

TEACHING ENTREPRENEURSHIP: IMPACT OF BUSINESS TRAINING ON MICROFINANCE CLIENTS AND INSTITUTIONS

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Abstract—Most academic and development policy discussions about microentrepreneurs focus on credit constraints and assume that subject to those constraints, the entrepreneurs manage their business optimally. Yet the self-employed poor rarely have any formal training in business skills. A growing number of microfinance organizations are attempting to build the human capital of microentrepreneurs in order to improve the livelihood of their clients and help further their mission of poverty alleviation. Using a randomized control trial, we measure the marginal impact of adding business training to a Peruvian group lending program for female microentrepreneurs. Treatment groups received thirty- to sixty-minute entrepreneurship training sessions during their normal weekly or monthly banking meeting over a period of one to two years. Control groups remained as they were before, meeting at the same frequency but solely for making loan and savings payments. We find little or no evidence of changes in key outcomes such as business revenue, profits, or employment. We nevertheless observed business knowledge improvements and increased client retention rates for the microfinance institution.

I firmly believe that all human beings have an innate skill. I call it the survival skill. The fact that the poor are alive is clear proof of their ability. They do not need us to teach them how to survive; they already know. So 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. Muhammad Yunus, *Banker to the Poor* (1999).

I. Introduction

FEW doubt that financial constraints limit the ability of the poor to invest and thus increase their income. Many, however, claim that the poor optimize their profits given such financial constraints. This is the spirit of the

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opening quote by Muhammad Yunus and is the rationale behind focusing interventions for microentrepreneurs solely on credit or savings, with no attention to skills training.

In this study, we implemented a randomized control trial to assess the marginal impact of incorporating entrepreneurial training into a microcredit program. Although a program evaluation at one level, this study provides an opportunity to test whether these microentrepreneurs are indeed maximizing their profits given the resources available to them, or whether instead simple lessons on business development can guide them toward higher profits. As an example, in one lesson, the trainers have each microentrepreneur write out a budget for her enterprise, often focusing on particular products or services. Particularly after taking into account the microentrepreneurs' opportunity cost of time, many activities prove to be generating an economic loss. Similar, more concrete evidence comes from de Mel, McKenzie, and Woodruff (2008a; 2008b) who conducted a field experiment to measure returns to capital for microentrepreneurs in Sri Lanka. They found considerable heterogeneity, with many microentrepreneurs (in particular, women) earning negative returns to capital. Most interesting and relevant here is the heterogeneity: those with higher cognitive abilities (as measured by a digit-span test) yielded the highest returns. This calls into the question the "poor but rational" view that microentrepreneurs maximize profits subject to their financial constraints (Yunus, 1999; Duflo, 2006).

The study was conducted with FINCA-Peru, a microfinance institution (MFI) that implements village banks for poor, female microentrepreneurs in Lima and Ayacucho. We have strong reasons to expect significant selection biases with respect to the types of individuals who seek out such training and are allowed in such programs, and thus a randomized control trial is helpful for measuring the efficacy of such interventions. We randomly assigned preexisting lending groups to either treatment or control. Treatment groups then received the training as part of their mandatory weekly meetings. Control groups remained as they were before: a credit and savings-only group. We conducted a baseline survey before the intervention and a follow-up survey between one and two years later.

The entrepreneurial training materials, and the training of the credit officers, were developed and adapted by Freedom from Hunger (FFH), a U.S.-based nonprofit organization, and Atinchik, a Peruvian firm. Similar entrepreneurship training has been used around the world by other organizations, such as the International Labor Organization, Promujer in Latin America, and BRAC in Bangladesh. FFH is considered a leader in the credit-with-education integrated model of microfinance and is directly responsible for such work in eighteen countries and over fifty financial institu-

tions for over 700,000 clients. Its influence in credit-linked training programs is evident from the adoption of its approach by other organizations without direct intervention from FFH and its prominent role at industry events such as the Microcredit Summit (Dunford, 2002). However, little is known about the marginal impact of these nonfinancial services.¹

The policy issue is not simply whether such education is beneficial. Much debate also exists in the policy community regarding the optimal method of introducing such interventions. The business development services (BDS) approach typically calls for market-based solutions, in which services are rendered for a fee equal to or higher than marginal costs. If, however, the services provided are of unclear value to the more inexperienced entrepreneurs, this approach may create an adverse selection effect: those for whom impact may be highest will be least likely to pay the fee and join the program.

In the primary specification, which compares follow-up measures of outcomes with a control for the baseline value of the outcome, we find no statistically significant benefits for the client. In difference-in-difference specifications, we find some evidence of improvements in revenue, particularly in bad months. The microfinance institution benefits from increased client retention and, to a lesser extent, evidence of improved repayment. Also, we find suggestive evidence of important heterogeneities with respect to selection: the beneficial impacts were more intense on business practices and institutional outcomes (but not business outcomes) for individuals who expressed the least interest in business training during the baseline survey. Section II presents the nature of the intervention and basic hypothesis. Section III explains the experimental design, and section IV details the data collected and empirical strategy. Section V presents the results, and section VI concludes.

II. The Intervention and Its Expected Effects

The goal of the business training intervention is twofold: to improve business outcomes and overall welfare for clients and to improve institutional outcomes for the microfinance institution. Stronger businesses may demand more services, and clients may be less likely to default if they are satisfied (due either to higher cash flow or a stronger feeling of reciprocity). But the two goals do not necessarily reinforce each other: stronger businesses may “graduate” to larger formal sector banks, and thus the business training could lead to lower client retention for the MFI.

¹ One notable exception is an analysis of the noncredit services offered by the microfinance institutions in Bangladesh. This study used a structural approach to estimate the impact of credit services and assumed the residual impact to be due to the noncredit aspect of the program (McKernan, 2002). Prior evaluations of FFH have measured the impact of the entire package of credit with education versus no services, not the marginal value of the education to the credit program. A comparison has been done on Project HOPE’s credit program with health education versus the credit program alone (Smith, 2002).

A. The Intervention

FINCA-Peru is a small, nonprofit, financially sustainable microfinance institution that has been operating in Peru since 1993.² Its mission is to improve the socioeconomic situation of the poor and empower women through the promotion of the village-banking methodology. By providing them with working capital to increase inventory and invest in their businesses, FINCA expects to increase the earned income of its clients, primarily poor women with no collateral. In addition to providing credit, FINCA teaches its clients to save by requiring weekly or monthly savings deposits that correspond to the size of the loan the client has taken out and by encouraging additional voluntary savings for which they receive market interest rates. FINCA further aims to empower clients by giving them the opportunity to run their banks through their rotating participation on the village bank board.

FINCA has operations in three particularly poor districts of Lima and in two Andean provinces, Ayacucho and Huanavelica. As of June 2003, FINCA sponsored 273 village banks with 6,429 clients, 96% of them women. FINCA members, particularly those in Ayacucho, are relatively young and have little formal education. These clients each hold, on average, \$233 in savings, whereas the average loan is \$203, with a recovery rate of 99%. FINCA charges sufficient interest to be self-sustainable. Its sustainability indicator (total income/total expenses) was 113.8% in 2003, 107.6% in 2004, and 128.4% in 2005.

The business training materials were developed through a collaborative effort of FINCA, Atinchik,³ and FFH and had been used in the past in other projects.⁴ The program included general business skills and strategy training, not client-specific problem solving. Although the pedagogy did include discussion with the clients (not just lecture) and various short exercises, the program was not focused on providing specific, individualized advice. The content of the training was similar in both locations but was organized and presented differently to cater to the differences in educational levels and learning processes.⁵ In Lima, clients

² Prior to this study, FINCA-Peru, had been associated with FINCA International, a large U.S.-based, nonprofit organization responsible for creating and replicating the village banking methodology around the world.

³ Atinchik, a nine-year old firm, specializes in the generation of training materials in business management for microentrepreneurs. It used similar training previously in a project in Peru for the World Bank.

⁴ Since 1995, FFH has provided technical assistance to eighteen MFIs in Asia, Africa, and Latin America, with its program Credit with Education, a combination of microcredit and educational services. Working with independent local partners, FFH provides training in microfinance products, MFI capacity building, and adult education in health and business development. Its business education curriculum was developed through market assessments using individual surveys, focus groups with key informants, pilot testing, and the feedback of clients and staff. The materials used in Peru were slightly modified from materials used extensively by FFH’s affiliate in Bolivia, CRECER.

⁵ Among FINCA’s Lima clients, the literacy rate is 98%, the majority has a secondary education, and 40% have some postsecondary schooling as well. In the Ayacucho region, however, almost 70% of FINCA clients did not finish secondary school, and approximately 15% are illiterate.

received handouts and did homework, whereas in Ayacucho, teaching relied more heavily on visual aids and was sometimes in Quechua, a local indigenous language. The training materials in Lima were organized in two modules. The first module introduced attendees to what a business is, how a business works, and the marketplace. Clients were taught to identify their customers, competitors, and the position of the business in the marketplace and then learned about product, promotional strategies and commercial planning. The second module explained how to separate business and home finances by establishing the differences between income, costs, and profit, teaching how to calculate production costs, and product pricing. (Appendix B provides more details on the content of the business training.)

Training began in October 2002 in Lima and in March 2003 in Ayacucho and was planned to last 22 weekly sessions. Each bank timed the beginning of the training with the beginning of new loan cycles, so not all banks began training at the same time. Ayacucho's meetings are weekly, whereas in Lima some groups meet weekly and others meet biweekly.

B. The Intended Effects

The goal of the program is to teach entrepreneurial skills. However, if the entrepreneurial spirit is more about personality than skills, teaching an individual to engage in activities similar to those of a successful entrepreneur may not lead to improved business outcomes. The training aims to improve basic business practices such as how to treat clients, how to use profits, where to sell, the use of special discounts, credit sales, and the goods and services produced. These improvements should lead to more sales and more workers and could eventually provide incentives to join the formal sector.

We also examine the impact on two sets of household outcomes: household decision making and child labor. The link to household decision making is straightforward and one of the oft-cited motivations of such training: improved business success could empower female microentrepreneurs with respect to their husbands or partners in business and family decisions by giving them more control of their finances. The link to child labor is ambiguous, however. Since many children work in family enterprises, this is an important outcome to observe. The training may lead to changes in the business that either increase or decrease the marginal product of labor, hence increase or decrease child labor through a substitution effect. If the training increases business income, then we expect increased wealth to lead to a decrease in child labor and an increase in schooling.⁶ Furthermore, an indirect effect may occur in which the

training inspires the mother to value education more and thus invest more in the schooling of her children.

In addition to impact on the clients' businesses and households, the training could have impact on important outcomes for the MFI. If clients' businesses improve, they are better able to repay their loans. The training also may engender goodwill and sentiments of reciprocity, also leading to higher repayment rates.⁷ Loan sizes and savings volumes are more ambiguous: if clients learn how to manage their cash flows better, perhaps they will need less debt. Or the business training may lead them to expand their business, and thus also demand more financial capital.

Although much of the academic literature focuses on repayment rates for microfinance, many institutions (which typically have nearly perfect repayment) are more concerned with client retention (Copestake, 2002). The expected effects here are ambiguous. If clients like the training, they may be more likely to remain in the program in order to receive the training, whereas obviously if they do not like the training (perhaps due to the additional 30 to 60 minutes per week required for the village bank meetings), they may be more likely to leave. The net effect is critical for the microfinance institution, since maintaining a stable client base is important for the sustainability of the organization.

III. The Experimental Design and the Monitoring of the Intervention

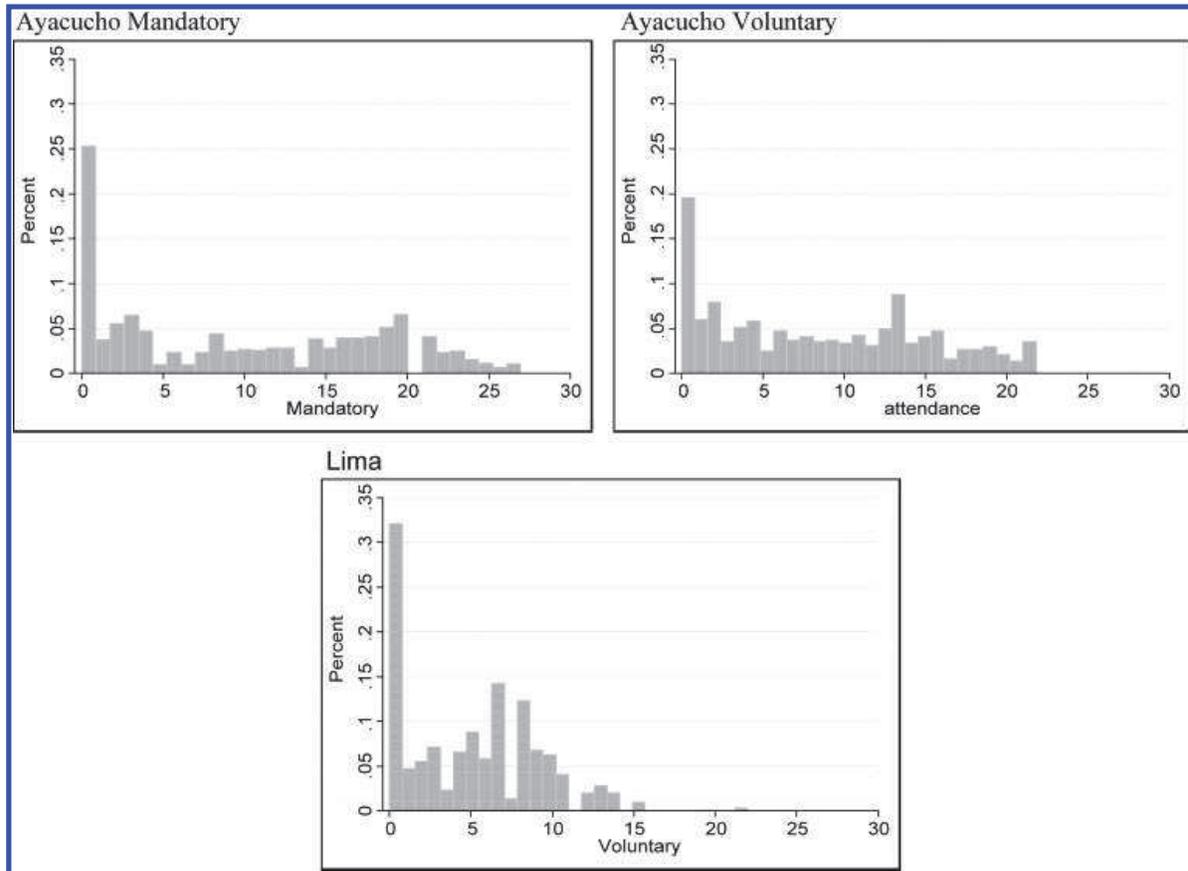
We evaluate the effectiveness of integrating business training with microfinance services using a randomized control trial in which preexisting lending groups of, on average, twenty women were assigned randomly to control and treatment groups. In Ayacucho, of the 140 village banks (3,265 clients), 55 were assigned to a mandatory treatment group (clients had to stay through the training at their weekly bank meeting),⁸ 34 were assigned to a voluntary treatment group (clients were allowed to leave after their loan payment was made, before the training began), and 51 were assigned to a control group that received no additional services beyond the credit and savings program. In Lima, of 99 FINCA-sponsored banks (1,326 clients), 49 were assigned to mandatory treatment and 50 were assigned to control (there was no voluntary treatment group in Lima). The randomization was stratified by the credit officer; hence, each credit officer has the same proportion of

⁷ Repayment rates are often nearly perfect in sustainable MFIs working with some form of group lending. Still, individual delays in payments and defaults are not that rare and represent a cost to the banks, as they put pressure on the other members of the banks or groups to implement internal measures to guarantee repayment or ultimately pay the defaulted debt from their own pockets.

⁸ In banks assigned to mandatory training, periodic meetings started with the training session. Fines were applied for absence from or tardiness to the training sessions and could result in expulsion from the bank (absence or tardiness to group meetings also can lead to expulsion from FINCA for the control group members).

⁶ The connection between increased income and the reduction of child labor and the increments in schooling can be reviewed in Basu and Van (1998), Baland and Robinson (2000), and Edmonds (2005, 2006), among others.

FIGURE 1.—DISTRIBUTION OF INDIVIDUAL ATTENDANCE, BY TREATMENT AND LOCATION



treatment and control groups. No other policy changes, such as lending criteria, monitoring, or enforcement, occurred along with the training.

We monitored the attendance at the weekly meetings and the training sessions. On average, training sessions in mandatory training banks had an 88% attendance rate, while attendance in voluntary banks was 76%.⁹ The training did not occur at each meeting (and does not typically under most implementations of credit with education in other MFIs). First, some treatment banks put the trainings on hold if they were having problems such as high default and drop-out rates. In these cases, they would often enter a restructuring phase that involved reinforcement of the traditional FINCA training about good repayment practices and discipline. The training session was also skipped at the first and last meeting of each cycle and when the meeting included a group activity, such as the celebration of a birthday or regional and religious holidays. In these cases, the session would be postponed until the following meeting. In other cases, the clients and credit officers decided that they needed more time to grasp fully the information offered in

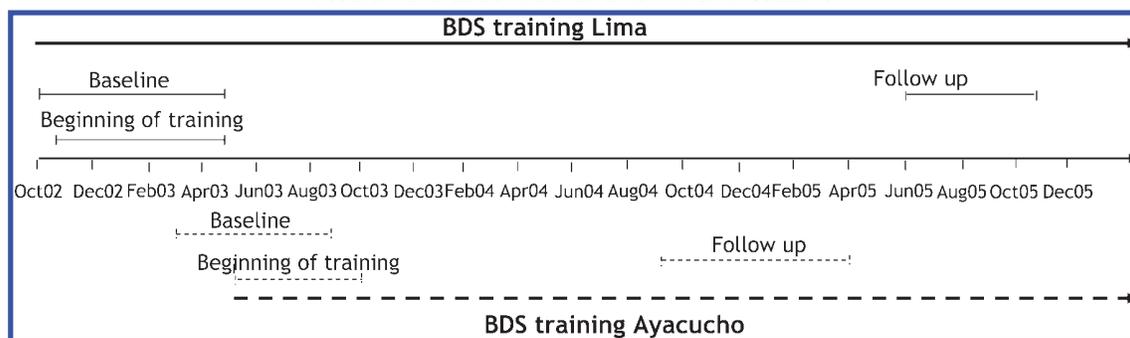
one session. In some cases, it became a normal practice for banks to agree to spend an extra meeting reviewing the material of the previous training session.¹⁰

These practices not only delayed the completion of the training materials, but also caused heterogeneity in treatment intensity across groups (figure 1). In Lima, for example, the average bank advanced 3.5 sessions per loan cycle over the twelve-meeting cycles. However, it was common for banks to complete 5 training sessions in the first loan cycle and gradually slow to an average of 2.6 training sessions per cycle over time. As a result, after at least 24 months since the launch of the training, only half the banks had reached the seventeenth session out of a total of 22 programmed sessions. At the individual level, married, older, and more educated individuals are more likely to have higher attendance rates (results not in tables). The empirical analysis will compare the village banks assigned to treatment to those assigned to control, regardless of how well FINCA adhered to the training program, how well clients attended the training, and how long clients continued participating in the lending program. This is important not only

⁹ Attendance in voluntary banks gradually slowed from an average of 80% at the beginning to 70% in the last two cycles observed.

¹⁰ In the case of Lima, such revisions often implied using the sessions to work in groups, with the support from the credit officer, on the assigned homework.

FIGURE 2.—TIME LINE OF THE INTERVENTION AND DATA COLLECTION



to avoid a selection bias from heterogeneous intensity of treatment, but also because the delays experienced here are normal for credit-with-education interventions.¹¹ Thus, had the training been adhered to more strictly, we would be estimating the impact of a treatment that is different from normal implementation.

IV. Data and Estimation Methods

This evaluation uses three key data sources: FINCA financial transaction data, a baseline survey before the randomization results were announced, and a follow-up survey up to two years later.

Financial transaction data are from FINCA's database, which contains the reports of all the transactions made by each bank client at every scheduled meeting since 1999. It includes information on the loan cycles, broken down by loan payment, interest, mandatory and voluntary savings, fines for tardiness, and contributions to cover default of other members. The database also includes some socioeconomic characteristics of the clients, such as age, education, and business main economic activity, registered when the client joined a FINCA-sponsored village bank.

The baseline and follow-up surveys included a variety of questions on the sociodemographic characteristics and other general information about the client's household and business. Expected outcomes are divided into four categories: (1) institutional outcomes, including loan repayment and client retention¹² (2) business results, (3) business processes, knowledge, and savings practices (that is, testing whether the specific practices taught in the training were adopted), and (4) household outcomes, including empowerment in decision making and child labor (the Lima follow-up survey included questions related to the time that chil-

dren between 6 and 15 years old dedicate to domestic work and school activities). The full list of outcome variables and their definitions is in table A1 in Appendix A.

In treatment banks, the baseline survey was given within a few weeks prior to the bank beginning the training. Figure 2 shows the time line of these components of the study for Ayacucho and Lima. Most baseline surveys were completed at the FINCA office at the time of their weekly meeting, although due to time constraints, some of them had to be completed at their home or place of business. In Ayacucho, we completed 3,265 baseline surveys, and in Lima, we completed 1,326 baseline surveys.

Seventy-six percent of the clients in the baseline survey were reached and surveyed for the follow-up survey. For the 62% of the clients interviewed in the baseline who were no longer members of a FINCA-sponsored village bank when the follow-up surveys began, we located them using addresses collected in the baseline survey or, in some cases, asking neighbors or FINCA members. However, some clients had moved far away, were impossible to locate, or refused to be interviewed. In total, we interviewed 83% of the clients who were still borrowing from FINCA and 72% of those who had dropped out of the program.¹³

In order to show that the random assignment produced observably similar treatment and control groups, column 4 of tables 1, 2, 3, and 4 reports key demographic characteristics and financial transaction history from before BDS training began. At the time of the randomization, data were available on prior repayment rates, the average loan size, and the average savings size. The remaining variables were unobserved at the time of the randomization, but also are similar across treatment and control groups, as expected.

To estimate the impact of the business training program, we either compare treatment to control in the follow-up data (with and without controls for baseline values of the outcome and other covariates) or use a difference-in-difference (DD) estimator if the measure is included in both the baseline and the follow-up survey. Due to the randomization, both estimators provide an unbiased estimate of the

¹¹ This stylized fact reported to us by FFH staff from their experience implementing credit with education in hundreds of financial institutions and nongovernmental organizations around the world.

¹² Group loan repayment has been almost perfect within FINCA, even before business training. Thus, what we look at here is individual performance in terms of payment tardiness and default. Reductions in this indicator may not lead to increased payment collection by FINCA but reduce transaction costs by banks and FINCA itself in enforcing late payments by the individual or by making the bank liable.

¹³ We discuss the implications of attrition on the interpretation of our results in section VC.

TABLE 1.—IMPACT OF TRAINING ON BUSINESS RESULTS

Dependent Variable ^a	Number of Clients	Summary Statistics: Mean, Standard Errors, and Differences					OLS, Difference-in-Difference			T-C Difference, with Control for Baseline Outcome	
		Baseline		Follow-Up		Without Covariates	With Covariates ^b	Without Covariates	With Covariates ^b	Without Covariates	With Covariates ^b
		Treatment	Control	Difference	Treatment						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Double difference estimate reported</i>											
Sales (log)											
Last month	2,807	6.571	6.652	-0.081 (0.055)	7.247	7.176	0.072 (0.055)	0.153 (0.078)	0.153 (0.079)	0.019 (0.062)	-0.001 (0.053)
Good month	2,807	7.933	7.909	0.024 (0.049)	8.083	8.070	0.013 (0.049)	-0.011 (0.050)	-0.011 (0.050)	0.013 (0.063)	-0.012 (0.051)
Normal month	2,807	7.141	7.182	-0.041 (0.046)	7.338	7.292	0.046 (0.046)	0.088 (0.052)	0.088 (0.052)	0.031 (0.062)	0.010 (0.050)
Bad month	2,807	5.871	6.003	-0.132 (0.075)	6.513	6.383	0.130 (0.075)	0.262 (0.100)	0.262 (0.100)	0.069 (0.080)	0.046 (0.068)
Difference good-bad month	2,807	2.062	1.906	0.157 (0.064)	1.570	1.687	-0.116 (0.064)	-0.273 (0.103)	-0.273 (0.104)	-0.056 (0.055)	-0.058 (0.055)
<i>Number of workers</i>											
Total	2,966	2.004	1.956	0.048 (0.056)	2.215	2.163	0.053 (0.056)	0.004 (0.065)	0.004 (0.065)	0.046 (0.060)	0.039 (0.056)
Paid workers, nonfamily members	2,964	0.280	0.218	0.062 (0.040)	0.311	0.301	0.009 (0.040)	-0.052 (0.044)	-0.052 (0.044)	0.019 (0.044)	0.017 (0.039)
<i>First difference estimate reported</i>											
Weekly profit from main product	1,767	NA	NA	NA	12.624	10.931	1.694 (2.267)	NA	NA	1.862 (2.348)	1.665 (2.238)

Each coefficient reported in the table is from a separate regression. OLS regressions include credit officer fixed effects; standard errors are clustered by village bank.
^aDependent variables are defined as follows. Last month sales: Logarithm of main business's sales in the month preceding each survey. Good/normal/bad month sales: Logarithm of difference in monthly sales between good and bad month. Number of total workers: Number of workers in the main business. Number of paid workers, not family members: Number of workers in the main business who are not household members. Weekly profit from main product: Difference between the weekly revenue and cost of the most profitable product in the main business.
^bThe covariates are location (Ayacucho or Lima), business activity, business size, age, schooling, and number of FINCA loans received by the client.

TABLE 2.—IMPACT OF TRAINING ON BUSINESS PRACTICES

Dependent Variable ^a	Number of Clients	Summary Statistics: Mean, Standard Errors and Differences				Follow-Up		OLS Difference-in-Difference		T-C Difference, with Control for Baseline Outcome	
		Baseline		Difference		Control	Difference	Without Covariates	With Covariates ^b	Without Covariates	With Covariates ^b
		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Double difference estimate reported</i>											
Tax formality	2,989	0.148	0.154	-0.006 (0.013)	0.154	0.154	0.001 (0.013)	0.007 (0.012)	0.007 (0.012)	-0.001 (0.017)	-0.007 (0.015)
Paid fixed salary to self	2,824	0.051	0.029	0.022 (0.011)	0.143	0.149	-0.006 (0.011)	-0.028 (0.027)	-0.028 (0.027)	0.012 (0.015)	0.011 (0.015)
Keeping records of: Sales	2,911	0.292	0.289	0.003 (0.018)	0.403	0.371	0.031 (0.018)	0.028 (0.020)	0.028 (0.020)	0.030 (0.019)	0.024 (0.019)
Withdrawals (Lima only)	988	0.093	0.096	-0.003 (0.024)	0.291	0.217	0.075 (0.024)	0.078 (0.031)	0.078 (0.031)	0.079 (0.029)	0.077 (0.027)
Number of sales locations	3,431	1.073	1.073	-0.001 (0.016)	1.036	1.028	0.008 (0.016)	0.009 (0.026)	0.009 (0.026)	0.020 (0.022)	0.027 (0.021)
Level of diversification: Number of income sources (Ayacucho only)	2,378	2.318	2.336	-0.018 (0.029)	1.450	1.486	-0.036 (0.029)	-0.018 (0.038)	-0.018 (0.038)	-0.046 (0.032)	-0.046 (0.030)
Allows sales on credit	3,431	0.602	0.579	0.023 (0.017)	0.570	0.549	0.021 (0.017)	-0.002 (0.015)	-0.002 (0.015)	0.024 (0.019)	0.025 (0.018)
<i>First difference estimate reported (no baseline data available)</i>											
Keeping records of payments to workers	2,999	NA	NA	NA	0.158	0.149	0.009 (0.013)	NA	NA	0.009 (0.015)	0.009 (0.014)
Business knowledge index	3,431	NA	NA	NA	3.359	3.247	0.112 (0.049)	NA	NA	0.105 (0.058)	0.089 (0.054)
Started new business	3,431	NA	NA	NA	0.136	0.153	-0.016 (0.012)	NA	NA	-0.019 (0.013)	-0.020 (0.013)
Profit used for business growth	3,431	NA	NA	NA	0.688	0.652	0.036 (0.016)	NA	NA	0.029 (0.018)	0.024 (0.017)
Proportion of clients who faced problems with business (Lima only)	1,053	NA	NA	NA	0.653	0.636	0.017 (0.030)	NA	NA	0.023 (0.030)	0.026 (0.031)
Proportion of clients who: Planned innovations in their businesses	3,431	NA	NA	NA	0.657	0.635	0.022 (0.016)	NA	NA	0.021 (0.017)	0.025 (0.016)
Executed innovations in their businesses		NA	NA	NA	0.410	0.359	0.052 (0.017)	NA	NA	0.045 (0.019)	0.046 (0.018)

Each coefficient reported in the table is from a separate regression. LPM used for dichotomous variables (tax formality, profit used for business growth, fixed salary, keeping records, started new business, allowing sales on credit and proportion of clients who faced problems, planned innovations, or executed innovations). OLS regressions include credit-officer fixed effects; standard errors are clustered by village bank.

^aDependent variables are defined as follows. Tax formality: Binary variable equal to 1 if client has a tax ID number. Paid fixed salary to self: Binary variable equal to 1 if client pays herself a fixed salary. Keeping records of sales and withdrawals: Binary variable equal to 1 if client records sales or withdrawals in a registry or notebook. Number of sales locations: Number of locations where the client sells her main business's products. Level of diversification: Number of income sources (personal or family businesses, other jobs, or working activities, for example—Ayacucho only). Allows sales on credit: Binary variable equal to 1 if client makes sales on credit. Business knowledge index: Number of right answers given by the client when asked about what should be done to increase business sales and plan for a new business. Started new business: Binary variable equal to 1 if client reports that she began a new business in the past year (Ayacucho) or the past two years (Lima). Profit used for business growth: Binary variable equal to 1 if client reported reinvesting profits for the growth or continuity of the business. Proportion of clients who faced problems with business: Binary variable equal to 1 if client reports that her business faced a specific problem in the past year (Ayacucho) or the past two years (Lima). Proportion of clients who planned or executed innovations in their businesses: Binary variable equal to 1 if client had an idea for or implemented a change or innovation to improve the business (Ayacucho) or to solve the problems faced (Lima).

^bThe covariates are location (Ayacucho or Lima), business activity, business size, age, schooling, and number of FINCA loans received by the client.

TABLE 3.—IMPACT OF TRAINING ON HOUSEHOLD OUTCOMES

Dependent variable ^a	Number of Clients	Summary Statistics: Mean, Standard Errors and Differences				Follow-Up		OLS, Difference-in-Difference		T-C Difference, with Control for Baseline Outcome		
		Baseline		Difference		Treatment	Control	Difference	Without Covariates	With Covariates ^c	Without Covariates	With Covariates ^c
		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
<i>Double difference estimate reported</i>												
Client's participation in Saving for business	3,354	0.952	0.959	-0.008 (0.007)	0.957	0.959	-0.002 (0.007)	0.006 (0.009)	0.006 (0.009)	0.001 (0.006)	-0.001 (0.006)	
Saving for households	3,398	0.849	0.837	0.012 (0.012)	0.908	0.905	0.003 (0.012)	-0.009 (0.015)	-0.009 (0.015)	0.006 (0.011)	0.008 (0.011)	
Borrowing for business	3,317	0.947	0.939	0.008 (0.009)	0.912	0.910	0.001 (0.009)	-0.006 (0.013)	-0.006 (0.013)	0.008 (0.010)	0.010 (0.010)	
Borrowing for households	3,326	0.802	0.821	-0.019 (0.012)	0.917	0.913	0.004 (0.012)	0.023 (0.017)	0.023 (0.017)	0.006 (0.010)	0.004 (0.010)	
Number of children	3,053	0.690	0.708	-0.018 (0.018)	0.602	0.627	-0.024 (0.018)	-0.006 (0.020)	-0.006 (0.020)	-0.027 (0.019)	-0.031 (0.017)	
Taking money/products from business	2,747	0.964	0.973	-0.009 (0.007)	0.969	0.972	-0.003 (0.007)	0.006 (0.008)	0.006 (0.008)	-0.003 (0.007)	-0.005 (0.006)	
Keeping track of household bills	3,358	0.604	0.603	0.001 (0.017)	0.611	0.613	-0.002 (0.017)	-0.003 (0.021)	-0.003 (0.021)	-0.003 (0.017)	-0.003 (0.017)	
<i>T-C difference estimate reported (no baseline data available)</i>												
No need to separate money	3,417	NA	NA	NA	0.616	0.630	-0.014 (0.017)	NA	NA	-0.014 (0.018)	-0.013 (0.017)	
Child labor (individual-level data—Lima only): Working children ^b	675	NA	NA	NA	0.307	0.325	-0.018 (0.029)	NA	NA	-0.032 (0.038)	-0.026 (0.039)	
Daily hours dedicated to House work	675	NA	NA	NA	1.019	1.008	0.011 (0.052)	NA	NA	0.002 (0.066)	0.000 (0.065)	
Child labor	675	NA	NA	NA	0.558	0.614	-0.056 (0.068)	NA	NA	-0.077 (0.081)	-0.071 (0.085)	
Schooling	674	NA	NA	NA	7.398	7.307	0.091 (0.091)	NA	NA	0.099 (0.137)	0.087 (0.138)	
Children with perfect attendance	664	NA	NA	NA	0.973	0.962	0.011 (0.011)	NA	NA	0.011 (0.013)	0.011 (0.013)	

Each coefficient reported in the table is from a separate regression. LPM used for dichotomous variables (no need to separate money, working children, and children with perfect attendance), OLS regressions include credit officer fixed effects; standard errors are clustered by village bank.

^aDependent variables are defined as follows. Client's participation on: Binary variable equal to 1 if the client participates on making key decisions for household and business, planning the number of children to have, deciding the amount of money/products taken from the business, and paying household bills. No need to separate money: Binary variable equal to 1 if the client thinks that is not necessary to separate her money from that of her husband or partner or other adult in the household to control expenses and savings. Working children: Binary variable equal to 1 if the child works. Daily hours dedicated: Number of hours the child dedicated to each activity in the week before the survey; schooling includes the time the child spent at school, as well as the time he or she dedicated to do homework or study at the household. Children with perfect attendance: Binary variable equal to 1 if the child attended school all the days that he or she could have.

^bSample for the analysis on child labor includes school-aged children (between 6 and 15 years of age).

^cThe covariates are location (Ayacucho or Lima), business activity, business size, age, schooling, and number of FINCA loans received by the client.

TABLE 4.—IMPACT OF TRAINING ON INSTITUTIONAL OUTCOMES

Dependent Variable ^a	Number of Clients	Baseline			Follow-Up			OLS, Difference-in-Difference		OLS, T-C Difference, with Control for Baseline Outcome	
		Treatment	Control	Difference	Treatment	Control	Difference	Without Covariates	With Covariates	Without Covariates	With Covariates
		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Double difference estimate reported</i>											
Loan size	3,170	209.32	216.55	-7.23 (9.29)	190.01	183.22	6.80 (9.28)	19.34 (16.97)	23.01 (15.36)	10.96 (17.08)	12.85 (15.54)
Cumulative savings	3,170	307.07	300.49	6.58 (14.36)	212.72	209.46	3.25 (14.34)	-6.15 (17.75)	-0.54 (17.34)	1.98 (18.15)	1.01 (15.89)
<i>First difference estimate reported (no baseline data available)</i>											
Perfect repayment	3,170	NA	NA	NA	0.813	0.783	0.031 (0.015)	NA	NA	0.029 (0.020)	0.028 (0.018)
Dropout											
Permanent or temporary dropout	3,170	NA	NA	NA	0.593	0.633	-0.040 (0.018)	NA	NA	-0.041 (0.025)	-0.040 (0.021)
Permanent dropout	3,170	NA	NA	NA	0.437	0.461	-0.024 (0.018)	NA	NA	-0.026 (0.025)	-0.026 (0.020)

Each coefficient reported in the table is from a separate regression. LPM used for dichotomic variables (perfect repayment, permanent or temporary dropout, and permanent dropout). OLS regressions include credit-officer fixed effects; standard errors are clustered by village bank.

^aDependent variables are defined as follows. Loan size: Amount borrowed from FINCA's external account at beginning of loan cycle (US\$). Cumulative savings: Balance at end of loan cycle (US\$). Perfect repayment: Binary variable equal to 1 if, since the beginning of training, the client made all her payments on time or had sufficient savings to cover missed payments. Permanent or temporary dropout: Binary variable equal to 1 if client had left a FINCA village bank by December 2,005.

impact of the intention to treat with a business training program on a particular outcome variable. However, the preferred estimator is the difference estimator, with controls for baseline value of the outcome variable (column 10 in tables 1–4).

Econometrically, the single difference estimator comes from the following expression:

$$Y_{ijt} = \alpha + \beta_3 D_j^T + \beta_4 Y_{ij0} + \varepsilon_{ijt}, \tag{1}$$

and the double difference estimator comes from

$$Y_{ijt} = \alpha + \beta_1 Post_t + \beta_2 D_j^T + \beta_3 Post_t D_j^T + \varepsilon_{ijt}, \tag{2}$$

where Y_{ijt} denotes an outcome variable for client i in bank j at time t , D_j^T is a dummy variable that takes the value 1 if the client belonged to a treatment bank, $Post_t$ is a binary variable equal to 1 if the observation corresponds to the posttreatment time period equation (2), and ε_{ijt} denotes the error term. Then β_3 in both specifications is the treatment estimate of the program's impact on outcome Y . That is, β_3 measures the difference between the treatment and control groups in the evolution of outcome Y and is an unbiased estimate of the average impact of being assigned to a treatment group on the outcome variable Y . In cases where we have only the measure in the follow-up survey, the estimate for equation (1) does not include the baseline value of the outcome variable.

Many of the outcome variables included in this study are binary. In such cases, we estimate a linear probability model (LPM) and report the marginal effect of D_i^C for the impact of business training on outcome Y . In the tables in section V, we also report estimates of β_3 that result from regressions that add to equations (1) and (2), respectively, a set of covariates such as the clients' age and education, the number of loans received from FINCA, business type and size, and branch location.¹⁴ We cluster all standard errors in the OLS specifications within the village bank, the unit of randomization (since training occurred during village bank group meetings). In addition, we include fixed effects for the credit officer, as randomization was stratified so that the work load was similar for each credit officer (see Duflo, Glennerster, & Kremer, 2007).

We evaluate the impact of this intervention on 36 institutional, business, and household outcomes, 13 of them related to business knowledge and practices. However, testing multiple outcomes using equation (1) or (2) independently increases the probability of rejecting a true null hypothesis for at least one outcome above the significance level used for each test (Duflo et al., 2007). We need to adjust the estimated p -values if we want to test whether

¹⁴ Since treatment was assigned randomly, the insertion of these covariates would not affect the consistency of the parameter of interest. Rather, its inclusion is used to improve estimation precision, account for chance differences between groups in the distribution of prerandom assignment characteristics, and account for nonrandom attrition in the follow-up survey (discussed in section VC).

business training has an impact on the family of outcomes associated with business practices and knowledge, business results, or institutional outcomes. A summary measure that captures this idea is the mean standardized treatment effect. Following Kling, Liebman, and Katz (2007), we implement that by defining a summary measure Y^* as the unweighted average of all standardized outcomes of a family. That is,

we get $Y^* = \sum_k Y_k^* / k$, where $Y_k^* = (Y_k - \mu_k) / \sigma_k$. Y_k denotes

the outcome variables within each family, which were redefined in some cases so that a larger value is always better for the business, household, or MFI.¹⁵ Standardization is done using mean and variance for the control group, at baseline when the DD specification is used. Thus, the mean and standard deviation of β in equation (1) for Y^* allows us to test whether treatment had an overall positive effect on the corresponding family of outcomes.¹⁶

We also use the summary measure Y^* to test whether the training generates heterogeneous treatment effects for each family of outcomes along characteristics such as prior interest in training, schooling, and business size as measured by total revenues. We use the following model:

$$Y_{ij}^* = \alpha + \delta X_{i0} + \beta_1 D_j^T + \beta_2 D_j^T X_{i0} + \varepsilon_{ij}, \quad (3)$$

where X_0 is a binary variable that denotes the characteristic of interest prior to the intervention. In this case, β_1 is the treatment control difference (TCD) estimator for individuals who have characteristic $X = 0$ and $(\beta_1 + \beta_2)$ measures the impact for individuals who have characteristic $X = 1$.

V. Results

A. Aggregate Results by Outcome Category

We divide the analysis into four categories: (1) business outcomes, (2) business processes and knowledge, (3) household outcomes including empowerment in decision making and child labor, and (4) microfinance institutional outcomes.

Business results. Table 1 presents the results on business outcomes such as sales and employment. For the preferred specification in columns 10 and 11, we find no statis-

tically significant effects, and most point estimates are close to 0. In the DD estimation (columns 8 and 9), we find the following treatment effects: sales in the month prior to the surveys were 15% higher (s.e. = 8%),¹⁷ 1% lower in “good months” (s.e. = 5%), nine percentage points higher in a “normal” month (s.e. = 5%), and 26% higher in “bad months” (s.e. = 10%).¹⁸ Thus there is weak evidence that the training may have helped clients identify strategies to reduce the downward fluctuations in their sales, not just the level of sales. For instance, the training taught them how to think about diversifying the goods and services they offer, as well as to think more proactively about alternative activities in slow months for their core business. The improved cash flow also may have reduced their seasonal demand for credit, helping to explain the lack of impact of the training on loan size and cumulative savings (see table 4, discussed more below).

We find no effect, in either specification, on the number of workers, family or hired, employed at the family business. Finally, for retail business, no change in profit margin was observed on the most common product sold. Due to time and reliability constraints, we asked about profit margin only for the main product.¹⁹ However, unless the profit margin shrank on other products despite not decreasing on the main product, the increased overall revenue implies an increase in profits. For service businesses, since no change in labor was observed, the increased revenue should translate roughly to increased profits.

Business skills and practices. In the follow-up survey, we asked clients questions about key elements of the training, such as business knowledge, marketing strategies, use of profits, and record keeping (see table A1 for the full list of survey questions and variable definitions). Table 2 shows the results on fourteen of these outcome measures. Most of them move in the intended direction but in the difference estimates (column 7), only five of them are significant at the 90% level, with four of those five significant at the 95% level. The outcomes that are significant at 95% are keeping records of their withdrawals from their business, an index of business knowledge questions, the proportion who report using profits for business growth, and implementation of innovations in the business. We find no statistically significant (at 90%) changes in tax formality, paid fixed salary to self, number of sales locations, level of diversification, allowing sales on credit, keeping records of payments to workers, started new business, proportion of clients who

¹⁵ An example for the family of institutional outcomes is that we use client retention for the construction of the corresponding summary measure instead of dropout. In the case of continuous variables such as fines and solidarity discounts, the adjustment implied multiplying those variables by -1 . Also, notice that we develop this analysis only for the TCD specification in the case of institutional outcomes and the family of outcomes related to business practices and knowledge, since the DD specification required dropping many variables and would break the purpose of this kind of analysis. The family of business results does use the DD specification, so that we drop the variable on profit margin for the main product as it was collected only in the follow-up.

¹⁶ We classify our expected outcomes into four categories: (1) institutional outcomes, (2) business results, (3) business processes/knowledge, and (4) household outcomes.

¹⁷ Both treatment and control groups experienced positive growth in sales in the month prior to the survey. Growth in the control group was 52%, while growth in the treatment group was 68%.

¹⁸ Both groups experienced growth in this indicator. Growth in the control group was 38%, while growth in the treatment group reached 64%.

¹⁹ Still, many clients were not able or willing to answer the questions related to the construction of this variable—that is, weekly revenue and cost for the main business product.

faced problems with business, and proportion of clients who planned innovations in their businesses.

It is important to note that these are self-reported process changes. Since the program taught individuals to engage in such activities and the surveys were associated with FINCA Peru in the minds of the borrowers, it is possible that the self-reports are biased in favor of the treatment groups.

Household outcomes. Table 3 reports the results on household outcomes. We divide the household outcomes into two categories: empowerment in household decision making and child labor. We detect no impact on household decision making, such as how to use the FINCA loan and savings, whether to take money or products from the business, or family size decisions.²⁰ Participants are also no more likely to keep track of household bills or separate their money from that of their husband or partner. One explanation for the lack of empowerment effects may be that we are working with women who already run a business, keep savings, and manage loans so that they are already empowered enough for the business training not to have an effect on the indicators analyzed here (it does suggest that modules focusing on these issues may not be optimal to include). Also, as indicated in section 2, FINCA clients routinely receive empowering messages during their group meetings.

We also examine several outcomes on child labor, with competing hypotheses: business training may increase the value mothers place on education more generally, thus leading to higher schooling. Thus, in terms of the business, the training may increase or decrease the returns to labor. We find in net a reduction in daily hours dedicated to child labor and an increase in schooling, but neither result is statistically significant (p -value is 0.411 and 0.317, respectively).

Institutional results. We found effects of training on institutional outcomes such as client retention, but not on loan size or accumulated savings (table 4). Perfect repayment among treatment groups is three percentage points higher than among control groups (p -value of 0.036).²¹ However, in the OLS specifications, the results are weaker statistically (p -value of 0.144 without covariates and 0.114 with covariates).²²

²⁰ The reported outcome takes the value of 1 if the female FINCA client is one of the decision makers and 0 otherwise.

²¹ A client is said to have had a perfect repayment record if her payments over the cycle plus her savings were always enough to cover the amount borrowed plus interest.

²² This statistic does not necessarily affect FINCA's finances because clients can still recover in the next weaker/month and FINCA can collect solidarity discounts associated with the joint liability mechanism within each bank. FINCA does incur noticeable transaction costs, however, in monitoring and enforcing, as any arrears, in any given week, leads to considerable discussion and midweek follow-up as part of the normal procedures. The ultimate repayment rate to FINCA is around 98% to 99% and is not different between treatment and control groups.

We also found that treatment group clients were 4 percentage points less likely to either permanently or temporarily drop out (p -value of 0.054) and 2.6 percentage points less likely to permanently drop out (p -value of 0.206). The proportion of dropout is high: 63% of the clients in the control group and 59% of clients in the treatment group left their banks at some point between the beginning of training and the follow-up survey. We infer from this that clients place a high value on the training they receive, causing them to avoid, at a minimum, temporary exits, and perhaps permanent ones as well. If the business training is particularly successful in helping microentrepreneurs increase the size and formality of their business, it may lead to exit and entry into more formal sector banking services. Although that is not observed, it is possible that after more time, this would have been observed.

Of those who do leave, treatment clients are more likely to cite the length of weekly meetings as a factor in dropping out of the program (see table A2). So while in net, the business training is good for client retention, the program can expect to lose some clients due to lengthier meetings. Making the training voluntary in principle would reduce this tension, but we find the improvement in dropout rates is slightly higher for the mandatory treatment than the voluntary treatment groups.²³

Another explanation for the increase in client retention for treatment groups is the improvement of clients' business outcomes, leading to higher repayment capability. The increase in client retention could be driven by the reduction in default rather than client satisfaction if the training causes some clients who might have defaulted to increase their ability to make loan payments. This would require an increase in business income to provide the funds to make extra payments, but as we saw above, such impacts were not clearly detected. We also examined whether the treatment led to more dropout with default compared to dropout without default (this is not reported in the tables). We found that the treatment effect is larger in reducing dropout without default, but neither is significant statistically when disaggregated.

The improved default and client retention rates have implications for the profitability of the institution, as discussed in more detail in section VI. However, we find no change in average loan size borrowed or cumulative savings at FINCA by the clients. Similarly, we do not find any changes in the collection of fines and in solidarity discounts that could have affected the client's feeling toward the training.²⁴

Naturally the training is costly, as it requires labor costs for the organization to train staff, likely leads to a lower quantity of clients an individual credit officer can handle on

²³ This regression result is not in the tables but is available on request.

²⁴ Fines and solidarity discounts were systematically registered in FINCA's database only from June 2004, so we do not have records for clients who left FINCA before that.

TABLE 5.—IMPACT OF TRAINING ON INDEXES OF FAMILIES OF OUTCOMES BY SUBGROUPS

	Ex-Ante Attitude towards:							
	Base Model		Training		Education		Business Size	
	Without Covariates	With Covariates	Low Interest	High Interest	Below High School	Above High School	Below Median	Above Median
Business results								
Number of clients	2,751	2,751	1,493	1,258	2,179	572	1,388	1,363
T-C difference at follow-up	0.019 (0.034)	0.011 (0.027)	0.012 (0.044)	0.006 (0.063)	0.010 (0.034)	0.011 (0.084)	0.058 (0.036)	-0.087 (0.056)
Difference-in-difference	0.039 (0.027)	0.039 (0.027)	0.045 (0.035)	-0.014 (0.054)	0.030 (0.029)	0.042 (0.074)	0.060 (0.037)	-0.041 (0.051)
Business practices								
Number of clients	2,690	2,690	1,444	1,246	2,141	549	1,375	1,315
T-C difference at follow-up	0.030 (0.016)	0.024 (0.014)	0.042 (0.018)	-0.028 (0.026)	0.030 (0.015)	-0.028 (0.036)	0.025 (0.019)	0.012 (0.025)
Institutional index								
Number of clients	3,170	3,170	1,680	1,490	2,579	591	1,483	1,687
T-C difference at follow-up	0.049 (0.040)	0.049 (0.032)	0.099 (0.043)	-0.104 (0.052)	0.052 (0.041)	-0.011 (0.067)	0.048 (0.044)	0.005 (0.051)
Empowerment								
All decisions								
Number of clients	2,346	2,346	1,294	1,052	1,892	454	1,173	1,173
T-C difference at follow-up	-0.024 (0.017)	-0.027 (0.017)	-0.074 (0.023)	0.096 (0.038)	-0.032 (0.019)	0.000 (0.049)	-0.025 (0.027)	-0.010 (0.037)
Difference-in-difference	-0.017 (0.025)	-0.017 (0.025)	-0.079 (0.034)	0.124 (0.046)	-0.030 (0.027)	0.036 (0.064)	-0.029 (0.038)	0.012 (0.050)
Household decisions								
Number of events	2,893	2,893	1,561	1,332	2,289	604	1,538	1,355
T-C Difference at follow-up	-0.004 (0.020)	-0.007 (0.019)	-0.034 (0.025)	0.056 (0.039)	-6.014 (0.022)	0.007 (0.043)	0.006 (0.028)	-0.025 (0.039)
Difference-in-difference	0.001 (0.024)	0.001 (0.024)	-0.035 (0.036)	0.067 (0.048)	0.004 (0.027)	-0.050 (0.060)	-0.020 (0.036)	0.033 (0.049)
Business decisions								
Number of clients	2,697	2,697	1,490	1,207	2,152	545	1,358	1,339
T-C Difference at follow-up	-0.015 (0.027)	-0.020 (0.027)	-0.084 (0.035)	0.139 (0.056)	-0.020 (0.030)	0.004 (0.074)	-0.002 (0.043)	-0.038 (0.057)
Difference-in-difference	-0.009 (0.036)	-0.009 (0.036)	-0.082 (0.047)	0.151 (0.069)	-0.035 (0.040)	0.108 (0.096)	-0.023 (0.055)	0.015 (0.075)

T-C difference estimate for institutional index and business practices. Double difference estimate for business results and empowerment Index. OLS regressions include credit officer fixed effect. Standard errors are clustered by village bank.

a continuing basis, and also requires some materials. Freedom from Hunger has found with previous partners that the total cost to an organization is between 6% and 9% of total operating costs (vor der Bruegge, Dickey, & Dunford 1999). For FINCA Peru, which charges an annualized interest rate of about 84%, this implies about a 10% increase in its costs. The marginal revenue will come from the increased client retention and repayment rates (no change in loan sizes was observed). The fixed cost of managing a village bank is high, but the variable operating cost of each individual client is quite low. The financial cost of capital is also low—roughly one-fifth of the interest revenue. Thus, the improved client retention rate (a 4 percentage point improvement in client retention) generates significantly more increased net revenue (revenue net of cost of capital) than the marginal cost of providing the training. The benefit from the improved client repayment is more difficult to estimate, since the true benefit to FINCA comes through lower enforcement costs (the eventual default is virtually nonexistent). Thus, in all, a lower-bound exercise (that is, ignoring repayment rate benefits) still suggests this is a profitable undertaking for FINCA. Indeed, after the study ended,

FINCA decided to implement the mandatory version of business training in all village banks.

B. Results for Outcome Family Indexes by Subgroups

Following the discussion in section IV and Kling et al. (2007), table 5, panel A reports the mean standardized treatment effect for four families of outcomes, although empowerment outcomes are separated in household and business decisions. We find statistically significant (at 90%) and positive average effects on two of the four families of out-

TABLE 6.—RESPONSE RATE BY THE FOLLOW-UP SURVEY BY LOCATION AND RETENTION IN FINCA

	Treatment	Control	Difference	T-statistic
Global	75.2	77.9	-2.7	-2.06
By Location				
Lima	77.2	83.5	-6.2	-2.85
Ayacucho	74.5	74.8	-0.3	-0.17
By retention in FINCA				
Clients	83.2	83.9	-0.6	-0.34
Ex-clients	69.9	74.2	-4.3	-2.44

TABLE 7.—MEAN STANDARDIZED TREATMENT EFFECTS UNDER VARYING MISSING DATA ASSUMPTIONS

	Lower Bounds				Unadjusted Treatment Effect Estimate	Upper Bounds					
	(1)	(2)	(3)	(4) 0.10 sd		(4) 0.05 sd	(5)	(6) 0.05 sd	(6) 0.10 sd	(7)	(8)
Business results	-1.016 (0.046)	-0.741 (0.034)	-0.124 (0.027)	-0.013 (0.026)	0.025 (0.026)	0.052 (0.027)	0.099 (0.026)	0.136 (0.025)	0.248 (0.025)	0.906 (0.028)	1.249 (0.039)
Business practices	-0.545 (0.020)	-0.410 (0.017)	-0.103 (0.012)	-0.023 (0.012)	0.004 (0.012)	0.024 (0.014)	0.058 (0.012)	0.084 (0.012)	0.164 (0.013)	0.602 (0.022)	0.784 (0.027)
Empowerment											
All decisions	-0.883 (0.032)	-0.214 (0.016)	-0.133 (0.019)	-0.045 (0.018)	-0.016 (0.018)	-0.017 (0.025)	0.043 (0.018)	0.073 (0.018)	0.161 (0.019)	0.293 (0.022)	1.052 (0.050)
Household decisions	-0.661 (0.029)	-0.216 (0.021)	-0.121 (0.021)	-0.042 (0.021)	-0.016 (0.021)	0.001 (0.024)	0.037 (0.021)	0.063 (0.021)	0.142 (0.022)	0.250 (0.023)	0.669 (0.037)
Business decisions	-1.179 (0.045)	-0.212 (0.023)	-0.150 (0.027)	-0.049 (0.027)	-0.015 (0.027)	-0.009 (0.036)	0.052 (0.027)	0.085 (0.027)	0.186 (0.027)	0.350 (0.034)	1.562 (0.075)

(1) Imputes minimum value of each variable in the nonattrited treatment distribution to attrited in treatment group, maximum value of nonattrited control distribution to attrited in control group. (2) Same as column 1 for those variables for which we have no baseline (BL) observation. If variables are dichotomic and observed at BL, it assumes nonreversal for attrited in treatment group. If variables are continuous or categorical and observed at BL, it imputes the median growth rate of bottom growth quintile of each variable in the nonattrited treatment distribution to attrited in treatment group, median growth rate of top growth quintile of nonattrited control distribution to attrited in control group. (3) Imputes mean minus 0.25 s.d. of the nonattrited treatment distribution to attrited in treatment group, mean plus 0.25 s.d. of the nonattrited control distribution to attrited in control group. (4) Imputes mean minus 0.10 s.d. of the nonattrited treatment distribution to attrited in treatment group, mean plus 0.10 s.d. of the nonattrited control distribution to attrited in control group. (5) Mean standardized treatment effect on the nonattrited. (6) Imputes mean plus 0.10 s.d. of the nonattrited treatment distribution to attrited in treatment group, mean minus 0.10 s.d. of the nonattrited control distribution to attrited in control group. (7) Imputes mean plus 0.25 s.d. of the nonattrited treatment distribution to attrited in treatment group, mean minus 0.25 s.d. of the nonattrited control distribution to attrited in control group. (8) Same as column 9 for those variables for which we have no BL observation. If variables are dichotomic and observed at BL, it assumes nonreversal for attrited in control group. If variables are continuous or categorical, and observed at BL, it imputes the median growth rate of top-growth quintile of each variable in the nonattrited treatment distribution to attrited in treatment group, median growth rate of bottom growth quintile of nonattrited control distribution to attrited in control group. (9) Imputes maximum value of each variable in the nonattrited treatment distribution to attrited in treatment group, minimum value of nonattrited control distribution to attrited in control group.

comes, business results, and business practices. The results for institutional outcomes are positive but not significant and are negative but not significant for empowerment with respect to decision-making power in the household.

Table 5, panel B also explores the hypothesis of heterogeneous effects among subgroups defined by the client's attitude toward training, education, and business size. We find that for improvements in the families of institutional outcomes, business practices and institutional outcomes are strongest (significant at 90% and 99%, respectively) for clients who expressed the least interest in business training in the baseline survey. Similar heterogeneity is similarly signed but not significant statistically for business results and oppositely signed and significant statistically (99%) for empowerment. If more weight is put on the business and institutional outcomes, this result has implications for the appropriate method for introducing business training to a program or market, since the impact is highest on those who indicate the lowest demand for the service. Under those circumstances, charging a fee for the business training initially may yield the exact wrong set of clients in order to maximize impact. Instead, one may want free trial periods to convince the less informed about the quality of the training. Or this suggests making the business training mandatory for borrowers (or linked to a service of high perceived value) may be beneficial.²⁵

With respect to education and business size as measured by sales, results are more inconclusive. The positive impact

of training on business practices seems stronger for the less educated and for the larger businesses. But the results on business results and institutional outcomes are not heterogeneous in this respect.

C. Attrition from the Follow-Up Survey

We had a response rate of 76% for the follow-up survey. Table 6 shows that the response rate was lower in the treatment group (75.2%) compared to the control group (77.9%). This differential response rate occurred at the Lima site and for former clients, but not in Ayacucho and for current clients.

Given our nonresponse rate, we analyze the implications of different plausible assumptions on our estimated treatment effects, along the lines of the nonparametric approaches followed in Horowitz and Manski (2000) and Lee (2002). In table 7, we report the lower- and upper-bound estimates for the mean standardized treatment effects of the outcome under various assumptions about missing data. Column 5 reproduces the mean standardized treatment effects in table 5. Columns 1 and 9 present the lower and upper bounds obtained under the worst-case scenario. For the lower (upper) bound, we impute the minimum (maximum) value of each variable in the observed treatment distribution to the nonresponders in the treatment group, and the maximum (minimum) value of the observed control distribution to the nonresponders in the control group.

The second scenario (columns 2 and 8) adjusts the worst-case scenario for the set of indicators for which we use the DD estimator, that is, those for which we observe the outcome at baseline. If variables are dichotomous, the lower (upper) bound assumes nonreversal for the nonresponders

²⁵ However, a surprising outcome is that training also led to a reduced role of the female client in business decisions. That is, among those less interested in training, treated clients were less likely to report having decision-making power in their business than control clients.

in the control group. If variables are continuous or categorical, it imputes the median growth rate of the bottom (top) growth quintile of each variable in the observed treatment distribution to the nonresponders in the treatment group and the median growth rate of the top (bottom) growth quintile of the observed control distribution to the non-responders in the control group.

The third scenario (columns 3 and 7) follows Kling and Liebman (2004) and imputes to the lower (upper) bound the mean minus (plus) 0.25 standard deviations of the observed treatment distribution to the nonresponders in the treatment group, the mean plus (minus) 0.25 standard deviations of the observed control distribution to nonresponders in the control group. The fourth scenario (columns 4 and 6) repeats the third scenario but with a 0.1 standard deviation.

Given the 24% attrition rate, it is not surprising to find very large differences between the lower and upper bounds of the worst-case scenario. In the case of the index for the family of business results, the mean standardized treatment effect can be either largely negative (a reduction of 1.01 standard deviations) or largely positive (an increase of 1.12 standard deviations). The next three scenarios reduce the range gradually, with the last one implying a mostly positive range for the mean standardized treatment. That is, with our level of nonresponse and size effect, if the treatment effect for the nonresponse varies by more than 0.1 standard deviation from the observed, then the results are no longer statistically different from 0.

VI. Conclusion

We raised a fundamental question regarding informal economies in developing countries: Are microentrepreneurs maximizing profits given a financial constraint, or can basic entrepreneurship training lead to improved managerial decisions, and thus profits? We find positive results, but on a preponderance of the outcomes.

We find that basic business training to preexisting clients of a microcredit program does not lead to higher profits or revenues on average for the primary econometric specification that compares outcome variables, controlling for baseline values. Difference-in-difference specifications, on the other hand, find a positive but small impact on enterprise revenues. Clients also report engaging in some of the exact activities being taught in the program: separating money between business and household, reinvesting profits in the business, maintaining records of sales and expenses, and thinking proactively about new markets and opportunities for profits. Finally, client retention is also increased, which has positive implications for the sustainability of the financial institution. Still, we cannot disentangle whether it is associated with the high value they put on the training or an effective increase in sales, of which we have some evidence.

Many further predicted positive impacts did not come to fruition. For example, the business training did not have a

significant impact on registration for formal business licenses, did not increase the number of sales locations, and did not induce entrepreneurs to keep records to payments of workers, start a new business (point estimate was actually negative, p -value of 0.163), reduce the proportion who reported having problems in their business, or increase the number of business that reported planning innovations.

Many of our models of entrepreneurial activity in developing countries treat human capital as fixed and focus instead on financial constraints and information asymmetries in credit and equity markets (Banerjee & Newman 1993; Paulson & Townsend 2004). Similarly, much of the microfinance industry focuses on the infusion of financial capital into microenterprises, not human capital, as if the entrepreneurs already have the necessary human capital. Some development practitioners, however, actively pursue strategies to teach adults (typically women) entrepreneurial skills. These programs are strikingly heterogeneous, and little is known about their impact on economic outcomes for the poor.

Indeed, as a result, much tension exists in the development finance community regarding whether lenders should specialize in financial services only or should integrate non-financial services into their programs (MkNelly, Watetip, Lassen, & Dunford, 1996).²⁶ The idea that specialization is good is certainly not new, but in this setting, it is unknown whether the economies of scope outweigh the risks of having credit officers simultaneously become teachers.²⁷ Aside from losing focus on the lending and savings activities, providing detailed business advice may lead to higher default if the borrower then perceives the lender as partially responsible for any business changes that do not succeed (that is, does a lender giving business advice effectively convert the debt into equity?). Thus, examining the effects on the institution, rather than just client outcomes, is important.

Another important result is that we sometimes find the stronger effects for those clients who expressed less interest in the training in the baseline survey. This result implies that demand-driven market solutions may not be as simple as charging for the marginal cost of the services. It is possible that after a free trial, clients with low prior demand would appreciate the value and demand the services. Or eventually, word of mouth may lead to higher demand by the less informed. Alternatively, programs could make the training a necessary component of some other desired commodity, such as credit. The experimental setup and outcomes measured here do not allow us to examine the exact prescription from this finding; in addition, the finding was not particularly strong and consistent across all outcomes.

²⁶ In a third alternative, the parallel approach, nonfinancial services are provided to the same individuals by another organization (or other employees of the same organization) in coordination with the financial service provider.

²⁷ The issue is even starker in other education add-on components such as health and nutrition training, which are often part of the credit-with-education approach. Such modules were not part of this initiative.

Although this paper has broader implications to theories about what constrains entrepreneurs with little money from expanding their enterprises, this is at a basic level an exercise in program evaluation. We suggest, however, that it is a necessary exercise for both policymakers and academics. Given the plethora of these projects and the importance of human capital to our thinking about growth and development, it is imperative that we know whether these efforts can have a positive effect on the poor. Many disagree on whether such programs should be implemented. In fact, the very origins of the microfinance movement, led by Muhammad Yunus of the Grameen Bank, are based on the presumption that credit constraints alone, not skills, are the obstacle to the entrepreneurial poor.

Further experimentation might evaluate impacts of more specific training on particular habits, skills, or knowledge to examine whether perhaps there are important improvements that could be made with focus on the right topic. Furthermore, important heterogeneity may exist with respect to preexisting credit clients versus others, and thus evaluations such as these should be conducted on nonclients in order to examine whether the impacts would be larger. It also would be important to evaluate the ongoing sustainability of any business changes for the client and the lending institution. For instance, will the selection of clients differ if the training is incorporated and well publicized, and, if so, how will that affect the impact of the intervention? Finally, an open debate exists regarding alternative delivery processes, such as whether credit officers rather than training specialists should be delivering the education, as well as the relative merits of different training modules and pedagogies.

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TABLE APPENDIX

TABLE A1.—DESCRIPTIONS OF OUTCOME VARIABLES

Variable	Description	Time of Measurement
<i>1. Institutional outcomes</i>		
Loan size	Amount borrowed from FINCA's external account at beginning of loan cycle (US\$).	Last cycle before and last available after the training
Cumulative savings	Balance (voluntary and mandatory) at end of loan cycle (US\$).	Last cycle before and last available after the training
Perfect repayment	Binary variable equal to 1 if, since the beginning of training, the client made all her payments on time or had sufficient savings to cover missed payments.	Every cycle since the beginning of training
Permanent or temporary dropout	Binary variable equal to 1 if client had left a FINCA village bank ever after beginning training.	
Permanent dropout	Binary variable equal to 1 if client had left a FINCA village bank by December 2005.	
<i>2. Business results</i>		
Last month sales (log)	Logarithm of main business's sales in the month preceding each survey.	BL and FU
Good month sales (log)	Logarithm of main business's sales in a good month.	BL and FU
Normal month sales (log)	Logarithm of main business's sales in a normal month.	BL and FU
Bad month sales (log)	Logarithm of main business's sales in a bad month.	BL and FU
Difference good-bad month sales (log)	Logarithm of difference in monthly sales between good and bad month.	BL and FU
Number of total workers	Number of workers in the main business.	BL and FU
Number of paid workers, not family members	Number of workers in the main business who are not household members.	BL and FU
Weekly profit from main product	Difference between the weekly revenue and cost of the most profitable product in the main business.	FU
<i>3. Business practices</i>		
Tax formality	Binary variable equal to 1 if client has a tax ID number.	BL and FU
Paid fixed salary to self	Binary variable equal to 1 if the client pays herself a fixed salary. Missing observations due to refusal to answer or inability to provide clear answer.	BL and FU
Keeping records of sales	Binary variable equal to 1 if client records sales in a registry or notebook.	BL and FU
Keeping records of withdrawals (Lima only)	Binary variable equal to 1 if client records her cash or withdrawals in a registry or notebook.	BL and FU
Number of sales locations	Number of locations where the client sells her main business's products.	BL and FU
Level of diversification—number of income sources (Ayacucho only)	Number of income sources the client reports (for example, personal/family businesses, other jobs or working activities). Available only for Ayacucho.	BL and FU
Allows sales on credit	Binary variable equal to 1 if client makes sales on credit.	FU, but recalling situation 12 months before survey
Keeping records of payments to workers	Binary variable equal to 1 if client records payments to workers who are not household members in a registry or notebook.	FU
Business knowledge index	Number of right answers given by the client when asked about what should be done to increase business sales and plan for a new business.	FU
Started new business	Binary variable equal to 1 if client reports that she began a new business in the past year (Ayacucho) or the last two years (Lima).	FU
Profit used for business growth	Binary variable equal to 1 if client reported reinvesting profits for the growth or continuity of the business.	FU
Proportion of clients who faced problems with business (Lima only)	Binary variable equal to 1 if client reports that her business faced a specific problem in the past year (Ayacucho) or the past two years (Lima).	FU
Proportion of clients who planned innovations in their businesses	Binary variable equal to 1 if client had an idea for a change or innovation to improve the business (Ayacucho) or solve the problems faced (Lima).	FU
Proportion of clients who executed innovations in their businesses	Binary variable equal to 1 if client implemented a change or innovation to improve the business (Ayacucho) or to solve the problems faced (Lima).	FU
<i>4. Empowerment outcomes</i>		
Financial decisions	Binary variable equal to 1 if the client participates in making key decisions for household and business finance.	BL and FU
Number of children	Binary variable equal to 1 if the client participates in making decisions regarding family size.	BL and FU
Taking money/product from business	Binary variable if the client participates on deciding the amount of money or products taken from the business.	BL and FU
Keeping track of household bills	Binary variable equal to 1 if the client is also in charge of ensuring that the household bills have been paid.	BL and FU
No need to separate money	Binary variable equal to 1 if the client thinks that is not necessary to separate her money from that of her husband or partner or other adult in the household to control expenses and savings.	FU
<i>5. Child labor outcomes</i>		
Working children	Binary variable equal to 1 if the child works.	
Daily hours dedicated to house work/child labor/schooling	Number of hours the child dedicated to each activity in the week before the survey; schooling includes the time the child spent at school, as well as the time he or she dedicates to doing homework or studying at the household.	
Children with perfect attendance	Binary variable equal to 1 if the child attended school all the days that he or she could have.	

TABLE A2.—POSTINTERVENTION DIFFERENCES FOR DROPOUT REASONS—AYACUCHO AND LIMA

	Total		Treatment		Control		Difference	T-Statistic
	Number of Observations	%	Number of Observations	%	Number of Observations	%		
Number of clients	3,457		2,093	60.54	1,364	39.46		
<i>1. Reasons related to policies and procedures of the FINCA program</i>								
Dissatisfied with FINCA's loan terms	227	6.57	131	6.26	94	6.89	-0.633	-0.737
Dissatisfied with FINCA's saving terms	51	1.48	28	1.34	23	1.69	-0.348	-0.83
Dissatisfied with the solidarity discounts (only Lima) ^a	47	4.42	20	3.68	27	5.19	-1.509	-1.196
The meetings were too long or too far (interference with business's schedule and/or personal activities)	404	11.69	256	12.23	145	10.63	1.601	1.437
Unequal or bad treatment of bank members	142	4.11	82	3.92	59	4.33	-0.408	-0.592
Because of the training	0	0	0	0	0	0	0	-
FINCA discovered loans from other institutions (only Ayacucho) ^b	13	0.54	7	0.45	6	0.71	-0.259	-0.825
Found an institution with better loan terms	18	0.52	11	0.53	7	0.51	0.012	0.049
<i>2. Reasons related to group loans</i>								
The village bank "graduated" (or was dissolved)	30	0.87	14	0.67	13	0.95	-0.284	-0.928
Personal conflicts in the bank (with other bank members or with the bank's president)	170	4.92	106	5.06	63	4.62	0.446	0.594
<i>3. Reasons related to the client's business</i>								
No credit needs because of the good situation of the business (sufficient capital in the business or the business operates seasonally)	29	0.84	18	0.86	11	0.81	0.054	0.169
No credit needs or could not pay the loan because of the bad situation of the business or other reasons	304	8.79	187	8.93	116	8.5	0.43	0.437
Closed the business or new activity or job	69	2	38	1.82	30	2.2	-0.384	-0.794
<i>4. Personal Reasons</i>								
Expenses resulting from a family crisis (such as illness) or family event (such as a wedding)	312	9.03	193	9.22	118	8.65	0.57	0.573
Other personal problems	124	3.59	74	3.54	50	3.67	-0.13	-0.201
Left the region or went on a long trip	215	6.22	140	6.69	75	5.5	1.19	1.417
A relative influenced the client	37	1.07	23	1.1	14	1.03	0.073	0.202
<i>5. Reasons due to environmental factors</i>								
Environmental or macroeconomic factors	57	1.65	31	1.48	26	1.91	-0.425	-0.959
<i>6. Other reasons</i>								
Other/Did not respond	221	6.39	134	6.4	85	6.23	0.171	0.201

^aThere are 1,063 observations (543 received treatment).^bThere are 2,394 observations (1,550 received treatment).

EXHIBIT A1.—BUSINESS TRAINING SESSIONS PRESENTED IN LIMA

Module 1: Training for Success		Module 2: The Business and the Family: Costs and Finances	
Session	Title	Session	Title
1	Training for Success	1	The Business and the Family
2	What Is a Business?	2	Income, Costs, and Profit
3	How does a Business Work?	3	My Costs of Production and Operating Resources
4	The Market	4	How Do I Calculate the Cost of Production of My Product?
5	Who Are My Customers?	5	Prices and Price Equilibrium
6	Who Are My Competitors?	6	How to Make a Good Price Decision
7	Review session 1	7	The Registers and Controls in My Business
8	Business Game: Module 1	8	The Growth of My Business
9	My Business's Position in the Market	9	Will I Be Able to Pay My Loan?
10	Product and Price Commercial Strategy	10	Taxes
11	Marketplace and Promotion Commercial Strategy		
12	My Commercial Plan		
13	Review session 2		
14	Business Game: Module 2		
15	Business Game: Module 3		

EXHIBIT A2.—BUSINESS TRAINING SESSIONS PRESENTED IN LIMA

Module 1: Manage Your Business Money		Module 2: Increase Your Sales	
Session	Title	Session	Title
1	Separate Business and Personal Money	1	Know Your Customers
2	Use Business Loans for Your Business	2	Treat Your Customers Well
3	Calculating Profits	3	Sell to Different Kinds of Customers
4	Track, Plan, and Invest Your Business Money	4	Improve Your Products and Services
5	Decide How to Use the Profits of the Business to Satisfy the Needs of the Business and Your Personal Needs	5	Sell New and Complementary Products and Services
6	Prevent Business Losses	6	Seize Opportunities to Sell
7	Manage Credit Sales	7	Sell Where Customers Buy the Most
8	Review of the Learning Sessions of “Manage Your Business Money”	8	Set the Right Price
		9	Promote Your Business with Good Selling Practices
		10	Plan for Increased Sales
Module 3: Plan for a Better Business			
Session	Title		
1	Use Planning Steps to Grow Your Business		
2	Examine How Your Business Is Doing		
3	Decide How You Can Improve Your Business		
4	Develop and Test New Business Ideas		
5	Plan How Much to Make and Sell		
6	Plan Business Costs		
7	Plan for More Profit		
8	Find Resources for Your Business		
9	Prepare for Unexpected Events		

APPENDIX B

Business Training Materials

In Lima, the training was administered as a two-part program (see exhibit A1). Module 1, “Training for Success,” consists of fifteen sessions that introduce the topics of business administration and marketing. Classes begin by introducing attendees to what a business is, how a business works, and the marketplace. Women are taught to identify their customers, business competitors, and the position of the business in the marketplace. Later in the module, sessions cover topics on product, price, and promotional strategies and a commercial plan. The module also includes review sessions and a business game that participants play in several sessions.

The second module, “Business and Family: Costs and Finances,” consists of ten sessions that explain how to separate business and home finances. The classes cover the differences among income, costs, and profit; how to calculate production costs; and product pricing. Other sessions cover maintaining records of the business’s operations, business growth, loan repayment, and taxes.

Every session of these two modules included worksheets on the topics taught for the clients to practice and review at the meetings or at home.

In Ayacucho, the training program was grouped into three modules with topics less advanced than those taught in Lima (see exhibit 2). Ses-

sions were presented in 30-minute classes and did not use worksheets as in Lima. Module 1, “Manage Your Business Money,” begins by defining the differences between money for personal expenses and for the business. Women are taught how to calculate profits and about the use of profits for the household and business. Sessions cover how to handle selling to customers on credit, how to record business expenses, how to prevent losses, and the importance of investing in the business. The module also includes a review session.

Module 2, “Increase Your Sales,” begins by providing an overview of five key elements in sales: customers, business product or service, product placement, pricing, and marketing. Many of the following sessions are dedicated to providing women with practical means of applying these concepts. The topics covered include the key elements of good customer relations, how to target sales to different types of customers, and approaches for varying the types and timing of the products that are sold in order to increase sales. Participants are also taught how to identify locations, price goods, and conduct activities that increase sales and profits.

The third module, “Plan for a Better Business,” teaches members how to incorporate planning into their business. Sessions begin by presenting why planning is beneficial and what traits characterize a successful business. Attendees are instructed on how to solve business problems and how to introduce new products or changes. Later sessions teach the tools needed to prepare a sales plan, calculate business and loan costs, search for new resources, and handle unexpected problems and opportunities.

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1. Kjetil Bjorvatn, Bertil Tungodden. 2010. TEACHING BUSINESS IN TANZANIA: EVALUATING PARTICIPATION AND PERFORMANCE. *Journal of the European Economic Association* **8**:2-3, 561-570. [[CrossRef](#)]
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