influence from training on the clients' preference for copycatting, but, in the training group, more female than male entrepreneurs express a preference for doing the same kind of business as their neighbor (t-test of equality, $p=0.015$).

In sum, the human capital intervention had an impact on a range of mind-set variables. Notably, however, training had no effect on the entrepreneurs' willingness to compete, with both trained and non-trained males being significantly more willing to compete than females. We argue that the difference in willingness to compete represents a fundamental difference in mind-set between the male and female entrepreneurs, and that the greater aversion to competition among the female entrepreneurs may constitute an 'internal' constraint on business growth.

7.3 External constraints

In Tanzania, as in most other countries, females face more binding external constraints on their activities than males. For instance, females typically have the main responsibility for the household. One indication of this in our data is the fact that females spend on average ten hours less per week than men in their businesses. Qualitative information from our surveys also shows that females more often than males operate their businesses in or close to their home, which suggests domestic commitments.

Moreover, females may in some cases have a lesser say in decisions that are important for the household, including business decisions. One indication of this from our survey is the fact that females are less informed about their husbands' income than vice versa. In the follow-up survey, we asked the married clients whether they knew what their spouse's income was in a normal month: 79% of the male entrepreneurs responded positively, whereas only 45% of the female entrepreneurs reported to have this information. In the follow-up survey we also gathered anecdotal evidence suggesting that in some cases the husbands were in charge of businesses formally operated by female PRIDE members.

It seems reasonable to assume that domestic obligations and lack of influence over business decisions make females less able to implement business knowledge from the training program. In particular, such constraints are likely to form a significant barrier to carrying out important business decisions like firing employees and introducing new business activities, which seem to be driving forces for increased sales and profits among the male entrepreneurs in our data set.[16] Moreover, we find no effect of training on time spent in the business or on how informed married, female entrepreneurs are about their spouse's income, which indicates that the training has not eased the external constraints on business growth faced by the female entrepreneurs.

[16] Accordingly, when reflecting upon the possible impact of the training program immediately after its completion, the teachers involved expressed concerns as to whether the female participants would benefit from it, stating that: "Because of culture, most women are marginalized and sometimes interfered by their male counterparts when it comes to growing their business."

7.4 A simple model

We here outline a simple model that illustrates how a complementarity between business knowledge and internal and external constraints, or simply constraints for short, may explain the gender difference in impact from training. Let the sales of entrepreneurs *i* be determined by two factors; knowledge (k_i) and constraints (c_i). Moreover, in line with the data, let profits be proportional to sales. Knowledge is assumed to be exogenously given, based on the realistic assumption that there is no market for business training of small scale entrepreneurs.[17] Increased knowledge is the target of business training. Constraints capture the degree to which entrepreneurs have the freedom or willingness to implement their ideas in practice. In line with what we observed in the follow-up survey and in the lab, we assume that these constraints are not affected by the training.

To highlight the key mechanism in the clearest possible way, we assume that knowledge and constraints are perfectly complementary in explaining the level of sales (and hence profits):

$$y_i = \arg\min(k_i, c_i)\,. \qquad (1)$$

Consider two types of entrepreneurs, males and females, $i=m,f$, where $c_m > c_f$. Assume now that the level of knowledge, both prior to training and after training, is in the interval:

$$c_f < k_i < c_m\,, \qquad (2)$$

implying that c_f is a binding constraint for females, while males are constrained by knowledge.[18] Clearly, when the inequality in (2) holds, the model predicts that the increase in k_i caused by the human capital intervention should boost sales and profits of male entrepreneurs only.

A similar model can also be used to explain the lack of impact from the business grant. If we interpret the variable *c* in the model above as representing financial capital, and assume that business knowledge, both prior to and after the training, is the binding constraint for both

[17] Business training courses do exist in Tanzania, but are costly, and typically targeted to more advanced entrepreneurs than the average microfinance client.

[18] For completeness, if $k_i<c_f$, training would stimulate the businesses of both males and females, while if $k_i>c_m$, it would not affect the businesses of either gender.

males and females, then it follows that there will be no impact from the business grant intervention.

8. Concluding remarks

Our study has shown that a human capital intervention in the form of business training can have a powerful effect on business performance of poor microenterpreneurs. In contrast, a comparable infusion of financial capital had no effect on the businesses. This suggests that human capital is a fundamental constraint for microenterprise development and more binding than the financial capital constraint.

We find that the effect of the human capital intervention is contingent on gender. In particular, we find on average no effect on business performance of training for female entrepreneurs, while male entrepreneurs experience an increase in sales and profits of around 20-30%. The lack of treatment effect on business outcomes for female entrepreneurs harmonizes with the findings in Karlan and Valdivia (forthcoming), who do not observe any effect on sales of the business training program implemented amongst members of a female-only microfinance institution in Peru. Taken together, the Peru-study, the present Tanzania-study on business training, and the studies by de Mel *et al*. (2008, 2009a) on the returns to capital among microentrepreneurs in Sri Lanka, suggest that promoting business development is more challenging among female entrepreneurs than among male entrepreneurs.

Bruhn *et al*. (2010) emphasize the importance of managerial capital as a determinant for business performance. Their argument is that different levels of managerial capital, in dealing with financial capital, workers and customers, can explain the heterogeneous effects of capital grants found by for instance de Mel *et al*. (2009a). However, an important ambition of the business training program evaluated in the present paper was precisely to provide the entrepreneurs with more management skills. The fact that this treatment had very different impacts on male and female entrepreneurs points to the importance of other, and perhaps deeper, factors that may constrain the female entrepreneurs. Here, we have referred to these factors as internal and external constraints, and linked them to lab evidence on the willingness to compete and to survey and other interview-based evidence on the social position of women in Tanzania. Our research indicates that, given the more binding constraints facing female entrepreneurs, adding human or financial capital may be relatively fruitless. An important

policy implication from our research is thus that more comprehensive measures are necessary in order to promote development among female entrepreneurs, paying greater attention to their motivation for joining microfinance and to the external constraints which may limit their ambitions.

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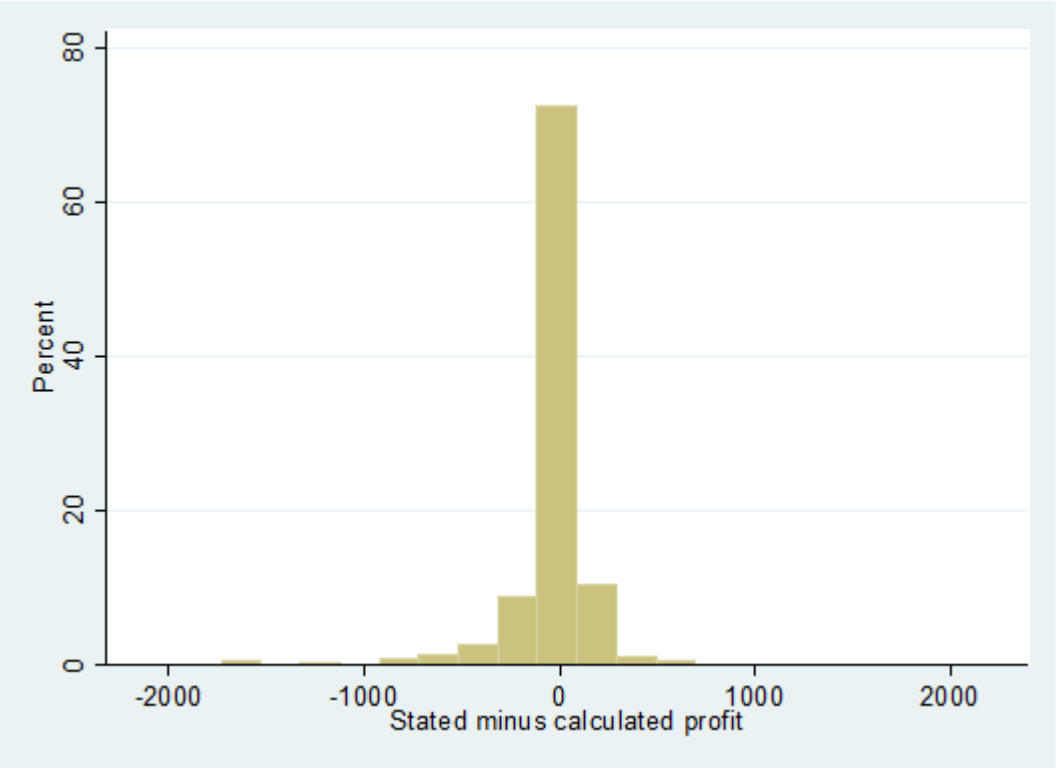
Figure 1



Note: The figure shows the distribution of the difference between stated profits and calculated profits (both in thousand TZS) for the full sample of active entrepreneurs in the follow-up survey.

Table 1: Baseline values by gender

	(1) Full sample	(2) Male	(3) Female	(4) Difference
BUSINESS OUTCOMES				
Profit	568.497	625.206	538.664	86.542**
	(17.914)	(34.305)	(20.417)	(37.565)
Sales	2489.228	3062.518	2187.640	874.877***
	(143.895)	(228.591)	(182.218)	(301.021)
Profit margin	0.332	0.311	0.343	-0.032**
	(0.007)	(0.013)	(0.009)	(0.015)
SECTOR				
Commerce	0.699	0.703	0.697	0.006
	(0.018)	(0.031)	(0.022)	(0.038)
Service	0.377	0.257	0.441	-0.184***
	(0.019)	(0.029)	(0.024)	(0.040)
Manufacturing	0.154	0.234	0.111	0.123***
	(0.014)	(0.029)	(0.015)	(0.030)
SCALE OF BUSINESS				
Employees	1.084	1.180	1.033	0.147
	(0.064)	(0.102)	(0.082)	(0.135)
PRIDE loan	770.342	766.677	772.275	-5.608
	(9.394)	(16.009)	(11.614)	(19.780)
Investments	198.983	249.937	172.178	77.760*
	(20.692)	(43.369)	(21.762)	(43.462)
BUSINESS PRACTICE				
Keeping records	0.663	0.667	0.661	0.006
	(0.019)	(0.032)	(0.023)	(0.039)
Registration	0.207	0.230	0.194	0.035
	(0.016)	(0.028)	(0.019)	(0.034)
Marketing Index	0.490	0.498	0.485	0.014
	(0.012)	(0.019	(0.015)	(0.024)
Business knowledge	0.704	0.722	0.694	0.028**
	(0.006)	(0.011)	(0.008)	(0.013)
CHARACTERISTICS OF THE ENTREPRENEUR				
Age	37.710	37.30	37.92	-0.622
	(0.333)	(0.591)	(0.402)	(0.701)
Education	7.935	7.734	8.040	-0.306*
	(0.084)	(0.137	(0.105)	(0.176)
Muslim	0.662	0.730	0.626	0.104***
	(0.019)	(0.030	(0.024)	(0.039)
Observations	644	222	422	

*Note: The table reports average values from the baseline survey in 2008. Profit: Monthly profit in the businesses of the entrepreneur, in thousand TZS. Sales: Monthly sales in the businesses of the entrepreneur, in thousand TZS. Profit Margin: Profit/Sales. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees in the businesses of the entrepreneur. PRIDE loan: Initial size of loan in PRIDE, in thousand TZS. Investments: Investments in the businesses of the entrepreneur in the last 12 months, excluding additions to stocks, in thousand TZS. Keeping records: Indicator variable taking the value one if the entrepreneur reports keeping records. Registration: Indicator variable taking the value one if at least one of the businesses of the entrepreneur is registered by the government. Marketing index: An index of marketing initiatives made by entrepreneur the last year, from zero (no initiatives) to one (initiatives along three dimensions to attract customers). Business knowledge: Test of business skills, share of correct answers. Age: The age of the entrepreneur, in number of years. Education: The number of years of schooling of the entrepreneur. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim. Standard errors in parentheses, p-values from two-sided t-tests of equality; *p<0.10, ** p<0.05, *** p<0.01.*

Table 2: Verification of randomization

	(1) Training, Full Sample	(2) Training, Female	(3) Training, Male	(4) Grant, Full Sample	(5) Grant, Female	(6) Grant, Male
Profit (log)	-0.021	-0.036	0.016	-0.016	-0.036	0.021
	(0.040)	(0.052)	(0.072)	(0.039)	(0.052)	(0.065)
Sales (log)	0.001	-0.002	-0.020	0.035	0.047	0.038
	(0.035)	(0.046)	(0.058)	(0.035)	(0.046)	(0.058)
Commerce	0.068	0.045	0.115	-0.086	-0.100	-0.029
	(0.055)	(0.068)	(0.098)	(0.054)	(0.063)	(0.094)
Service	0.095*	0.108*	0.075	-0.010	-0.063	0.150
	(0.053)	(0.062)	(0.102)	(0.053)	(0.059)	(0.104)
Manufacturing	0.071	0.130	-0.018	-0.050	-0.148*	0.149
	(0.063)	(0.085)	(0.113)	(0.060)	(0.076)	(0.109)
Employees	0.006	0.005	0.017	-0.016	-0.007	-0.054*
	(0.013)	(0.015)	(0.031)	(0.011)	(0.013)	(0.028)
PRIDE loan	-0.066	0.051	-0.245	0.011	0.006	-0.029
	(0.087)	(0.105)	(0.156)	(0.087)	(0.103)	(0.157)
Investments	-0.029	-0.063	-0.031	0.010	0.076	-0.066
	(0.041)	(0.052)	(0.053)	(0.040)	(0.048)	(0.043)
Keeping records	0.044	0.005	0.104	-0.066	-0.080	-0.017
	(0.046)	(0.057)	(0.079)	(0.046)	(0.058)	(0.077)
Registration	0.093*	0.084	0.108	0.014	0.000	0.044
	(0.050)	(0.065)	(0.081)	(0.051)	(0.062)	(0.097)
Marketing Index	-0.190**	-0.121	-0.298**	-0.001	0.010	-0.007
	(0.074)	(0.084)	(0.128)	(0.071)	(0.086)	(0.121)
Age	-0.004	-0.006*	-0.001	0.004	0.006*	0.002
	(0.002)	(0.003)	(0.004)	(0.002)	(0.003)	(0.005)
Education	-0.017*	-0.029**	0.011	-0.003	0.002	-0.016
	(0.010)	(0.012)	(0.018)	(0.011)	(0.012)	(0.020)
Muslim	0.067	0.058	0.054	-0.117***	-0.060	-0.271***
	(0.045)	(0.054)	(0.083)	(0.045)	(0.055)	(0.081)
Business Knowledge	0.156	0.134	0.071	-0.011	-0.106	0.060
	(0.122)	(0.156)	(0.213)	(0.120)	(0.152)	(0.202)
Grant	0.021	0.036	0.006			
	(0.056)	(0.066)	(0.084)			
Training				0.020	0.035	0.006
				(0.054)	(0.064)	(0.080)
Observations	644	422	222	644	422	222

*Note: The table reports regressions of treatment status on variables from the baseline survey in 2008. Profit: Monthly profit (log) in the businesses of the entrepreneur. Sales: Monthly sales (log) in the businesses of the entrepreneur. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees in the businesses of the entrepreneur. PRIDE loan: Initial size of loan in PRIDE, in thousand TZS. Investments: Investments in the businesses of the entrepreneur in the last 12 months, excluding additions to stocks, in thousand TZS. Keeping Records: Indicator variable taking the value one if the entrepreneur reports keeping records. Registration: Indicator variable taking the value one if at least one of the businesses of the entrepreneur is registered by the government. Marketing index: An index of marketing initiatives made by the entrepreneur the last year, from zero (no initiatives) to one (initiatives along three dimensions to attract customers). Business knowledge: Test of business skills, share of correct answers.Age: The age of the entrepreneur, in number of years. Education: The number of years of schooling of the entrepreneur. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 3: Stated profit vs. calculated profit

	(1)	(2)	(3)	(4)
Training	0.109**	0.074	0.042	0.038
	(0.049)	(0.048)	(0.046)	(0.039)
Grant	-0.003	-0.015	-0.021	-0.024
	(0.032)	(0.029)	(0.027)	(0.025)
Training*Female	-0.155**	-0.110*	-0.070	-0.063
	(0.063)	(0.059)	(0.057)	(0.051)
Female	0.079*	0.054	0.043	0.035
	(0.046)	(0.043)	(0.042)	(0.036)
Sum Female	-0.045	-0.036	-0.029	-0.025
	(0.040)	(0.035)	(0.034)	(0.032)
Observations	526	510	494	478

*Note: The table reports regressions of the difference between stated profits (log) and calculated profits (log) on treatment status, controlling for gender. Column (1) is for the full sample of active entrepreneurs in the follow-up survey. Columns (2) – (4) are trimmed samples, where we have removed the entrepreneurs with the largest difference between stated and calculated profits. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, ***p<0.01.*

Table 4A: Profits

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.	(5) OLS with covar.	(6) OLS no covar
Training	0.211*	0.253**	0.237*	0.283**	0.265**	0.305***
	(0.117)	(0.115)	(0.130)	(0.127)	(0.115)	(0.115)
Grant	0.057	0.027	0.056	0.025	0.055	0.025
	(0.071)	(0.075)	(0.070)	(0.074)	(0.070)	(0.075)
Training*Female	-0.255*	-0.309**	-0.289*	-0.350**	-0.253*	-0.308**
	(0.150)	(0.150)	(0.171)	(0.169)	(0.149)	(0.148)
Female	-0.027	-0.004	-0.027	-0.004	-0.039	-0.019
	(0.109)	(0.107)	(0.108)	(0.106)	(0.102)	(0.102)
Sum Female	-0.045	-0.057	-0.052	-0.067	0.012	-0.003
	(0.091)	(0.091)	(0.106)	(0.105)	(0.090)	(0.090)
Observations	494	494	494	494	494	494

*Note: The table reports regressions of stated profits (log) on treatment status, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 4B: Profit margin and sales

	(1) Profit Margin ITT	(2) Profit Margin ATET	(3) Sales ITT	(4) Sales ATET
Training	-0.014	-0.015	0.257**	0.288**
	(0.028)	(0.031)	(0.123)	(0.137)
Grant	-0.004	-0.004	0.038	0.036
	(0.016)	(0.015)	(0.073)	(0.072)
Training*Female	0.003	0.003	-0.262*	-0.295*
	(0.033)	(0.037)	(0.157)	(0.177)
Female	-0.013	-0.013	0.044	0.044
	(0.024)	(0.024)	(0.110)	(0.109)
Sum Female	-0.010	-0.012	-0.006	-0.007
	(0.018)	(0.021)	(0.089)	(0.103)
Observations	494	494	494	494

*Note: The table reports regressions of profit margin (stated profits/sales) and sales (log) on treatment status, all regressions controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 5A: Finance and investment

	(1) Total Savings ITT	(2) Total Loans ITT	(3) Total Investments ITT	(4) Consump./Loan ITT
Training	218.059***	173.668**	-38.395	-0.096**
	(82.246)	(78.592)	(177.041)	(0.047)
Grant	6.359	13.988	12.143	-0.050
	(63.705)	(47.380)	(90.523)	(0.033)
Training*Female	-172.751	-174.798*	75.188	0.068
	(107.680)	(91.262)	(196.098)	(0.061)
Female	37.364	52.654	-97.901	0.040
	(75.420)	(57.195)	(167.152)	(0.046)
Sum Female	45.308	-1.130	36.792	-0.028
	(67.688)	(48.473)	(81.628)	(0.038)
Observations	494	494	494	494

*Note: The table reports ITT regressions of total savings, total loans, total investments, and share of consumption of PRIDE loan on treatment status, all regressions controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable (not available in (4)). Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 5B: Employee relations

	(1) No. of workers ITT	(2) No. fired ITT	(3) No. given bonus ITT
Training	-0.053	0.273***	0.141
	(0.200)	(0.086)	(0.161)
Grant	0.015	0.111*	0.020
	(0.104)	(0.066)	(0.079)
Training*Female	0.227	-0.214*	0.035
	(0.226)	(0.112)	(0.182)
Female	-0.226	0.080	-0.102
	(0.181)	(0.054)	(0.140)
Sum Female	0.174	0.059	0.176**
	(0.113)	(0.064)	(0.078)
Observations	494	494	494

*Note: The table reports ITT regressions of total number of workers, total number of fired workers, and total number of workers given bonus on treatment status, all regressions controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, **p<0.05, *** p<0.01.*

Table 5C: Other business practices

	(1) Marketing Index ITT	(2) Commerce ITT	(3) Record Keeping ITT	(4) Registration ITT
Training	0.125***	0.130**	0.255***	-0.087
	(0.045)	(0.059)	(0.065)	(0.070)
Grant	-0.003	-0.067*	0.025	0.056
	(0.027)	(0.034)	(0.040)	(0.035)
Training*Female	-0.049	-0.078	-0.082	0.104
	(0.054)	(0.076)	(0.082)	(0.078)
Female	0.013	0.075	0.024	-0.146**
	(0.041)	(0.056)	(0.066)	(0.064)
Sum Female	0.076**	0.052	0.173***	0.017
	(0.030)	(0.042)	(0.049)	(0.036)
Observations	494	494	494	494

*Note: The table reports ITT regressions of a marketing index, involvement in commerce, record keeping, and formal registration of the business on treatment status, all regressions controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 6A: Business knowledge

	(1) Lab ITT	(2) Survey ITT	(3) Combined ITT	(4) Business Plan ITT
Training	0.044	0.052**	0.161*	-0.048
	(0.040)	(0.024)	(0.089)	(0.079)
Grant	−	0.022	−	0.046
		(0.015)		(0.046)
Training*Female	0.037	-0.023	-0.052	0.192*
	(0.052)	(0.030)	(0.108)	(0.099)
Female	-0.099**	-0.020	-0.110	-0.149*
	(0.041)	(0.021)	(0.080)	(0.076)
Sum Female	0.080**	0.029*	0.110*	0.144**
	(0.033)	(0.017)	(0.060)	(0.058)
Observations	211	494	211	494

*Note: The table reports ITT regressions of business knowledge on treatment status, all regressions controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable (not available for regressions (1) and (4)). Column (1) is from an incentivized test in the lab, column (2) from a non-incentivized test in the follow-up survey. The dependent variable in column (3) is the sum of the performance on the two tests. Grant is not included in columns (1) and (3), since the lab took place prior to the distribution of the business grant. Column (4) reports the result of the business plan competition from the follow-up survey, where the dependent variable is a dummy taking the value one if the plan was justified and zero otherwise. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 6B: Mindset: Lab

	(1) Confidence ITT	(2) Compete ITT	(3) Risk ITT	(4) Time ITT
Training	-0.535	-0.042	-0.834***	-0.001
	(0.440)	(0.512)	(0.315)	(0.119)
Training*Female	1.289**	0.309	1.120***	0.136
	(0.557)	(0.650)	(0.393)	(0.144)
Female	-1.654***	-1.436***	-0.917***	-0.108
	(0.355)	(0.482)	(0.263)	(0.098)
Sum Female	0.754**	0.027	0.229	0.135
	(0.323)	(0.400)	(0.229)	(0.084)
Observations	211	211	211	211

*Note: The table reports ITT regressions of the entrepreneur's confidence, willingness to compete, risk- and time preferences, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, and religion. Confidence is measured on a scale from minus one (worse than others) to one (better than others), willingness to compete is measured as the number of times the entrepreneur decides to compete, risk is measured as the number of times the entrepreneur chooses the risky alternative, and time is a dummy taking the value one if the entrepreneur decides to wait with the payment for five weeks. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table 6C: Mindset: Survey

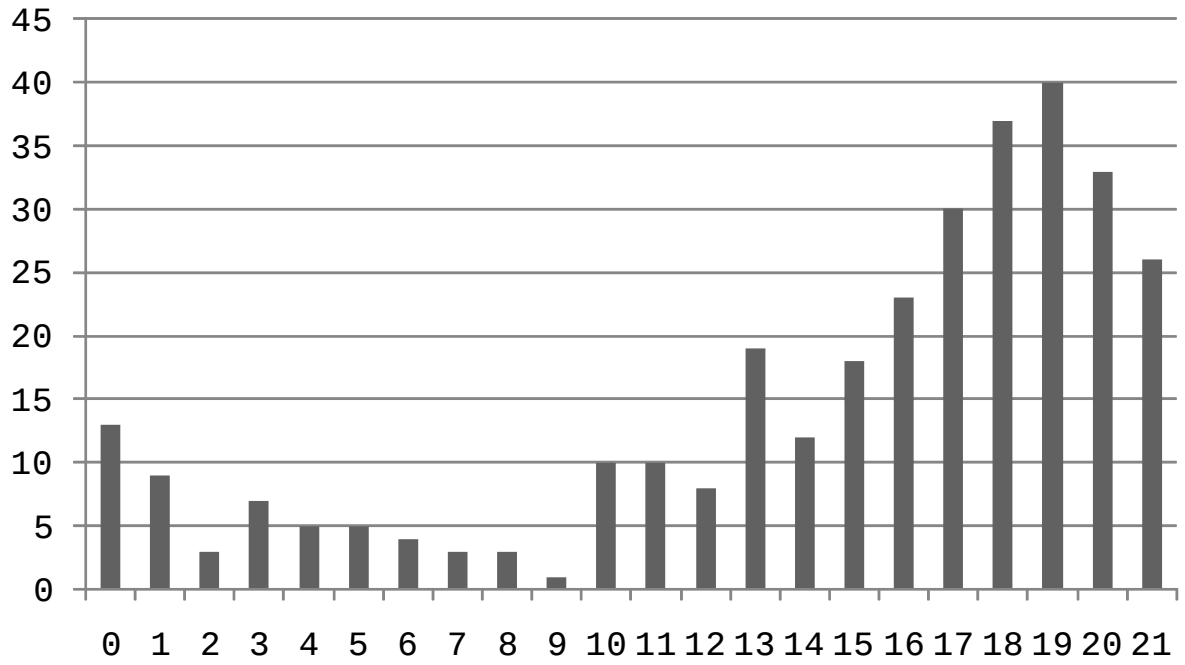
	(1) Quality of worker ITT	(2) Bureaucratic barriers ITT	(3) Market size ITT	(4) Copycatting ITT
Training	0.139**	0.124*	0.001	0.071
	(0.069)	(0.072)	(0.038)	(0.063)
Training*Female	-0.171*	-0.169*	0.053	-0.110
	(0.088)	(0.093)	(0.050)	(0.084)
Grant	-0.050	-0.023	0.033	0.054
	(0.044)	(0.045)	(0.026)	(0.044)
Female	0.060	0.005	0.008	-0.036
	(0.064)	(0.069)	(0.036)	(0.062)
Sum Female	-0.032	-0.045	0.053	-0.039
	(0.054)	(0.055)	(0.033)	(0.055)
Observations	493	493	493	493

*Note: The table reports ITT regressions of the entrepreneur's responses to general mind-set questions in the follow-up survey, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, and religion. The dependent variable is in columns (1)-(3) a dummy variable taking the value one if the entrepreneur does not consider the dimension to represent an obstacle. The three dimensions are the quality of workers, bureaucratic barriers, and market size. The dependent variable in column (4) is a dummy variable taking the value one if the entrepreneur would not prefer to do the same thing as the neighbour. One observation is missing for this part of the follow-up survey. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Appendix A

We here present various tables referred to in the main text.

Figure 1A



Note. The figure shows the distribution of attendance at the training program, with the number of lectures on the horizontal axis and the number of entrepreneurs on the vertical axis.

Table A1: Bounds on profit estimates

	(1) Lower Lee Bound ITT With covar.	(2) Lower Lee Bound ATET With covar.	(3) Original Estimates ITT With covar.	(4) Original Estimates ATET With covar.	(5) Upper Lee Bound ITT With covar.	(6) Upper Lee Bound ATET With covar.
Training	0.083	0.095	0.247**	0.278**	0.303***	0.334***
	(0.108)	(0.122)	(0.115)	(0.128)	(0.113)	(0.124)
Grant	0.003	0.003	0.027	0.025	0.052	0.050
	(0.071)	(0.070)	(0.075)	(0.074)	(0.072)	(0.071)
Training*Female	-0.179	-0.209	-0.303**	-0.343**	-0.207	-0.222
	(0.142)	(0.162)	(0.150)	(0.169)	(0.143)	(0.160)
Female	-0.009	-0.008	-0.010	-0.010	-0.024	-0.025
	(0.107)	(0.106)	(0.107)	(0.106)	(0.106)	(0.105)
Sum Female	-0.097	-0.114	-0.056	-0.066	0.096	0.112
	(0.088)	(0.103)	(0.090)	(0.105)	(0.084)	(0.096)
Observations	477	477	494	494	477	477

*Note: The table reports upper and lower bounds for the ITT and ATET estimates of the treatment effect on profits, following the approach in Lee (2005) and controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A2: Verification of randomization: Lab sample

	(1) Training, Full Sample	(2) Training, Female	(3) Training, Male
Profit (log)	-0.012	-0.054	0.168
	(0.078)	(0.107)	(0.124)
Sales (log)	0.004	-0.008	-0.019
	(0.066)	(0.095)	(0.090)
Commerce	-0.037	-0.145	0.072
	(0.091)	(0.114)	(0.163)
Service	0.089	0.012	0.182
	(0.103)	(0.126)	(0.158)
Manufacturing	0.144	0.039	0.252
	(0.117)	(0.179)	(0.156)
Employees	0.002	-0.009	0.025
	(0.029)	(0.032)	(0.055)
PRIDE loan	0.103	0.205	-0.024
	(0.168)	(0.205)	(0.289)
Investments	-0.081	-0.042	-0.347***
	(0.054)	(0.079)	(0.109)
Keeping records	0.117	0.043	0.176
	(0.080)	(0.101)	(0.148)
Registration	0.153*	0.108	0.222
	(0.085)	(0.119)	(0.162)
Marketing index	-0.263**	-0.268*	-0.221
	(0.117)	(0.146)	(0.179)
Age	-0.002	-0.005	0.006
	(0.005)	(0.006)	(0.009)
Education	-0.023	-0.043**	0.012
	(0.016)	(0.019)	(0.035)
Muslim	0.052	0.013	-0.058
	(0.078)	(0.106)	(0.130)
Business knowledge	0.111	-0.014	-0.166
	(0.215)	(0.301)	(0.347)
Observations	211	137	74

*Note: The table reports regressions of treatment status on variables from the baseline survey in 2008 for the entrepreneurs taking part in the lab experiment in March 2009. Profit: Monthly profit (log) in the businesses of the entrepreneur. Sales: Monthly sales (log) in the businesses of the entrepreneur. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees in the businesses of the entrepreneur. PRIDE loan: Initial size of loan in PRIDE, in thousand TZS. Investments: Investments in the businesses of the entrepreneur in the last 12 months, excluding additions to stocks, in thousand TZS. Keeping Records: Indicator variable taking the value one if the entrepreneur reports keeping records. Registration: Indicator variable taking the value one if at least one of the businesses of the entrepreneur is registered by the government. Marketing index: An index of marketing initiatives made by the entrepreneur the last year, from 0 (no initiatives) to 1 (initiatives along three dimensions to attract customers). Business knowledge: Test of business skills, share of correct answers. Age: The age of the entrepreneur, in number of years. Education: The number of years of schooling of the entrepreneur. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, ***p<0.01.*

Table A3: Baseline values by gender: Trimmed sample

	(1) Full sample	(2) Male	(3) Female	(4) Difference
BUSINESS OUTCOMES				
Profit	544.692	606.770	511.828	94.942**
	(19.354)	(37.609)	(21.728)	(40.498)
Sales	2263.485	2911.545	1920.395	991.151***
	(119.517)	(234.655)	(130.392)	(247.475)
Profit margin	0.335	0.316	0.345	-0.030*
	(0.008)	(0.015)	(0.010)	(0.017)
SECTOR				
Commerce	0.664	0.661	0.666	-0.005
	(0.021)	(0.036)	(0.026)	(0.045)
Service	0.399	0.269	0.467	-0.198***
	(0.022)	(0.034)	(0.028)	(0.046)
Manufacturing	0.170	0.281	0.111	0.169***
	(0.017)	(0.034)	(0.018)	(0.035)
SCALE OF BUSINESS				
Employees	1.093	1.263	1.003	0.260*
	(0.068)	(0.123)	(0.081)	(0.143)
PRIDE loan	776.113	766.667	781.115	-14.448
	(10.661)	(18.248)	(13.146)	(22.422)
Investments	216.649	274.444	186.051	88.394
	(25.857)	(53.399)	(27.571)	(54.259)
BUSINESS PRACTICE				
Keeping records	0.648	0.655	0.644	0.011
	(0.021)	(0.037)	(0.027)	(0.045)
Registration	0.229	0.269	0.207	0.062
	(0.019)	(0.034)	(0.023)	(0.040)
Marketing index	0.491	0.493	0.489	0.004
	(0.013)	(0.021)	(0.016)	(0.027)
Business knowledge	0.704	0.718	0.696	0.023
	(0.007)	(0.012)	(0.009)	(0.015)
CHARACTERISTICS OF THE ENTREPRENEUR				
Age	37.990	37.579	38.207	-0.628
	(0.372	(0.659	0.450)	(0.782)
Education	7.933	7.731	8.040	-0.309
	(0.094	(0.148	(0.120)	(0.197)
Muslim	0.670	0.737	0.635	0.102**
	(0.021)	(0.034)	(0.027)	(0.044)
Observations	494	171	323	

*Note: The table reports average values from the baseline survey in 2008 for the trimmed sample of 494 participants. Profit: Monthly profit in the businesses of the entrepreneur, in thousand TZS. Sales: Monthly sales in the businesses of the entrepreneur, in thousand TZS. Profit Margin: Profit/Sales. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees in the businesses of the entrepreneur. PRIDE loan: Initial size of loan in PRIDE, in thousand TZS. Investments: Investments in the businesses of the entrepreneur in the last 12 months, excluding additions to stocks, in thousand TZS. Keeping records: Indicator variable taking the value one if the entrepreneur reports keeping records. Registration: Indicator variable taking the value one if at least one of the businesses of the entrepreneur is registered by the government. Marketing index: An index of marketing initiatives made by the entrepreneur the last year, from zero (no initiatives) to one (initiatives along three dimensions to attract customers). Business knowledge: Test of business skills, share of correct answers. Age: The age of the entrepreneur, in number of years. Education: The number of years of schooling of the entrepreneur. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim. Standard errors in parentheses. p-values are from t-tests of equality; *p<0.10, ** p<0.05, *** p<0.01.*

Table A4: Verification of randomization: Trimmed Sample

	(1) Training, Full Sample	(2) Training, Female	(3) Training, Male	(4) Grant, Full Sample	(5) Grant, Female	(6) Grant, Male
Profit (log)	-0.039	-0.020	-0.009	-0.007	-0.048	0.053
	(0.044)	(0.059)	(0.079)	(0.044)	(0.059)	(0.074)
Sales (log)	0.036	-0.006	0.030	0.003	0.031	-0.007
	(0.040)	(0.056)	(0.063)	(0.041)	(0.056)	(0.065)
Commerce	0.032	0.001	0.076	-0.075	-0.081	0.014
	(0.061)	(0.077)	(0.103)	(0.059)	(0.071)	(0.098)
Service	0.066	0.087	0.038	0.001	-0.054	0.203*
	(0.059)	(0.073)	(0.114)	(0.060)	(0.068)	(0.108)
Manufacturing	0.054	0.107	-0.035	-0.062	-0.157*	0.137
	(0.070)	(0.099)	(0.119)	(0.069)	(0.090)	(0.122)
Employees	-0.001	-0.015	0.025	-0.009	0.007	-0.045
	(0.018)	(0.020)	(0.034)	(0.016)	(0.020)	(0.031)
PRIDE loan	-0.074	0.032	-0.232	-0.032	-0.057	-0.035
	(0.102)	(0.124)	(0.176)	(0.103)	(0.123)	(0.183)
Investments	-0.012	-0.052	-0.022	0.005	0.088*	-0.097**
	(0.044)	(0.058)	(0.052)	(0.042)	(0.045)	(0.042)
Keeping records	0.058	0.010	0.115	-0.057	-0.070	0.019
	(0.050)	(0.064)	(0.087)	(0.052)	(0.067)	(0.087)
Registration	0.087	0.120	0.036	0.046	0.025	0.076
	(0.058)	(0.076)	(0.092)	(0.058)	(0.073)	(0.099)
Marketing index	-0.149*	-0.072	-0.281*	0.031	0.029	0.053
	(0.084)	(0.099)	(0.154)	(0.082)	(0.098)	(0.142)
Age	-0.003	-0.005	-0.002	0.003	0.005	0.002
	(0.003)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)
Education	-0.017	-0.026*	0.010	-0.007	-0.000	-0.029
	(0.012)	(0.014)	(0.022)	(0.012)	(0.014)	(0.023)
Muslim	0.064	0.041	0.075	-0.126**	-0.079	-0.270***
	(0.052)	(0.065)	(0.095)	(0.052)	(0.065)	(0.091)
Business knowledge	0.238*	0.205	0.111	-0.062	-0.072	-0.269
	(0.142)	(0.181)	(0.250)	(0.137)	(0.173)	(0.240)
Grant	-0.009	0.015	-0.030			
	(0.061)	(0.074)	(0.093)			
Training				-0.009	0.015	-0.029
				(0.059)	(0.072)	(0.090)
Observations	494	323	171	494	323	171

*Note: The table reports regressions of treatment status on variables from the baseline survey in 2008 for the trimmed sample of 494 entrepreneurs. Profit: Monthly profit (log) in the businesses of the entrepreneur. Sales: Monthly sales (log) in the businesses of the entrepreneur. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors. Employees: Number of employees in the businesses of the entrepreneur. PRIDE loan: Initial size of loan in PRIDE, in thousand TZS. Investments: Investments in the businesses of the entrepreneur in the last 12 months, excluding additions to stocks, in thousand TZS. Keeping Records: Indicator variable taking the value one if the entrepreneur reports keeping records. Registration: Indicator variable taking the value one if at least one of the businesses of the entrepreneur is registered by the government. Marketing index: An index of marketing initiatives made by the entrepreneur the last year, from zero (no initiatives) to one (initiatives along three dimensions to attract customers). Business knowledge: Test of business skills, share of correct answers. Age: The age of the entrepreneur, in number of years. Education: The number of years of schooling of the entrepreneur. Muslim: Indicator variable taking the value one if the entrepreneur is Muslim. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A5: Stated profit: Full sample

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.	(5) OLS no covar.	(6) OLS with covar.
Training	0.169	0.219*	0.189	0.245*	0.228**	0.278**
	(0.115)	(0.114)	(0.127)	(0.125)	(0.113)	(0.113)
Grant	0.078	0.043	0.077	0.041	0.076	0.040
	(0.070)	(0.072)	(0.070)	(0.072)	(0.070)	(0.072)
Training*Female	-0.245	-0.304**	-0.278	-0.345**	-0.260*	-0.324**
	(0.151)	(0.152)	(0.171)	(0.172)	(0.147)	(0.148)
Female	-0.006	0.017	-0.006	0.018	-0.009	0.013
	(0.110)	(0.109)	(0.110)	(0.108)	(0.104)	(0.104)
Sum Female	-0.076	-0.085	-0.089	-0.100	-0.032	-0.047
	(0.093)	(0.091)	(0.108)	(0.105)	(0.091)	(0.091)
Observations	526	526	526	526	526	526

*Note: The table reports regressions of stated profits (log) on treatment status for the full sample of 526 entrepreneurs, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A6: Stated profit: Trimmed sample (510)

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.	(5) OLS no covar.	(6) OLS with covar.
Training	0.220*	0.261**	0.245*	0.292**	0.275**	0.316***
	(0.114)	(0.112)	(0.126)	(0.124)	(0.112)	(0.112)
Grant	0.050	0.025	0.048	0.022	0.046	0.022
	(0.069)	(0.074)	(0.069)	(0.072)	(0.069)	(0.073)
Training*Female	-0.263*	-0.309**	-0.295*	-0.348**	-0.257*	-0.306**
	(0.148)	(0.149)	(0.167)	(0.167)	(0.146)	(0.147)
Female	-0.017	-0.002	-0.017	-0.002	-0.029	-0.016
	(0.106)	(0.106)	(0.106)	(0.105)	(0.101)	(0.100)
Sum Female	-0.043	-0.048	-0.050	-0.056	0.018	0.010
	(0.090)	(0.090)	(0.104)	(0.104)	(0.090)	(0.090)
Observations	510	510	510	510	510	510

*Note: The table reports regressions of stated profits (log) on treatment status for the trimmed sample of 510 entrepreneurs where the 16 entrepreneurs with the largest difference between stated profits (log) and calculated profits (log) have been removed, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A7: Stated profit: Trimmed sample (478)

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.	(5) OLS with covar.	(6) OLS no covar.
Training	0.210*	0.254**	0.232*	0.280**	0.265**	0.304***
	(0.117)	(0.117)	(0.129)	(0.127)	(0.116)	(0.116)
Grant	0.034	0.001	0.032	-0.003	0.032	-0.002
	(0.072)	(0.077)	(0.071)	(0.075)	(0.071)	(0.077)
Training*Female	-0.256*	-0.313**	-0.286*	-0.351**	-0.256*	-0.312**
	(0.151)	(0.151)	(0.170)	(0.168)	(0.149)	(0.148)
Female	-0.025	0.000	-0.025	0.000	-0.033	-0.013
	(0.107)	(0.106)	(0.106)	(0.105)	(0.103)	(0.102)
Sum Female	-0.046	-0.060	-0.054	-0.071	0.009	-0.009
	(0.091)	(0.091)	(0.106)	(0.105)	(0.090)	(0.090)
Observations	478	478	478	478	478	478

*Note: The table reports regressions of stated profits (log) on treatment status for the trimmed sample of 478 entrepreneurs, where the 48 entrepreneurs with the largest difference between stated profits (log) and calculated profits (log) have been removed, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion, and the lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A8: Calculated profit

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.	(5) OLS with covar.	(6) OLS no covar.
Training	0.164	0.201*	0.184	0.226*	0.221*	0.256**
	(0.119)	(0.119)	(0.132)	(0.131)	(0.118)	(0.119)
Grant	0.077	0.055	0.076	0.053	0.075	0.053
	(0.072)	(0.076)	(0.071)	(0.075)	(0.072)	(0.076)
Training*Female	-0.180	-0.223	-0.203	-0.251	-0.179	-0.221
	(0.154)	(0.155)	(0.175)	(0.175)	(0.155)	(0.156)
Female	-0.078	-0.065	-0.078	-0.065	-0.084	-0.074
	(0.110)	(0.111)	(0.109)	(0.110)	(0.103)	(0.104)
Sum Female	-0.016	-0.021	-0.018	-0.025	0.041	0.035
	(0.093)	(0.093)	(0.108)	(0.108)	(0.094)	(0.095)
Observations	494	494	494	494	494	494

*Note: The table reports regressions on calculated profits (log) for the trimmed sample of 494 entrepreneurs, where the 32 entrepreneurs with the largest difference between stated profits (log) and calculated profits (log) have been removed, controlling for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, marketing index, religion and a lagged dependent variable. Cluster-robust standard errors in parentheses; *p<0.10, ** p<0.05, *** p<0.01.*

Table A9: Profit: Interval regressions

	(1) ITT no covar.	(2) ITT with covar.
Training	0.230*	0.260**
	(0.120)	(0.115)
Grant	0.050	0.037
	(0.076)	(0.077)
Training*Female	-0.280*	-0.326**
	(0.155)	(0.150)
Female	-0.085	-0.072
	(0.107)	(0.104)
Sum Female	-0.049	-0.066
	(0.098)	(0.096)
Observations	494	494

*Note: The table reports interval regressions on stated profits (log) for a trimmed sample where the 32 entrepreneurs with the largest difference between stated profits (log) and calculated profits (log) have been removed, controlling for gender and covariates. The lower bound is defined as min(stated profit, calculated profit) and the upper bound is defined as max(stated profit, operating profit). Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, an index of marketing effort, religion, and a lagged dependent variable (stated profit). Cluster-robust standard errors in parentheses; p<0.10, ** p<0.05, *** p<0.01.*

Table A10: Risk and time preference: Interval regressions

	(1) Interval Regression - Risk	(2) Interval Regression - Time
Training	0.621**	0.021
	(0.295)	(0.138)
Training*Female	-0.838**	-0.149
	(0.376)	(0.168)
Female	0.565**	0.108
	(0.262)	(0.110)
Sum Female	-0.217	-0.128
	(0.217)	(0.097)
Observations	211	211

*Note: The table reports interval regressions on time and risk preferences, following the approach of Benjamin et al. (2010), and controlling for gender and covariates. The dependent variables are the minimum risk premium that the client requires to choose the risky alternative and the log of the minimum continuously compounded weekly interest rate that the participant requires to choose the delayed payment. We control for gender and covariates. Covariates include age, education, number of businesses, PRIDE branch, PRIDE loan size, an index of marketing effort and religion. Cluster-robust standard errors in parentheses; p<0.10, ** p<0.05, *** p<0.01.*

Appendix B-1: Topics in the business training program

1	Entrepreneurship and entrepreneurial character
2	Developing an entrepreneurial behaviour
3	Importance of long-term view and orientation in the business
4	Identification of creative business ideas
5	Understanding of business environment
6	Planning for your business
7	Understanding of the market for your business
8	Marketing strategies/techniques for your business
9	Improving customer service
10	Pillars of good customer service
11	Managing people in your business
12	How to get good workers
13	Allocating responsibilities and appraising employee performance
14	Keeping business records
15	Costing and pricing
16	Managing working capital
17	Sources of finance for small businesses

Appendix B-2: Business Grant Letter

Dear entrepreneur,

Please find enclosed a business grant of 100 000 TZS, which we give to you for free to develop your business. We trust that you will spend this money wisely. The funders of this grant require that we register how this money has been spent. For this purpose, we would like you to make a list of the items that you have spent the business grant on. We will collect this sheet when we visit your business in June-July 2009.

I have invested in the following items:	**TSZ**
1.	
2.	
3.	
4.	
5.	
6.	
7.	
Sum	**100 000**

Date when sheet is collected by research team:

Signed

Appendix B-3: Lab Instructions

[Introduction]

Welcome. We appreciate your willingness to participate in this session, which I will lead. In this session you will be asked to make some economic choices, and you will earn money based on your choices and your performance.

The results from this session will be used in a research project on microcredit and entrepreneurship. It is therefore very important that all of you follow certain rules of conduct. You are not allowed to talk to any of the other participants during the session. If you have any questions or need any help, please raise your hand and one of us will assist you. All cell-phones must be turned off and put away If someone does not follow these instructions, we will have to ask him or her to leave the workshop.

If you need to go to the bathroom during the workshop, please raise your hand. Importantly, do not leave the room without permission.

We will now ask you to turn over the sheet which is on your desk. This is the registration form, which I will now read.

My assistant will now collect the sheets.

The session will be conducted under anonymity. It will not be possible for the other participants or anyone else, except for the researchers, ever to find out what choices you make, and hence what you earn in the session. This session consists of three activities. First, you will be asked some general questions not related to business. Second, you will be asked to make some choices under uncertainty. Finally, you will be asked some questions related to business. The activities are completely independent, which means that your performance in one activity has no impact on what happens in the other activities. The estimated time of the whole session is approximately two hours.

In each activity, you can earn money. You will not be informed about how much money you have earned until the end of the session. The payment to you is organized as follows. The researchers keep track of how much money you earn throughout the session. At the end of the session, they prepare an envelope containing the money you have earned, where they will ensure that it is impossible to identify the amount of money inside the envelope simply by looking at it. This envelope will be handed over to you in private when you leave the session.

[First round of questions - fixed rate]

We will now explain the first activity in this session. We will shortly ask you some general questions not related to business. These questions are grouped in five different topics; sports and leisure, math, politics, health and nutrition, and places in Dar es Salaam and Tanzania.

On each topic, we ask you 10 questions, and for each question you can choose between four different answers. Your job is to tick off the correct answer. You should only tick off one alternative. If you tick off more than one alternative, your answer will be considered incorrect. We now provide an example of how you should do this.

Your job is to tick off one of these answers. The correct answer is 67. Hence, if you tick off any of the other numbers, your answer is incorrect. In particular, you should never tick off more than one alternative.

For each correct answer, you are paid the fixed rate of 250 TSZ.

We will now hand out the questions on the first topic, sports and leisure, but please do not turn over the page before you are told to do so.

You can now turn over the sheet. First, now and for all sheets that you receive, make sure that you fill in your correct desk number, so that we can pay you correctly. We will now read question by question, and then for each question you tick off what you think is the correct answer.

Is this clear to everyone? If not, then please raise your hand and we will assist you.

I'll now start reading the first question.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the second topic, math. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the third topic, politics. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the fourth topic, health and nutrition. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the fifth topic, places in Dar es Salaam and Tanzania. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet

You have now answered all the questions on this topic. My assistants will now collect the sheets.

[Second round of questions – competition]

You have now completed the first set of questions on the five topics.

We will now ask you to answer a second set of questions on the same topics. This time, however, we will give you a choice between two different kinds of payment. One option for you is to work for the same fixed rate as you did with the first set of questions, namely that you receive 250 TSZ for each correct answer. Alternatively, you may choose to enter into a competition. Your payment will then depend on how well you perform relative to other microcredit clients from PRIDE. Let us explain in

more detail. We collected a group of microcredit clients at the same loan level as you from a different branch in PRIDE. We asked them to answer the same kind of questions as you will now answer, and we then calculated the average number of correct answers among these microcredit clients. It is this average that you can choose to compete against. In the following, for short, we will refer to this average as the performance of a typical microcredit client. If you decide to compete, you will be paid TSZ per correct answer if you provide at least as many correct answers as the typical microcredit client. However, if you provide fewer correct answers than the typical microcredit client, you will receive nothing.

To give an example, suppose that the typical microcredit client provides 5 correct answers, and you manage to provide 6 answers correctly. If you chose to compete, you will then be rewarded the high rate of 750 TSZ per correct answer. However, if you only manage 4 correct answers, which is less than 5, you will receive nothing.

On the other hand, if you choose not to compete, you will always be rewarded the fixed rate of 250 TSZ for each correct answer.

The choice you have to make is summarized on the overhead projector.

To repeat, if you choose not to compete you will earn 250 TSZ per correct answer. If you choose to compete, you will earn 750 TSZ per correct answer if you correctly answer at least as many as the typical microcredit client. Otherwise, you will receive nothing. Please raise your hand if you don't understand.

You can choose between the fixed rate and the competition for each of the five topics. We will soon hand out a sheet where you have to make this choice for sports and leisure. However, let us first provide you with an example of how to do this. Look at this overhead:

To repeat: First, you are asked to state whether you think you are better than, equally good as, or worse than a typical microcredit client in answering questions on sports and leisure. Second, you are asked to decide whether you want to work for a fixed rate or compete when answering questions on sports and leisure. Is this clear to everyone? If not, please raise your hand.

We will now hand out this sheet. Please do not turn over the sheet before you are told to do so.

I will now read the sheet.

We will now collect the sheet for sports and leisure

We will now hand out the same sheet for the second topic, math. Please do not turn over the sheet before you are told to do so.

I will now read the sheet.

We will now collect the sheet for math

We will now hand out the same sheet for the third topic, politics. Please do not turn over the sheet before you are told to do so.

I will now read the sheet.

We will now collect the sheet on politics.

We will now hand out the same sheet for the fourth topic, health and nutrition. Please do not turn over the sheet before you are told to do so.

I will now read the sheet.

We will now collect the sheet for health and nutrition.

We will now hand out the same sheet for the fifth topic, places in Dar es Salaam and Tanzania. Please do not turn over the sheet before you are told to do so.

I will now read the sheet.

We will now collect the sheet for places in Dar es Salaam and Tanzania.

We will now hand out the second set of questions, where again we start with sports and leisure. Please do not turn over the sheet until you are told to do so.

I'll now start reading the questions on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the second topic, math. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the third topic, politics. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the fourth topic, health and nutrition. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will collect the sheets, and hand out the questions for the fifth topic, places in Dar es Salaam and Tanzania. Again, please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on this topic. My assistants will now collect the sheets.

You have now completed this part of the session. Our assistants will now calculate what you have earned in answering these questions, and prepare your payment from this part of the workshop. You will receive this payment at the end of the workshop.

[Choices under uncertainty]

We now move to the second part of the workshop, where you also can earn money, but in a different way. Let's explain in more detail.

First, we will simply give each of you 1000 TSZ. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take the risk, then you can be lucky or unlucky. If you are lucky, you will get 6000 TSZ instead of 1000 TSZ. If you are unlucky, you lose the 1000 TSZ and nothing is added to your final payment from this situation

Here is how we decide whether you have been lucky or unlucky. When everyone has made their choice of whether to take the risk or not, we prepare two pieces of paper; one piece with the word LUCKY, the other piece with the word UNLUCKY.

We will then put them into two identical and empty envelopes, and the envelopes will be placed in this bowl. Thus it will be impossible for any of us to identify which envelope contains the word LUCKY. We will randomly select one of you to make the draw of one of the envelopes. If this envelope contains the word LUCKY, we will pay 6000 TSZ to those of you who chose to take risk. However, if this envelope contains the word UNLUCKY, those who chose to take the risk will not receive anything in this situation. Thus, it is equally likely that those who take the risk are LUCKY or UNLUCKY.

For those of you who chose the certain payment, the outcome of this draw does not affect your pay. In any case, you receive the certain payment of 1000 TSZ.

Is this understood? If there are any questions please raise your hands now and we will assist you.

On the overhead, we summarize the choice you have to make.

Is this understood? If there are any questions please raise your hands now and we will assist you.

We will now hand out the sheet where you have to make the choice of whether to risk your 1000 TSZ or keep them. Please do not turn over the sheet until you are told to do so.

You should now make the choice of whether to risk your 1000 TSZ or keep them.

We will now collect the sheet.

We will now proceed to determine the outcome for those of you who took the risk in this situation.

We will now put the envelopes in the bowl, and then decide who should make the draw of one of the envelopes. We do this by picking at random one of the desk numbers from this bowl.

Desk number xx is chosen to pick one of the envelopes.

We will shortly open the envelope and reveal whether the participants who took the risk were LUCKY or UNLUCKY in this situation. However, first we will ask you to make a few more choices of this kind. In the meantime, we post the envelope on the wall.

Now we move on to a new situation. Again, we will give you some money, this time 1500 TSZ. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take the risk, then you can be lucky or unlucky. If you are lucky, you will get 6000 TSZ instead of 1500 TSZ. If you are unlucky, you lose the 1500 TSZ and nothing is added to your final payment from this situation

After everyone has made their choice, we will again prepare two envelopes and follow the same procedure as earlier. Thus, it is equally likely that those who take the risk are LUCKY or UNLUCKY.

Is this understood? If there are any questions please raise your hands now and we will assist you.

On the overhead, we summarize the choice you have to make.

We will now hand out the sheet where you have to make the choice of whether to risk your 1500 TSZ or keep them. Please do not turn over the sheet until you are told to do so.

You should now make the choice of whether to risk your 1500 TSZ or keep them.

We will now collect the sheet.

We will now proceed to determine the outcome for those of you who took the risk in this situation.

We will now put the envelopes in the bowl, and then decide who should make the draw of one of the envelopes.

Desk number xx is chosen to pick one of the envelopes.

Now we move on to the next situation. Again, we will give you some money, this time 2000 TSZ. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take the risk, then you can be lucky or unlucky. If you are lucky, you will get 6000 TSZ instead of 2000 TSZ. If you are unlucky, you lose the 2000 TSZ and nothing is added to your final payment from this situation

After everyone has made their choice, we will again prepare two envelopes and follow the same procedure as earlier.

On the overhead, we summarize the choice you have to make.

We will now hand out the sheet where you have to make the choice of whether to risk your 2000 TSZ or keep them. Please do not turn over the sheet until you are told to do so.

You should now make the choice of whether to risk your 2000 TSZ or keep them.

We will now collect the sheet.

We will now proceed to determine the outcome for those of you who took the risk in this situation.

We will now put the envelopes in the bowl, and then decide who should make the draw of one of the envelopes.

Desk number xx is chosen to pick one of the envelopes.

We now turn to the last situation in this section of the workshop

Again, we will give you some money, this time 2500 TSZ. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take the risk, then you can be lucky or unlucky. If you are lucky, you will get 6000 TSZ instead of 2500 TSZ. If you are unlucky, you lose the 2500 TSZ and nothing is added to your final payment from this situation

After everyone has made their choice, we will again prepare two envelopes and follow the same procedure as earlier.

On the overhead, we summarize the choice you have to make.

We will now hand out the sheet where you have to make the choice of whether to risk your 2500 TSZ or keep them. Please do not turn over the sheet until you are told to do so.

You should now make the choice of whether to risk your 2500 TSZ or keep them.

We will now collect the sheet.

We will now proceed to determine the outcome for those of you who took the risk in this situation.

We will now put the envelopes in the bowl, and then decide who should make the draw of one of the envelopes.

Desk number xx is chosen to pick one of the envelopes.

We have now completed all four situations in this part of the session.

We will now, for each of the four situations, reveal whether those who took the risk were lucky or unlucky. Let us start with the first situation.

Those who took the risk in the first situation were….

You have now completed the second part of this session. Our assistants will now calculate what you have earned when making these choices, and prepare your payment from this part of the workshop. You will receive this payment at the end of the workshop.

[Best practices in business - fixed rate]

We now move to the third part of the workshop, where you can also earn money. You will be asked to answer 10 questions about best practices in running a business. Also here, for each question, you can choose between four different answers. Your job is to tick off the correct answer. Please remember only to tick off one alternative for each question. If you tick off more than one alternative, we will consider your answer as incorrect. For each correct answer, you are paid a fixed rate of 250 TSZ.

We will now hand out the sheet with business questions. Please do not turn over the sheet before you are told to do so.

I'll now start reading the questions that are on your sheet.

You have now answered all the questions on best business practices. My assistants will now collect the sheets.

[Best practices in business – competition]

We will now ask you to answer a second set of questions on best practices in business. This time, however, we will give you a choice between two different kinds of payment. One option for you is to work for the same fixed rate as you did with the first set, namely that you receive 250 TSZ for each correct answer. Alternatively, you may choose to enter into a competition. Your payment will then depend on how well you perform relative to a typical microcredit client. If you decide to compete, you will be paid 750 TSZ per correct answer if you provide at least as many correct answers as the typical microcredit client. However, if you provide fewer correct answers than the typical microcredit client, you earn nothing.

We will now hand out a sheet where you are asked to decide whether you want to work for a fixed rate or compete on this topic. As before, you are also asked to state whether you think you are better than, equally good as, or worse than a typical microcredit client in answering questions on best practices in business.

I'll now read the sheet.

We will now collect the sheet for business.

We are now ready to give you the second set of questions on business practices.

I'll now start reading the questions.

You have now answered all the questions on this topic. My assistants will collect the sheets.

You have now completed the last part of the session. My assistants will now prepare the payments you have earned throughout the workshop before you leave. This will be paid to you just after the session.

Additionally, you will be paid an amount as compensation for participating. Your participation compensation will be handed over to you by your PRIDE branch manager.

This is how we will proceed for the participation compensation. You can choose between three alternatives.

To repeat: First alternative: You can choose to receive your participation compensation one week from now, on Monday March 23. You will then receive a participation compensation of 15,000 TSZ.

Second alternative: You can choose to receive your participation compensation three weeks from now, on Monday April 6. You will then receive a participation compensation of 20,000 TSZ.

Third choice: You can choose to receive your participation compensation five weeks from now, on Monday April 20. You will then receive a participation compensation of 25,000 TSZ.

Based on your choice, we will give you a signed letter to certify your right to receive your participation compensation, and date of collecting the payment from your branch manager. For the branch manager, we will prepare an envelope with your name and a specification of your chosen payment date on the envelope, and your participation compensation inside of it. We will prepare the envelope so that it is impossible for anybody, including the branch manager, to identify its content.

Is this understood? Please raise your hand if you have any questions.

We will now hand out the sheet where you choose the date of payment for your participation compensation.

Now my assistants will collect your papers.

This ends the workshop. Our assistants will now prepare your payments.

In addition to the payment from this session and the participation compensation, we are happy to announce that we will also give each of you, as a gift, a business grant of 100,000 TSZ, which you can use to develop and expand your business. This grant will be handed over in a separate envelope after the session. We trust that you will spend this money wisely on developing your business, and wish you all the best in your future business activities.

The funders of this business grant require that we register how this money has been used. For this purpose, we ask you to specify how you spent the grant. In the envelope containing the business grant, there is a sheet for this purpose. We will collect this sheet when we visit your business in June/July 2009.

While we are waiting for the assistants to prepare the payments which you have earned, we would like to offer you some refreshments. After the refreshments we will give you an envelope with your payment and the signed sheet for your participation compensation, and an envelope with the business grant.

We would like to thank you all for participating in this session. Your input will be most valuable for our research project on microcredit and entrepreneurship. May we ask you not to discuss this session with others before the end of this week, since we will arrange further sessions with other microcredit clients the coming days. Please leave the pen on your desk when you leave the room. Again, thank you for your participation in this workshop.

Chapter 2

Business training in Tanzania: From research driven experiment to local implementation

Business training in Tanzania:
From research driven experiment to local implementation

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Abstract

Field experiments documenting positive treatment effects have a strong policy message: Scale up! However, such experiments are typically implemented under the close supervision of the research group in charge of the study. In contrast, scaling up would typically imply relying on local organization. It is not obvious that the positive treatment effects identified in the research-led intervention can be replicated locally. The present study explicitly addresses this challenge by analysing the local version of a research-led business training program among small-scale microfinance entrepreneurs in Tanzania. Comparing attendance in the local and external programs, we find that success in local implementation cannot be taken for granted. The paper also analyses the effect of business training on outcome variables of interest to the microfinance institution, and provides evidence on willingness to pay for training. We conclude that i) business training can be successfully implemented locally when the institutional environment is right; ii) training is likely to be beneficial to the microfinance institution; and iii) it should be possible to charge a participation fee that covers most of the cost of such a program.

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1. Introduction

A recent literature in development economics has used field experiments to investigate a host of issues of importance to policy makers, including the role of community participation in improving health services (Björkman and Svensson 2009), the effect of deworming on educational outcomes (Kremer and Miguel 2003), and the extent to which business training can increase profits for microentrepreneurs (Karlan and Valdivia, forthcoming, Berge *et al.*, 2011). These studies evaluate carefully implemented interventions, closely monitored by a research team. To draw policy implications, however, one would like to know what the effect of a program is when the researchers have stepped back, and what the willingness of local stakeholders is to implement such a program. Success in the research-driven experiment does not automatically translate into success when the program is implemented locally, and does not always capture all objectives of importance to the local stakeholders.

The difficulty of scaling up is particularly pressing when the program is complex, such as business training, where the intervention stretches over time, and where the organizational setting and skills of the teachers matter greatly for the quality of the service provided. As emphasized by Sternberg *et al.* (forthcoming) when analyzing the challenges of scaling up educational programs: "Programs often work on a small scale due to adoption by highly motivated individuals. Moreover, in the context of small-scale implementations, a key factor is often the proximity of the creators of the program to its first adopters and implementers. This proximity implies not only the physical proximity, but also the proximity of ideas and beliefs—those educators who are willing to try new programs usually see a value in doing so and thus are more predisposed to raise the odds of the program to succeed. Therefore, programs may work on a small scale, but they fail when they are upscaled because the initial sample of the program's deliverers was not representative of the larger population" (p. 9).

In Bjorvatn and Tungodden (2010) and Berge *et al.* (2011), we document that a business training program given by professional trainers from the University of Dar es Salaam Entrepreneurship Centre (UDEC) significantly affected business skills, entrepreneurial attitudes, business practices, and business outcomes among microfinance clients of the microfinance institution Promotion of Rural Initiative and Development Enterprise (PRIDE) Tanzania. For PRIDE, the business training program was seen as a pilot project that, if successful, would be implemented in one form or another by PRIDE itself. However, two

important questions remain, even if positive effects are documented for the clients: Can PRIDE implement the program? Do they want to implement it?

First, we discuss the question of whether PRIDE can implement the program. Because outsourcing business training to professional trainers, such as UDEC, is expensive and hard to implement on a large scale in Tanzania, an important question for PRIDE is whether such a program can be offered in-house by PRIDE credit officers. Would the quality of such an internal program be sufficiently high to attract the attention of the entrepreneurs, as was the case for the course offered by the professional trainers?

The second question is whether PRIDE want to implement the program? In Berge *et al.* (2011), we document a positive impact of business training on business outcomes, in particular for male entrepreneurs. Thus, from a societal point of view, business training is likely to be beneficial. However, as stressed by Armendãriz de Aghion and Morduch (2010), a microfinance institution typically balances social impacts on the one hand and financial sustainability on the other hand, which means that PRIDE also has to consider the benefits and costs for the institution from offering the training. One motive for PRIDE to offer business training to its clients on a regular basis is clearly that this could give PRIDE a competitive edge over other microfinance institutions and, thus, attract more customers. Another motive is that business training could improve the quality of PRIDE's clients, in the sense that the clients would be more loyal to the bank, and that increased business skills would translate into higher loans and fewer payment problems. However, it not obvious that increased business skills would lead to higher loans and fewer exits. Indeed, a more knowledgeable and successful entrepreneur may find cheaper sources of finance outside of the microfinance institution, which, after all, charges a relatively high interest rate on the loans, as well as imposing other conditions such as joint liability and frequent loan meetings. If training triggers the exit of clients, the microfinance institution may become more reluctant to offer such services to its clients. Further, PRIDE's decision on whether to offer the training would also depend on the entrepreneurs' willingness to pay for such a course. Do PRIDE have to offer the program for free to make it attractive to the clients, or can they cover the costs by imposing a participation fee?

The remainder of the paper is organized as follows. Section 2 briefly describes the intervention, a business training program offered to microfinance entrepreneurs in Dar es

Salaam, Tanzania. Section 3 presents the empirical strategy, with an emphasis on randomization procedures, and Section 4 reports the results. Section 5 summarizes the feedback on the training program by the external trainers, and Section 6 concludes the paper.

2. The training program

The business training program consisted of 21 sessions, each lasting 45 minutes, and was offered at the premises of PRIDE immediately after the weekly loan meeting. The aim of the program, which commenced in August 2008 and ended in January 2009, was to unleash entrepreneurship among their clients. The course covered a range of topics, such as record keeping, marketing practices, customer care, and employee management. It was developed by the University of Dar es Salaam Entrepreneurship Centre (UDEC), and piloted extensively.[19] The trainers from UDEC implemented the course at two branches chosen for the study, and taught each session four times at each branch. There was neither a course fee nor any sitting allowances.

For capacity building purposes, PRIDE chose four of its credit officers to follow the training given by UDEC. The credit officers would then lecture on the same topic to a fifth group of entrepreneurs. The professional trainers also attended these lectures in order to give feedback on the performance of the credit officers.

3. Empirical strategy

The two main questions addressed in the present analysis are: first, is the microfinance institution capable of offering a training program of a sufficiently high quality?; and second, would it be in the interest of the microfinance institution to offer such a course? In order to address the first question, we focus on the attendance at the sessions offered by the professional trainers (external training) and by the local credit officers (internal training), with a high attendance indicating high quality. Regarding the second question, we focus on membership in PRIDE. If business training leads to massive exit from the institution, as trained clients for instance qualify for less expensive loans in ordinary banks, the institution may not benefit from offering such a program.

[19] The training program is described in detail in Berge *et al.* (2011).

We use the idea of a randomized field experiments to address these questions.[20] Two groups were randomly chosen, one of which was offered a treatment (the treated group), whereas the other (the control group) was not. As the two groups, on average, should be identical in terms of observables and, more importantly, unobservables, any post-treatment difference between the two groups captures the causal impact of the intervention.

In the present paper, we investigate two interventions. In the first, which we call the type-of-training experiment, the treated group is the internally trained group (or "internal group", for short), and the control group is the externally trained group (the "external group"). In the second intervention, which we call the impact-of-training experiment, the treated group is the group offered training, whereas the control group is the group not offered training.

3.1 Randomization procedures

We selected two of PRIDE's branches in Dar es Salaam for the interventions, the Magomeni and Buguruni branches, which we refer to as Branch A and Branch B, respectively, in the following. For the impact-of-training experiment, we randomly chose two days for training and two days for non-training. More precisely training was carried out on Tuesdays in Branch A, and on Thursdays in Branch B. For the control group, we chose Mondays in Branch A and Wednesdays in Branch B. By choosing treatment and control on different days, we minimized spillovers from the treatment group to the control group.

As loan groups were randomly assigned a loan meeting day and hour according to the availability of time slots at the branches, there is no reason to believe that there was any systematic difference between clients according to the day of the loan meeting. Thus, the entrepreneurs were effectively randomly assigned to either training or no training. This allows us to identify a causal effect of training on the outcomes of interest.[21]

For the type-of-training experiment, we randomly chose one hour of the day for the internal training. More precisely, the internal session was offered to clients who had their loan

[20] On the methodology of randomization, see Duflo *et al.* (2008). For a critical perspective, see Deaton (2009) and Rodrik (2009).
[21] Berge *et al.* (2011) analyze in detail the effect of the training program offered by UDEC on business-related issues.

meeting at 2 pm, while the four external training sessions were offered to clients who had their loan meetings between 9 am and 1 pm. As the hour the of loan meeting was allocated according to availability, there is no reason to believe that the loan groups were different in any systematic way according to the hour of their loan meeting.

For both interventions, we only considered clients with PRIDE loans between 500 000 TZS and 1 000 000 TZS, amounts that represented the second and third steps on the loan ladder in the group lending program. This was motivated by the fact that there were very high dropout rates among clients with smaller loans, and also that we wanted to avoid an excessively heterogeneous target group for the lectures.

For the impact-of-training experiment, we conducted a baseline survey among the clients eligible for training or non-training. We managed to interview 644 of the 1164 eligible clients (319 from the training group and 325 from the non-training group). The baseline survey was presented to the entrepreneurs as an effort "to identify strategies to improve the functioning of microcredit institutions in Tanzania", and, hence, they were not informed about the prospective business training course. After the baseline survey, the clients we had reached through the training group received an invitation to attend training, whereas the clients we had reached through the non-training group constituted the control group for this intervention. Table 1 indicates that the randomization procedure was successful, in that the treatment and control groups in the impact-of-training experiment were in terms of a set of observable background characteristics.

For the type-of-training experiment, we did not conduct a baseline survey of the clients who were eligible for the internal training because we did not initially plan to include them in the research part of the project. For this group, therefore, we invited all eligible clients that we could reach at the loan meeting where the training was announced. Effectively, the share of eligible clients that we reached for the internal group was close to the share of clients that we reached with the baseline survey and, thus, we made the working assumption that the pool of invited clients for the internal training was the same size as the pool of invited clients for the external training. Moreover, the letter of invitation to training was the same for all clients and, hence, they did not know ex ante that two different training programs, one internal and one external, were going to be implemented. We therefore argue that there should not be any systematic difference between the pool of clients that showed up initially for the external

training or the internal training. Hence, despite the slight difference in recruitment procedure, we shall think of the type-of-training experiment as a randomized experiment, with the group showing up initially at the internal session as the treated group, and the group showing up initially at the external sessions as the control group.[22]

3.2 Treatment–control balances

Table 2 shows the balance between the treatment and control groups in the impact-of-training experiment. There were 644 individuals in this sample, of which 319 were trained and 325 were not trained. Except for the fact that there were somewhat more females in the control group (69%) than in the trained group (62%), the difference being significant at the 10% level, the table shows no difference between the two groups on observables. In both groups, the average participant is around 40 years old, with a PRIDE loan of 770 000 TZS (USD 510), and just under eight years of schooling. This equality in background variables is also consistent with the fact that there is no systematic difference between clients according to the day of the loan meeting.

Table 1 shows the balance between the treatment and control groups in the type-of-training experiment.[23] The sample consisted of 349 clients, all of whom attended either the first or the second session of the program. Of these, 290 belonged to the external group and 59 to the internal group. The external group was divided into four classes in Branch A, classes A1–A4, and four classes in Branch B, classes B1–B4. For the internal group, there was one class in each branch, A5 and B5.[24]

There are no significant differences between the two groups on observable background variables, which indicates that the randomization procedure was successful. This is also consistent with there not being any systematic difference between clients according to the hour of the loan meeting.

[22] We focus on clients who attended the first and the second session, at which point it was not clear to the participants that the programs were different. The first session was an introduction to the course, and in this lecture the external trainer played a leading role in the internal the as well as the external program. Gradually, however, as the internal trainer became more experienced, the external trainer simply took the role of observer in the internal program. Focusing only on those who attended the first session gives very similar results, but the sample size is naturally smaller.

[23] Table 1 includes a variable on prior business knowledge, collected in the baseline survey and thus not available for the internal group. Hence, this variable is not included in Table 2.

[24] Figure 1A in the Appendix reports attendance rates for each of the six sessions.

3.3 Econometric models

For the impact-of-training experiment, we estimate the following equation:

$$Y_i = \beta_0 + \beta_1 Training_i + \gamma X_i + \varepsilon_i \quad (1)$$

where *Y* is an outcome variable, *Training* is a binary variable taking a value of one if the entrepreneur was offered trained and zero if not, and *X* is a vector of control variables. Given that there are no systematic differences between the group that was offered training and the control group, β_1 measures the causal impact of the training on the outcome variable. For the type-of training-experiment, we estimate the following equation:

$$Y_i = \beta_0 + \beta_1 Internal_i + \beta_2 Internal_i * Branch_i + \beta_3 Branch_i + \gamma X_i + \varepsilon_i \quad (2)$$

where *Y* is an outcome variable, *Internal* is a binary variable taking a value of one if training was internal and zero if it was external, *Branch* is a binary variable taking a value of one for Branch B and zero for Branch A, *Internal*Branch* is an interaction term, indicating whether the internal training at Branch B had a different impact on attendance than did the internal training in Branch A, and *X* is a vector of control variables.

Our focus on the interaction term between internal training and the branch, and not on external training and the branch, is based on the fact that external training was standardized across branches, with the same teacher giving the lecture in both branches. In contrast, the internal trainers were branch specific. Moreover, it is plausible that the local environment at the branch could have had a greater impact on the internal training program than it did on the external one. For instance, the added attraction of professional trainers from the university could be necessary to overcome turbulence and delays at the loan meetings, factors which could lead to dropouts from an internal program.[25]

Finally, we study the willingness to pay for training by estimating the following equation:

$$Y_i = \beta_0 + \gamma X_i + \varepsilon_i \quad (3)$$

[25] We also considered whether the external training differed across branches, but found no significant effects. Therefore, the branch variable was not included in the econometric model for the impact-of-training experiment.

where *X* is a vector of background variables. Note that because we are most interested in the willingness to pay for business training for those who have not received such training, i.e., the control group, we are not looking for treatment effects on this issue.

4. Results

4.1 The type-of-training experiment: Can they do it?

Is the local institution able to offer a high-quality course in-house? In order to answer this question, we focus on attendance, the assumption being that if quality is low, attendance will be low as well.

We start the analysis of attendance with an overview of the evolution of attendance over time for the different branches and types of training, conditioned on attendance in either the first or second session (see Figure 1).

The figure shows average attendance for the four externally trained classes, A1–A4, and B1–B4, compared with the two groups of internally trained clients, A5 and B5. We can clearly see that for class B5, which is marked with a dashed line, attendance dropped substantially more after the first two sessions than was the case for the other three groups. In fact, the average attendance for B5 was 10 out of the 21 sessions, compared with 16 sessions for the internally trained in the other branch (class A5), and, again, 16 for the externally trained classes in each branch. Strikingly, attendance for class B5 was the lowest among all classes for all sessions except one.

Table 3 shows the result from estimating Equation 2, and confirms the impression from Figure 1.[26] As our sample is limited to those who actually showed up at the first or second sessions, we measured attendance by attendance at all subsequent lectures, i.e., from class 3 to class 21. Regression (1) shows the results without covariates, and regression (2) with covariates. We find no statistically significant difference in attendance between the internally and externally trained groups in Branch A. Indeed, if anything, the coefficient on Training Internal is positive, indicating a higher attendance for the internally trained group than for the

[26] In Bjorvatn and Tungodden (2010), we focus on how background variables from a lab experiment may shed light on attendance in the external training program.

externally trained group in Branch A.

The interaction term is negative and significant at the one per cent level. It shows an average difference in attendance between the internally trained groups in the two branches of more than six lectures. This is a quantitatively large difference, corresponding to one quarter of the total course.

Finally, we observe that attendance is not related to gender, number of years at school (education), or loan size at PRIDE. However, regression (2) shows that attendance was somewhat higher for people above median age, possibly due to younger entrepreneurs having more extensive domestic obligations.

Our data do not allow us to identify the reasons for the difference in success in implementing the internal program between the two branches. It could be the result of teacher-specific factors or the local environment in which the training took place, such as physical infrastructure or organization of loan meetings, or perhaps a combination of personal and institutional factors. Hence, our analysis suggests that the answer to the question "Can they do it?" is yes, but that success cannot be taken for granted and is sensitive to the local conditions.

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4.2 The impact-of-training experiment: Should they do it?

In order to address this question, ideally we would have liked to analyze the impact of the locally implemented course. However, as noted earlier, we do not have a control group of untrained clients for the internal group and, hence, we are limited to studying the effect of the external training program on outcomes of relevance to PRIDE. Nevertheless, we know from the analysis above that PRIDE seems to be able to implement a program of similar quality when the conditions are right. Therefore, any results on the impact of external training can serve as an indicator of how a successfully implemented program may affect PRIDE.

By offering a training program, a microfinance institution could potentially obtain both better clients (higher loan levels, fewer repayment problems) and more clients (existing clients stay, training attracts new clients). However, of course, training is costly, even if implemented locally. Some, or all, of these costs may be recovered by a participation fee, but that depends on the clients' willingness to pay. Moreover, training could lead to exit, as trained

entrepreneurs are able to identify alternative, and cheaper, sources of finance for their investments, such as their own savings or loans from ordinary banks. This would reduce the value of training for the institution.

While our data do not allow us to undertake a complete cost–benefit analysis, at least we are able to shed light on some relevant aspects. First, Berge, Bjorvatn, and Tungodden (2011) demonstrate that training has led to improved business practices, such as bookkeeping, and, for male entrepreneurs, higher profits. These positive effects should translate into fewer payment problems, meaning better clients for PRIDE. However, if the trained clients exit, the fact that training has improved their financial performance would be of limited value to PRIDE. We therefore start our analysis by looking at the exit data, and then address the clients' willingness to pay for training.

4.2.1 Exit

Table 4 shows the results from estimating Equation 1, with the outcome variable being exit from PRIDE. The sample consists of the entrepreneurs interviewed in the baseline survey, and the background variables are also from that survey.

Regression (1) shows that 45 per cent of the clients interviewed in mid-2008 had exited the microfinance institution two and a half years later. Interestingly, training had no effect on the exit rate. Thus, any fears within PRIDE of the training leading clients to exit are not supported by the data, but, of course, neither is the hope that training would lead to more loyal clients.

Regarding the control variables, we observe a lower propensity to exit amongst the higher-age clients. This could well reflect the fact that older clients have a longer relationship with PRIDE and also have more well-established businesses. The size of the latest PRIDE loan, gender, and education do not relate systematically to the exit decision.

In sum, together with the observation documented in Berge *et al.* (2011) that training has led to improved business practices, such as bookkeeping, and higher profits (for males), the fact that training does not lead to exit is good news for PRIDE. Any additional effect that training may have in attracting more, and perhaps more attractive, clients, would of course strengthen this conclusion.

4.2.2 Willingness to pay

Offering a business training program is costly. Indeed, the variable cost per participant of the externally provided training program was estimated to be around 100 000 TZS (USD 67). This covers compensation to the trainers, as well as expenses related to providing teaching materials and soft drinks to the participants.

A relevant question for the local institution when considering whether to offer training in-house is whether at least part of their costs can be covered by a participation fee. How much are the entrepreneurs willing to pay for such a training program? In the follow-up survey conducted in mid-2009, we asked the entrepreneurs this question.[27]

One might expect that the answers to this question, which of course should be interpreted with some caution, would depend on whether the respondent had in fact received training or not. Indeed, comparing the responses of the trained and untrained, we find that the average willingness to pay amongst the untrained was 56 400 TZS (approximately USD 37.6), compared with 45 400 TZS (approximately USD 30.3) amongst the trained, the difference of 11 000 TZS being statistically significant at the five per cent level (t-test of equality, p-value = 0.022). This may reflect the fact that the trained clients in general feel a lesser need to undergo yet another training program.

To PRIDE, it is the willingness to pay for the untrained that is more relevant, and, hence, this is the sample we focus on here. The average willingness to pay for this group, 56 400 TZS, is around half of the estimated cost of offering such a course using the external trainers. Presumably, however, PRIDE can organize the course cheaper in-house. Our numbers therefore indicate that it should be possible for PRIDE to cover most of its costs through participation fees.

Interestingly, the average willingness to pay conceals a quite large variation amongst the entrepreneurs, as illustrated by Figure 2. Clearly, while charging a higher price would exclude many clients, quite a few clients declared a willingness to pay close to 100 000 TZS, which in fact would cover all the variable costs of a program given by UDEC. Who are the

[27] The exact question was: "Imagine that you were given the opportunity to participate in a 20-session (with 60 minutes per session) entrepreneurship training course catered to your level. What is the maximum amount you would be willing to pay per session?"

entrepreneurs with the higher willingness to pay for business training? The answer to this question may be of great importance to PRIDE in their consideration of which pricing policy to follow if offering such a course.

Table 5 reports the results from estimating Equation 3, limited to the untrained entrepreneurs. Interestingly, we observe that clients with greater prior business knowledge are more willing to pay for the training, the coefficient suggesting an additional willingness to pay relative to younger clients of 16 600 TZS, corresponding to 30% of the average for the control group (which, as noted above, was 56 400 TZS). This may indicate that PRIDE faces a problem whereby the clients who are in more need of training are less willing to pay for such a course. Thus, these clients may be excluded from training if PRIDE were to charge a price that covered the variable cost of training, which illustrates the difficulty involved in the trade-off between financial sustainability and social impacts. The fact that older people are more willing to pay for the training is consistent with the observation in Table 3 that attendance in the course is increasing with age.

5. External trainers' review

The external trainers' review of the program may be useful for the development and implementation of future training programs, and in this section we discuss some of the main conclusions in the report that they delivered to the research team after the completion of the course.

The external trainers highlight the diverse background of the participants, not only in terms of education, but also with respect to prior business knowledge and experience. This diversity made it challenging to tailor the course to the individual needs of the entrepreneurs. We note, however, that education is not significantly related to attendance in Table 3, which indicates that the trainers managed to present the material in a way that was accessible and interesting for the different types of participants. Nevertheless, the trainers suggest in their report that it could have been useful to supplement the training with individual consulting on specific issues and problems.

Even though the clients has different backgrounds, most of them has the same issues in mind when attending the lectures, for example, *"How can I get more customers?", "How can I get*

a larger loan?", and "How can I make my business more profitable?". Participants enjoyed learning from each other's experiences, and they were willing to share their business challenges and problems. A participatory method was adopted in the training and according to the trainers this motivated participants to be more active and involved throughout the course. The trainers also emphasized the importance of relating the lectures to real world examples, to make the insights more vivid for the entrepreneurs.

Some topics in the training were appreciated more than others according to the trainers, particularly marketing, customer service, recording keeping, and sources of finance. Interestingly, as reported in Berge *et al.* (2011), we also found that the training has a strong impact on the business practices along these dimensions. On the negative side, many clients complained to the trainers that the course lasted for too long, which made it hard for the clients to keep up attendance. Hence, in future programs, one might consider sharpening the focus of the program, possibly dropping some of the more abstract sessions that were less well received by the participants.

6. Conclusion

The many recent field experiments conducted in poor countries have improved our understanding of the causal mechanisms at work in the development process. At the same time, from a policy perspective, there has been a lack of focus on how these research projects can be taken further and, particularly on the extent to which they can be implemented and scaled up by local stakeholders. In this paper, we have discussed these challenges in light of a recent field experiment in Tanzania, where our research team organized a business training program for a group of entrepreneurs in the microfinance institution PRIDE. As part of this research project, we also implemented initiatives that should assist PRIDE in scaling up the program, if successful, and we showed that PRIDE was capable of doing so in one of the branches in our study. This indicates that there is local capacity to sustain and expand this training program within PRIDE, whereas the lack of success in the other branch highlights that such initiatives are more sensitive to local conditions than is the case for a research-driven project. We also provide some evidence indicating that it would be in the interest of PRIDE to scale up this training program, both to preserve financial sustainability and improve its social impact.

Our study highlights the importance of investigating the local capacity and local willingness to build on the lessons from a research driven field experiment. Further research is clearly needed in this area, to ensure that not only researchers, but also the local communities, benefit from the many important field experiments presently conducted in developing countries.

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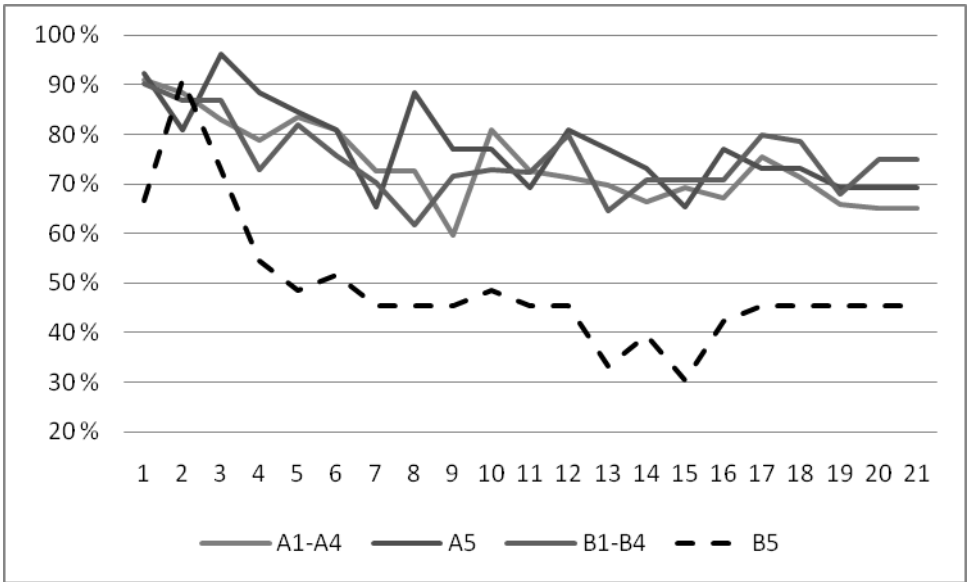
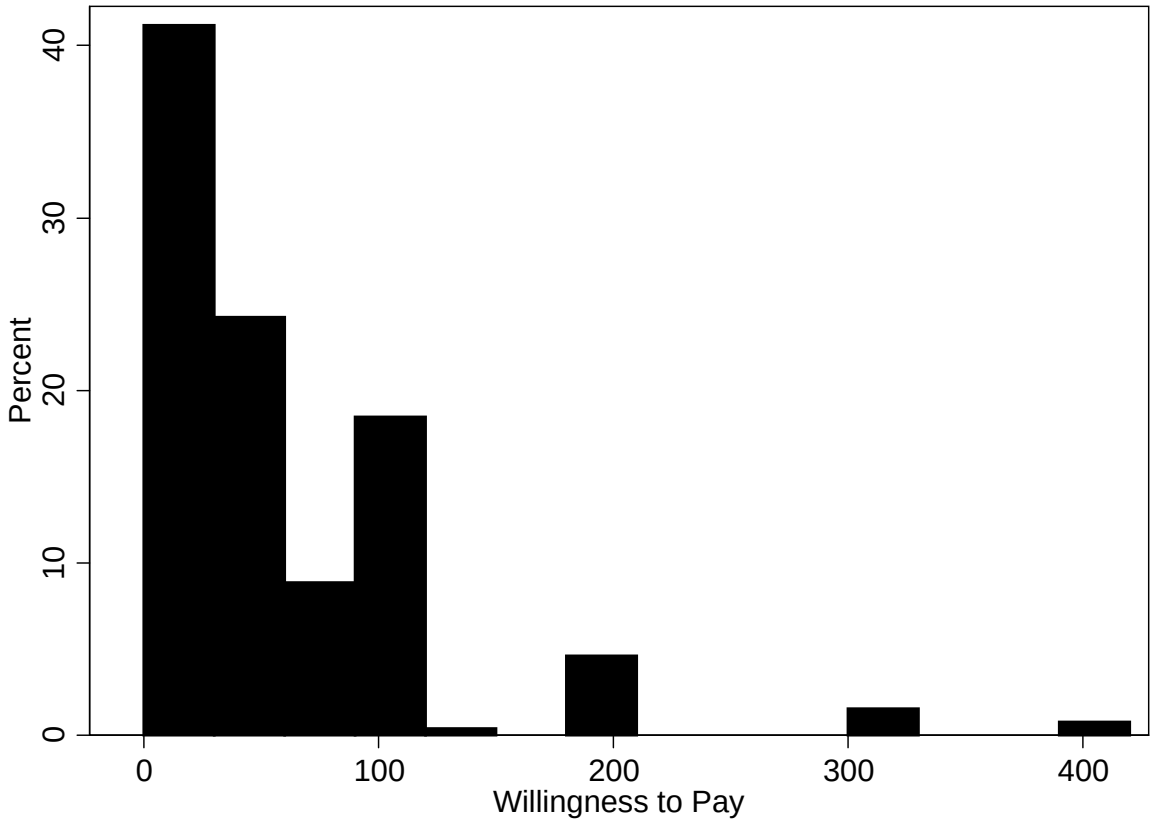
Figure 1: Development in attendance over time



Note: The figure shows attendance rates at each of the 21 sessions of the training program for the internal and external groups, at the branch level. There are two classes in the internal group, A5 at Branch A and B5 at Branch B. Attendance rates for the external group are shown as the average of the four external classes A1–A4 in Branch A and, similarly, the average of classes B1–B5 in Branch B. For further details, see Figure 1A in the Appendix.

Figure 2: Willingness to pay for business training



Note: The figure shows the distribution of the willingness to pay for a 20-session business training program, in Tanzanian Shillings, based on the response of the 260 entrepreneurs in the control group that we managed to reach in 2009. The willingness to pay is calculated by multiplying by 20 the expressed willingness to pay for a single session of a 20-session program.

Table 1: Treatment–control balance: Type-of-training experiment

	(1) Total	(2) Internal Group	(3) External Group	(4) Difference
Female	0.61	0.63	0.61	0.02
	(0.03)	(0.06)	(0.03)	(0.07)
Age	39.56	39.73	39.53	0.20
	(0.45)	(0.95)	(0.51)	(1.35)
PRIDE loan	753.01	754.24	752.76	1.48
	12.74	(31.27)	(13.97)	(34.04)
Education	7.79	7.82	7.82	-0.19
	(0.11)	(0.13)	(0.13)	(0.29)
Observations	349	59	290	

*Note: The table reports average values. Female is a dummy variable with a value of one if the participant is a female. Age is expressed in number of years. PRIDE loan denotes the loan size in 2008, in thousands of Tanzanian shillings. Education is the number of years of schooling. Standard errors are in parentheses: *p<0.10, ** p<0.05, *** p<0.01.*

Table 2: Treatment–control balance: Impact-of-training experiment

	(1) Total	(2) Training Group	(3) Control Group	(4) Difference
Female	0.66	0.62	0.69	-0.07*
	(0.02)	(0.03)	(0.03)	(0.04)
Age	39.71	39.30	40.11	-0.80
	(0.33)	(0.47)	(0.47)	(0.66)
PRIDE loan	770.34	761.13	779.38	-18.26
	(9.39)	(13.37)	(13.20)	(18.79)
Education	7.93	7.80	8.06	-0.26
	(0.08)	(0.12)	(0.12)	(0.17)
Prior business knowledge	4.93	4.95	4.90	0.06
	(0.04)	(0.06)	(0.06)	(0.09)
Observations	644	319	325	

Note: The table reports average values. Female is a dummy variable with a value of one if the participant is a female. Age is expressed in number of years. PRIDE loan denotes the loan size in 2008, in thousands of Tanzanian shillings. Education is the number of years of schooling. Prior business knowledge is measured by the number of correct answers on a test conducted as part of the baseline survey (0–10). Standard errors are in parentheses, and the star symbol indicates p<0.10 from two-sided t-tests of equality.

Table 3: Attendance

	(1) Attendance no covar.	(2) Attendance with covar.	(3) Diploma with covar.	(4) Diploma no covar.
Training Internal	0.87	0.89	-0.04	-0.04
	(1.06)	(1.08)	(0.08)	(0.08)
Training Internal *Branch B	-6.18***	-6.08***	-0.36**	-0.36**
	(1.76)	(1.73)	(0.14)	(0.15)
Branch B	0.29	0.42	0.03	0.04
	(0.56)	(0.58)	(0.04)	(0.04)
Female		-0.82		-0.02
		(0.57)		(0.04)
PRIDE loan_High		-0.19		-0.01
		(0.53)		(0.04)
Age_High		1.33***		0.02
		(0.51)		(0.03)
Education_High		0.92		0.06
		(0.62)		(0.04)
Constant	13.79***	13.42***	0.88***	0.87***
	(0.43)	(0.63)	(0.03)	(0.04)
Observations	349	349	349	349

*Note: The table reports regressions on the number of sessions attended by the entrepreneurs, and whether the client qualified for a diploma by attending 10 or more sessions. Training Internal is a dummy indicating that the training was provided by internal lecturers. Branch B is a dummy indicating that the client was a member of Branch B, while Training Internal *Branch B is an interaction term between Training Internal and Branch B. Age_High is a dummy indicating age above the median age in the sample. PRIDE loan_High is a dummy indicating that loan size before the training was above the median in the sample. Education_High is a dummy indicating that years of schooling is above the median sample. Standard errors are shown in parentheses, *p<0.10, ** p<0.05, *** p<0.01.*

Table 4: Exit from PRIDE

	(1) Exit no covar.	(2) Exit with covar.
Training	-0.00	-0.01
	(0.04)	(0.04)
Female		0.06
		(0.04)
Age_High		-0.14***
		(0.04)
PRDIE loan_High		-0.02
		(0.04)
Education_High		0.02
		(0.04)
Constant	0.45***	0.49***
	(0.03)	(0.05)
Observations	644	644

*Note: The table reports regressions on a dummy variable indicating that the client was no longer a member of PRIDE in December 2010. Training is a dummy indicating that the client was eligible for training. Female is a dummy taking a value of one if the participant is a female. Age_High is a dummy indicating age above the median age in the sample. PRIDE loan_High is a dummy indicating that loan size before the training was above the median in the sample. Education_High is a dummy indicating that years of schooling is above the median in the sample. Standard errors are shown in parentheses., *p<0.10, ** p<0.05, *** p<0.01.*

Table 5: Willingness to pay for training

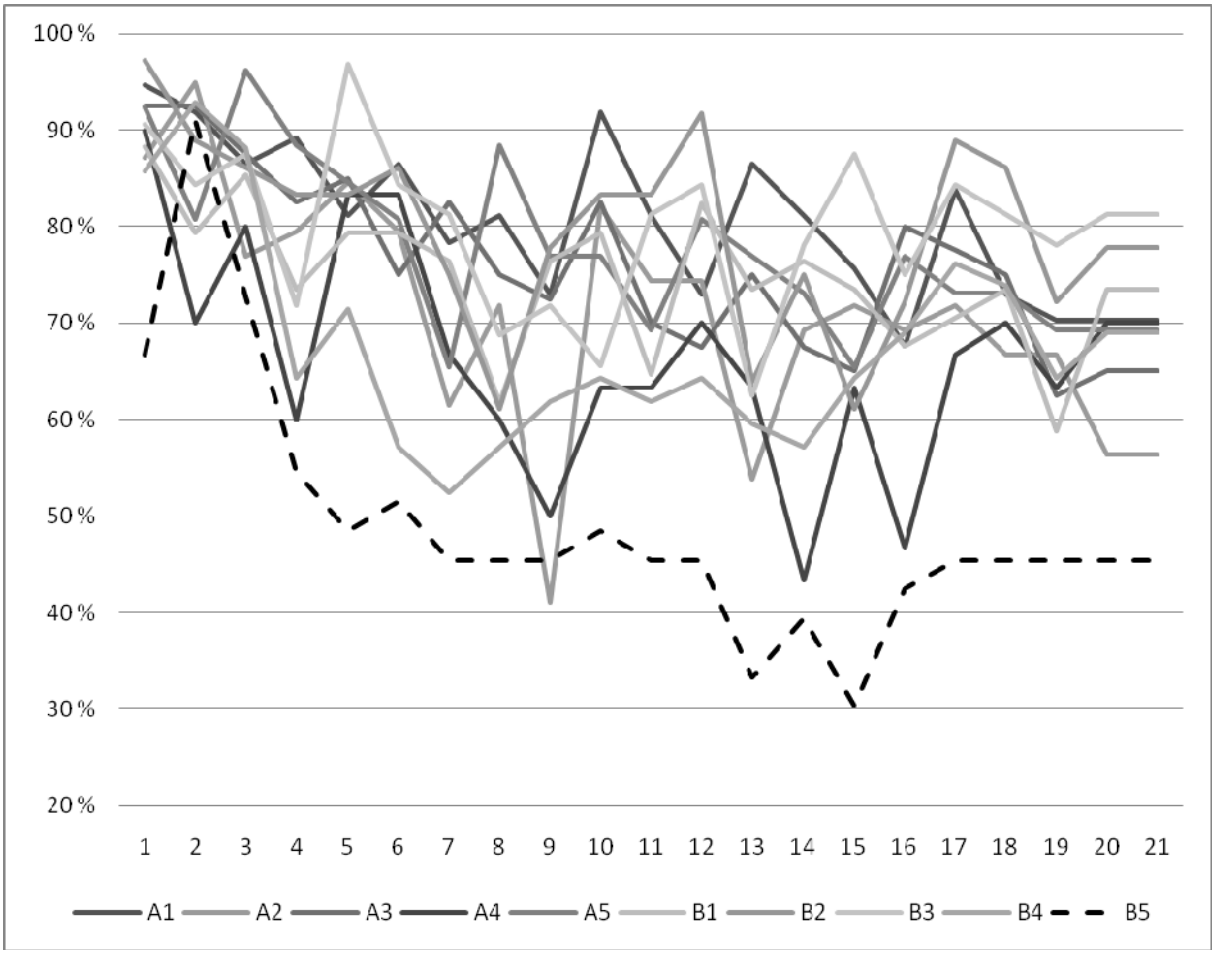
	Willingness to pay
Female	1.06
	(8.53)
Age_High	17.42**
	(8.17)
PRIDE loan_High	12.48
	(7.56)
Education_High	9.22
	(9.10)
Prior Business Knowledge_High	16.61*
	(9.31)
Constant	31.48***
	(8.04)
Observations	260

Note: The table reports the regression on willingness to pay for a 20-session training program, in thousands of Tanzanian Shillings. The willingness to pay is calculated by multiplying by 20 the expressed willingness to pay for a single session of a 20-session program. Female is a dummy indicating female gender. Age_High is a dummy indicating age above the median age in the sample. PRIDE loan_High is a dummy indicating that loan size before the training was above the median in the sample. Education_High is a dummy indicating that years of schooling is above the median in the sample. Prior Business Knowledge_High is a dummy indicating that prior business knowledge is above the median in the sample. Standard errors are shown in parentheses.
**p<0.10, ** p<0.05, *** p<0.01.*

Appendix

Here we present the figure referred to in the note to Figure 1.

Figure 1A. Development in attendance over time, all classes.



Note: The figure shows attendance rates at each of the 21 sessions of the training program for all classes, both internal (A1–A4 and B1–B4) and external (A5 and B5).

Chapter 3

Measuring spillover effects from business training: Evidence from a field experiment among microentrepreneurs

Measuring spillover effects from business training: Evidence from a field experiment among microentrepreneurs

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APRIL 14, 2011

Abstract

I measure knowledge and information spillovers from a business training program for microfinance clients in Tanzania. Clients with trained group members are compared with clients with non-trained group members to identify spillover effects. I find that knowledge, attitudes and business practices may transmit from trained clients to their loan group members. Simple comparisons between trained and control clients may therefore underestimate the impact of such a training program. However, spillover effects are found to be heterogeneous, depending on both the gender of the recipient and the gender composition of the loan group.

*Norwegian School of Economics, Bergen, e-mail: lars.ivar.berge@nhh.no.. I would like to thank Kjetil Bjorvatn, Bertil Tungodden, Erik Ø. Sørensen, Kjell G. Salvanes, Linda Helgesson Sekei, Sturla F. Kvamsdal, Lars Christian Bruno, Raphael Lalive, Kim Lehrer and participants at CSAE 2011 for very useful comments and suggestions. I would also like to thank Sparebanken Vest, Norges Bank, and Prof. Vilhelm Keilhaus Minnefond for financial support. I also acknowledge the support of Research on Poverty Alleviation (REPOA), and University of Dar es Salaam Entrepreneurship Centre (UDEC) in the design and implementation of the business training program. A special thanks to Juda Lyamai for excellent research assistance.

1. Introduction

Many microcredit institutions have introduced entrepreneurship training as an integrated part of their programs, to boost the growth of clients' businesses. Research has been conducted to understand the impact of such add-ons to microcredit clients, and results are somewhat mixed. Karlan and Valdivia (fortcoming) find modest effects on female entrepreneurs in Peru, while Berge, Bjorvatn and Tungodden (2011) find that such treatment can change business practices and increase profits substantially, although mainly for male clients.

Less is known about the wider impact of such educational programs, which may clearly not only influence treated individuals, but also influence knowledge and choices of their families, business partners and friends via their social interaction. Indeed, field experiments have been criticized for not incorporating the wider impact of interventions in the analysis, see e.g. Acemoglu (2010). The present paper seeks to address this gap in the literature.

Early observational studies of social interaction and spread of knowledge and information were often plagued by weak empirical design, where it was hard to draw causal inference (Manski, 1993). However, newer research with more credible identification strategies finds that information spillovers via social networks can be important. For example, Miguel and Kremer (2003) analyzed the role of social networks in the adoption of knowledge about de-worming drugs in rural Kenya, and found that those being exposed to information about de-worming drugs via their social network were less likely to be infected than individuals who had not been exposed to such information via their social network.

Another example is given by Lalive and Cattaneo (2009), who analyzed the effect of cash subsidies to prevent school-dropout in rural villages in Mexico, and found that also the non-treated in villages with treated students changed their behaviour relative to that of the non-treated in other villages. An elegant example of a natural experiment is given by Sacerdote (2001), who utilized the random room allocation of freshman students to dormitories at Dartmouth College. He found evidence of "peer influence" as students who shared rooms with able students tended to perform better. However, in an overview on peer effects in education, Sacerdote (2010) concludes that peer effects are modest in explaining academic results, but much more important in explaining social outcomes, such as drinking and smoking.

The research question in this paper is therefore to understand the wider impact of entrepreneurship training on microcredit clients' group members. This is an important question, as it sheds light not only on the wider impact of this specific intervention, but also on how information and knowledge are spread in general via social interaction.

To identify such effects, I utilize the field experiment described in Berge, Bjorvatn and Tungodden (2011), where selected members of loan groups were offered free business training, while other members in the same groups were not offered training. Loan groups of five are mostly formed by its members, and if one member does not fulfil the weekly loan obligations, the fellow group members must pay. The loan group is also part of a larger entity called the "market enterprise group" (MEC), which consists of ten loan groups that meet at the same time and place. If a complete loan group in the MEC defaults, the other groups in the MEC must cover the remaining debt.

At the time of the introduction of the training program, all participants in the study were members of PRIDE Tanzania (Promotion of Rural Initiatives and Development Enterprises), the country's largest microfinance institution (MFI).[28] The training program was tailored for the typical loan group member in PRIDE, covering a range of topics, such as marketing, basic accounting skills and customer care.[29] To my knowledge, this is the first study that measures educational externalities in a field experiment setting.

I find evidence of spillover effects for male entrepreneurs on mostly loan group-related outcomes, while effects on females are more modest. However, I do find that females in female-only loan groups improve their business knowledge and become more willing to take risks.

The remainder of the paper is organized as follows. In section two, I present findings from semi-structured in-depth interviews, and discuss how and why we might expect information and attitudes to spread in a loan group. Section three presents the experimental design and methodology in detail, while section four presents the results. In section five I discuss the findings and suggest mechanisms that may explain the observed pattern. Section six concludes.

[28] For further details on the organization, see www.pride-tz.org.
[29] For a detailed description of the training program, see Berge *et al.* (2011).

2 Mechanisms of spillovers

2.1 Findings from in-depth interviews

Three months into the training program, semi-structured interviews with trained clients took place.[30] In this section I report findings from these interviews that shed light on how spread of information and knowledge in loan groups can take place. One trained client who has shared knowledge from the business training program with his group members is Gudila:

> *Mr. Paulo, who is running a chicken-and-chips business, is not attending the course, but I have managed to advise him and he has made substantial changes to his business. This includes cooking using charcoal instead of firewood, putting a better roof on his business premises, keeping chicken meat in a more hygienic way and maintaining the cleanliness of his assistant. In addition, he has introduced an additional supporting product, beef meat soup. He is doing better business than before, and thus gets more profit.*

The above quote illustrates one type of spillover that may be present in loan groups: advice regarding daily business challenges. But why should we expect spillover effects in loan groups?

First, it is in the trained group members' own interest that their group members perform well, because of the joint liability loan scheme's PRIDE practices. Trained group members, who better understand how to avoid default, therefore have strong incentives to influence other group members' investment and business strategies in order to avoid repayment problems, and in particular to influence group members to invest in safe assets that ensure loan repayment (Armendãriz de Aghion and Morduch, 2010). This is also what happens, according to Livin:

> *We show them our notes, and whenever possible we explain to them what we have been taught. This is mainly done while attending a PRIDE meeting. Now they are also able to pay back their loans without problems.*

[30] Most interviews took place at the clients' businesses or homes, and were conducted in Swahili, the local language. Quotes are therefore translated from Swahili to English.

Since group members are jointly responsible for the loans, they have incentives to form loan groups where they already have social ties to the other members. Being part of the same loan group presumably also strengthens the existing social ties. The training, seemingly, has also made clients more confident and caused them to discuss and seek advice more:

> *Even before the training we have been sharing skills and experience together at PRIDE meetings and even at home. But this training has uplifted us to give confidently more accurate advice. (Fatuma)*

Second, indirectly trained clients may be curious about what the trained clients have learnt and done with their businesses, and ask for advice, as the trained client Zaituni experienced:

> *Our group members would also like to get the training. Since they could not join the course, they ask what we have learnt whenever we meet in the PRIDE meeting and we explain to them. For example, Fatuma, who is my friend, whom I discuss business with, is not taking the course but she is always eager to learn from the course. I have even provided my notes for her. I don't know to what extent she has changed her business, but I am told her customer care service is better now.*

Third, in addition to direct communication between group members, group members who observe changes in trained clients' businesses might copy their innovations, e.g. imitate a restaurant's new menu or change price accordingly. Norbert, for example, points out that non-trained group members become curious when they see their fellow group members improve:

> *Some of them would like to receive the same training because they see their group members making substantial improvement because of the training*. (*Norbert*)

As Hassan has experienced, it is also possible to earn money from business knowledge:

> *I have put the Ten Commandments of Customer Service on the wall of my shop and my customers are really impressed. I earned five thousand shillings yesterday from my friend after training him about good customer service.*

However, you would probably not want to teach your competitors about good customer service. Group members, who by definition co-operate on financial issues, are, or may

become, competitors in the product market. Explaining market strategies or business secrets to fellow group members might therefore be a bad idea if they want to prosper themselves.

Another argument against sharing of knowledge and best practices in loan groups is the fact that it is time consuming and difficult to explain concepts of customer service, accounting or marketing strategies, particularly if they are recently introduced to these concepts themselves. This is also experienced by Gudila:

> *Some of them are inquisitive about what we have learnt and when they ask questions we do share knowledge. The problem is time, and it's difficult to share with our group members unless we come to the meetings early.*

Finally, some fellow group members of trained clients may be too proud to ask for advice:

> *Some of them would like to do the course, because they see some changes for those who are doing the course. Others do not like to hear anything about the course because they are proud of being able to manage both their businesses and loans. Generally, there is no course sharing between those who are taking the course and those who are not. Only one friend of mine who is new to PRIDE visits me in my business, and asks about the course. I have been sharing with him whatever I have. (Said)*

The quotes in this section illustrate that the loan group can be an arena for sharing of business knowledge, and they show that this can happen through both direct and observational learning. They also show that training may not only influence non-trained group member marketing and business practices, but that training can improve the repayment performance of non-trained group members as well, which is in the trained members' own interest.

On the other hand, they also illustrate some of the limitations with the loan group as a centre for knowledge sharing. Clients are busy and must sort out financial issues when they meet, thereby demanding that loan group members arrive early at the loan meetings or meet somewhere else to discuss and share business knowledge.

2.2 Gender, group composition and group dynamics

Knowledge and information sharing in groups most likely depend on group members' actual ability to co-operate and to discuss their social preferences in practice, and on a healthy and inclusive environment so that ideas and knowledge can flourish. If group members are not able to work and co-operate well together in the group, or do not care much about each other, it is less likely that one would see knowledge spillovers from trained clients to their non-trained fellow group members.

Loan groups are most often self-selected, but this does not necessarily mean that all loan groups are functioning well, or that group members are able to co-operate and share relevant knowledge. In particular, research points to the importance of gender for group dynamics. Croson and Gneezy (2009), in an overview article, conclude that females' social preferences are shaped more by the institutional settings than those of males, and that males are more eager to compete than females. Surely, if group members are more eager to compete than to co-operate, we would expect less sharing of knowledge within the loan groups.

Looking at the impact of gender composition in groups, Dufwenberg and Muren (2005), in a lab experiment, find that groups are more generous and egalitarian when females are in the majority. Similarly, Berge, Juniwaty and Sekei (2011), conducting a lab experiment with PRIDE clients in Dar es Salaam, find that female groups perform better in a problem-solving game than mixed or male groups, even though males outperform females at the individual level. This could indicate that females are more able co-operators, and that males constrain females in group settings. More traditional societies may also have strong gender norms, which may result in a less inclusive group atmosphere in mixed groups than in female groups, as males typically are expected to lead and make decisions when together with females.

2.3 Social interaction and spillovers in loan groups

The findings from the semi-structured interviews and the findings in Berge, Bjorvatn and Tungodden (2011) on the impact on the directly trained, together with the research on gender differences and group composition, give some guidance on what kind of spillovers to expect, and who are the most likely recipients of these spillovers.

Berge, Bjorvatn and Tungodden (2011) find that both males and females have improved their business knowledge, to more or less the same extent. However, there is a tendency that males have made more changes in their businesses than females, such as firing more employees or increasing total loans. Males have also increased their profits substantially, while there is no such effect for females.

These findings may suggest that spillover effects might be less evident for females than for males. On the other hand, if female microentrepreneurs are better co-operators, as suggested in Berge, Juniwaty and Sekei (2011), this points to potentially stronger spillover effects within female-only loan groups than in groups with one or several males.

3. Experimental design and methodology

3.1 The Treatment: Spillovers from business training

As discussed in the previous sections, the treatment in this study is to expose microcredit clients to improved business knowledge, practices and outcomes *among their trained loan group members*. Due to either direct discussion or observational learning among the clients and their trained loan group members, this indirect treatment can improve business knowledge, practices and outcomes, or influence group-related outcomes. In the following, I refer to these entrepreneurs as "indirectly trained clients", and clients that have no trained group members as "control clients". The clients who have participated in the training program are called "trained clients".

Selected loan group members were offered a business training course consisting of 21 one-hour lectures taking place right after the weekly loan meetings on the premises of the microfinance institution. Entry control was strict, and only selected group members were allowed to enter the training sessions. We can therefore rule out the possibility that the treatment (being exposed to trained group members) was confounded with training directly improving clients' knowledge and practices.

3.2 Sample selection and sources of data

Entrepreneurs with loan meetings on Tuesdays or Thursdays with medium-sized loans (500 000–1 000 000 TZS) who were reached by surveyors were eligible to take part in the

business training. The indirectly trained are group members of the trained entrepreneurs, who either were not eligible for training or were eligible, but not reached by the surveyors. This selection procedure effectively split the loan groups in two, where, e.g. two out of five group members were offered training, while three were not (but were thereby "indirectly trained").

Identically, clients with loan meetings on Mondays or Wednesdays, who had group members with medium-sized loans who were reached by surveyors but who were not eligible for training (since their loan group meeting was on Mondays or Wednesdays), make up my control group.

Loan groups are randomly allocated to different days by the MFI. Figure 1 summarizes the sample selection. Note that the only thing that ex ante differs between indirectly trained clients and control clients is the fact that the former group had group members who were offered business training, while clients from the latter group did not have group member who were offered business training.

Table 1 shows that 583 clients had one or several group members who were eligible to participate in the training. Of these, 132 clients were reached and interviewed in a survey, after completion of the training. In total, 470 clients had one or several group members who were not offered training, but who had medium loan size and were reached by surveyors. Of these, 129 clients were reached and interviewed. These 261 clients make up the sample for this paper.

The clients were surveyed in May and June 2009, four to five months after the end of the training program, which started in August 2008. However, respondents were also asked about the state of their business one year before the training program started.

Summary statistics are shown in table 2. We see that the typical client in my sample is 37 years old, has on average slightly fewer than three children, has eight years of schooling and is most likely married. He/she is working around 60 hours per week, and has few or no employees. More than 60% of the entrepreneurs are involved in commerce (e.g. running kiosks, selling charcoal or used clothes), and around 40% of females and 30% of males are involved in service industries (small restaurants, hairdressing). Approximately 15% of male and 10% of female clients are running manufacturing businesses (furniture making, tailoring), while only a few per cent of the clients are involved in agriculture, since most clients live in

urban areas. We also note that males have significantly higher sales, even though females have more businesses. Finally, we see that daily income per capita in a household is 6800 TZS (5.3 USD) for females and 5800 TZS (4.5 USD) for males.

3.3 Intention to treat estimator

Moreover, to get the intention to treat estimator (ITT) of being in a group with trained group members, I estimate β_1 from the following equation:

$$Y_i = \alpha + \beta_1 TR_i + \varepsilon_i \quad (1)$$

TR_i is a binary variable taking the value one if client *i* has any group members that have been offered training. I also estimate the intention to treat estimator by including a covariate matrix X_i:

$$Y_i = \alpha + \beta_1 TR_i + \beta_2 \mathrm{X}_i + \varepsilon_i \quad (2)$$

Assuming that treatment status (TR_i) is uncorrelated with unobserved explanatory factors, there is no need to include a covariate matrix X_i to get unbiased ITT estimates, but including covariates may make the estimation more precise. Standard errors are clustered at the loan group level.

3.4 Average treatment effect on the treated

The ITT estimator does not take into account that not all participants at the business training attended all the lectures, with the average attendance rate being 70%. As a result, the intensity of the indirect training varies among the indirectly treated. Some have group and centre members who frequently showed up at the training, while others have peers that never showed up.

However, as discussed previously, group members typically select each other, causing some concern for self-selection and endogeneity. For example, prosperous clients might also have prosperous group members who choose to show up at all sessions, and who also teach their new knowledge to their indirectly trained group members. I therefore estimate:

$$Y_i = \alpha + \beta_1 INTENSITY_i + \delta X_i + \varepsilon_i \quad (3)$$

where $INTENSITY_i$ is instrumented by TR_i. $INTENSITY_i$ is the total number of sessions attended by the MEC members of the client, that is, the larger group to which all loan groups belong.[31] All clients in the control group take the value of zero, while all indirectly treated have a value larger than zero, as someone from all eligible groups showed up at one or several sessions. To obtain the effect of having one more group member who showed up at 21 sessions, the estimate must be multiplied by 21. As there is only one-sided compliance (no control clients have group members who received training), this enables me to identify the average treatment effect on the (indirectly) treated (ATET) (Angrist and Pischke, 2009).

3.5 Heterogeneous treatment effects

Since Berge, Bjorvatn and Tungodden (2011) find gender biases, section 2 concluded that we may also expect different indirect impacts of the training. I therefore run separate regressions for male and female.

However, Berge, Juniwaty and Sekei (2011) find that female-only groups co-operate better. Hence, I explore whether there are heterogeneous treatment impacts among females, according to whether they are in groups with only females or in mixed-gender groups. I therefore estimate the following equation:

$$Y_i = \alpha + \beta_1 Tr_i + \beta_2 FemGroup_i + \beta_3 (Tr_i * FemGroup_i) + \beta_4 X_i + \varepsilon_i \quad (4)$$

$FemGroup$ is a dummy taking the value 1 if the client is a member of a loan group consisting of females only. The effect of being in a loan group with trained clients is β_1, while β_3 is the additional treatment effect of being in a loan group with only females. The sum of β_1 and β_3 is therefore the treatment effect on females in female-only groups, and is referred to as "Sum Tr*FemGr" in the tables.

[31] I do not summarize over attendance within the loan group, since there may be spillover effects across loan groups within the MEC as well. However, results do not change much if I instead summarize over the enterprise group.

3.6 Verification of equal control and treatment groups

To verify that the indirectly trained and the control groups were similar along observables before the treatment, tables 3–7 show the results from performing t-tests on background variables based on treatment status. Since I look at treatment effects on males, females, females in female groups, and females in mixed groups, I do separate t-tests for all these subgroups. Table 3 shows the difference between indirectly trained and control males, and shows that significantly more indirectly treated were born in Dar es Salaam than the control clients. Table 4 shows that indirectly trained females had more employees one year ago, and there is a similar tendency in table 5. Table 5 also shows that control clients had 0.4 more children than treatment clients (among the females in female-only groups). Finally, table 6 shows that treated females in mixed groups had 0.7 more children than the control clients, and that indirectly trained females in mixed groups are somewhat older than their control group. Because of these differences, I include age, number of children, number of employees, and dummy taking the value 1 if the client was born in Dar es Salaam, as covariates.

4. Results

In this section, I first present the impact on males, before I move on to the impact on females. The semi-structured interviews suggest that loan group members frequently interact and discuss business-related topics, and that the training itself has contributed to more sharing of knowledge and information. Table 8 shows that males have been influenced along several dimensions. We observe that the indirectly trained discuss more business, on average 0.28–0.34 times more per week with each group member than control males, which is an increase of about 25%.

The findings are also confirmed by the ATET estimates in columns (3)–(4). If an MEC member attended one more training session, this would increase average group discussion by 0.002 times per week. This means that having one more trained client in an MEC who participated at all 21 lectures would cause clients to discuss 0.042 times more per week. The average number of MEC members with training among the indirectly trained is 11, meaning that the average treatment effect of being in a group with 11.5 clients who participated at all sessions would be to discuss business 0.48 times more, which as expected is a higher estimate

than the ITT estimates. However, the increased interaction has seemingly not resulted in stronger business knowledge, with coefficients very close to zero.

On the other hand, when we look at the clients' attitude to risk and their regard for PRIDE, we see that something has happened. Indirectly trained males have become more risk averse, and are more satisfied with PRIDE. In the survey, clients were given hypothetical choices between a risky and a safe bet, where the safe bet was gradually reduced, while the risky bet option was held constant. Based upon this, I add up the number of times the clients choose the risky bet, so that a lower number means more risk-averse preferences. I find that indirectly trained males play it safe significantly more often than control males. Out of five bets they choose the safe bet 0.7 times more often than the control males. Berge, Bjorvatn and Tungodden (2011) find the same pattern for directly trained males, but with a somewhat stronger effect.[32]

Perhaps related to the finding that indirectly trained males discuss more business, we also see from table 8 that the attitude towards PRIDE has improved, as indirectly trained males are 13 percentage points more satisfied with PRIDE than control males. This may reflect that they feel PRIDE is doing something positive when providing business training, and even though they do not receive training themselves, they are benefiting more from their membership. Their satisfaction may also be related to the finding that indirectly trained males have substantially increased their PRIDE loans, on average by 110 000–130 000 TZS (92–109 USD).[33] The same goes for total loans, as indirectly trained males have increased their loans by 163 000–168 000 TZS.

Furthermore, we see that their increased loans have mostly been spent on income-generating assets, and not on consumption-related goods.[34] This is not an obvious finding, as clients report that 15–20% of loans are used on non-income-generating items.

On the other hand, when we look at other business practices and knowledge, I do not find any significant spillover effects. Indirectly trained males do not report more marketing initiatives, and have not changed their record-keeping practices. Thus, it is not so surprising that indirectly trained males have not increased their profits.

[32] Berge *et al*. (2011a) used an incentivized lab when studying attitude towards risk.
[33] Treated males have also increased their loans if we look at initial loan size, or loans minus savings.
[34] Buying land and houses, paying old debt, saving, and lending to other is categorized as income generating.

Table 9 shows the overall impact of spillovers on indirectly trained female clients. Perhaps as expected, findings are indeed modest. However, when we look at the impact among females in female-only loan groups, some interesting patterns emerge. From table 11, we see that females in female-only groups have improved their business knowledge by 8 percentage points, which is significantly more than females in mixed-gender groups, who have not experienced any knowledge gain. On the other hand, females in female-only groups do not discuss more business because of the indirect training. Hence, it appears that it is the quality of communication rather than the quantity that has been affected by training.

From table 12, we also see that attitudes of females in female groups have been influenced by the indirect training, as they have become more risk seeking, making 0.75–0.82 more risky bets than control females in female-only groups. An interesting point to make is that indirectly trained males and indirectly trained females in female groups make very similar risk choices, while control males and females are very different. Berge, Bjorvatn and Tungodden (2011) observe a similar pattern among the directly trained. This finding may be explained by the business training course emphasizing "appropriate risk taking", including anecdotes of males overconfidently rushing to the next business opportunity, with limited success.

However, when looking at other practices or outcomes, related to either the loan group or the clients' businesses, I do not find any treatment impacts, nor do I find any treatment impact on females in mixed groups. Finally, from table 10, we note that there are no overall impacts.

5. Discussion

In the previous section, we saw that there is stronger evidence of spillover effects for male than for female clients. We saw that males discuss more business with their loan group members, increase their loans and invest the loans more wisely. In addition, males have changed their attitudes, and become more positive towards PRIDE and more reluctant to take risks. However, there is no evidence that males have improved their business knowledge, or changed much in their businesses. Hence, the spillover effects on males are mostly on dimensions directly related to the loan group. In contrast, for females, spillover effects were only evident within female-only groups, with spillovers consisting of improved business knowledge, and reduction in risk aversion. There was no evidence of any impact on group-related outcomes or on business practices.

What can explain this observed pattern? The general finding that males are more affected by the indirect training is consistent with that of Berge, Bjorvatn and Tungodden (2011), who also find stronger impacts on trained males. However, they also find that trained males have improved their knowledge and changed their business practices along many dimensions, while I mostly find spillover effects for males on loan-group-related outcomes. As discussed in section 2, because of lack of time and incentives, trained clients may not be able or willing to spend time on teaching concepts of customer care or marketing strategies to their group members.

However, if trained clients have become more financially literate because of the training, they may use this knowledge to influence attitudes and decisions of their group members in their own interest. This may partly explain the finding that indirectly treated males invest more wisely and have become more risk averse. Another reason may simply be that trained clients find it easier to co-operate and share knowledge with group members about issues that are already being discussed in the loan group, such as loans and use of loans.

Furthermore, the finding that females in female-only groups have gained business knowledge in the same range as trained females, may be explained along similar lines as in Berge, Juniwaty and Sekei (2011). They find that groups consisting of females, who individually are outperformed by males, perform significantly better than both mixed and male-only groups. Accordingly, males, when present in a group, are typically expected to lead and make decisions. Females are therefore in practice constrained from utilizing their skills and competency when together with males. In spillover cases, this may translate into a bad learning environment in loan groups where men are present. Recall that the weekly loan meeting is the most relevant arena for spillovers, since this is where business discussion among group members typically takes place. Hence, male dominance in this arena may seriously impede spillovers among females.

Berge, Bjorvatn and Tungodden (2011) also find that male microfinance clients are more competitive than female microfinance clients, thereby confirming the results discussed in Croson and Gneezy (2009). In the loan group setting, this may translate into an environment where males perceive each other as competitors in the social group, even though they are not competing in the product market. Because of this, treated males may be reluctant to share business knowledge with their fellow group members. In addition, males have weaker co-

operating abilities than females, which may limit the ability to transmit knowledge even when there is a will.

6. Concluding remarks

In this paper, I have measured the impact of business training on its beneficiaries' loan group members. The findings show that knowledge, attitudes and certain practices related to the loan group may transmit from trained clients to their loan group members. Comparing trained and control clients may therefore underestimate the impact of such a training program. However, the indirect impacts are found to be heterogeneous, as males and females are affected differently, along different dimensions. Indirectly treated males are mostly found to change business practices and attitudes related to the loan group, while females in female-only groups improve their knowledge the most.

These heterogeneous findings indicate that there are important underlying differences in how males and females respond to the institutional setting, which in this case is the loan group. Understanding such responses may be important when designing institutions and policies, and should be an important topic for future research.

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Figure 1: Sample selection and treatment status

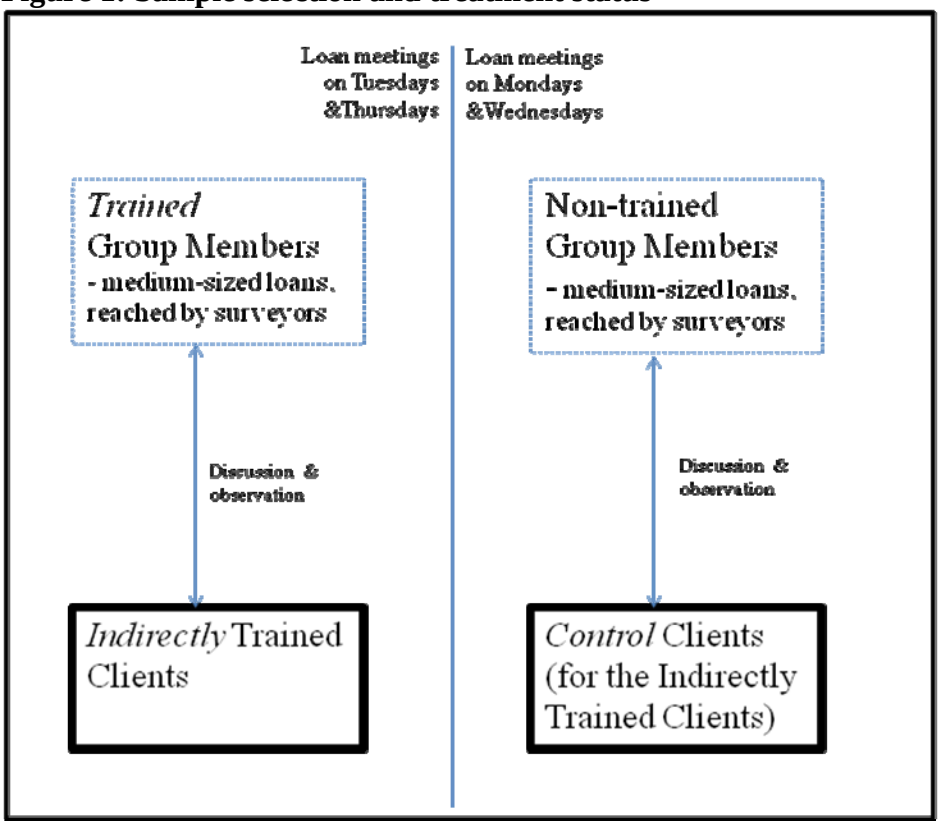

Table 1: Eligible versus surveyed clients

	Eligible Clients	Surveyed Clients
Indirectly Trained	583	132
Control Group	470	129
Total	1053	261

Table 2: Summary statistics by gender

	(1) TOTAL	(2) MALE	(3) FEMALE	(4) DIFFERENCE
SCALE OF BUSINESS				
Sales+	13.868	14.067	13.754	0.312***
	(0.064)	(0.118)	(0.073)	(0.132)
Number of Businesses	1.330	1.219	1.394	–0.175**
	(0.033)	(0.054)	(0.041)	(0.068)
Employees	0.391	0.385	0.394	–0.009
	(0.055)	(0.079)	(0.073)	(0.113)
PRIDE Loan	359 004	388.542	341.818	46.724
	(21.114)	(35.821)	(26.088)	(43.774)
SECTOR				
Commerce	0.648	0.615	0.667	–0.052
	(0.030)	(0.050)	(0.037)	(0.068)
Service	0.368	0.302	0.406	–0.104*
	(0.030)	(0.047)	(0.038)	(0.062)
Manufacturing	0.115	0.167	0.085	0.082**
	(0.020)	(0.039)	(0.022)	(0.041)
HOUSEHOLD INCOME				
Household Income	29.619	24.698	32.482	–7.784**
	(1.697)	(1.865)	(2.431)	(3.492)
Income per Household Member	6.461	5.820	6.834	–1.015
	(0.320)	(0.426)	(0.439)	(0.661)
CHARACTERISTICS OF THE ENTREPRENEUR				
Children	2.628	2.438	2.739	–0.302
	(0.124)	(0.245)	(0.135)	(0.257)
Born in Dar es Salaam	0.272	0.146	0.346	–0.120***
	(0.028)	(0.036)	(0.037)	(0.056)
Work Hours	57.594	62.021	55.018	7.003**
	(1.548)	(2.515)	(1.941)	(3.187)
Education	8.008	8.094	7.958	0.136
	(0.147)	(0.212)	(0.198)	(0.306)
Age	37.471	36.771	37.878	–1.108
	(0.530)	(0.909)	(0.651)	(1.100)
Marital Status	0.789	0.865	0.746	0.119**
	(0.025)	(0.035)	(0.034)	(0.052)
OBSERVATIONS	261	96	165	

*Note: The table reports average values. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 (before the training), in thousand TZS, as reported in 2009 (after the training). +Note that I have only 88 and 154 observations for males and females, respectively, because of log transformation of zero-observations. Number of Businesses: The total number of businesses owned by the clients in 2009 (a business must have either a separate location or activity). Employees: Number of employees in the businesses of the entrepreneur in 2008, as reported in 2009. PRIDE Loan: Initial size of loan in thousand TZS as reported by PRIDE in 2008. Commerce, Service, and Manufacturing: Share of clients involved in each of these sectors in 2009. Household Income: Total daily household income in the household of the entrepreneur in 2009. Income per Household Member: Total daily household income per household member in the household of the entrepreneur in 2009. Children: Total number of children in 2009. Born in Dar es Salaam: Indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Education: The number of years of schooling of the entrepreneur. Age: The age of the entrepreneur, in number of years. Marital status: Indicator variable taking the value one if the client is married. Standard errors in parentheses. Inference from t-test: *p<0.10, ** p<0.05, *** p<0.01.*

Table 3: Treatment – control balance, male sample

	(1) INDIRECTLY TRAINED	(2) CONTROL GROUP	(3) DIFFERENCE
Age	37.31	36.14	1.171
			(1.830)
Employees	0.308	0.477	–0.170
			(0.158)
PRIDE Loan	374.039	405.682	–31.643
			(72.200)
Children	2.731	2.091	0.640
			(0.490)
Born in Dar es Salaam	0.212	0.0698	0.142*
			(0.072)
Work Hours	60.73	63.55	–2.815
			(5.066)
Marital Status	0.885	0.841	0.044
			(0.071)
Education	7.923	8.295	0.372
			(0.426)
Sales (log)+	14.169	13.950	0.220
			(0.236)
OBSERVATIONS	52	44	

*Note: The table reports averages. Age: The age of the entrepreneur, in number of years. Employees: Number of employees in the businesses of the entrepreneur in 2008 (before the training), as reported in 2009 (after the training). PRIDE Loan: Initial loan size in thousand TZS at PRIDE, as reported by PRIDE in 2008. Children: Total number of children in 2009. Born in Dar es Salaam: An indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Marital Status: Indicator variable taking the value one if the client was married in 2009. Education: Years of schooling of the entrepreneur. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 in TZS, as reported in 2009. +Note that because of log transformation of zero-observations, I have only 47 and 41 observations in the treatment and control groups, respectively. Standard errors in parentheses. Inference from t-tests: *p<0.10, ** p<0.05, *** p<0.01.*

Table 4: Treatment – control balance, female sample

	(1) INDIRECTLY TRAINED	(2) CONTROL GROUP	(3) DIFFERENCE
Age	38.313	37.471	0.842
			(1.305)
Employees	0.550	0.247	–0.303**
			(0.145)
PRIDE Loan	356 875	327 647	29 228
			(52 310)
Children	2.750	2.729	0.021
			(0.270)
Born in Dar es Salaam	0.362	0.329	0.033
			(0.074)
Work Hours	55.66	54.41	1.251
			(3.894)
Marital Status	0.775	0.718	0.057
			(0.068)
Education	8.113	7.812	0.301
			(0.397)
Sales (log)+	13.659	13.846	–0.187
			(146)
OBSERVATIONS	80	85	

*Note: The table reports averages. Age: The age of the entrepreneur, in number of years. Employees: Number of employees in the businesses of the entrepreneur in 2008 (before the training), as reported in 2009 (after the training). PRIDE Loan: Initial loan size in thousand TZS at PRIDE, as reported by PRIDE in 2008. Children: Total number of children in 2009. Born in Dar es Salaam: An indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Marital Status: Indicator variable taking the value one if the client was married in 2009. Education: Years of schooling of the entrepreneur. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 in TZS, as reported in 2009. +Note that because of log transformation of zero-observations, I have only 75 and 79 observations in the treatment and control groups, respectively. Standard errors in parentheses. Inference from t-tests: *p<0.10, ** p<0.05, *** p<0.01.*

Table 5: Treatment – control balance, female-only sample

	(1) INDIRECTLY TRAINED	(2) CONTROL GROUP	(3) DIFFERENCE
Age	38.143	39.500	1.357
			(1.821)
Employees	0.595	0.205	0.391*
			(0.235)
PRIDE Loan	352.381	285.227	67.154
			(61.028)
Children	2.524	3.159	–0.635*
			(0.248)
Born in Dar es Salaam	0.429	0.295	0.133
			(0.104)
Work Hours	56.762	54.250	2.512
			(5.213)
Marital Status	0.714	0.727	–0.013
			(0.098)
Education	8.214	7.636	0.578
			(0.543)
Sales (log)+	13.567	13.760	–0.194
			(0.186)
OBSERVATIONS	42	44	

*Note: The table reports averages. Age: The age of the entrepreneur, in number of years. Employees: Number of employees in the businesses of the entrepreneur in 2008 (before the training), as reported in 2009 (after the training). PRIDE loan: Initial loan size in thousand TZS at PRIDE, as reported by PRIDE in 2008. Children: Total number of children in 2009. Born in Dar es Salaam: An indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Marital Status: Indicator variable taking the value one if the client was married in 2009. Education: Years of schooling of the entrepreneur. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 in TZS, as reported in 2009. +Note that because of log transformation of zero-observations, I have only 41 and 42 observations in the treatment and control groups, respectively. Standard errors in parentheses. Inference from t-test:.*p<0.10, ** p<0.05, *** p<0.01.*

Table 6: Treatment – control balance, females in mixed groups

	(1) INDIRECTLY TRAINED	(2) CONTROL GROUP	(3) DIFFERENCE
Age	38.500	35.293	3.207*
			(1.828)
Employees	0.500	0.293	0.207
			(0.166)
PRIDE Loan	361.842	373.171	–11.329
			(86.995)
Children	3.000	2.269	0.732*
			(0.248)
Born in Dar es Salaam	0.290	0.366	–0.076
			(0.107)
Work Hours	54.447	54.585	–0.138
			(5.891)
Marital Status	0.842	0.707	0.135
			(0.094)
Education	8.000	8.000	0.000
			(0.587)
Sales (log)+	13.771	13.942	–0.172
			(0.231)
OBSERVATIONS	38	41	

*Note: The table reports averages. Age: The age of the entrepreneur, in number of years. Employees: Number of employees in the businesses of the entrepreneur in 2008 (before the training), as reported in 2009 (after the training). PRIDE Loan: Initial loan size in thousand TZS at PRIDE, as reported by PRIDE in 2008. Children: Total number of children in 2009. Born in Dar es Salaam: An indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Marital Status: Indicator variable taking the value one if the client was married in 2009. Education: Years of schooling of the entrepreneur. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 in TZS, as reported in 2009. +Note that because of log transformation of zero-observations, I have only 34 and 37 observations in the treatment and control groups, respectively. Standard errors in parentheses. Inference from t-tests:*p<0.10, ** p<0.05, *** p<0.01.*

Table 7: Treatment – control balance, complete sample

	(1) INDIRECTLY TRAINED	(2) CONTROL GROUP	(3) DIFFERENCE
Age	37.917	37.016	0.901 (1.061)
Employees	0.455	0.326	0.129 (0.109)
PRIDE Loan	363.636	354.264	9.373 (42.308)
Children	2.742	2.512	0.231 (0.248)
Born in Dar es Salaam	0.303	0.242	0.061 (0.055)
Work Hours	57.659	57.527	0.132 (3.102)
Marital Status	0.818	0.760	0.059 (0.051)
Education	8.038	7.977	0.061 (0.295)
Sales (log)+	13.856	13.881	–0.026 (0.128)
OBSERVATIONS	132	129	

*Note: The table reports averages. Age: The age of the entrepreneur, in number of years. Employees: Number of employees in the businesses of the entrepreneur in 2008 (before the training), as reported in 2009 (after the training). PRIDE Loan: Initial loan size in thousand TZS at PRIDE, as reported by PRIDE in 2008. Children: Total number of children in 2009. Born in Dar es Salaam: An indicator variable taking the value one if the client was born in Dar es Salaam. Work Hours: Weekly work hours for the client in 2008, as reported in 2009. Marital Status: Indicator variable taking the value one if the client was married in 2009. Education: Years of schooling of the entrepreneur. Sales: Log of monthly sales in the businesses of the entrepreneur in 2008 in TZS, as reported in 2009. +Note that because of log transformation of zero-observations, I have only 122 and 120 observations in the treatment and control groups, respectively. Standard errors in parentheses. Inference from t-tests: *p<0.10, ** p<0.05, *** p<0.01.*

Table 8: Treatment effects, males

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.
Group Discussion	0.275	0.336*	0.002	0.002*
	(0.185)	(0.196)	(0.001)	(0.001)
Business Knowledge	–0.046	–0.032	–0.000	–0.000
	(0.037)	(0.039)	(0.000)	(0.000)
Risk	–0.738*	–0.741*	–0.004*	–0.004*
	(0.437)	(0.429)	(0.003)	(0.002)
PRIDE Satisfaction	0.128*	0.126*	0.001*	0.001*
	(0.073)	(0.074)	(0.000)	(0.000)
PRIDE Loan Balance	109.919**	133.407***	0.648**	0.780***
	(47.901)	(47.867)	(0.269)	(0.262)
Total Loan Balance	168.108***	163.058***	0.991***	0.953***
	(57.324)	(54.390)	(0.340)	(0.301)
Cons. PRIDE Loan	–60.367*	–54.606*	–0.356*	–0.319*
	(32.408)	(32.534)	(0.192)	(0.187)
Inv. PRIDE Loan	168.497**	124.542*	0.993*	0.728**
	(83.828)	(63.461)	(0.507)	(0.359)
Marketing Index	0.013	0.013	0.000	0.000
	(0.052)	(0.054)	(0.000)	(0.000)
Business Records	0.058	0.015	0.000	0.000
	(0.162)	(0.127)	(0.001)	(0.001)
Profit (log)+	0.132	0.117	0.001	0.001
	(0.186)	(0.183)	(0.001)	(0.001)
OBSERVATIONS	96	96	96	96

*Note: Columns (1) and (2) report the impact of being a member of a loan group where one or several group members have been offered training. Columns (3) and (4) report estimates from instrumenting the total number of training sessions attended by loan group members by an indicator variable taking the value of one if the client is a member of a loan group where one or several group members have been offered training. Outcome variables are defined as follows. Group Discussion: Number of times per week the client discusses business with fellow enterprise group members, divided by the number of group members. Business Knowledge: Percentage of correct answers on six multiple-choice questions. Risk: The number of times the client chose the risky option when choosing (hypothetically) between a safe and a risky bet, where the value of the safe bet was gradually reduced. PRIDE Satisfaction: An indicator variable taking the value of one if the client was satisfied with PRIDE. PRIDE Loan Balance: Amount outstanding at PRIDE. Total Loan Balance: Amount outstanding in thousand TZS at all loan sources. Cons. PRIDE Loan: Loan usage on consumption, such as food, paying for drugs, school uniforms, etc. Inv. PRIDE Loan: Business-related loan use, in addition to investments in house and land, and repayment of other loans. Marketing Index: A normalized index of three questions measuring change in marketing practices. Business Records: Number of different types of records (e.g. sales records, stocks records). Profit: Monthly operating profit (log). +: Note that I have only 91 observations of profit, because of log transformation of five zero-observations (five clients had closed down their businesses in 2009). Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value 1 if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 9: Treatment effects, females

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.
Group Discussion	–0.119	–0.143	–0.001	–0.001
	(0.172)	(0.182)	(0.001)	(0.001)
Business Knowledge	0.031	0.031	0.000	0.000
	(0.028)	(0.027)	(0.000)	(0.000)
Risk	0.392	0.447	0.002	0.003
	(0.274)	(0.283)	(0.002)	(0.002)
PRIDE Satisfaction	–0.010	0.003	–0.000	0.000
	(0.062)	(0.062)	(0.000)	(0.000)
PRIDE Loan Balance	–49.689	–45.978	–0.304	–0.280
	(50.908)	(51.250)	(0.312)	(0.307)
Total Loan Balance	–45.307	–59.401	–0.278	–0.361
	(56.520)	(55.243)	(0.346)	(0.332)
Cons. PRIDE Loan	8.201	7.093	0.050	0.043
	(29.701)	(31.283)	(0.181)	(0.187)
Inv. PRIDE Loan	–43.826	–58.134	–0.269	–0.354
	(46.715)	(45.989)	(0.285)	(0.276)
Marketing Index	0.014	0.017	0.000	0.000
	(0.047)	(0.048)	(0.000)	(0.000)
Business Records	0.001	–0.037	0.000	–0.000
	(0.171)	(0.164)	(0.001)	(0.001)
Profit (log)+	–0.101	–0.163	–0.001	–0.001
	(0.125)	(0.120)	(0.001)	(0.001)
OBSERVATIONS	165	165	165	165

*Note: Columns (1) and (2) report the impact of being a member of a loan group where one or several group members have been offered training. Columns (3) and (4) report estimates from instrumenting the total number of training sessions attended by loan group members by an indicator variable taking the value of one if the client is a member of a loan group where one or several group members have been offered training. Outcome variables are defined as follows. Group Discussion: Number of times per week the client discusses business with fellow enterprise group members, divided by the number of group members. Business Knowledge: Percentage of correct answers on six multiple-choice questions. Risk: The number of times the client chose the risky option when choosing (hypothetically) between a safe and a risky bet, where the value of the safe bet was gradually reduced. PRIDE Satisfaction: An indicator variable taking the value of one if the client was satisfied with PRIDE. PRIDE Loan Balance: Amount outstanding at PRIDE. Total Loan Balance: Amount outstanding in thousand TZS at all loan sources. Cons. PRIDE Loan: Loan usage on consumption, such as food, paying for drugs, school uniforms, etc. Inv. PRIDE Loan: Business-related loan use, in addition to investments in house and land, and repayment of other loans. Marketing Index: A normalized index of three questions measuring change in marketing practices. Business Records: Number of different types of records (e.g. sales records, stocks records). Profit: Monthly operating profit (log). +Note that I have only 164 observations of profit, because of log transformation of one zero-observation (one client had closed down her businesses in 2009). Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value 1 if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 10: Treatment effects, complete sample

	(1) ITT no covar.	(2) ITT with covar.	(3) ATET no covar.	(4) ATET with covar.
Group Discussion	0.036	0.031	0.000	0.000
	(0.133)	(0.139)	(0.001)	(0.001)
Business Knowledge	0.004	0.004	0.000	0.000
	(0.022)	(0.022)	(0.000)	(0.000)
Risk	0.009	0.066	0.000	0.000
	(0.256)	(0.256)	(0.002)	(0.002)
PRIDE Satisfaction	0.042	0.040	0.000	0.000
	(0.047)	(0.046)	(0.000)	(0.000)
PRIDE Loan Balance	5.644	10.427	0.034	0.062
	(38.345)	(39.022)	(0.230)	(0.230)
Total Loan Balance	30.328	21.964	0.183	0.132
	(43.048)	(42.111)	(0.258)	(0.249)
Cons. PRIDE Loan	–19.521	–21.029	–0.118	–0.126
	(22.154)	(22.244)	(0.133)	(0.132)
Inv. PRIDE Loan	36.742	27.538	0.222	0.165
	(44.538)	(42.441)	(0.268)	(0.251)
Marketing Index	0.011	0.008	0.000	0.000
	(0.035)	(0.035)	(0.000)	(0.000)
Business Records	0.014	–0.013	0.000	–0.000
	(0.124)	(0.120)	(0.001)	(0.001)
Profit (log)+	–0.012	–0.030	–0.000	–0.000
	(0.105)	(0.102)	(0.001)	(0.001)
OBSERVATIONS	261	261	261	261

*Note: Columns (1) and (2) report the impact of being a member of a loan group where one or several group members have been offered training. Columns (3) and (4) report estimates from instrumenting the total number of training sessions attended by loan group members by an indicator variable taking the value of one if the client is a member of a loan group where one or several group members have been offered training. Outcome variables are defined as follows. Group Discussion: Number of times per week the client discusses business with fellow enterprise group members, divided by the number of group members. Business Knowledge: Percentage of correct answers on six multiple-choice questions. Risk: The number of times the client chose the risky option when choosing (hypothetically) between a safe and a risky bet, where the value of the safe bet was gradually reduced. PRIDE Satisfaction: An indicator variable taking the value of one if the client was satisfied with PRIDE. PRIDE Loan Balance: Amount outstanding at PRIDE. Total Loan Balance: Amount outstanding in thousand TZS at all loan sources. Cons. PRIDE Loan: Loan usage on consumption, such as food, paying for drugs, school uniforms, etc. Inv. PRIDE Loan: Business-related loan use, in addition to investments in house and land, and repayment of other loans. Marketing Index: A normalized index of three questions measuring change in marketing practices. Business Records: Number of different types of records (e.g. sales records, stocks records). Profit: Monthly operating profit (log). +Note that I have only 255 observations of profit, because of log transformation of six zero-observation (six clients had closed down their businesses in 2009). Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value 1 if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 11: Business knowledge and discussion, female sample with interaction effects

	(1) Group Disc. no covar.	(2) Group Disc. with covar.	(3) Knowledge no covar.	(4) Knowledge with covar.
Indirect Training	0.166	0.216	–0.025	–0.023
	(0.162)	(0.169)	(0.034)	(0.033)
Ind.Tr.*FemGr	–0.549	–0.697*	0.109**	0.105**
	(0.337)	(0.385)	(0.054)	(0.052)
Female Group	0.419	0.504	–0.092**	–0.090***
	(0.295)	(0.323)	(0.035)	(0.034)
Sum Tr*FemGr	–0.383	–0.480	0.084**	0.081**
	(0.296)	(0.329)	(0.041)	(0.041)
Observations	165	165	165	165

*Note: The table reports ITT regressions. Outcome variables are defined as follows. Group Discussion: Number of times per week the client discusses business with fellow enterprise group members, divided by the number of group members. Business Knowledge: Percentage correct answers on six multiple-choice questions. The outcomes are regressed on a dummy taking the value one if the client was in a group where someone was offered training, an interaction term of training and female-only group, and finally a dummy taking the value of one if the client is a member of a female-only group. "Sum Tr*FemGr" is the linear combination of the two first independent variables. Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value one if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 12: Attitudes, female sample with interaction effects

	(1) Risk no covar.	(2) Risk with covar.	(3) PRIDE Satisfaction no covar.	(4) PRIDE Satisfaction with covar.
Indirect Training	0.010	0.053	–0.038	–0.053
	(0.419)	(0.430)	(0.089)	(0.087)
Ind.Tr.*FemGr	0.735	0.763	0.053	0.107
	(0.552)	(0.579)	(0.124)	(0.123)
Female Group	–0.486	–0.497	–0.035	–0.076
	(0.361)	(0.380)	(0.083)	(0.083)
Sum Tr*FemGr	0.745**	0.816**	0.015	0.054
	(0.354)	(0.375)	(0.086)	(0.087)
Observations	165	165	165	165

*Note: The table reports ITT regressions. Outcome variables are defined as follows. Risk: The number of times the client chose the risky option when choosing (hypothetically) between a safe and a risky bet, where the value of the safe bet was gradually reduced. PRIDE Satisfaction: An indicator variable taking the value one if the client was satisfied with PRIDE. The outcomes are regressed on a dummy taking the value one if the client was in a group where someone was offered training, an interaction term of training and female-only group, and finally a dummy taking the value of one if the client is a member of a female-only group. "Sum Tr*FemGr" is the linear combination of the two first independent variables. Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value one if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 13: Loan balance, female sample with interaction effects

	(1) PRIDE Loan Balance no covar.	(2) PRIDE Loan Balance with covar.	(3) Total Loan Balance no covar.	(4) Total Loan Balance with covar.
Indirect Training	–64.949	–40.431	–31.287	–29.703
	(67.956)	(68.333)	(79.964)	(76.618)
Ind.Tr.*FemGr	28.751	–10.778	–26.840	–57.556
	(101.673)	(103.767)	(113.611)	(122.714)
Female Group	22.413	49.629	9.681	27.907
	(84.389)	(87.647)	(87.919)	(95.925)
Sum Tr*FemGr	–36.197	–51.209	–58.127	–87.259
	(75.413)	(76.901)	(80.727)	(88.171)
Observations	165	165	165	165

*Note: The table reports ITT regressions. Outcome variables are defined as follows. PRIDE Loan Balance: Amount outstanding at PRIDE. Total Loan Balance: Amount outstanding in thousand TZS at all loan sources. The outcomes are regressed on a dummy taking the value one if the client was in a group where someone was offered training, an interaction term of training and female-only group, and finally a dummy taking the value one if the client is member of a female only group. "Sum Tr*FemGr" is the linear combination of the two first independent variables. Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value one if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 14: Usage of loan, female sample with interaction effects

	(1) Cons. PRIDE Loan no covar.	(2) Cons. PRIDE Loan with covar.	(3) Inv. PRIDE Loan no covar.	(4) Inv. PRIDE Loan with covar.
Indirect Training	4.256	–12.637	–17.318	–20.583
	(38.234)	(38.798)	(68.031)	(68.125)
Ind.Tr.*FemGr	7.364	38.231	–50.309	–72.753
	(58.868)	(59.819)	(94.298)	(100.928)
Female Group	10.779	–8.733	–13.135	–4.848
	(37.397)	(39.593)	(70.718)	(77.919)
Sum Tr*FemGr	11.620	25.594	–67.627	–93.336
	(44.980)	(47.318)	(65.099)	(68.498)
Observations	165	165	165	165

*Note: The table reports ITT regressions. Outcome variables are defined as follows. Cons. PRIDE Loan: Loan usage on consumption, such as food, paying for drugs, school uniforms, etc. Inv. PRIDE Loan: Business-related loan use, in addition to investments in house and land, and repayment of other loans. The outcomes are regressed on a dummy taking the value one if the client was in a group where someone was offered training, an interaction term of training and female-only group, and finally a dummy taking the value one if the client is member of a female-only group. "Sum Tr*FemGr" is the linear combination of the two first independent variables. Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value one if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Table 15: Business practices and scale, female sample with interaction effects

	(1) Marketing Index no covar.	(2) Marketing Index with covar.	(3) Record Keeping no covar.	(4) Record Keeping with covar.	(5) Profit+ no covar.	(6) Profit+ with covar.
Indirect Training	–0.016	–0.005	0.065	0.033	–0.048	–0.048
	(0.069)	(0.068)	(0.273)	(0.279)	(0.186)	(0.178)
Ind.Tr.*FemGr	0.057	0.043	–0.119	–0.136	–0.093	–0.217
	(0.095)	(0.098)	(0.352)	(0.356)	(0.249)	(0.247)
Female Group	–0.047	–0.037	–0.124	–0.122	–0.290	–0.211
	(0.070)	(0.071)	(0.245)	(0.258)	(0.184)	(0.183)
Sum Tr*FemGr	0.041	0.037	–0.054	–0.102	–0.141	–0.265
	(0.065)	(0.070)	(0.219)	(0.202)	(0.166)	(0.167)
Observations	165	165	165	165	164	164

*Note: The table reports ITT regressions. Outcome variables are defined as follows. Marketing Index: A normalized index of three questions measuring change in marketing practices. Business Records: Number of different types of records (e.g. sales records, stocks records). Profit: Monthly operating profit (log). +Note that I have only 164 observations of profit, because of log transformation of one zero-observation (one client had closed down their businesses in 2009). The outcomes are regressed on a dummy taking the value one if the client was in a group where someone was offered training, an interaction term of training and female-only group, and finally a dummy taking the value one if the client is member of a female-only group. "Sum Tr*FemGr" is the linear combination of the two first independent variables. Covariates include age, no. of children, no. of employees before the treatment and dummy taking the value one if the client was born in Dar es Salaam. Cluster-robust standard errors in parentheses (clustered at the enterprise group level). Cluster-robust standard errors in parentheses (clustered at the enterprise group level). *p<0.10, ** p<0.05, *** p<0.01.*

Chapter 4

Group composition and group dynamics: Evidence from a lab experiment with microfinance clients

Group composition and group dynamics: Evidence from a lab experiment with microfinance clients

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Abstract

In a lab experiment, we investigate the effect of gender composition on group dynamics in a microfinance institution in Tanzania. We focus on three dimensions: i) a group's ability to solve problems in practice, ii) a group's willingness to accept risk, and iii) a group's behavior with regard to a public good problem involving the possibility of free riding. We find that gender composition is of fundamental importance in understanding group dynamics. Female groups outperform male and mixed groups in problem solving, even though males at the individual level outperform females. Similarly, we find that female groups take more risk than male and mixed groups. However, we find no differences between female, male and mixed groups in the public good game.

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Loan group composition should be based on gender; once you have a single man in a group of women there is a problem.
(Female loan group member)

1. Introduction

Loan groups with joint liability are fundamental in many microfinance institutions (MFIs), and thus it is of great importance to understand their group dynamics. Typically, there are a number of joint decisions to be made in such loan groups, and the ability of the members to cooperate is therefore of great importance. Let us provide two examples. If someone in the group has a problem with their business and loan repayments, members must jointly decide how to deal with this. Similarly, when a member applies for a larger loan, the group members must jointly decide whether to accept the increased risk this creates for the group. If groups are unable to handle such issues in a positive manner, the progress of its members may be hampered and groups may dissolve, with clients eventually exiting the loan programs.

It is well established that there are systematic gender differences in preferences. The social preferences of females are shaped more by the institutional settings than are those of males, and males are more competitive and less risk averse than females (Croson and Gneezy, 2009). These differences probably also play an important role in shaping group behavior.

We therefore conducted a lab experiment with microfinance clients to analyze the impact of gender composition on group dynamics.

Other studies of group composition suggest that gender composition may be decisive for group outcomes, although the evidence so far is somewhat mixed. For instance, Apesteguia *et al*. (Forthcoming), studying a large business game with students, show that teams formed by females are outperformed by both mixed and male teams, while Fenwick and Neal (2001), studying students' group performance in a business strategy game, conclude that "groups may be more effective when women outnumber or equal men." Dufwenberg and Muren (2006), in a lab experiment, also find that female-dominated groups perform differently, and conclude that groups are more generous and egalitarian when females are in the majority. Similarly, in

a development setting, Chattopadhyay and Duflo (2004) find that female leadership in village councils in India influences what kind of public goods are provided.

Although many papers discuss gender issues and microfinance, surprisingly few papers discuss the role of gender composition in loan groups. One exception is Anthony and Horne (2003), who find that the number of females in a loan group correlates positively with individual repayment rates. However, to our knowledge, there are no experimental studies examining group composition and dynamics in a microfinance setting.

We take the first step towards filling this gap by conducting a lab experiment in a microfinance setting, with three group games capturing important aspects of loan group dynamics.

First, to examine whether gender composition is significant for solving group tasks, we conducted a problem-solving game with 10 multiple choice questions. Second, to examine how gender composition affects group decisions involving risk, we conducted a decision game in which the groups had to decide between a safe and a risky investment. Finally, another vital part of loan group dynamics is the members' willingness to fulfill their loan obligations, which serves as a public good for the other members of the group. To examine the role of gender composition on public good provision and free riding, we conducted a standard public good game.

Our experimental design is novel, because we measure practical cooperation and decision making by letting group members communicate freely face to face, whereas to the best of our knowledge, communication and decision making in previous economic lab studies on group behavior has taken place via computers or voting devices (such as, for instance, the studies of risk and groups by Ertac and Gurdal (2010) and Masclet (2009)). We believe this is an important feature of the design, because many situations in the real world are constrained and shaped by *ability* as much as *willingness* to cooperate. To draw causal inference from gender composition to group outcomes, we randomly allocated clients to mixed or single gender groups.

Our study shows that the gender composition of groups is important in several respects for well-functioning microfinance loan groups. Our main findings are as follows. i) Clients of single gender groups benefit more from group cooperation in solving problems than those of

mixed groups. ii) Female groups benefit more from cooperation than male or mixed groups. iii) Female groups take more risk than male and mixed groups. iv) Single gender groups are no different from mixed groups in terms of public good contribution. Our findings from the risk game also indicate that female groups make decisions that are no different from average individual decisions, whereas mixed and male groups become more risk averse.

Our findings also have important policy implications for MFIs. First, if they want to attract more males, they should consider offering individual loans, because males are apparently less able to cooperate in groups. Second, when clients exit, the remaining group members have no replacement and the MFI must fill the gap; attention should then be paid to the gender composition of the group. In particular, placing a male entrepreneur in a group of female entrepreneurs should be done with caution, as this may negatively affect group dynamics. The findings also suggest that group lending has a stronger appeal to women than to men, which may to some extent explain the female dominance of microfinance.[35]

The paper is organized as follows. Section 2 describes the experimental context and design, and Section 3 presents the results. Section 4 discusses the results and presents findings from focus group discussions. Section 5 concludes and discusses policy implications.

2. Experimental context and design

The experiment was conducted in Dar es Salaam, Tanzania, in October 2010, at the Research on Poverty Alleviation (REPOA) research institute. Participants were recruited from among microcredit clients of the Promotion of Rural Initiative and Development Enterprises (PRIDE) Tanzania, the country's largest microfinance institution (MFI). The participants' ages ranged from 21 to 68 years, with an average of 36 years. Of the 229 participants, 129 were female and 100 male. Around 75% had completed primary education, i.e. seven years of schooling. In a field experiment using microfinance clients from the same MFI, Berge (2011) finds that most clients run small-scale, nonregistered businesses with few employees, typically running small kiosks or restaurants, with a daily profit in the range of 10–20 US Dollars (USD).

[35] Lafourcade *et al*. (2005) reports that 58–86% of microfinance clients are female, depending on the geographical area, and approximately 60% are in Africa.

The experiment was run as follows. We invited 309 PRIDE clients to a "Workshop on microfinance and entrepreneurship" where they would earn money, which 229 attended. We conducted six sessions with different clients, each lasting approximately three hours. The experiment was single blind.

The sessions consisted of two parts: the first with individual games, and the second with group games. Individual games were those in which the participants made decisions on their own, without cooperation or influence from other participants. Group games refer to those in which participants made decisions together with other participants. In the individual part, participants played a problem-solving game, two decision-making games involving a risky investment, a dictator game, and finally a public good game.[36] These games were played independently of each other.

In the group part, participants were randomly allocated to single gender or mixed gender groups of four, where they worked together in a problem-solving game and a decision-making game.[37] Because the participants were allocated to single gender or mixed gender groups on a random basis, we are able to establish causal relationships between gender composition and the outcomes of interest.

The mixed groups consisted of two females and two males. If there were not enough participants to form a complete group of four, or the gender composition in the session did not fit the intended group composition, we still asked the participants to perform the task in the problem-solving and decision-making games, but these groups were excluded from the analysis. For this reason, we have data from 52 groups. Of these, 22 groups were mixed, 12 were male, and 18 were female. The same groups were maintained for both the problem-solving and decision-making games.

In the individual problem-solving game, participants were asked to answer 10 multiple choice questions, both related to business and other topics. For each correct answer, the client

[36] Instructions were given in Kiswahili. See the appendix for the English translation.
[37] When the participants entered the session, they received a tag with their ID number. A duplicate of this tag was placed in one of two boxes depending on the participant's gender. In three of six sessions, we formed mixed gender groups by picking two identity numbers from a "Male" box and two from a "Female" box to form one group. In the other three sessions, we formed single gender groups by picking either four identity numbers from the "Male" box, or four from the "Female" box.

received 150 Tanzanian Shillings (TZS), approximately equal to 10 US cents.[38] After this, the participants were randomly allocated to groups of four. Each group had to cooperate in answering 10 similar questions, with each group handing in one answer sheet, and where the only difference was that the payoff was multiplied by four to keep individual stakes constant. On the other hand, in the group game, participants were sitting around a table and could freely communicate with other members of their group.[39] It was made clear that the amount the group earned would be shared equally among the group members.

The risk games were conducted in a similar way, with identical individual and group games. Participants on an individual basis first had to make two decisions involving risk. In the first round, clients could either make a safe investment, from which they with certainty would receive 1000 TZS, or they could gamble and receive either 0 or 2500 TZS with equal probability. In the second round, the safe bet was increased to 1500 TZS, with the gamble being unchanged.

In the group decision game, the same procedure was used for each round played, with the only difference being that the payoff was multiplied by four to keep individual stakes and incentives constant.[40] Before they made the first decision, we communicated to the participants that the outcomes of the lotteries would be determined at the end of the session, by asking one of the participants to pick one of two envelopes, of which one contained a sheet of paper that read "LUCKY" and another that read "UNLUCKY."

Between the individual and the group games in problem solving and decision making, we conducted a dictator game and a public good game. In the dictator game, each participant received 1000 TZS that he/she could decide to keep for himself/herself or share with another PRIDE client. The dictator game was played twice. The dictators in one round were told that the recipient was a male in the session and in the other round that the client was a female.[41]

In the public good game, we randomly allocated participants to either single gender groups or mixed groups of four.[42] We ensured that participants were aware of their group composition,

[38] As a comparison, a typical meal with rice, beans and meat costs approximately 1500 TZS.
[39] Each group had a question sheet and a pen to record answers directly on the sheet.
[40] We do not use the result from the second round of the risk games in our analysis because almost everyone chose the safe option (48 out of 52 groups).
[41] The order of the two dictator games was varied on a random basis to avoid systematic differences.
[42] Participants could see how the randomization was conducted.

but they could not identify who was in their group nor cooperate with their group members. Each participant received an endowment of 2000 TZS, which could either be kept in a private account or contributed to a group fund. Contributions to the group fund were doubled and then shared equally among the group members.[43]

A few weeks after the experiment, we conducted focus group discussions (FGDs) with participants to better understand the dynamics of the groups in the lab experiment. We conducted five FGD sessions, two with male groups, two with female groups, and one mixed session, all consisting of 7–9 participants. The participants in mixed FGDs were randomly picked from participants in single gender FGDs. In total, 34 participants took part in the FGDs.

3. Empirical strategy

To estimate the impact of group composition on problem-solving, decision-making and public good contributions, we begin by estimating the following equation:

$$Y_i = \alpha + SingleGender_i\beta_1 + \varepsilon_i \quad (1)$$

Y_i is the group outcome of interest, which is (i) the number of problems solved correctly, (ii) whether or not the group decided to gamble, and (iii) the total contributions by the group in the public good game. *SingleGender* is a dummy equal to one if the group consists of only males or females. Because clients are randomly allocated to either single or mixed gender groups, β_1 has a causal interpretation as the impact of gender composition on the group outcome of interest.

We also include a set of control variables, $\boldsymbol{X}_i$, in our regression to account for potential initial differences between the groups, by estimating:

$$Y_i = \alpha + SingleGender_i\beta_1 + \boldsymbol{X}_i\delta + \varepsilon_i \quad (2)$$

[43] We explained the game thoroughly by conducting role-plays with research assistants as models.

Control variables include group averages of loan size in PRIDE, age, contributions in the dictator game, and years of membership of PRIDE, in addition to the number of literate members. In addition, when analyzing the impact of group composition on problem solving and decision making, we control for total individual knowledge and total number of risk takers in the group, respectively.

Furthermore, because we wish to explore the impact of gender composition on group dynamics, we include the interaction term $SingleGender_i Male_i$ and estimate:

$$Y_i = \alpha + SingleGender_i \beta_1 + SingleGender_i Male_i \beta_2 + \varepsilon_i \quad (3)$$

β_1 measures the difference in outcome of interest between female groups and mixed groups, while $\beta_1 + \beta_2$ captures the difference between male groups and mixed groups. However, we should interpret β_2 with care. The coefficient measures the difference between male and female groups, and should not be given a causal interpretation, because an individual by definition cannot belong to both a male and a female group. Note that we do not need to include a term for male in our regression, because the constant term α captures mixed gender groups, while the remaining two terms capture female and male groups. Finally, we also included covariates when we estimated the differences between the groups:

$$Y_i = \alpha + SingleGender_i \beta_1 + SingleGender_i Male_i \beta_2 + \boldsymbol{X}_i \delta + \varepsilon_i \quad (4)$$

We estimate (1)–(4) by the ordinary least squares (OLS) method when we study the impact of group composition on problem-solving and public good contributions. However, we use a probit model and report marginal effects when estimating whether groups decide to gamble or not, since this is a binary outcome. The results are similar to those obtained with OLS, but are rejected at slightly weaker significance levels.

4. Results

In this section we present our findings. Contribution rates in the dictator games are reported in Table 1. Participants contributed an average of 440 TZS to males, and 452 TZS to females, from an allocation of 1000 TZS. However, this difference in contribution between males and females is not significantly different from zero. This also holds when we disaggregate by gender, and we see that contributions are very similar in all cases. We note that contribution rates are very high (40–47%). We use average contribution rates in the group as a control variable in the main games, which we present in the following subsections.

4.1 Problem-solving game

The left part of Figure 1 shows the distribution of number of correct answers for the individual problem-solving game for males and females, respectively. We observe that males are more often placed to the right of the graph, indicating that males achieve higher scores. Table 2 shows that males answer an average of 5.75 from a maximum of 10 correct answers, while females average 5.39 correct answers (t-test, $p = 0.01$). Examining the number of correct group answers in Table 3, the findings are reversed, with female groups achieving 0.79 more correct answers than male groups (t-test, $p = 0.05$), and 0.9 more correct answers compared with mixed groups (t-test, $p = 0.01$). To further investigate this issue, we regressed gender group composition on the group score.

When estimating equation (1), we see from Table 4, regression (1), that single gender groups (both male and female groups) achieved 0.59 more correct answers than mixed groups ($p < 0.05$). In regression (2) we included control variables, and the impact of being in a single gender group becomes slightly stronger ($p < 0.01$).

From regressions (1) and (2), we conclude that single gender groups perform better in the problem-solving test, indicating that the group dynamics are more positive in such groups. Furthermore, to explore whether this result is driven mainly by female or male groups, we include the interaction term *SingleGenderGroup*Male* in the regression, as reported in column (3). We observe that the overall effect of a single gender group from regressions (1) and (2) must clearly be driven by female groups performing significantly better than both male and mixed groups (significant at the 1% level), because they achieve 0.9 more correct

answers than the mixed groups ($p < 0.01$). As expected from the size of the coefficients, we also note that a joint significance test of *SingleGenderGroup* and *SingleGenderGroup*Male* reveals that the performance of male groups is not significantly different from that of mixed groups. In regression (4), we control for covariates, and again see that the estimates become slightly higher ($p < 0.01$).

4.2 Risk and decision-making games

On the left-hand side of Figure 2 and table 5, we see that males and females are identical at the individual level when it comes to taking risk, with 50% of both males and females choosing the risky option. However, from the group level on the right-hand side of Figure 2, we see that the percentage of risk takers is much lower for male and mixed groups; 25% of male groups and 18% of mixed groups choose to take risk compared with 44% of female groups. From the t-tests in Table 6, we also note that female groups are significantly less risk averse than mixed groups (significant at the 10% level).

Table 7 reports regression results on the impact of group composition on a group's risk decision. From regressions (1) and (2), we see that single gender groups are no more likely than mixed groups to choose the risky option. However, in regressions (3) and (4), we see that female groups are 25–26% more likely than mixed groups to choose the risky option.[44] When covariates are included, the coefficient is significant at the 5% level, and when covariates are not included, the coefficient is significant at the 10% level. Furthermore, in regression (4), the coefficient of the interaction term *Single Gender Group*Male* is also significant but negative. This indicates that male groups take less risk than female groups. The number of risk takers in the group also significantly affects the group outcome. The more risk takers in a group, the more likely the group is to choose the risky option.

Finally, t-tests show that female groups do not make significantly different risk decisions than the average number of individual decisions among group members, while male and mixed groups become significantly more risk averse in groups (significant at the 5% and 1% levels). This may indicate that female groups are more efficient in making joint decisions, in the sense that joint decisions are closer to their individual choices.

[44] Ordinary least squares results are very similar, although slightly less significant.

4.3. Public good game

Table 8 shows descriptive statistics at the individual level for the public good game. We see that participants contributed an average of slightly more than 50% of their endowment to the group fund. Females contributed an average of 1101 TZS from a maximum of 2000 TZS, while males contributed 943 TZS, but the difference is far from statistically significant. Furthermore, we note that contributions from participants in mixed gender groups are almost identical to those from participants in single gender groups. Table 9 reports regression results from the public good game that confirm the descriptive evidence in Table 8. Regressions (1) and (2) show that the average public good contribution is not influenced by whether the group was single gender or mixed.[45] Furthermore, regressions (3) and (4) show that groups consisting of males do not contribute significantly different than female or mixed groups.

5. Discussion and findings from the focus group discussions

We have shown that group composition is important for cooperation and decision making. At the individual level, we found that females are less able than males to answer correctly. However, when females are in groups with other females, we found that they outperform male and mixed groups. Surprisingly, total individual knowledge does not correlate with group performance, indicating that it is not the case that four clever people sitting together necessarily perform better. Female groups appear to have a more constructive group process than male groups, managing to utilize members' capabilities. If this reflects a more general pattern for loan groups in microfinance, it may provide a reason why females find it more attractive to become members of microfinance institutions; they manage to cooperate well and can handle joint liability schemes in a constructive way.

Similar conclusions can be drawn from the risk game. At the individual level, both for males and females, there was an equal split between participants choosing the risky and the safe option.[46] When groups decided whether to gamble, we saw that in general they were more

[45] Note that these groups are not identical to those used in the problem-solving and decision-making games. Furthermore, the sample in the public good game is not identical to the sample in the problem solving and decision making games. This is because we conducted two randomizations: one for the public good game, and one for the problem-solving and decision-making game.

[46] This is in contrast to previous research, which typically shows that females are more risk averse than males (Croson and Gneezy, 2009).

likely than individuals to play safe, because only 15 of 52 groups chose the risky option. Ertac and Gurdal (2010) and Masclet (2009) found a similar pattern, and suggest that there is a cautious shift when people enter a group. Because females are often found to be more risk averse than males (Croson and Gneezy, 2009), one may believe that female groups would be hostile towards risk. However, this does not appear to be the case, because we find that female groups take more risk than male and mixed groups; nor do we find that female groups make significantly different choices than they do individually. Thus, female groups' acceptance of risk may be a reason why females seem more comfortable than males with group loans.

The finding that female groups perform better in the problem-solving game is probably related to the finding in the decision-making game. As female groups are more able to discuss and make common agreements in the problem-solving game, the fear of being blamed if the outcome of the gamble were negative may be less important. On the other hand, in the male and mixed gender groups, the atmosphere may be less inclusive, and groups may therefore more easily choose the nonrisky option if, for example, one member were reluctant to gamble.

While we find that group composition may influence the *ability* of groups to cooperate and solve problems, we find no gender differences in public good contributions between the different groups, indicating that group composition does not influence *willingness* to cooperate.

We had 34 participants in focus group discussions (FGDs) six weeks after the lab experiment, to shed further light on the results from the experiment**.** We conducted five sessions of FGDs, two with male groups, two with female groups, and one mixed session, all consisting of 6–9 participants. Several interesting explanations were provided concerning the dynamics of cooperation in male and female groups. For instance, a male participant said:

> *There is a Kiswahili proverb: "Two bulls do not stay in one house." When you put men together there is always a tendency for them to disagree with each other, while females on the other hand would listen to each other.*

The quote reflects that it may be difficult for males to cooperate and listen to each other. Another male pointed out that women's lack of confidence make them more open to others' arguments:

Women lack self-confidence and this helps them to accept ideas and suggestions from other females. Unlike women, the self-confidence of males makes it difficult for them to accept ideas and suggestions from each other, and therefore they don't perform well in a group.

The response from a woman in another session indicates that females' lack of confidence is related to their belief that they have a disadvantage in terms of education. Hence, working together is seen as a solution:

… I told you that women lack experience and education; therefore it is more useful for them to work in groups rather than independently.

Discussing gender differences in groups, a male participant indicated the issue that males are expected to make decisions when together with females:

Whenever males and females are mixed in a group, females tend to step aside, assuming that males are supposed to lead, even when the male is inexperienced in the relevant subject.

On the other hand, a female participant said that it was not about females stepping aside, but that male arguments are heeded to a greater extent:

In most cases a male's suggestion, answer or idea is given more weight, thus women will tend to listen to men.

The findings from the focus groups indicate that in mixed groups, females step aside and let the males decide. Females appear to lack self-confidence, and assume that males are more knowledgeable. Males, on the other hand, tend not listen to each other and do not want to reveal weakness. However, when females are grouped, they realize that four heads are better than one, and in our games this translates into discussing questions openly and firmly to find correct answers, and making decisions that suit the group. This indicates that females are dominated by males in group settings, thereby effectively constraining females from utilizing their knowledge and ability to cooperate.

5. Concluding remarks

Our lab experiment with microfinance clients suggests that female groups gain more from cooperation and that males constrain females if they are together in a group. We have seen that female groups outperformed initially more knowledgeable males in the problem-solving game. Furthermore, groups consisting of females take more risk than other groups.

Hence, gender composition is important for loan group dynamics, which may be important for social impact and the financial sustainability of microfinance institutions. When designing loan group schemes, MFIs should therefore take into account gender composition, because placing males in female groups may have negative effects. In addition, if an MFI wishes to attract more males, they should consider offering individual loans because it seems likely that males gain less from group cooperation than females.

Our findings that females are more able to cooperate than males and that the presence of males disturbs the dynamics of female groups may also shed light on other important issues in related to microfinance and entrepreneurship.

First, the findings may partly explain why microfinance is dominated by females, because the loan group setting is often one of few places where females can be together and cooperate without male interference.

Second, they may also shed light on the apparent difficulty of raising female profits and incomes, because females seem less able to utilize their competencies and skills in social contexts involving males. This may be particularly true in settings with huge gender segregation, such as Tanzania.

Finally, our study may also contribute more general insight into the literature on gender differences in willingness to compete. Males have previously been found to be more eager to compete than females (Croson and Gneezy, 2009), while our study suggests that females are more able team players. This may therefore suggest that females are more attracted to environments where cooperation is more important than eagerness to compete.

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Figure 1: Gender, gender composition and problem solving

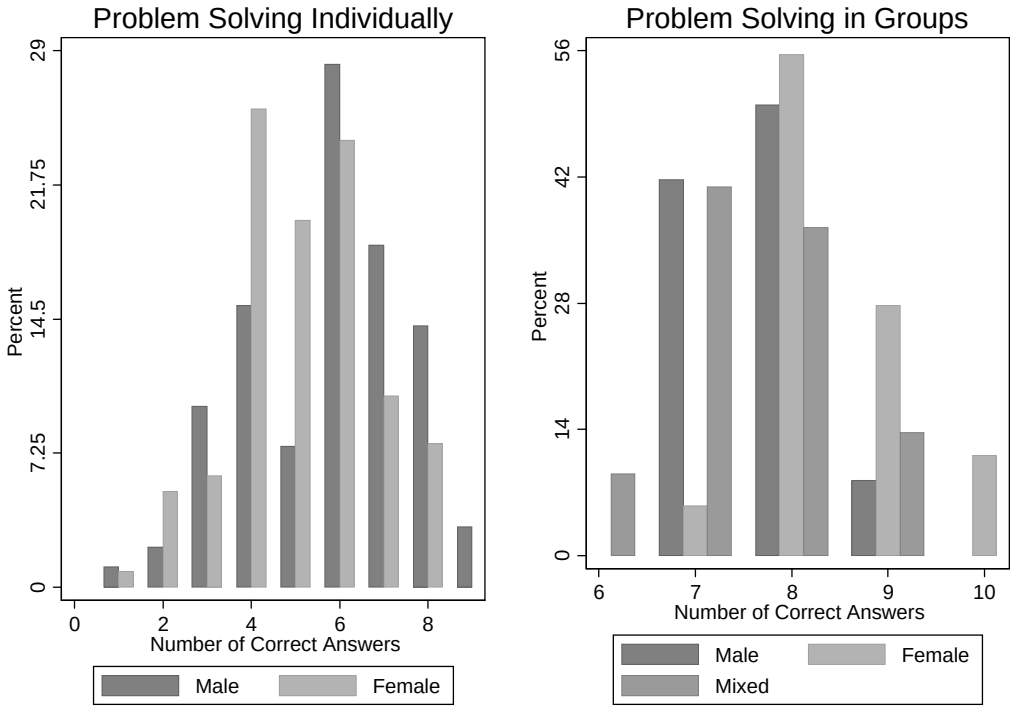

Figure 2: Gender, gender composition and decision making

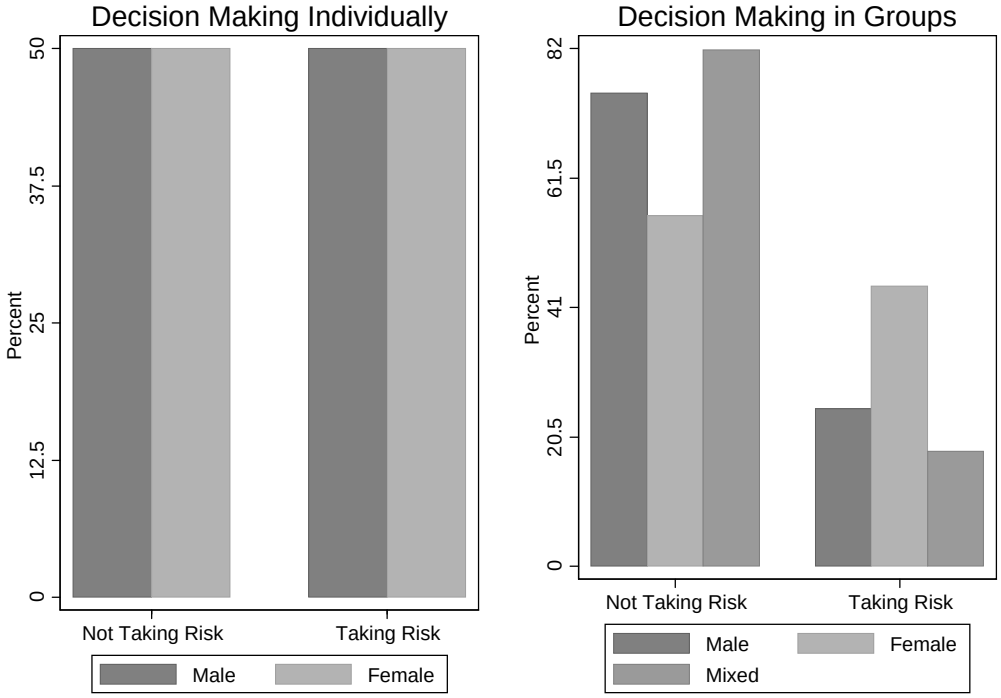

Table 1: Descriptive statistics of dictator game

	N	Mean	Std. Dev.	Median	Min	Max
Total						
Amount sent to Male Recipient	229	439.96	246.57	500	0	1000
Amount sent to Female Recipient	229	452.40	256.61	500	0	1000
Difference		*–12.44*	*(17.37)*			
Sent by Male						
Amount sent to Male Recipient	100	440.50	245.74	500	0	1000
Amount sent to Female Recipient	100	425.50	232.85	500	0	1000
Difference		*15.00*	*(22.02)*			
Sent by Female						
Amount sent to Male Recipient	129	439.53	248.17	500	0	1000
Amount sent to Female Recipient	129	473.25	255.72	500	0	1000
Difference		*–33.72*	*(25.59)*			

*This table reports the contribution in the Dictator Game. Participants were asked to share 1000 TZS with another person. Each participant had to make this decision twice: with a male and with a female. In the first part of the table, we report the average contribution of all participants to male and female recipients. In the second part, we report average contributions by males, and in the third part, we report average contributions by females. Inference from t-test. *p < 0.1, ** p < 0.05, ***p < 0.01. Standard errors in parentheses.*

Table 2: Number of correct answers, individually

	N	Mean	Std. Dev.	Median	Min	Max
Total	208	5.39	1.70	6	1	9
Male	92	5.75	1.79	6	1	9
Female	116	5.11	1.57	5	1	8
Difference Male–Female		*0.64***	*(0.23)*			

*This table reports the number of correct answers in the problem-solving game in the individual round. There were 10 multiple choice questions in the game. Inference from t-test. *p < 0.1, ** p < 0.05, ***p < 0.01. Standard errors in parentheses.*

Table 3: Number of correct answers, by group

	N	Mean	Std. Dev.	Median	Min	Max
Total	52	7.88	0.87	8	6	10
Male	12	7.66	0.65	8	7	9
Female	18	8.44	0.78	8	7	10
Mixed	22	7.54	0.86	7.5	6	9
Difference Male–Mixed		*0.12*	*(0.28)*			
Difference Female–Mixed		*0.90****	*(0.26)*			
Difference Male–Female		*–0.78***	*(0.27)*			

*This table reports the number of correct answers in the problem-solving game at the group stage. There were 10 multiple choice questions in the game. Inference from t-test. *p < 0.1, ** p < 0.05, ***p < 0.01. Standard errors in parentheses.*

Table 4: Regression results for problem solving

	(1) Correct Answers no covar.	(2) Correct Answers with covar.	(3) Correct Answers no covar.	(4) Correct Answers with covar.
Single Gender Group	0.59**	0.78***	0.90***	1.07***
	(0.24)	(0.22)	(0.26)	(0.25)
Single Gender Group * Male			–0.78***	–0.75***
			(0.26)	(0.27)
Total Knowledge Endowment		0.03		0.06
		(0.04)		(0.04)
Average Loan Size		0.13*		0.10
		(0.07)		(0.08)
Average Years with MFI		0.09		0.08
		(0.08)		(0.07)
Average Age		–0.00		–0.02
		(0.02)		(0.02)
Number of Literate Members		0.21		0.07
		(0.29)		(0.28)
Average Altruism		0.10		0.09
		(0.06)		(0.06)
Constant	7.55***	4.33***	7.55***	5.13***
	(0.18)	(1.58)	(0.18)	(1.40)
Observations	52	52	52	52

*Notes: This table shows results from OLS estimations. The dependent variable is the number of questions that a group is able to answer correctly (from 10 questions). The unit of observation is the group (which consists of four members). Single Gender Group is a dummy variable that takes the value of one if a group is single gender and zero if the group is mixed. Single Gender Group*Male is an interaction term to capture male groups. Total Knowledge Endowment measures the total number of correct answers in the individual knowledge test by all the members in the group. Average Loan Size measures the average loan size of the four members of the group. Average Years with MFI is the average number of years of membership of PRIDE among the four members of the group. Number of Literate Members counts the number of members who are able to read. Average Altruism measures the average contribution from the group members in the dictator game.*
*Robust standard errors are in parentheses. *p < 0.10, ** p < 0.05, *** p < 0.01.*

Table 5: Proportion of risk takers, individually

	N	Mean	Std. Dev.	Median	Min	Max
Total	208	0.50	0.50	0.50	0	1
Male	92	0.50	0.50	0.50	0	1
Female	116	0.50	0.50	0.50	0	1
Difference Male–Female		*0.00*				

This table reports the proportion of participants who choose to take risk individually. Participants were assigned the value of one if they took risk, and zero if they did not.

Table 6: Proportion of risk takers, by group

	N	Mean	Std. Dev.	Median	Min	Max
Total	52	0.29	0.46	0	0	1
Male	12	0.25	0.45	0	0	1
Female	18	0.44	0.51	0	0	1
Mixed	22	0.18	0.39	0	0	1
Difference Male–Mixed		*0.07*				
Difference Female–Mixed		*0.26**				
Difference Male–Female		*–0.19*				

*This table reports the proportion of groups that chose to take risk in the decision-making game. Participants were assigned a value of one if they took risk, and zero if they did not. Inference from Mann–Whitney test. *z < 0.1, ** z < 0.05, ***z < 0.01.*

Table 7: Regression results for risk and decision making

	(1) Risky Investment no covar.	(2) Risky Investment with covar.	(3) Risky Investment no covar.	(4) Risky Investment with covar.
Single Gender Group	0.18	0.20*	0.25*	0.26***
	(0.12)	(0.10)	(0.13)	(0.10)
Single Gender Group * Male			–0.16	–0.20***
			(0.13)	(0.08)
Number of Risk Takers		0.30***		0.30***
		(0.08)		(0.09)
Average Loan Size		–0.07		–0.07
		(0.05)		(0.04)
Average Years with MFI		0.07		0.06
		(0.05)		(0.04)
Average Age		–0.00		–0.01
		(0.01)		(0.01)
Number of Literate Members		–0.11		–0.12
		(0.14)		(0.11)
Average Altruism		0.02		–0.00
		(0.03)		(0.03)
Observations	52	52	52	52

*Notes: This table shows the marginal effects after probit estimations. The dependent variable is a dummy variable taking the value of 1 if the group decides to take a risk, and zero otherwise. The unit of observation is the group (which consists of four members). Single Gender Group is a dummy variable that takes the value of 1 if a group is single gender and zero if the group is mixed. Single Gender Group*Male is an interaction term to capture male groups. Number of Risk Takers counts the number of members in the group who take risk individually. Average Loan Size measures average loan size of the four members of the group. Average Years with MFI is the average number of years of membership of PRIDE among the four members of the group. Number of Literate Members counts the number of members who are able to read. Average Altruism measures the average contribution from the group members in the dictator game.*
*Robust standard errors in parentheses. *p < 0.10, ** p < 0.05, *** p < 0.01.*

Table 8: Descriptive statistics of public good game

	N	Mean	Std. Dev.	Median	Min	Max
Total						
Contribution to Public Fund	208	1027.88	815.13	1000	0	2000
By Gender						
Males' Contribution to Public Fund	96	942.71	848.74	1000	0	2000
Females' Contribution to Public Fund	112	1100.89	781.60	1000	0	2000
Difference		*–158.18*	*(113.11)*			
By Group Composition						
Contribution in Mixed Groups	88	1018.18	844.39	1000	0	2000
Contribution in Same Gender Groups	120	1035.00	796.49	1000	0	2000
Difference		*–16.82*	*(114.67)*			

*This table reports the contribution in the public good game. Participants were asked to distribute 2000 TZS into either a private fund or a public fund. The first part shows average contribution by all participants. The second part reports the contributions when we disaggregate by gender, and the third part reports the contribution when we disaggregate by group composition. Inference from t-test. *p < 0.1, ** p < 0.05, ***p < 0.01. Standard errors are in parentheses.*

Table 9: Regressions results for social preference

	(1) Average PG Contribution no covar.	(2) Average PG Contribution with covar.	(3) Average PG Contribution no covar.	(4) Average PG Contribution with covar.
Single Gender Group	16.82	49.93	95.05	111.58
	(121.87)	(118.88)	(129.10)	(128.85)
Single Gender Group * Male			–180.54	–144.05
			(137.23)	(124.42)
Average Altruism		71.89**		71.29***
		(27.04)		(26.47)
Average Loan Size		–1.57		–6.19
		(30.52)		(30.38)
Average Years with MFI		23.50		22.90
		(33.99)		(32.94)
Average Age		14.13		13.13
		(12.54)		(13.48)
Number of Literate Members		185.30		181.83
		(181.88)		(184.53)
Constant	1018.18***	–934.11	1018.18***	–855.47
	(101.52)	(899.36)	(102.55)	(944.00)
Observations	52	52	52	52

*Notes: This table shows results from OLS estimations. The dependent variable is the average of group members' contributions into the public fund in the public good game. The unit of observation is the group (which consists of four members). Single Gender Group is a dummy variable that takes the value of 1 if a group is single gender and zero if the group is mixed. Single Gender Group*Male is an interaction term to capture male groups. Average Altruism measures the average contribution from the group members in the dictator game. Average Loan Size measures average loan size of the four members of the group. Average Years with MFI is the average number of years of membership of PRIDE among the four members of the group. Number of Literate Members counts the number of members who are able to read.*
*Robust standard errors are in parentheses. *p < 0.10, ** p < 0.05, *** p < 0.01.*

Appendix: Lab instructions

[Before the session starts]

[Moderator ensures that Overhead 1 ("Karibuni") is on when participants enter room]

[MODERATOR ensures that the participants follow the rules of conduct after entering the room]

[When Moderator receives a sign from the Head of the Experiment (LHE), he starts reading the introduction]

[The session]

[Introduction]

Welcome. We appreciate your willingness to participate in this session, which I will lead. In this session you will be asked to make some economic choices, and you will earn money based on your choices and your performance.

The results from this session will be used in a research project on microcredit and entrepreneurship. It is therefore very important that all of you follow certain rules of conduct. You are not allowed to talk to any of the other participants during the session. If you have any questions or need any help, please raise your hand and one of us will assist you. All cell-phones must be turned off and put away If someone does not follow these instructions, we will have to ask him or her to leave the workshop.

If you need to go to the bathroom during the workshop, please raise your hand. Importantly, do not leave the room without permission.

[MODERATOR proceeds when HE gives signal]

The session will be conducted under anonymity. It will not be possible for the other participants or anyone else, except for the researchers, ever to find out what choices you make, and hence what you earn in the session. This session consists of three activities.

First, you will be asked to perform several individual activities. Second, you will be asked to make decisions a group were other group members are anonymous. Finally, you will be asked to work together with other participants to solve problems.

The activities are completely independent, which means that your performance in one activity has no impact on what happens in the other activities. The estimated time of the whole session is approximately three hours.

In each activity, you can earn money. You will not be informed about how much money you have earned until the end of the session. The payment to you is organized as follows. The researchers keep track of how much money you earn throughout the session. At the end of the session, they prepare an envelope containing the money you have earned, where they will ensure that it is impossible to identify the amount of money inside the envelope simply by looking at it. This envelope will be handed over to you in private when you leave the session.

It is very important that you remember your desk number and report it in each activity, as the desk number is your identity in this experiment.

[Individual Game: Knowledge test]

We will now explain the first activity in this session. We will shortly ask you some general questions. The questions are grouped in two topics: health and nutrition and business knowledge.

In total there are 10 questions, and for each question you can choose between four different answers. Your job is to tick off the correct answer. You should only tick off one alternative. If you tick off more than one alternative, your answer will be considered incorrect. We now provide an example of how you should do this.

[MODERATOR reads Overhead KT]

Your job is to tick off one of these answers. The correct answer is XXXX. Hence, if you tick off any of the other numbers, your answer is incorrect. In particular, you should never tick off more than one alternative.

For each correct answer, you are paid the fixed rate of 150 Tsh.

We will now hand out the questions but please do not turn over the page before you are told to do so.

[MODERATOR waits until the first sheet has been handed out to all participants. He continues when HE gives signal]

You can now turn over the sheet. First, now and for all sheets that you receive, make sure that you fill in your correct desk number, so that we can pay you correctly. We will now read question by question, and then for each question you tick off what you think is the correct answer.

Is this clear to everyone? If not, then please raise your hand and we will assist you.

[MODERATOR proceeds when HE gives signal]

I'll now start reading the first question.

[MODERATOR reads the questions on the sheet]

[LHE gives a signal 15 seconds after Moderator has finished reading each question and the alternative answers; this applies for both topics]

You have now answered all the questions on this topic. My assistants will collect the sheets.

[Individual Risk Game]

We now move to the second part of the workshop, where you also can earn money, but in a different way. Let’s explain in more detail.

First, we will simply give each of you 1000 Tsh. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take risk, then you can be lucky or unlucky. If you are lucky, you will get 2500 Tsh instead of

1000 Tsh. If you are unlucky, you lose the 2500 Tsh and nothing is added to your final payment from this situation.

Here is how we decide whether you have been lucky or unlucky. When everyone has made their choice of whether to take the risk or not, we prepare two pieces of paper; one piece with the word LUCKY, the other piece with the word UNLUCKY.

[F illustrates the procedure, as Moderator reads]

We will then put them into two identical and empty envelopes, and the envelopes will be placed in this bowl. Thus it will be impossible for any of us to identify which envelope contains the word LUCKY. We will randomly select one of you to make the draw of one of the envelopes at the end of the workshop. If this envelope contains the word LUCKY, we will pay 2500 Tsh to those of you who chose to take risk. However, if this envelope contains the word UNLUCKY, those who chose to take the risk will not receive anything in this situation. Thus, it is equally likely that those who take the risk are LUCKY or UNLUCKY.

For those of you who chose the certain payment, the outcome of this draw does not affect your pay. In any case, you receive the certain payment of 500 Tsh.

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

On the overhead, we summarize the choice you have to make.

[MODERATOR shows Overhead 5 and reads it. He then continues]

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

We will now hand out the sheet where you have to make the choice of whether to risk your 1000 Tsh or keep them. Please do not turn over the sheet until you are told to do so.

[MODERATOR waits until HE provides a signal]

You should now make the choice of whether to risk your 1000 Tsh or keep them.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now collect the sheet.

[MODERATOR waits until HE provides a signal]

We remind you that the determination of LUCKY and UNLUCKY outcome will be done at the end of the experiment.

[MODERATOR waits until HE provides a signal]

Now we move on to a new situation. Again, we will give you some money, this time 1500 Tsh. This is your money. You may decide to add it to the total amount of money that you are paid at the end of the session, or you may decide to take a risk. If you take the risk, then you can be lucky or unlucky. If you

are lucky, you will get 2500 Tsh instead of 1500 Tsh. If you are unlucky, you lose the 1500 Tsh and nothing is added to your final payment from this situation

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

On the overhead, we summarize the choice you have to make.

[MODERATOR shows Overhead 7 and reads it. He then continues]

We will now hand out the sheet where you have to make the choice of whether to risk your 1500 Tsh or keep them. Please do not turn over the sheet until you are told to do so.

[MODERATOR waits until HE provides a signal]

You should now make the choice of whether to risk your 1500 Tsh or keep them.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now collect the sheet.

[MODERATOR waits until HE provides a signal]

Now all of you have made choice, at the end of the workshop, we will determine the outcome with the same procedure as have been explained.

[MODERATOR waits until HE provides a signal]

[MODERATOR waits until HE provides a signal]

When all of you have made your choices, at the end of the workshop, we will determine the outcome with the same procedure as have been explained.

You have now completed this particular part of this session.

We now proceed to another activity.

[Individual Game: Dictator Game]

We now move to the next activity of the workshop, where you also can earn money, but in a different way. Let's explain in more detail.

We will start a pair-activity. Each of you will be assigned to another person. This person is also a PRIDE client. You and this person will receive 1000 TZS in total.

You will not be told who you will be paired with, and your partner will not know your identity. You will only know one characteristic of your partner**. This characteristic will be given to you privately in the sheet that we will hand out to you.**

You shall decide how to share the money between you and your partner, and you can send from 0 up to 1000 TZS to your partner with 100 as increment.

[MODERATOR waits until HE provides a signal]

On the overhead, we summarize the choice you have to make.

[MODERATOR shows Overhead DG and reads it. He then continues]

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

We will now hand out a sheet where you have to make decisions how much to share for your partner**. In the sheet, you can see one characteristic of your partner.** Please do not turn over the sheet until you are told to do so.

[MODERATOR waits until HE provides a signal]

You should now make the decision.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now collect the sheets.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now do this one more time. You will be paired with another PRIDE client. You and this person will receive 1000 TZS in total.

As in the previous activity, you will not be told who you will be paired with, and your partner will not know your identity. You will only know one characteristic of your partner**. This characteristic will be given to you privately in the sheet that we will hand out to you.**

You shall decide how to share the money between you and your partner, and you can send from 0 up to 1000 TZS to your partner with 100 as increment.

[MODERATOR waits until HE provides a signal]

We will now hand out a sheet where you have to make decisions how much to share for your partner. In the sheet, you can see one characteristic of your partner. Please do not turn over the sheet until you are told to do so.

[MODERATOR waits until HE provides a signal]

You should now make the decision.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now collect the sheets.

[Group Game: Public Good Game]

We now move to the next activity of the workshop, where you also can earn money, but in a different way. In this particular activity, you will play in a group. This mean, both your decision and other's decision will matter for the sum of money that you earn in this activity.

Your group member will be randomly selected, and there are 4 persons in each group. We create the group by taking the number from two different boxes randomly. You will not know who your group members are, only the researcher will know who group with whom.

To be read ONLY in SAME GENDER TREATMENT

Let's create the groups before we proceed with the information about the activity. Here, there are two boxes, one consists of desk number of male participants, and the other consists of desk numbers of female participants. Now, we will make groups of 4 persons that consists of people with the same gender. Now, my assistant will take 4 desk numbers from male box, this is the first group. Then, we proceed to take 4 numbers from female box, then this is second group. We will proceed to the next group.

In case the remaining desk numbers in the box are not enough to create a group, the participants with these desk numbers will do different task.

To be read ONLY in MIXED GENDER TREATMENT

Let's create the groups before we proceed with the information about the activity. Here, there are two boxes, one consists of desk number of male participants, and the other consists of desk numbers of female participants. Now, we will make groups of 4 persons that consists of two female and two male participants. Now, my assistant will take 4 desk numbers from male box, this is the first group. Then, we proceed to take 4 numbers from female box, then this is second group. We will proceed to the next group.

In case the remaining desk numbers in the box are not enough to create a group, the participants with these desk numbers will do different task.

Now, we will proceed with the information about how you can earn money in this session.

You are now in a group of 4 persons with 3 other members in this room. Each group member receives 2000 TZS and will decide how to allocate this 2000 TZS. You can either put these 2000 TZS into your **private fund** or you can invest them **fully or partially** into **group fund.** Each TZS you do not invest into the group fund will automatically remain in your private fund and will be added into your payment.

The total group fund from 4 people's contribution will be doubled and shared equally to all participants.

To make you easily understand this particular activity, I will ask my assistant to visualize this activity.

First example:

Now, I give each person 2000 TZS. This is their money; they will decide whether they want to keep it for private, or to contribute to group fund.

Now, you see that all of them do not contribute. This mean each of them keep 2000 for their private fund. Then, the group fund remaining zero. This mean they will not get money from the group fund. So, everyone will get 2000 from this activity and can bring home this 2000 TZS.

Because this was an example, I am taking the money back from them.

Let's try second example:

As before, I give each of group members 2000 TZS. This is their money; they will decide whether they want to keep it for private, or to contribute to the group fund.

Now you see that all of them contribute 2000 TZS. Then the total group fund will be 8000. Then we will add 8000 more to the group fund, so, group fund become 16000. We share the money equally to all participants. Then, you see that each participant receives ::::::::::::::::::4000 from group fund.

As you see they contributed all their money to the group fund, hence their private fund is zero, because, now, they receive 4000 from group fund, the total of private fund and their share from group fund that they can bring home is 4000 TZS.

Because this was an example, I am taking the money back from them.

Let's try third example:

As before, I give each of group members 2000 TZS. This is their money; they will decide whether they want to keep it for private, or to contribute to the group fund.

Now you see that member 1 contribute 0, member 2 contribute 500, member 3 contribute 1500 and member 4 contribute 2000.

This mean, member 1 has 2000 in his private fund, member 2 has 1500 TZS in his private fund, member 3 has 500 in his private fund, and member 4 has nothing left in his private fund.

Now let's calculate how much money is in the group fund. You see that this is 4000. Then, we will double it with the meaning that we add 4000 more to the group fund, so now, it becomes 8000. Then we divided them equally to 4 participants.

NOW YOU WILL RECEIVE A SHEET WHERE YOU SHOULD WRITE HOW MUCH EVERYONE WILL RECEIVE FROM THE GROUP FUND.

PLEASE WRITE DOWN NOW, and my assistant will check whether you have finished to answer.

As everyone has answered, let us calculate how much everyone get. Now, you see that everyone have receive the same amount of money. Please write it down, how much everyone get in your sheet.

My assistant now will collect the answer.

So, now, you see that everyone receive 2000 from the group fund.

Now, let's us calculate how much money each member has.

Member one has 2000 in the private fund, and receive 2000 from the group fund, the total is 4000 that he/she can bring home.

Member two has 1500 in the private fund, and receives 2000 from the group fund, the total is 35000 that he/she can bring home.

Member 3 has 500 in private the fund, and receives 2000 from the group fund, the total is 2500 that he/she can bring home.

Member 4 has 0 in the private fund, and receives 2000 from the group fund, the total is 2000 that he/she can bring home.

Now, let us redo the same example so that it becomes clearer for you.

Now I am taking the money back from them.

Now we redo the example

As before, I give each of the group members 2000 TZS. This is their money; they will decide whether they want to keep it for private, or to contribute to the group fund.

Now you see that member 1 contribute 0, member 2 contribute 500, member 3 contribute 1500 and member 4 contribute 2000.

This mean, member 1 has 2000 in his private fund, member 2 has 1500 TZS in his private fund, member 3 has 500 in his private fund, and member 4 has nothing left in his private fund.

Now let's calculate how much money is in the group fund. You see that this is 4000. Then, we will double it with the meaning that we add 4000 more to the group fund, so now, it becomes 8000. Then we divided them equally to 4 participants. ::::::::::::::::::::::::::::::.

So, now, you see that everyone receive 2000 from the group fund.

Now, let's us calculate how much money each member has.

Member one has 2000 in the private fund, and receive 2000 from the group fund, the total is 4000 that he/she can bring home.

Member two has 1500 in the private fund, and receives 2000 from the group fund, the total is 35000 that he/she can bring home.

Member 3 has 500 in the private fund, and receives 2000 from group fund, the total is 2500 that he/she can bring home.

Member 4 has 0 in the private fund, and receives 2000 from group fund, the total is 2000 that he/she can bring home.

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

[Control Questions]

Now, let's try more examples, but now, you should calculate by yourself and write down the answers.

Now, we will hand out a sheet with examples.

CHECK CONTROL SHEET QUESTIONS THIS IS CONTROL QUESTIONS INCLUDING THE P-EXPERIMENT

[MODERATOR waits until HE provides a signal]

Now, my assistant will collect the sheet.

[MODERATOR waits until HE provides a signal]

Now, we finish with examples and we hope you have fully understood the activity. We proceed with the main activity whereas you should make decision which will determine how much money you will bring home as this is a group activity, remember that the decisions of the other members in your group will also determine how much money you bring home.

[MODERATOR waits until HE provides a signal]

[Group Game: Public Good Game C-experiment]

Remember now you have been grouped with 3 different participants in this room;

[for SAME GENDER TREATMENT] who have the same gender as you

[for MIXED GENDER TREATMENT] one of them have similar gender as you, and the two others are people with opposite gender.

The group for participants with these particular number:_____ is not full. So, these persons should do other task. My assistant will come to you and explain the special task.

Now, we give each of you 2000 TZS. Then you must decide how much you want to contribute to the group fund and how much you want to keep for private fund. As you remember from our previous examples the money that you keep in the private fund will be added directly to the amount that you bring home, and money that you put in the group fund will be doubled and shared equally to all 4 members in the group.

[MODERATOR shows Overhead CE and reads it. He then continues]

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

We will now hand out the sheet where you have to make decision how much you will put into the group fund. Please do not turn over the sheet until you are told to do so.

[MODERATOR waits until HE provides a signal]

Now, considering the examples that have been shown before, how much do you want to contribute to the group fund and how much do you think the other participants will contribute? Please write it down.

[MODERATOR reads the sheet and continues when HE provides a signal]

We will now collect the sheet.

Thank you for your cooperation up to this point.

We now proceed to other activity.

[GROUP GAME]

Now, we will form you into a group of four entrepreneurs. You will be allowed to talk with your group member in this session. Remember you are only allowed to talk with your group members, and not other participants. Further, please remember to talk in a tone such that only your group member can hear you. If anyone breaks this rule, we must kindly ask you to leave the classroom.

In this activity, you can earn money in a group. But then you will share the money equally among the members.

Now, let's determine the group.

Similar with before, we will randomly assign you into group. But, now we will announce who group with whom, and we will kindly ask you to take note of your group number. After everyone gets a group, we want you to sit together in your group. My assistant will let you know where each group should sit.

[GROUP COOPERATION 1: KNOWLEDGE TEST]

Now, you will do activity in a group. The first activity will be answering questions. In this activity, your group will solved questions that similar with previous individual questions. You can discuss among you what the right answers are.

There are 10 questions that a group should answer. For each right answer, the group will receive 600 TZS. Total amount received by the group will be distributed equally to each member. If your group answer the whole questions right, your group will receive bonus 5000 TZS. The time limits to answer the questions are 8 minutes.

On the overhead, we summarize the choice you have to make.

[MODERATOR shows Overhead KT and reads it. He then continues]

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

We will now hand out the sheet of questions that should be solved in your group. Please do not turn over the sheet until you are told to do so. You will have 8 minutes to work on these questions, if you still working when we said time is over, your group will be disqualified. After 7 minutes, you will be notified that there is 1 minute left.

[MODERATOR waits until HE provides a signal]

Now, you can start working.

[F give a signal that 7 minutes have been passed; Moderator announce the reminder]

[F give a signal that 8 minutes have been passed; Moderator announce that participant should put down their pen, and if they are still working then their group will be disqualified.]

Now you should stop working and put your pen at the table.

My assistant will collect the sheet.

[MODERATOR waits until HE provides a signal]

[Cooperation Game: Group Risk Game]

We now move to the next group activity of the workshop, where the group also can earn money, but in a different way. The money that the group earns will be shared equally among the member.

You will be allowed to talk with your group member in this session. Remember you are only allowed to talk with your group members, and not other participants. Furthermore, please remember to talk in the tone that only your group member can hear your sound. If anyone breaks this rule, we must kindly ask you to leave the classroom.

[RISK GAME 1]

In this activity, you as a group of four people will receive 4000 TZS.

This is your money. Your group may decide to add it to the total amount of money that you are paid at the end of the session, or your group may decide to take a risk.

If your group chooses not to take risk, the amount of 4000 Tsh will be divided equally among member of the group, meaning that each member will receive 1000 Tsh.

If your group takes the risk, then your group can be lucky or unlucky. If your group is lucky, your group will get 10000 Tsh instead of 4000 Tsh. This money will then be shared equally to each member, so that each member will receive 2500 TZs. If your group is unlucky, your group loses the 4000 Tsh and nothing is added to each member's final payment from this situation.

As this is a group activity, you must make decision in the group. One group only allowed making one decision.

[RISK GAME 2]

Now, we will redo the same game. Now we move on to a new situation. Again, you as a group of four people will receive some money. This time is 6000 TZS.

This is your money. Your group may decide to add it to the total amount of money that you are paid at the end of the session, or your group may decide to take a risk.

If your group chooses not to take risk, the amount of 6000 Tsh will be divided equally among member of the group, meaning that each member will receive 1500 Tsh.

If your group takes the risk, then your group can be lucky or unlucky. If your group is lucky, your group will get 10000 Tsh instead of 6000 Tsh. This money then will be shared equally to each member, so that each will receive 2500 TZs. If your group is unlucky, your group loses the 6000 Tsh and nothing is added to each member's final payment from this situation.

As this is a group activity, you must make decision in the group. One group is only allowed to make one decision.

We then will determine whether you will lucky or unlucky using the same procedure as before.

Is this understood? If there are any questions please raise your hands now and we will assist you.

[MODERATOR waits until HE provides a signal]

On the overhead, we summarize the choice you have to make.

[MODERATOR waits until HE provides a signal]

We will now hand out the sheet where you have to make the decision of investing or not. Please do not turn over the sheet until you are told to do so. You have 4 minutes to make the group decision.

[MODERATOR waits until HE provides a signal]

Now, please mark whether your group wants to invest or keep the money

We will now collect the sheet. Please remember to write your group number and each member desk number in the sheet.

[MODERATOR waits until HE provides a signal]

[DETERMINING THE RESULT]

[MODERATOR waits until HE provides a signal]

Now, we will determine the result of your investments.

Now, we will take the result for the investment choice one, when you decide to put 1000 in risky project or not. If it turns out of lucky, and the one who choose to invest will receive 2500.

And then… it is….

Now, we will take the result for the investment choice two, when you decide to put 1500 in risky project or not. If it turns out of lucky, and the one who choose to invest will receive 2500.

And then… it is….

Now, we will take the result for the group investment choice 1, when your group decides to put 4000 in the risky project or not. If it turns out of lucky, and the group who choose to invest will receive 10000, meaning that each member will receive 2500.

And then… it is….

Now, we will take the result for the group investment choice 2, when your group decides to put 6000 in risky project or not. If it turns out of lucky, and the group who choose to invest will receive 10000, meaning that each member will receive 2500.

And then… it is….

Your payment from investment choice will be determined according to this result.

Our assistant will now prepare the payment.

[SOCIAL NETWORK SURVEY]

[MODERATOR waits until HE provides a signal]

In the meantime, we will call each of your desk number and please stand up if your number is being called. Further, we will ask the others to raise their hand, if they have known this person outside the the workshop.

While we are waiting for the assistants to prepare the payments which you have earned, we would like to offer you [for morning session:] LUNCH; [for afternoon session:] REFRESHMENT. After the LUNCH/REFRESHMENT we will call your desk number one by one and give you an envelope with your payment and the signed sheet for your participation compensation.

[MODERATOR shows Overhead THANK YOU]

We would like to thank you all for participating in this session. Your input will be most valuable for our research project on microcredit and entrepreneurship. May we ask you not to discuss this session with others before the end of this week, since we will arrange further sessions with other microcredit clients the coming days. Please leave the pen on your desk when you leave the room. Again, thank you for your participation in this workshop.