

Cross Sectional Impact Analysis: Bias from Dropouts*

Gwendolyn Alexander Tedeschi
Manhattan College
Department of Economics and Finance
gwendolyn.tedeschi@gmail.com

and

Dean Karlan
Yale University,
Innovations for Poverty Action,
Financial Access Initiative
dean.karlan@yale.edu

Abstract

Several microfinance organizations have begun using a management tool, developed by Assessing the Impact of Microenterprise Services (AIMS) at the United States Agency for International Development (USAID), to assess impact. This tool recommends comparing veteran members to new members of a microcredit program, and attributes any difference to the impact of the program. The tool introduces a potential source of bias into estimates of impact by not instructing organizations to include program dropouts in their calculations. This paper uses data from a longitudinal study in Peru of Mibanco borrowers and non-borrowers to quantify some, but not all, of the biases in the cross-sectional approach. In these data, not including dropouts overestimates the impact of the credit program. Furthermore, we find that the sample composition shifted over the two years (i.e., the characteristics of those who join), introducing further bias into a cross-sectional impact assessment. Note that the “reestimates” here are themselves biased and thus not a recommended procedure. They are calculated merely to assess the attrition and sample composition biases in a cross-sectional approach that compares veterans to new entrants to assess impact.

Keywords: microfinance, impact methodologies, program evaluation, attrition, Peru

* The authors thank Monique Cohen and Gary Woller for useful discussions on this paper, and Nathanael Goldberg, Tomoko Harigaya and Karen Lyons for research assistance. All errors and opinions are our own.

1. Introduction

Microfinance institutions receive tremendous amounts of development aid and publicity.¹ Studying the impact of such programs always has been a critical question from both a policy perspective (e.g., should funds be allocated to such programs) as well as a monitoring perspective (e.g., is a particular organization achieving its mission). In an attempt to conduct impact evaluations with limited resources, some organizations now use a cross-sectional empirical methodology (hereinafter referred to as the “cross-sectional approach”, and often in referred to as a "separate sample pretest-posttest design") developed by the United States Agency for International Development (USAID), under its Assessing the Impact of Microenterprise Services (AIMS) program. A few examples of such studies using this methodology also exist in academic journals and conference papers (Copestake, Bhalotra and Johnson 2001; Maldonado, Gonzales-Vega and Romero 2002; Noponen 2005).² The cross-sectional approach estimates the impact of microfinance programs on clients by comparing incoming clients to veteran clients. The validity of this comparison rests on the assumption that the two groups are alike except for the effect of the program. One particular aspect of the cross-sectional approach may make this requirement especially unlikely to be met: the comparison does not include clients who drop out of the program. This may create bias in the impact estimate because the tool compares all incoming clients only to those who have remained in the program for some time.

This paper will quantify the direction and magnitude of this effect by comparing the results from the standard tool to those obtained using a slight but important change: we include dropouts in the analysis. We refer to this approach as the “recalculated cross-sectional approach.” It is important to note this recalculation removes only one of several potential sources of bias. The point of this paper, therefore,

¹ CGAP, the association of donor agencies investing in microfinance, estimates in its *Donor Guidelines on Good Practice in Microfinance* that the donor community spends US\$800 million - \$1 billion per year on microfinance.

² Note that these studies, in particular Copestake et al (2001) and Noponen (2005), employ a triangulation of methodologies, only one of which is the cross-sectional approach discussed in detail here.

is *not* to estimate the impact of a program, but rather to provide an empirical example of the consequence of ignoring the biases inherent in a cross-sectional impact assessment for microfinance institutions.

Here, following a suggestion from Karlan (2001) we demonstrate a method to improve upon the cross-sectional approach by adding program dropouts to the analysis: rather than comparing those who have been in the program for two years (veterans) to those who just entered, we compare those who *joined* two years ago (veterans and dropouts) to those who just entered. Of course, since selection bias and changes in institutional dynamics may still exist; we do not recommend this approach as a tool for measuring impact. However, since the cross-sectional approach is a popular tool we put forward this modification as an important improvement to enhance the accuracy of the measurements.

We measure dropout bias by replicating the AIMS cross-sectional tool using a longitudinal dataset that includes dropouts. The second round of the dataset includes both veteran clients and new entrants, who joined after the first survey round. To measure dropout bias, we use this single round of data to compare veterans to new clients, as the AIMS tool would recommend, and then we recalculate impact using the complete dataset that includes dropouts. In several cases, we find that correcting the sample frame by including the dropouts lowers the estimated impact. This could be because those who are made worse off from participating drop out of the program or perhaps because the poor are more likely to drop out of the program. Either way, the cross-sectional impact strategy upwardly biased impact. Section 2 summarizes the biases discussed in Karlan (2001). Section 3 describes the data. Section 4 analyzes the data using first the cross-sectional approach (without accounting for dropout), and then with the recalculated cross-sectional approach (after correcting for dropout). This section also examines whether evidence exists to support other assumptions inherent in the cross-sectional methodology, such as the requirement that selection criteria (whether by the lender or by individual self-selection) do not change over time. Section 5 concludes and makes policy recommendations.

2. Impact Assessment and the Perils of the Cross-Sectional Approach

The fundamental goal of any impact assessment is to estimate the effect of an intervention in relationship to the counterfactual—what would have happened in the absence of the intervention. A common technique to achieve this is to compare program participants to a group of similar non-participants. The difficulty is to find groups that are sufficiently comparable. With most impact assessments in microfinance, the major hurdle is that the treatment group was self-selected. If unobservable characteristics, such as entrepreneurial spirit, also cause an individual to choose to borrow, any observed differences in outcomes between borrowers and non-borrowers will be biased. The best way to solve this is through a randomized controlled trial, which ensures that the treatment group, on average, is identical to the control group except for the impact of the intervention, as in Karlan and Zinman (2008, 2009) and Banerjee et al (2009). However, outside of a specialized field experiment we do not generally observe MFIs randomly giving credit to some members of a community.

Quasi-experimental techniques based on program expansion have been used on cross-section data with some success (Coleman 1999; Coleman 2006). Propensity score matching is a non-experimental method that can also be employed on cross-sectional data (Arun, Imai, and Sinha 2006). Alternatively, panel data is another way to control for initial differences between the groups (Copestake et al 2005; Khandker 2005; Kiiru 2007; Tedeschi 2008). However, quasi-experimental methods are not always available, panel data is expensive and too time-consuming for most MFIs to gather, and experimental methods sometimes are not feasible and other times require expertise not available to the microfinance institution.

Thus, the AIMS program, along with the Small Enterprise Education and Promotion Network (SEEP, a consortium of non-governmental organizations that support microfinance), developed a set of low-cost tools for practitioners to use to study impact (Nelson and Garber 2001). Examples of these tools include a client exit survey and a tool to measure the use of loans, profits, and savings over time. While these tools may provide important feedback to the microfinance institution, one major drawback of these types of studies is the lack of a control group of non-borrowers, meaning that the entire sample has self-

selected into the treatment group. Without a control group of non-borrowers, we cannot say if credit is beneficial, *in general*, or if it merely appears successful because it has been given to the most entrepreneurial people.

One of these tools, the cross-sectional impact assessment, attempts to solve this problem by comparing veteran borrowers of a microcredit program to incoming clients that have yet to receive loans. The stated justifications for the cross-sectional approach are twofold: (1) since both veteran borrowers and new borrowers are self-selected into the program, evaluators can avoid the selection bias inherent in comparing clients to non-clients; (2) the evaluation will be less costly since all analysis is performed on existing clients only, not on a control group of non-clients. Karlan (2001) discusses why this approach is flawed: in its attempt to correct for one bias it introduces several new biases. The rest of this section summarizes the arguments put forth in that paper.

2.1. Dropout Bias

One bias from dropouts is caused by an incomplete sample. Suppose there are two types of participants, those who benefit from participation and those who are made worse off. Those who benefit stay in the program. Those who are made worse off leave the program. By only including in the treatment group those who remain in the program, those with negative impact are ignored. The cross-sectional impact analysis would find a positive impact, whereas the true impact depends entirely on the relative size of these two groups and their relative impacts. If one wants to know the net impact of a microfinance program, one must include the failures along with the success stories. After all, we would all be perfect if we ignored our failures when evaluating ourselves.

On the other hand, the most successful entrepreneurs may ‘graduate’ from the program. In this case, the cross-sectional methodology would underestimate the impact. Which is right? Without more data we cannot say, but fortunately there is a relatively simple fix which works either way: include the dropouts in the treatment group. The next section of this paper will explain how to do that.

Another dropout bias is related to program attrition. Suppose for the moment that the program has no impact whatsoever, neither positive nor negative, on any participant. Yet some individuals drop

out and others remain. If the rich are more likely to leave (perhaps the weekly meetings are more costly to them than they are to the poor), then the cross-sectional approach will underestimate the impact. The story behind this is different than the incomplete sample problem, but the net result is the same: the sample composition of the treatment and control groups is fundamentally different because the treatment group does not include those who left, whereas the control group includes those who will eventually leave. The solution is the same as for the incomplete sample problem: include the dropouts in the treatment group.

2.2. Timing Problems

Why does someone join a credit program now rather than two years ago? We do not know, but we intuit that there is a reason, and it is significant. We will examine this in the empirical analysis of this paper by comparing the two groups of individuals from the same baseline survey: (a) individuals who joined two years ago (at the time of the baseline survey), and (b) individuals who did not join two years ago, but did join by the time of the follow-up survey.

The empirical analysis is necessary in order to address several conceptual problems. Imagine that individuals join after coming to an epiphany that they must grow their business in order to pull themselves out of poverty. Or perhaps participants join when everyone in their household is healthy, and hence does not need constant care in the home. If ample opportunities exist for credit and savings in their community, then attributing the improvement in their lives to the microfinance institution could be erroneous. Their epiphany or their family's health may be the *causal* agent that led to the improved welfare, not the access to that particular source of credit.

Another timing problem may arise if the program changes the way it finds new clients. A lender might enter the poorest neighborhoods first, or those closest to the major highway first, and then move on to different areas. The lender may change their credit evaluation process as they become more experienced in the area. For example, the lender could start to check potential clients against lists provided by a credit bureau. Or a seemingly unrelated change could cause the groups to differ, such as a change in the interest rate charged, which could attract a different profile of client (for example, lowering

interest rates might attract wealthier clients, who have more financial alternatives). Any of these changes would cause the comparison of current clients to incoming clients to be biased. Major macroeconomic changes might also compel different types of individuals to become clients.

In the data, timing problems would cause differences in the baseline data between those who joined initially and those who joined later, which we examine in Section 4. One way to address the timing problem is to analyze the alternatives for credit and savings that borrowers have in their communities. Since social networks can create both credit (such as informal loans) and savings (Rotating Savings and Credit Associations, ROSCAs) opportunities, evaluating a client's next best alternative is not an easy task. Further research to understand the informal opportunities to borrow and save is essential for understanding the seriousness of the timing problem.

3. Data

The data used in this study were also collected through the AIMS program but are not related to the cross-sectional studies we discuss here. These longitudinal data were gathered in a more intense exercise to assess impact on individuals who borrow, as well as the effects on their households and microenterprises.³ We use these data because they allow us to reconstruct the cross-sectional approach with and without the inclusion of dropouts, and to compare the profiles of clients who join the program earlier to those who joined later.⁴ The sample consists of borrowers from *Mibanco*, a microfinance institution (MFI) operating in Lima, Peru, and a control group of households which did not borrow from any source but were eligible to receive a Mibanco loan.⁵ Two waves of data were collected: a baseline in 1997, and a follow-up on the same households in 1999. In both years two surveys were administered: a household survey that measured variables including employment, education, consumption and savings data at the household level; and a microenterprise survey that gathered data such as profits, assets, and business practices, on up to three microenterprises operated by the household. The variables chosen for

³ More information on AIMS and the data used in this survey can be found at <http://www.MicroLinks.org>. Data and surveys are also available at this site.

⁴ Tedeschi (2008) uses the longitudinal aspect of the data in a more rigorous impact assessment.

⁵ To be eligible for a Mibanco loan, the borrower's business must have been in operation for at least six months.

this study follow those that Dunn and Arbuckle (2001) measured in the project's final report, which breaks the analysis down into three categories: individual, household and enterprise. While most variables are self-explanatory, the variables that need further description are described in Table 1.

A random sample of borrowers in three credit districts throughout Lima was selected, matching the sectoral composition of the sample to that of Mibanco's entire borrower base.⁶ In the baseline survey, the sample consisted of 400 borrower households and 301 non-borrower (control) households. In the second round of data collection, enumerators found 305 original borrower households (76%) and 213 non-borrower households (71%) that agreed to be resurveyed.⁷ Of these, 92 households chose to close their microenterprises due to insufficient revenue, lack of capital, illness, death or to take a full-time or salaried job. These households are excluded from the enterprise and individual analysis due to an absence of data, but are included for household variables.

These data allow us to test for dropout bias and sample composition bias because they contain dropouts in the second (1999) round of the survey and several members of the 1997 control group who began borrowing by 1999. We use the 1999 round of survey data to reproduce the cross-sectional impact analysis, using the 1997 information only to categorize the observations as veterans (Group #1), dropouts (Group #2) and new entrants (Group #3).

The number of observations in each group differs by the level of analysis. Sample sizes are lowest for the individual outcomes (found in Table 4) since most of these questions were taken from the enterprise survey and not all primary respondents had enterprises in 1999. The number of observations for the savings variable is higher, as it was asked of all respondents in the household survey. For individual-level impacts, the primary respondent must be a borrower in a given period for the observation to be categorized as 'borrower.' For household and enterprise-level results (Tables 2 and 3), if any member of the household has a loan the observation is considered 'borrower' due to fungibility of money within

⁶ See Dunn and Arbuckle (2001) for complete details on the survey process.

⁷ Slightly over half of the panel leavers could not be located, meaning that the household had moved and their microenterprises either closed or moved. For those that were located, but not surveyed, the most common reason was distrust of the surveyors, although other reasons such as lack of time, being away from the household for extended periods, sickness and death, were also reported.

household. Some enterprise impact variables are about the primary enterprise only or aggregated for each household, leading to the smaller sample sizes (Panel A). Other enterprise impacts are measured at the firm level (Panel B), leading to significantly more observations since up to three enterprises were recorded per household. For the household data, sample sizes are lower for coping questions, which were only asked of households who had reported a negative economic shock, and for school and intergenerational launching (helping a daughter or son start their own enterprise) questions, which were only asked of households with school age children.

4. Empirical Analysis

4.1 Dropout Bias

In the first analysis, we address the incomplete sample bias and sample attrition bias using the 1999 survey data to construct the impact assessments as a microfinance program would do if they were following the AIMS guidelines (Nelson and Garber 2001). The 1997 data is only used to identify groups, so that we can compare results excluding dropouts ('cross-sectional approach'), and including dropouts ('adjusted cross-sectional approach'). The cross-sectional methodology compares mean outcomes in 1999 for Group #1 to Group #3, or the veterans to the new entrants. To create the adjusted cross-sectional approach, we replace the Group #1 veterans, with a weighted average of Groups #1 and #2 (veterans and dropouts) in order to include *all* who were borrowers in 1997, not just those who stayed in the program.⁸

Comparing means is equivalent to the following OLS specification:

$$Y_i = \alpha + \beta T_i + \varepsilon_i,$$

where T_i is an indicator variable equal to one if the weighted observation is from Groups #1 or #2, and is equal to zero if the observation is from Group #3.

Tables 2 through 4 show the results for this analysis, for enterprise outcomes, household outcomes and individual outcomes, respectively. Column 1 shows the mean outcome for the veterans

⁸ Weights are used because the sample of dropouts (Group #2) was smaller for this sample than it is estimated to be for the population as a whole. Dropout for non-delinquent Mibanco borrowers is reported as 56% percent in Dunn and Arbuckle (2001, p: 88).

(Group #1), Column 2 shows the mean outcome for the dropouts (Group #2) and Column 3 shows the mean outcome for the new entrants (Group #3). Column 5 then shows the cross-sectional results comparing veterans to new entrants. Column 6 shows the adjusted cross-sectional approach, comparing ‘veterans *and* dropouts’ to new entrants. Column 7 reports the t-statistic on the null hypothesis that no dropout bias exists in the cross-sectional methodology.

First, note that for the many of the outcomes no measurable difference is observed between veterans and new entrants. Although the difference between methodologies is often not significant statistically (the sample is very small), there is typically an upward bias for the cross-sectional method without taking dropouts into account.

The most striking change is in the first row of Table 2, Yearly Enterprise Profit from All Microenterprises. The cross-sectional methodology estimates an increase of 4083 nuevos soles per year⁹, which is about US\$1200. The recalculated methodology estimates a *decrease* of 588 nuevos soles per year. Another example: if we look at total employment over the top three enterprises operated by a veteran household, the cross-sectional methodology finds that veterans have 14.6 more days worked per month, whereas the recalculated methodology estimates an increase of only 4 days per month.

Table 3 shows parallel results, a systematically upward bias to the cross-sectional methodology. In the first row, Household Income from All Sources, we see a change from 6569 nuevos soles impact to only 2062 nuevos soles impact. Similarly stark differences are found for answers to qualitative questions about coping strategies. The cross-sectional methodology finds borrowers 1% less likely to employ ‘bad’ coping strategies, such as selling or pawning productive assets, whereas the adjusted methodology finds borrowers 7% *more* likely to employ bad coping strategies. For poor households, the difference is even starker, going from 0% likely to employ bad strategies to 12%.

4.2. Timing Problems

Next, we examine whether the composition of new borrowers changed over the two years, hence invalidating another key assumption of the cross-sectional methodology. This assumption could fail if life

⁹ The exchange rate at the time was 3.50 soles/US\$, hence this is equivalent to US\$1166.

events change the decision to participate, programs alter placement criteria, credit screening or client solicitation procedures, or macroeconomic phenomena lead to a different clientele. To do this analysis, we will compare the 1997 measures of two groups, those who entered in 1997 and those who entered in 1999. If we find that those who entered in 1999 were significantly wealthier (or poorer) in 1997 than those who entered the program in 1997, then this suggests that the selection process (whether intentional or not) indeed changed over the two years.

Table 5 shows these results. Several differences exist. First, new entrants in 1999 are more likely to have had a formal location in 1997 than the new entrants in 1997. This is likely to underestimate the impact, since the control group members (new entrants in 1999) are likely to have larger business if the businesses are more formal. On the other hand the veterans (new entrants in 1997) were more likely to own their business premise in 1997, and this would be likely to overstate impact. The largest differences are found in the household outcomes, specifically expenditure on appliances and per-pupil expenditures on education. Both indicate that, in 1997, those who joined the program that year were better off than those who waited until 1999.

5. Conclusion and Recommendation

The purpose of this paper is to make one point: if conducting a cross-sectional impact assessment, then the definition of “veterans” should *not* be “has been in the program for two years,” but rather “*joined the program two years ago.*” This small correction can improve the accuracy and hence reliability of the results. This is not to say all problems are removed, nor to say that a cross-sectional methodology (even one that includes dropouts) would satisfactorily measure the impact of a microcredit program. Furthermore, although it costs additional money to interview individuals who have left the program, this additional cost buys two things: (1) a more accurate impact assessment, and (2) valuable information on the causes of dropout. We believe the additional expense is money well spent, but exactly how well spent can be investigated empirically.

By replicating our analysis in more settings and determining the size and direction of the bias the microfinance community can get a clearer picture of the pattern of dropouts and the extent to which not including them will affect the results. The dropout rate among Mibanco clients, at 56% over a two-year period for this sample, is quite normal, and it would be especially interesting to see results for MFIs with different dropout rates. If for MFIs with lower dropouts rates the bias is found to be insubstantial, such MFIs can decide whether it is worthwhile to include dropouts in their analysis. Or, if in certain cases (such as MFIs with low dropout rates) the bias is found to be negative—implying either that dropouts are “successful graduates” or that better-off clients tend to drop out more often—such MFIs could legitimately decide not to include dropouts because, compared to the recalculated approach, the biased results would be a conservative estimate. Until further evidence exists, however, our results make it clear that not including dropouts makes a flawed methodology even more suspect. Although this paper does not discuss these issues, other articles on best practices for MFIs, including the AIMS tools discussed above, (Nelson and Garber 2001), suggest that systematic interviewing of dropouts can help tremendously with ongoing quality control and improvement of the services the MFI is offering (Micro-Save Africa 2002).

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TABLE 1: Explanation of Selected Variables

Enterprise Variables	
Operate in a formal location	Proportion whose business is inside an established formal market or in a commercial store-front location.
Business is licensed	Proportion of enterprises that were licensed by the municipality and registered with the national tax authority

Household Variables	
Inverse Simpson Index	A measure of income diversification, with a value of 1 implying that a family has only one source of income, and higher numbers implying a greater number of income sources and income from these sources being more evenly spread out.
Intergenerational Launching	The proportion of households with children that report a child (of any age) managing a microenterprise.
Bad Coping Strategies	For households that reported a negative economic shock, the proportion of households that sold, pawned or loaned out productive assets (as opposed to using savings, borrowing or reducing expenditures).

Individual Variables	
Total control over enterprise profits	The proportion of respondents that made the choice of how to spend enterprise profits entirely on his or her own.
Feels own contribution to household is important	The proportion of respondents who had a strong positive response.
Thinks others feel his/her contribution is important	The proportion of respondents who had a strong positive response.
Presence of savings	The proportion of households that had at least one form of liquid savings.

TABLE 2: Enterprise Outcomes

	Group 1: Client in 1997 & 1999 (1)	Group 2: 1997 Clients, 1999 Dropouts (2)	Group 3: New Client in 1999 (3)	All 1997 Clients (weighting columns 1 & 2) (4)	Cross- Sectional Impact: Col 1 - Col 3 & t- statistic (5)	Recalculated Impact, including dropouts: Col 4 - Col 3 & t-statistic (6)	"Cross Sectional" Impact Bias H ₀ : (5) = (6) (7)	
Panel A								
Revenue Variables	Yearly Enterprise Profit from all microenterprises	21956.03 (22513.19)	13613.82 (12446.91)	17872.68 (32255.37)	17284.39 (18049.10)	4083.35 0.84	-588.29 -0.13	2.11 0.04
	Monthly Gross Revenue from top 3 enterprises per household	7363.69 (12671.48)	6769.23 (23080.95)	5542.59 (11354.01)	7030.80 (19181.02)	1821.10 0.96	1488.20 0.78	0.21 0.84
Fixed Assets	Monthly gross revenue for primary microenterprise	5070.37 (9518.09)	6360.18 (24503.02)	5264.04 (11803.27)	5792.66 (19369.28)	-193.68 -0.10	528.62 0.25	-0.47 0.64
	Value of fixed assets for primary microenterprise	9115.50 (18628.31)	7065.07 (13351.90)	9903.37 (30366.99)	7967.26 (15892.31)	-787.87 -0.17	-1936.11 -0.44	0.55 0.58
Employment of HH and Non-HH Members	Value of fixed assets for all microenterprises owned by a household	14285.86 (23862.47)	9134.95 (15376.06)	10006.64 (29499.56)	11513.73 (19882.34)	4279.22 0.93	1507.09 0.35	1.04 0.30
	Total days worked per month for all workers in the primary microenterprise	59.94 (35.80)	51.12 (30.81)	55.85 (34.31)	55.00 (33.33)	4.09 0.69	-0.85 -0.16	1.19 0.23
	Total days worked per month for non-household members in the primary microenterprise	8.53 (25.76)	7.43 (20.25)	5.96 (17.17)	7.92 (22.80)	2.57 0.76	1.96 0.68	0.23 0.81
	Total Wages per month in Primary Microenterprise	154.89 (449.47)	157.29 (467.59)	173.23 (618.03)	156.23 (458.86)	-18.34 -0.19	-17.00 -0.18	-0.05 0.96
	Total days worked per month for all workers in the top 3 microenterprises	87.40 (51.44)	68.59 (43.46)	72.81 (44.20)	76.87 (47.98)	14.59 1.93	4.05 0.60	1.47 0.14
	Total days worked per month for non-household members in the top 3 microenterprises	11.74 (28.85)	9.39 (22.89)	9.25 (23.80)	10.42 (25.66)	2.49 0.60	1.18 0.33	0.26 0.80
	Number of Observations, max(min)	129(125)	157(135)	53(47)	286(260)			
Panel B								
Transactional Relationships	Buy mostly from wholesalers, proportion	0.75 (0.43)	0.65 (0.48)	0.78 (0.42)	0.69 (0.46)	-0.08 -1.54	-0.13 -2.17	1.40 0.16
	Sell mainly to businesses, proportion	0.09 (0.29)	0.08 (0.28)	0.07 (0.25)	0.09 (0.28)	0.03 0.83	0.02 0.70	0.26 0.79
	Operate in a formal location, proportion	0.26 (0.44)	0.19 (0.40)	0.36 (0.48)	0.22 (0.42)	-0.10 -1.57	-0.13 -2.28	0.93 0.35
	Ownership of premise, proportion*	0.68 (0.47)	0.68 (0.47)	0.52 (0.50)	0.68 (0.47)	0.16 2.24	0.16 2.40	-0.01 0.99
	Sell mostly by contract, proportion	0.25 (0.44)	0.20 (0.40)	0.14 (0.35)	0.22 (0.42)	0.11 2.15	0.08 1.72	0.80 0.42
	Business is licensed, proportion	0.49 (0.50)	0.40 (0.49)	0.45 (0.50)	0.44 (0.50)	0.04 0.66	-0.01 -0.15	1.21 0.23
	Number of Observations, max(min)	222(177)	242(190)	76(65)	464(367)			

Note: Number of observations varies due to missing observations.

* This variable has several "does not apply" responses, which causes the large differences in observations for this section.

Columns 1 - 4: Standard deviation reported in parenthesis.

Column 5: Difference between Col 1 and Col 3 reported on top line. t-statistic reported for H₀: Col 1 = Col 3 on second line.

Column 6: Difference between Col 3 and Col 4 reported on top line. t-statistic reported for H₀: Col 3 = Col 4 on second line.

Column 7: t-statistic for H₀: Cross-sectional impact (Col 5) = Recalculated cross-sectional impact (Col 6) reported on top line. p-value reported on second line.

TABLE 3: Household Outcomes

	Group 1: Client in 1997 & 1999	Group 2: 1997 Clients, 1999 Dropouts	Group 3: New Client in 1999	All 1997 Clients (weighting columns 1 & 2)	Cross- Sectional Impact: Col 1 - Col 3 & T-statistic	Recalculated Impact, including dropouts: Col 4 - Col 3 & T-statistic	"Cross Sectional" Impact Bias (5) = (6) H ₀ :	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Income	Household Income from All Sources	30686.71 (24363.88)	22638.66 (19314.86)	24117.38 (32545.37)	26179.81 (22009.85)	6569.33 1.34	2062.43 0.45	1.88 0.06
	Per Capita Income from All Sources	6779.46 (5422.23)	5263.00 (4929.56)	5117.42 (6907.67)	5930.24 (5198.26)	1662.04 1.59	812.82 0.83	1.58 0.12
Diversification	Inverse Simpson Index for All Households	2.36 (0.98)	2.32 (1.07)	2.06 (1.08)	2.33 (1.03)	0.30 1.79	0.28 1.77	0.25 0.81
	Inverse Simpson Index for Non-Poor Households*	2.36 (1.00)	2.22 (1.04)	2.05 (1.26)	2.28 (1.03)	0.31 1.30	0.23 1.00	0.69 0.49
	Inverse Simpson Index for Poor Households*	2.32 (0.84)	2.61 (1.10)	2.06 (0.77)	2.48 (0.99)	0.27 1.04	0.42 2.05	-0.82 0.42
Food Expenditure	Per Capita Daily Food Expenditure for All Households	4.31 (2.57)	4.02 (2.20)	3.74 (2.01)	4.15 (2.37)	0.57 1.63	0.41 1.36	0.64 0.52
	Per Capita Daily Food Expenditure for Non-Poor Households*	4.64 (2.61)	4.62 (2.20)	4.60 (2.13)	4.63 (2.38)	0.04 0.09	0.03 0.07	0.04 0.97
	Per Capita Daily Food Expenditure for Poor Households*	2.28 (0.71)	2.32 (0.94)	2.40 (0.59)	2.30 (0.84)	-0.13 -0.61	-0.10 -0.64	-0.15 0.88
	Expenditure on Household Improvements in previous year	1077.17 (2539.89)	592.12 (1712.78)	945.80 (2859.58)	805.54 (2126.67)	131.37 0.30	-140.26 -0.35	1.10 0.27
Household Investments	Expenditure on Household Appliances in last 2 years	2264.48 (5655.78)	1298.39 (3707.63)	674.20 (1700.73)	1723.47 (4682.06)	1590.28 2.91	1049.28 2.98	0.98 0.33
	Expenditure on Education per Child in School	713.48 (658.30)	718.76 (793.28)	433.99 (381.44)	716.44 (735.56)	279.49 3.35	282.44 3.96	-0.04 0.97
Launch School	Intergenerational Launching, proportion	0.13 (0.34)	0.09 (0.28)	0.09 (0.29)	0.11 (0.31)	0.04 0.87	0.02 0.39	0.72 0.47
	Number of observations, max(min)	129(109)	176(147)	56(49)	305(256)			
Coping Strategies	Bad Coping Strategies for All Households, proportion	0.02 (0.12)	0.16 (0.36)	0.03 (0.17)	0.09 (0.29)	-0.01 -0.41	0.07 1.81	-3.17 0.00
	Bad Coping Strategies for Non-Poor Households, proportion**	0.02 (0.13)	0.14 (0.35)	0.04 (0.20)	0.09 (0.28)	-0.02 -0.52	0.04 0.90	-2.31 0.02
	Bad Coping Strategies for Poor Households, proportion**	0.00 (0.00)	0.21 (0.41)	0.00 (0.00)	0.12 (0.32)	0.00 0.00	0.12 2.23	-2.63 0.01
	Number of observations, max(min)	65	109	35	174			

*There are 111, 130, 241, and 34 non-poor and 18, 46, 64, and 22 poor households in *Group 1*, *Group 2*, *All 1997*, and *Group 3*, respectively.

**There are 55, 80, 135, and 24 non-poor and 10, 29, 39, and 11 poor households in *Group 1*, *Group 2*, *All 1997*, and *Group 3* respectively.

Columns 1 - 4: Standard deviation reported in parenthesis.

Column 5: Difference between Col 1 and Col 3 reported on top line. t-statistic reported for H₀: Col 1 = Col 3 on second line.

Column 6: Difference between Col 3 and Col 4 reported on top line. t-statistic reported for H₀: Col 3 = Col 4 on second line.

Column 7: t-statistic for H₀: Cross-sectional impact (Col 5) = Recalculated cross-sectional impact (Col 6) reported on top line. p-value reported on second line.

TABLE 4: Individual Outcomes

		Group 1: Client in 1997 & 1999	Group 2: 1997 Clients, 1999 Dropouts	Group 3: New Client in 1999	All 1997 Clients (weighting columns 1 & 2)	Cross-Sectional Impact: Col 1 - Col 3 & T-statistic	Recalculated Impact, including dropouts: Col 4 - Col 3 & T-statistic	"Cross Sectional" Impact Bias Ho: (5) = (6)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Control	Total control over enterprise profits, proportion	0.47 (0.50)	0.52 (0.50)	0.55 (0.51)	0.50 (0.50)	-0.08 -0.64	-0.05 -0.42	-0.58 0.56
	Self Esteem and Respect	Feels own contribution to household is important, proportion	0.97 (0.18)	0.97 (0.18)	1.00 (0.00)	0.97 (0.18)	-0.03 -2.03	-0.03 -2.87
Attitude toward the future		Thinks others feel his/her contribution is important, proportion	0.88 (0.32)	0.89 (0.31)	0.90 (0.31)	0.89 (0.32)	-0.02 -0.22	-0.01 -0.17
	Savings	Feel prepared for the future, proportion	0.78 (0.42)	0.76 (0.43)	0.65 (0.49)	0.77 (0.42)	0.13 1.08	0.12 1.02
Number of Observations, max(min)		Taking action to prepare for the future, proportion	0.88 (0.32)	0.80 (0.40)	0.80 (0.41)	0.84 (0.37)	0.08 0.86	0.04 0.38
	Savings	Presence of savings, proportion	121(120) (0.50)	124 (0.50)	20 (0.51)	245(244) (0.50)	0.05 0.41	-0.02 -0.14
Number of Observations		129	175	56	304			

Note: Number of observations varies due to missing observations.

Columns 1 - 4: Standard deviation reported in parenthesis.

Column 5: Difference between Col 1 and Col 3 reported on top line. t-statistic reported for H0: Col 1 = Col 3 on second line.

Column 6: Difference between Col 3 and Col 4 reported on top line. t-statistic reported for H0: Col 3 = Col 4 on second line.

Column 7: t-statistic for H0: Cross-sectional impact (Col 5) = Recalculated cross-sectional impact (Col 6) reported on top line. p-value reported on second line.

TABLE 5: Selection Bias Estimates

Compares characteristics in 1997 of new clients of Mibanco in 1997 to clients who joined between survey periods.

		1997 characteristics of clients who joined in 1997 (1)	1997 characteristics of clients who joined in 1999 (2)	Comparison of 1997 Characteristics: Col 1 - Col 2 (3)
Basic	Female, proportion	0.62 (0.49)	0.48 (0.51)	0.14 1.31
	Primary Respondent has Baby (under 3), proportion	0.14 (0.34)	0.24 (0.44)	-0.10 -1.16
	Number of Observations, max(min)	258(258)	25(25)	
Enterprise	Electricity, proportion	0.81 (0.40)	0.75 (0.43)	0.05 0.89
	Yearly enterprise profit from all microenterprises	17304.07 (18220.77)	17872.68 (32255.37)	-568.61 -0.12
	Buy mostly from wholesalers & manufacturers	0.69 (0.46)	0.78 (0.42)	-0.09 -1.64
	Formal location	0.22 (0.41)	0.36 (0.48)	-0.14 -2.30
	Ownership of business premise	0.68 (0.47)	0.52 (0.50)	0.15 2.25
	Number of Observations, max(min)	385(249)	76(53)	
	Household	Per capita income from all sources	5733.5 (4768.70)	5117.4 (6907.67)
Expenditure on household appliances		1852.1 (5001.71)	674.2 (1700.73)	1177.90 3.05
Per pupil expenditure		723.01 (721.72)	433.99 (381.44)	289.02 3.96
Bad coping strategies for all households		0.11 (0.31)	0.03 (0.17)	0.08 2.01
Bad coping strategies for non-poor households*		0.10 (0.30)	0.04 (0.20)	0.05 1.08
Bad coping strategies for poor households*		0.12 (0.33)	0.00 (0.00)	0.12 2.20
Number of Observations, max(min)		257(221)	56(49)	
Individual		Feels own contribution to HH is important	0.97 (0.18)	1.00 (0.00)
	Feel prepared for the future	0.77 (0.42)	0.65 (0.49)	0.12 1.06
	Taking action to prepare for the future	0.83 (0.38)	0.80 (0.41)	0.03 0.32
	Number of Observations, max(min)	207(205)	20(20)	

Note: Number of observations varies due to missing observations. *There are 110 non-poor and 35 poor households among new clients in 1997, and 24 non-poor and 11 poor households among new clients in 1999.

Columns 1 - 2: Standard deviation reported in parenthesis.

Column 3: Difference between Col 1 and Col 2 reported on top line. T-statistic reported for $H_0: \text{Col 1} = \text{Col 2}$ on second line.