TEACHING BUSINESS IN TANZANIA:

EVALUATING PARTICIPATION AND PERFORMANCE

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There is increased awareness that success among small scale entrepreneurs in developing countries requires more than microfinance, and that an important limiting factor for business growth is the level of human capital among the entrepreneurs. The present paper uses a randomized control trial to evaluate a business training program in Tanzania. Our results show that there is a positive average treatment effect on business knowledge. It also appears that training has a stronger effect on the entrepreneurs with less formal education. Paradoxically, these entrepreneurs are also less consistent in their participation in the training program. An important implication from our study is therefore that when providing business training, special care should be given to ensure high participation rates. (JEL: C93, I21, J24, O12)

1. Introduction

The rise of microfinance is based on the premise that lack of access to credit and other financial services are serious constraints on business growth in developing countries. Many empirical studies lend support to this premise: Microfinance can indeed improve business outcomes (for an overview, see de Aghion and Morduch, 2008, and Collins et al, 2009). At the same time, there is a growing awareness that business success often requires more than financial capital.

An important limiting factor for the development of small scale businesses, and for the productive use of microfinance, is the level of human capital among the entrepreneurs. Investigating the returns to capital in Sri Lanka, de Mel et al (2008a and 2008b) find higher returns among entrepreneurs with higher cognitive skills, as measured by a digit-span recall test, and more years of

schooling.[2] These empirical findings clearly point at the potential importance of adding training to microfinance in order to promote business development among small scale entrepreneurs. And while NGOs like Freedom from Hunger have a long record of providing such training (see for instance New York Times, June 24, 2009), not much is known about their impact.

The ambition of the present paper is to study the effectiveness of one such business training program recently offered to small-scale microcredit entrepreneurs in Tanzania. The program was implemented during the autumn of 2008, and involved more than 300 clients of PRIDE Tanzania, the major microfinance institution in the country. We focus on two success criteria; participation and performance. First, for a training program to be effective, a minimum requirement is that people participate. If the entrepreneurs do not find the program rewarding and worth their time, they will simply opt out and, consequently, cannot benefit from it. Second, for a program to be effective, it has to improve the performance of the entrepreneurs. Ultimately, improved entrepreneurial performance should be reflected in increased profits (and other relevant business outcome measures). Indeed, the present paper is part of a larger research project that also looks at business outcomes. But given the close link between human capital and income found in the literature, and the methodological difficulties in measuring profits, it is both interesting and important to also study the intermediate step of human capital formation.[3]

Success along these two criteria cannot be taken for granted. First, participation in our study is voluntary. And with the participants being self employed business people, their presence at the course means absence from their businesses, which clearly carries a cost. Second, the participants are heterogeneous in terms of formal educational background, cognitive skills, and age. Some are likely to find the course too elementary and others too difficult. Heterogeneity may in this way reduce both participation and learning.

This paper is related to Karlan and Valdivia (2009), who evaluate the impact of a business training program in Peru, based on a randomized field experiment.[4] Of particular relevance for this paper are the effects they find on business knowledge. They report a statically significant, but quantitatively rather modest, improvement in business knowledge from the training. Our study differs from that of Karlan and Valdivia (2009) on several dimensions. First, the design and implementation of the training program in Tanzania were carried out by local resources, while in Peru the training was organized by Freedom from Hunger, a US-based NGO and a world leader in offering credit with education. Can a course designed and implemented by local expertise compete in terms of impact with a course organized by a "world leader"? Second, business knowledge in our study is measured by the use of incentivized questions, which ensures that the participants put in effort when responding to these questions. Third, we analyze the determinants of participation. Hence, while Karlan and Valdivia measure interest in the training program by statements made by the entrepreneurs prior to training, we measure interest by presence or absence in the course. Finally, our study investigates heterogeneous treatment effects on business knowledge.

The paper is organized as follows. We first describe the intervention and the entrepreneurs in the present study (211 observations. Section 3 analyzes course attendance in the training program among the treated lab-participants. Section 4 looks at the effect of training on business knowledge, considering both average treatment effect and heterogeneous effects. Section 5 concludes.

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[2] This evidence from Sri Lanka is supported by macro studies on the relationship between education and economic growth, and from micro studies of the positive link between cognitive skills and wage income, and to some extent also on self employment income, see Glewwe, 2002.

[3] On the difficulties in accurately measuring profits based on questionnaires, see de Mel et al (2009).

[4] This is the only randomized field trial of business training that we are aware of. Using a regression discontinuity design, Klinger and Schündeln (2008) study the effect of business training offered in relation to a business plan competition in Latin America. They find a positive effect of training on business startups and expansions.

2. The intervention and the entrepreneurs

From August 2008 to January 2009, more than 300 small scale entrepreneurs in Dar es Salaam, Tanzania, followed a business training course developed and implemented by University of Dar es Salaam Entrepreneurship Centre (UDEC).[5] The entrepreneurs were all clients of PRIDE Tanzania, the major microfinance institution in the country. The training consisted of 21 sessions, each lasting 45-60 minutes, and took place immediately after the clients' weekly loan meeting. The training was offered for free.[6] Clients who attended at least 10 out of the 21 sessions were awarded with a diploma from UDEC, confirming their participation in the course.

Clients were randomly selected into a treatment and control group from the pool of clients at intermediary loan levels (500 000 and 1 million Tanzanian Shillings (TZS), equivalent to 300 to 600 Euros).[7] In order to minimize spillover effects from treatment to control group, we randomly chose different days of the week for treatment and control clients. In this way, no training took place on days when members of the control group attended their weekly loan meetings. According to PRIDE Tanzania, loan groups were randomly assigned to loan days, and hence there is no reason to believe that the entrepreneurs in the control group are different from those in the treatment group in any systematic way. Comparing the two groups according to a range of observable characteristics, confirms this prediction. In total, 319 clients were offered training, while 325 clients were chosen as control group.

In order to measure the impact of training on business knowledge and mind set, we organized a lab in March 2009, approximately six weeks after the completion of the training program. We invited a randomly selected subset of our sample, 126 from the treated group and 126 from the control group, to take part in the lab. Of these, 211 actually attended the lab. Table 1 shows the planned and actual attendance between treatment and control group. As is evident, the attrition rate is only marginally different between the two groups (2 percentage points higher for the control group).

(Table 1 here)

To verify that the randomization process was successful, we compare the treatment and control group on key variables that we use throughout the paper in analyzing both participation and performance. Table 2 shows that there are no significant differences between the two groups on these dimensions. Moreover, it shows that the attrition did not cause any observable biases. The reported reasons for not attending are also very similar between the two groups. The main reasons were that the clients had exited PRIDE (42% in treated group, 36% in control group), were sick or on maternity leave (21%, 27%), or travelling, attending a funeral, or taking care of pressing family matters (37%, 36%). In sum, we have no reason to believe that the attrition causes any bias in the comparison of the treatment group and the control group.

(Table 2 here)

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[5] We chose to rely on local resources for teaching the course in order to maximize the relevance of the training program and in order to avoid gold-plating, so as to facilitate the replication of the program without donor support in the future. The course was piloted in the spring of 2008, with the assistance of PRIDE credit officers and clients, the research team and other researchers familiar with the constraints facing small scale entrepreneurs in Tanzania.

[6] The course covered topics such as "Entrepreneurship and entrepreneurial character", "Long-term outlook and planning; "Understanding the environment and the market", "Marketing tools and customer care", "Managing workers and yourself", "Calculating costs and prices, profits and loss", "Cash management and financing your business".

[7] The reason for not choosing clients from the lowest loan level (250 000 TZS in 2008) was that this group had a relatively large turnover. At the same time, since the majority of PRIDE clients are in the lower loan segments, we chose not to target those with loans greater than 1 million TZS.

3. Participation

The mean attendance for the sub-sample of treated lab participants was 15.9 out of 21 sesions (76%), the median was 18 sessions (86%).[8] Given that the training program was voluntary, and that the entrepreneurs had to stay away from their business when attending the course, it appears that most clients perceived the course as beneficial for their business.

While attendance in general was high, some entrepreneurs who were offered the course did not attend at all or at least very infrequently. Why? Did they find the course too easy or too difficult? Did females, who might have domestic duties that make spending time away from the house more difficult, have lower attendance? And does size of business operation, which could say something about alternative cost of time, matter for attendance? The answers to these questions are of importance for the design and placement of future courses.

In the following we analyze the relationship between attendance and the key background variables reported in Table 2. We report both (i) an OLS-regression with indicator variables and (ii) a standard OLS-regression with continuous variables (ii). The indicator variables have the suffix "High" indicating that the client is above median on the relevant dimension, which captures the idea that the effect on attendance derives from being above a threshold level.

(Table 3 here)

While, qualitatively speaking, there is not much of a difference between the two specifications, the indicator variables, with the exception of schooling, are generally more precisely estimated.

The evidence in Table 3 shows that entrepreneurs who are more schooled, more skilled (in terms of math), and more experienced (in terms of age) have higher attendance than those who score lower on these dimensions. One interpretation of these observations is that "weaker" entrepreneurs on these dimensions have a knowledge gap which discourages them from more regular attendance. The negative effect of loan level on attendance could indicate that entrepreneurs with a larger business have a higher alternative cost of time, and hence more often choose to attend the business rather than the training.

4. Performance

Improved business results are clearly the ultimate goal of business training. In this paper, however, we report the impact on entrepreneurs' business skills. This, we believe, is a useful intermediary step. First of all, in contrast to business results, business knowledge can be measured precisely by incentivized questions. Second, the close relationship between skills and performance uncovered in the empirical literature indicates that treatment effects on human capital should be a good proxy for treatment effects on business results.

In order to gauge business knowledge, we, in collaboration with UDEC, formulated 10 multiple choice questions on topics covered in the training program. These questions, together with questions on general topics and choices related to risk, time preference, and competition, were incentivized by monetary rewards and organized in a lab. On the business questions reported here, the participants earned 250 TZS, around 0.15 Euro, for each correct answer.[9]

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[8] These attendance rates are similar to those found in the Peru-study by Karlan and Valdivia (2009). They report 76% average attendance in banks with voluntary attendance.

[9] For comparison, lunch at a local restaurant in Dar es Salaam costs around 1000 TZS. Note that the participants were not informed ex-ante that some of them would take part in an incentivized test. Such a possibility might

The business knowledge index ("Business") is simply the number of correct answers on these incentivized multiple choice questions. The questions covered topics such as customer care, human resource management, time management, and definitions of sales, profits, variable costs and working capital. For example, the question on time management reads: "Which of the following is important when planning the daily tasks of your business?" The four possible answers to this question were: A) Remember to include family tasks; B) Make clear who is responsible for each task; C) Don't plan for more tasks than you can carry out yourself; D) Leave as many tasks as possible to your workers. The participants were given 30 seconds to answer each question.

4.1   Average treatment effect

Table 4 reports the performance of the treatment and control group on the business knowledge test. For comparison, and as a consistency check, we also investigate performance on non-business questions, which were structured and incentivized in exactly the same way as the questions on business. These topics are Sports, Math, Politics, Health, and Places in Dar es Salaam.

(Table 4 here)

We observe that there is a significant difference between treatment and control group only on business questions. The difference is precisely estimated, and quantitatively significant. On average, the group that was offered training had a 9% higher score on the business knowledge test.[10] Note that the treatment effect in our study is substantially higher than that found in Karlan and Valdivia (2009).[11] One reason could be the fact that there were fewer problems in implementing the course in Tanzania than in Peru, where the authors report many delays. Another reason could be that with incentivized questions, the respondents in our study try harder to give the right answer and thus reveal more precisely their level of business knowledge. Moreover, the fact that the treatment group did not perform better on any of the other topics indicates that treatment effect on business knowledge picks up an actual increase in the clients' knowledge on this topic, and not a difference in effort put into the test (which should have been reflected more broadly on all the topics).

A closer look at the data shows that the treated clients scored significantly better on three out of the ten questions, and not significantly worse on any of them. For instance, on the question "Which of the following is important when you plan the daily tasks in your business?", 83% in the treatment group, compared to only 64% in the control group, identified the correct answer "Make clear who is responsible for each task". Indeed, 18% of the control group clients chose the answer "Remember to include family tasks", compared to only 7% of the treated group clients. The importance of separating between business and household matters was stressed several times in the business training course, both in relation to time management and financial issues. Understanding this distinction is important for the entrepreneur in order to understand the income and costs of his or her business operations, and hence their profitability.

Another example is the question: "How do you calculate your sales for a particular good?", the correct answer being "Sales are the price times the number of items you sell of the good". Among the treated clients, 69% chose this answer, compared to 47% in the control group. The alternative answer "Sales are what you take home from the business every day" was chosen by 35% of the control clients compared to 25% among the treated clients. Again, a lack of understanding of a key concept such as income is likely to make it difficult for entrepreneurs to have a good understanding of the profitability of their business(es) and to make sound planning.

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have impacted both learning and attendance, and it would be interesting in future research to study the importance of such an incentive scheme.

[10] The average of 6.65 correct answers by control group participants translates into earnings of 1662.5 TZS, while the average of 7.24 correct answers for the treatment group gives earnings of 1810 TZS.

[11] In the Peru-study, the treated entrepreneurs had a business knowledge index of 3.359 whereas that of the control group was 3.247; in other words, a 3.5% increase in business knowledge due to training.

Finally, the third question on which there was a significant difference between the two groups was "Which of the following is an important part of customer service?", the correct answer being "To be reliable in relations with the customer". Among the treated clients, 91% answered this question correctly, compared to 76% in the control group. An alternative answer "To always praise the goods you sell" was favored by 20% of the control clients, compared to only 8% among the treated clients.

4.2   Heterogeneous treatment effects

It is plausible that the treatment effect depends on attendance in the training program. Moreover, the treatment effect is likely to depend on the participants' background and personal characteristics. Note that, in contrast to the average treatment effect discussed above, we cannot make causal inferences regarding heterogeneity in treatment effects. However, the correlations presented here provide at least suggestive evidence on systematic differences in the impact of the training program. We limit ourselves to presenting evidence on heterogeneous effects using indicator variables.[12]

(Table 5 here)

Regression (i) in Table 5 reports the relationship between the score on the business test and number of sessions attended for the 107 treated lab-participants, using the same controls as before. The coefficient on Attendance is 0.14, and significant at the 1 % level (p=0.002). It implies that five extra session attended is associated with an increase in the business score of 0.7, which in turn roughly corresponds to a 10% increase in performance relative to the control group (whose average score was 6.65, see Table 4).

Among the control variables, three stand out as statistically significant in explaining differences in business skills within the treatment group, namely math skills, gender, and loan level. Males and entrepreneurs with higher math skills are better informed in general. One indication of this is the fact that (not reported here) males score better on all general topics reported in Table 4, except health. This could be due to males being less preoccupied with family obligations, and therefore able to spend more time acquiring information and gaining knowledge. Indeed, we know from the baseline survey that males read newspapers more frequently than females. High math skills can also be shown to be positively related with high performance on all (non-math) general topics in Table 4. Math skills are likely to be a good proxy for absorptive capacity, leading to a higher level of knowledge in general. Finally, higher loan level signals a more experienced and advanced entrepreneur. Hence, clients with higher loans can reasonably be expected to have higher business knowledge.

Regression (ii) in Table 5 compares the treatment group and control group among the lab-participants, and shows how the treatment effect depends on differences in personal background and characteristics. There are two statistically significant interaction effects, a negative one on schooling (p=0.015) and a positive one on math (p=0.028). It is interesting to note the contrast between attendance and performance for those with less schooling. While attendance tended to be lower for the less educated, the treatment effect appears to be *higher* for this group. In fact, running an F-test, we cannot reject the hypothesis that training has no impact at all on entrepreneurs with above median schooling (p=0.287).

Our interpretation of this result is that these relatively "weak" candidates, characterized by relatively modest formal training, have the most to learn from training. These are the clients with the largest knowledge gap, and the treatment effect has been effective in reducing this gap. Since attendance tended to be *lower* for this group, the stronger correlation between training and performance cannot be ascribed to differences in attendance. On the contrary, taking into account differences in attendance should strengthen our results. In contrast, a gap in cognitive skills, as

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[12] Using indicator variables gave more precise estimates. In fact, while qualitatively similar, none of the interaction terms proved significant in a model with continuous variables. This could be due to heterogeneity being conditioned on threshold values in the background variables.

measured by math score, *reduces* the learning effect. A possible explanation of this is that performance on math questions is a proxy for absorptive capacity.

In sum, the effect of training appears to be highest for entrepreneurs who participate frequently in the course, who initially do not have a lot of formal education, but who at the same time have strong cognitive skills.

5. Concluding remarks

We conclude that the business training program in Tanzania was highly successful, both in terms of participation and performance. The median attendance rate was in excess of 80%. More importantly, the performance of the treated group on a test of business knowledge was significantly higher than that of the control group. Indeed, the treatment effect in our study was much larger than that found for a similar intervention in Peru (Karland and Valdiva, 2009).

Interestingly, our study shows that that the treatment effect tends to be stronger for entrepreneurs with more irregular attendance, such as those with less formal training. This result harmonizes with the finding in Karlan and Valdivia (2009) that entrepreneurs who reported less interest in participating in training were the ones to gain the most. An important policy implication from both of these studies, then, is that stimulating participation and reducing dropouts from business training is crucial, since no-shows and drop-outs could well be the ones with the highest learning potential.

Our study also shows that there is an interesting dichotomy between formal schooling and cognitive skills. While the learning effect tends to be weaker for clients with a higher level of schooling, the treatment effect tends to be stronger for clients with relatively high math skills. We believe that this reflects that math knowledge reflects absorptive capacity, which clearly is crucial for learning.

Our conjecture is that business knowledge is a good proxy for business results. We have in June-July 2009 carried out a first round of follow up surveys, and the data from that survey, as well as a survey planned for 2010, will show whether this is correct. Moreover, in future research we will also analyze the lab-data that we collected on various dimensions of mindset to investigate the effect of business training on attitude to risk, time preference, perception of own skills, and willingness to compete. Matching this data with data on business performance should allow us to shed light on the important question of the relative role of hard skills versus mindset as sources of business growth among small scale entrepreneurs in Africa.

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TABLE 1. Attrition in lab

	Treatment	Control
Planned	126	126
Actual	107	104
Percent	85%	83%

Notes: **Planned**: The number of entrepreneurs who were invited to take part in the lab. **Actual**: The number of entrepreneurs who participated in the lab.

TABLE 2. Treatment-Control balance

	(i) School	(ii) Math	(iii) Loan	(iv) Age	(v) Male
Panel A: Lab sample					
Treatment	–0.35	0.16	0.007	–0.10	0.06
	(0.33)	(0.38)	(0.03)	(0.83)	(0.07)
Control Mean	8.05	5.74	0.77	38.87	0.31
Control Std Dev	2.43	2.96	0.23	8.5	0.46
Observations	211	211	211	211	211
Panel B: Attrition sample					
Treatment	–0.40		0.04	3.00	0.1
	(0.66)		(0.08)	(3.13)	(0.15)
Control Mean	8.14		0.76	35.72	0.27
Control Std Dev	2.10		0.24	9.98	0.47
Observations	41		41	41	41

Notes: **School:** Client's number of years at school. **Math**: Number of correct answers on incentivized questions on math (0-10). **Loan:** Size of latest loan at PRIDE, in million TZS. **Age**: Client's age. **Male**: Client's gender (male=1, female=0). Robust standard errors in parenthesis.

TABLE 3. Explaining attendance

Specification	(i)	(ii)
Dependent variable	Attendance	
SchoolHigh	1.70*	
	(0.88)	
School		0.42**
		(.17)
MathHigh	1.62*	
	(0.85)	
Math		0.18
		(0.18)
LoanHigh	–1.74*	
	(0.94)	
Loan		–2.13
		(1.98)
AgeHigh	2.26**	
	(0.93)	
Age		0.14**
		(.05)
Male	0.22	.12
	(0.99)	(1.00)
Observations	107	107

Notes: The table reports an OLS- regression with indicator variables (i) and a standard OLS-regression with continuous variables (ii) on the relationship between attendance and key background variables for the 107 particpants in the treatment group who also took part in the lab session. **Attendance**: Client's number of attended sessions in the training program (0-21). **School:** Client's number of years at school. **Math**: Number of correct answers on incentivized questions on math (0-10). **Loan:** Size of latest loan at PRIDE, in million TZS. **Age**: Client's age. **Male**: Client's gender (male=1, female=0). The suffix **High** indicates whether the client is above (=1) or equal to or below (=0) the median on the particular dimension. Robust standard errors in parenthesis. * (**) denote statistical significance at 10 percent (5 percent) level.

TABLE 4. Average treatment effect on tests

Variables	Treatment Group	Control group	Difference	Standardized difference
Business	**7.24**	**6.65**	**0.59****	**0.29****
	(0.18)	**(0.20)**	**(0.27)**	**(0.13)**
Sports	5.96	5.59	0.37	0.14
	(0.25)	(0.26)	(0.36)	(0.14)
Math	5.36	5.22	0.14	0.05
	(0.25)	(0.30)	(0.39)	(0.13)
Politics	3.89	3.76	0.13	0.07
	(0.18)	(0.19)	(0.26)	(0.13)
Health	5.65	5.72	–0.07	–0.03
	(0.19)	(0.20)	(0.27)	(0.13)
Places	5.07	5.05	0.02	0.01
	(0.17)	(0.18	(0.25)	(0.14)

Note: Business, Sports, Math, Politics, Health, Places: In each case the variable is defined as the average number of correct answers on a test (0-10) on this topic. The last column, "Standardized difference", reports the difference between treatment and control group averages divided by the standard deviation of the control group on the relevant variable. Robust standard errors in paranthesis. ** denotes statistical significance at 5 percent level.

TABLE 5. Heterogeneous treatment effects

Specification	(i)	(ii)
Dependent variable	Business	
Attendance	0.14***	
	(0.04)	
Treated		0.15
		(0.51)
SchoolHigh	–0.13	1.40***
	(0.34)	(0.40)
MathHigh	1.22***	0.32
	(0.34)	(0.38)
LoanHigh	0.59*	0.10
	(0.33)	(0.37)
AgeHigh	–0.38	–0.66*
	(0.36)	(0.36)
Male	0.79**	1.18***
	(0.32)	(0.39)
Interaction with treated		
SchoolHigh		–1.30**
		(0.51)
MathHigh		1.13**
		(0.51)
LoanHigh		0.25
		(0.51)
AgeHigh		0.59
		(0.50)
Male		–0.36
		(0.51)
Observations	107	211

Notes: The table reports a standard OLS-regression (i) on the business knowledge index, attendance and key backround variables for the 107 particpants in the treatment group who also took part in the lab session, and an OLS-regression (ii) on the business knowledge index, treatment status, key background variables and interaction terms for all the 217 participants taking part in the lab session. **Business knowledge index:** Client's number of correct answers on the business test (0-10). **Attendance**: Client's number of attended sessions in the training program (0-21). Treated: Indicator variable for whether the client has received training (=1) or not (0). **School:** Client's number of years at school. **Math**: Number of correct answers on incentivized questions on math (0-10). **Loan:** Size of latest loan at PRIDE, in million TZS. **Age**: Client's age. **Male**: Client's gender (male=1, female=0). The suffix **High** indicates whether the client is above (=1) or equal to or below (=0) the median on the particular dimension. Robust standard errors in parenthesis. * (**) (***) denote statistical significance at 10 percent (5 percent) (1 percent) level.