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Microcredit and the Poorest of the Poor: Theory and Evidence from Bolivia

SERGIO NAVAJAS
The Ohio State University, Columbus, USA

MARK SCHREINER
Washington University in St. Louis, Missouri, USA

RICHARD L. MEYER
The Ohio State University, Columbus, USA

CLAUDIO GONZALEZ-VEGA
The Ohio State University, Columbus, USA

and

JORGE RODRIGUEZ-MEZA *
The Ohio State University, Columbus, USA

Summary. — We construct a theoretical framework that describes the social worth of a microfinance organization in terms of the depth, worth to users, cost to users, breadth, length, and scope of its output. We then analyze evidence of depth of outreach for five microfinance organizations in Bolivia. Most of the poor households reached by the microfinance organizations were near the poverty line—they were the richest of the poor. Group lenders had more depth of outreach than individual lenders. The urban poorest were more likely to be borrowers, but rural borrowers were more likely to be among the poorest. © 2000 Elsevier Science Ltd. All rights reserved.

Key words — Latin America, Bolivia, microcredit, poverty, outreach, sustainability

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1. INTRODUCTION

The professed goal of public support for microcredit is to improve the welfare of poor households through better access to small loans. Often public funds for microfinance organizations carry a mandate to serve the poorest (Consultative Group to Assist the Poorest, 1995). For example, the Microcredit Summit in February 1997 rallied support to seek more than $20 billion to provide microcredit to 100 million of the poorest households in the next ten years (Microcredit Summit, 1996).

Microcredit is the newest darling of the aid community. In Latin America, most of the excitement is based on the fame of a few of the best microfinance organizations. These include BancoSol, Caja Los Andes, PRODEM, FIE, and Sartawi in Bolivia; Caja Social in Colombia; ADEMI in the Dominican Republic; Financiera Calpiá in El Salvador; Compartamos in México; and ACP/MiBanco in Perú. Worldwide, the best-known microfinance organizations are the Grameen Bank of Bangladesh and the unit *desa* system of Bank Rakyat Indonesia (Yaron, Benjamin & Piprek, 1997). Grameen and BRI reach millions of depositors and borrowers, and many if not most are poor women. A survey of 200 of the thousands of microfinance organizations worldwide found 13 million loans worth $7 billion outstanding as of September 1995 (Paxton, 1996).

Although microcredit has claimed more and more of the aid budget, it may not always be the best way to help the poorest (Buckley, 1997; Rogaly, 1996). The fervor for microcredit may siphon funds from other projects that might help the poor more. Governments and donors should know whether the poor gain more from more small loans than from, for example, more health care, food aid, or cash gifts.

Is public support for microcredit wasted or worthwhile? No one knows. Most measures of the impact of microfinance organizations fail to control for what would have happened in their absence (Sebstad, Neill, Barnes & Chen, 1995; Von Pischke & Adams, 1980). If users borrow more than once, then they must perceive that they can get benefits. The question, however, is not whether microfinance is better than nothing for its users. The question is whether microfinance is better than some other development project for the poor as a whole.

We construct a theoretical framework for rigorous thought about the social worth of the output of a microfinance organization. The framework puts the standard theory of project analysis in terms of the jargon of microcredit. By defining precisely the social worth of service to the poorest, the framework helps to judge the tradeoffs between service to the poorest and service to others. The goal is to render more explicit the judgements used to allot public funds.

We also address three empirical questions with evidence from a comparison of the poverty of a treatment group—borrowers of five microfinance organizations in La Paz, Bolivia—with the poverty of a control group—the population of La Paz. The first empirical question is whether microfinance organizations reach the poorest of the poor (Gulli, 1998; Hulme & Mosley, 1996). We find that the five microfinance organizations in Bolivia most often reached not the poorest of the poor but rather those just above and just below the poverty line. The theoretical framework lays out the conditions under which these microfinance organizations may still have been a good use of public funds meant to help the poor.

The second question is whether group loans reach the poorest better than individual loans. While the theory is well-developed (Conning, 1997; Sadoulet, 1997), less is known about when the assumptions of theory hold in practice. We find that group lenders in Bolivia reached the poorest better than individual lenders.

The third question is whether rural lenders reach the poorest better than urban lenders. Rural poverty is both wide and deep, but, compared with urban lenders, rural lenders must deal with more seasonality, worse information, greater risks, less smooth cash flows, longer distances, more diversity, and sparser populations. We find that the share of the poorest in the portfolio was highest for rural lenders. We also find that since the urban lenders had more borrowers, the share of the urban poorest who were borrowers exceeded the share of the rural poorest who were borrowers.

Section 2 below defines *outreach*. Section 3 briefly describes the empirical methods. Section 4 compares the distribution of an index of the fulfillment of basic needs for borrowers with the distribution of a similar measure for the population. Section 5 concludes the paper.

2. A THEORETICAL FRAMEWORK FOR OUTREACH

Judgements of the performance of microfinance organizations have been based on the concepts of outreach and sustainability (Yaron, 1994). Here, we express outreach and sustainability in terms of the theory of social welfare. The purpose is to reconcile the jargon of microcredit with the standard tools of project analysis.

Outreach is the social value of the output of a microfinance organization in terms of depth, worth to users, cost to users, breadth, length, and scope. [1] Outreach is commonly proxied by the sex or poverty of borrowers, the size or the terms of loan contracts, the price and transaction costs borne by users, the number of users, the financial and organizational strength of the lender, and the number of products offered, including deposits.

Sustainability is permanence. The social goal is not to have sustainable microfinance organizations but rather to maximize expected social value less social cost discounted through time. In principle, sustainability is not necessary nor sufficient for social optimality. In practice, however, sustainable organizations tend to improve welfare the most. Most unsustainable microfinance organizations inflict costs on the poor in the future in excess of the gains enjoyed by the poor now. Sustainability is not an end in itself but rather a means to the end of improved social welfare (Rhyne, 1998).

Thus outreach stands for the social value of loans from a microfinance organization. Sustainability helps to maximize expected social value less social cost discounted through time, including the net gain of users from loans and deposits, the profits or losses of the microfinance organization, and the social opportunity cost of the resources used. Sustainability affects outreach since permanency tends to lead to structures of incentives and constraints that prompt all the groups of stakeholders in a lender to act in ways that increase the difference between social value and social cost.

In principle, a complete evaluation would use cost-benefit analysis or cost-effectiveness analysis to compare social value with social cost in general equilibrium. In practice, it is so expensive to measure social value and social cost that almost all evaluation proceeds in terms of outreach and sustainability in partial equilibrium.

(a) *Six aspects of outreach*

(i) *Depth*

Depth of outreach is the value that society attaches to the net gain from the use of microcredit by a given borrower. Since society places more weight on the poor than on the rich, poverty is a good proxy for depth. For example, society likely values the net gain from a small loan for a street kid or for a widow more than the same gains for a richer person.

Deeper outreach usually increases not only social value but also social cost. As income and wealth decrease, it costs more for a lender to judge the risk of a loan. This happens since, compared with the rich, the poor are more heterogeneous and less able to signal their ability and willingness to repay (Conning, 1999). Fixed costs also matter more for the poor since their loans are shorter and smaller and have more frequent installments, renewals, and disbursements.

Deeper outreach increases only social value and not social cost when a lender finds better ways to judge risk at a cost less than the savings from the better judgement. Such progress increases *access*, the ability and willingness to borrow and to repay at a price that covers the long-run cost of an efficient producer. Access is the nexus of *creditworthiness*—demand based on ability and willingness to repay—and the lending technology—supply based on an efficient way to judge creditworthiness. More access is progress since loans depend more on the creditworthiness of the borrower and less on the constraints of the lender to judge creditworthiness. For example, a lender that does not need physical collateral to judge creditworthiness could serve poorer users and thus have deeper outreach, all else constant, than a lender that requires physical collateral.

(ii) *Worth to users*

Worth of outreach to users is how much a borrower is willing to pay for a loan. Worth depends on the loan contract and on the tastes, constraints, and opportunities of the user. With the cost to the user constant, more worth means more net gain.

(iii) *Cost to users*

Cost of outreach to users is the cost of a loan to a borrower. This is distinct from the cost of a loan to society or from the cost of a loan to a lender. Cost to users includes both price and transaction costs. Price includes interest and

fees. Prices paid by the user are revenues for the lender. Transaction costs are nonprice costs. They include both noncash opportunity costs—such as the value of the time to get and to repay a loan—and loan-related cash expenses such as transport, documents, food, and taxes. Transaction costs borne by the user are not revenues for the lender.

The three aspects of depth, worth to users, and cost to users are tightly linked but still distinct. *Net gain* is the difference between worth to a user and cost to a user. It is the highest cost that the borrower would agree to bear to get the loan, less the cost that the borrower does in fact bear. In turn, depth of outreach reflects the social value attached to the net gain of a specific person. For example, $100 of net gain for a poor person may be worth more to society than $500 of net gain for a rich person.

Costs to users can be measured as the present value of the cash flows and transaction costs associated with a loan. Worth to users is more difficult to measure. Still, the relative worth of two or more loan contracts can be compared through their costs. If a borrower has alternative sources of loans, then net gain can be measured as the cost savings of a switch to a microfinance lender.

(iv) *Breadth*

Breadth of outreach is the number of users. Breadth matters since the poor are many but the aid dollars are few.

(v) *Length*

Length of outreach is the time frame in which a microfinance organization produces loans. Length matters since society cares about the welfare of the poor both now and in the future. Without length of outreach, a microfinance organization may improve social welfare in the short-term but wreck its ability to do so in the long term.

In theory, a perpetual source of support can allow a microfinance organization to achieve length of outreach without sustainability (Morduch, 1998a; Woller, Dunford, & Woodworth, 1998). In principle, such an organization could live a long time. In practice, however, longer outreach through sustainability usually strengthens the structures of incentives that serve to maximize expected social value less social cost discounted through time. Without length, borrowers have few selfish reasons to repay since the lender cannot promise to lend again in the future. Loan losses shorten length of outreach in a downward spiral. Likewise, lack of profits prompts employees to strip the lender bare and to bask in perks before the chance is gone.

(vi) *Scope*

Scope of outreach is the number of types of financial contracts offered by a microfinance organization. In practice, the microfinance organizations with the best outreach produce both small loans and small deposits. Deposits matter for two reasons. First, all poor people are depositworthy and save to smooth consumption, to finance investment, and to buffer risk. In contrast, not all poor people are creditworthy. Second, deposits strengthen the incentives for sustainability and length of outreach. Depositors shun microfinance organizations if they do not expect them to live to return their deposits. To attract and to keep deposits, a microfinance organization must please not donors and government but rather users and regulators.

(b) *Tradeoffs and feedback among the six aspects*

Depth is the social value of worth to users less cost to users. Breadth counts users, length counts years of service, and scope counts types of contracts. These six aspects of outreach are useful because direct measures of the social value of microfinance are expensive. Outreach is worth minus cost, weighted by depth, summed across breadth of users and scope of contracts, and discounted through length of time.

Social welfare depends on depth, worth, cost, breadth, length, and scope, but the greatest of these is length. In particular, more length in the short-term requires more profit. This means higher prices, more cost to users, and less net gain per user. In the long term, however, the tradeoff may vanish if the push for length leads to innovations in technology and organization that increase profits and/or increase worth to users without parallel increases in social cost or in cost to users. Increased length feeds back to decrease social cost because length gives users more selfish reasons to repay. More scope also increases worth to users and strengthens the incentives that boost length.

The debate over the social value of sustainability hinges on the effect of length. Microfinance organizations that do not aim for

sustainability believe that the short-term increase in net gain caused by low prices swamps the effects of reduced length from low profits. Lenders that aim for sustainability believe the converse.

The rest of this paper looks at evidence of depth of outreach for five microfinance organizations in Bolivia. Even if society cares only for the poorest, however, the theoretical framework highlights that social welfare depends on more than just depth. Breadth affects the number of the poorest served, and cost and worth to users affect the net gain. The poorest can use not only loans but also deposits, not only now but also in the future.

3. POVERTY OF BORROWERS FROM FIVE BOLIVIAN LENDERS

(a) *The organizations*

By Latin American standards, Bolivia is a poor country. GNP per capita in 1997 was about $950 (World Bank, 1999). The income distribution was highly skewed, and rural households, in particular, were very poor (UNDP, 1996). Still, Bolivia is a flagship for microcredit in Latin America and in the world (Gonzalez-Vega, Schreiner, Meyer, Rodriguez-Meza & Navajas, 1997a).

At the end of 1995, two of the five Bolivian microfinance organizations were regulated, and three were nongovernment organizations (NGOs). The three NGOs were Centro de Fomento a Iniciativas Económicas (FIE), Fundación para la Promoción y Desarrollo de la Microempresa (PRODEM), and Fundación Sartawi. BancoSol, the best-known microfinance organization in Latin America, is a bank that was split off from PRODEM (Gonzalez-Vega, Schreiner, Meyer, Rodriguez-Meza & Navajas, 1997b; Schreiner, 1997; Mosley, 1996). Caja de Ahorro y Préstamo Los Andes is a regulated nonbank (Rock, 1997).

The five lenders can be grouped by their lending technology and by their geographic market niche. In lending technology, BancoSol and PRODEM lend to groups, and FIE and Caja Los Andes lend to individuals. Sartawi works through communities to lend to both groups and individuals. In geographic market niche, PRODEM and Sartawi are mostly rural, while BancoSol, FIE, and Caja Los Andes are mostly urban. Thus BancoSol lends to urban groups, PRODEM lends to rural groups, and Caja Los Andes and FIE lend to urban individuals. Sartawi lends to rural groups and rural individuals.

The differences in technology and in market niche among the five lenders reflect their history of external support and the forces that spawned their creation. PRODEM lends to groups because, when founded in 1987, it followed the model of the Grameen Bank of Bangladesh. Although PRODEM worked at first in an urban market niche, it later shifted to a rural focus so as not to compete with BancoSol, which inherited most of the urban borrowers of PRODEM when it was split off in 1992. BancoSol was created in part to mobilize large deposits from rich households and firms in order to relieve the constraints on funds that had limited the growth PRODEM, in part to test whether an NGO could become a commercial bank, and in part to mobilize small deposits from poor households and firms. The development of both PRODEM and BancoSol was heavily shaped by technical assistance from the Calmeadow Foundation of Canada and from Acción International, a US-based NGO with links to group lenders in many countries in Latin America.

Caja Los Andes was founded in 1992 and has received funds from the Inter-American Development Bank, GTZ of Germany, and the Swiss government. Its individual loans reflect the influence of extensive technical assistance from the German consulting firm Interdizciplinäre Projekt Consult. At first, Caja Los Andes lent mostly for manufacturing in the belief that industry had the greatest effects on employment, but it soon added loans for commerce.

When FIE started to make loans in 1988, its clients were urban artisans who had completed classes with a training branch of the NGO. FIE only made loans for manufacturing until 1993, when, like Caja los Andes, it started to lend for commerce. By 1995, the lending and training arms of FIE were separated. FIE is unique among the lenders studied here because it has not had a single dominant donor nor a major source of technical assistance.

Sartawi started to lend to rural communities in part because it already worked with rural communities in nonfinancial development projects. The bulk of its funds came from Plan International, a rural-development NGO, and from the German Lutheran Church. Like FIE, Sartawi has had little external technical assistance. It separated lending from other activities in 1995. In Aymara, *sartawi* means *to progress*.

The five lenders have several traits in common. They all work in niches untouched by traditional banks. All five make small loans to first-time borrowers and bigger loans to repeat borrowers. All five charge high prices, and all five keep arrears and loan losses low with various mixes of screening, monitoring, and contract-enforcement. All five have received grants, technical assistance, and low-priced loans from USAID and other donors. Still, very little of their success has been due to access to funds from second-tier lenders in Bolivia. Compared with peers, all five have high outreach and sustainability (*Microbanking Bulletin*, 1998). They all aim to reduce poverty, but none explicitly targets the poor.

Bolivia, while sparsely peopled, may have the densest microcredit in the world. The five microfinance organizations studied here are the most important of the about 30 in Bolivia. They account for more than half of both clients and portfolio outstanding (*La Razón*, 1997).

(b) *The data*

In November and December of 1995, we surveyed a random sample of 622 of the more than 52,000 borrowers active with the five lenders at the end of September in the urban areas in and near La Paz and in the rural Altiplano near Lake Titicaca. Of the 588 cases with complete data, 221 came from BancoSol, 124 from Caja Los Andes, 91 from FIE, 83 from Sartawi, and 69 from PRODEM (Gonzalez-Vega *et al*., 1996).

(c) *An index of fulfillment of basic needs*

(i) *Conceptual issues*

A vast literature explores the measurement of poverty (Lipton & Ravallion, 1995). Here, we matched some questions in our survey of borrowers with questions in 1992 national poverty assessment (Ministerio de Desarrollo Humano, 1995). The questions measured household use of goods and services thought to be linked with the fulfillment of basic needs.

The answers were condensed in an Index of Fulfillment of Basic Needs. This approach is common in Latin America. It requires (Boltvinik, 1994):

—Theoretical definitions of basic needs and ways to satisfy them;
—Choices of observable proxies that indicate degrees of fulfillment;
—Norms that define the point where a need is considered unsatisfied;
—Aggregation of indicators to construct an index; and
—Choice of the poverty line for the index.

(ii) *Empirical issues*

The nationwide assessment picked the indicators, their norms, and the poverty line. In most cases, the norm was the median of an indicator, but some cases had more complex norms. Like all measures of absolute poverty, the poverty line and the norms were at least somewhat arbitrary. The index was computed not for individuals but for households. It had four parts:

Housing:
—Type of materials used for floors, walls and roof;
—Number of people per room.
Access to public services:
—Source of water;
—Presence of an indoor toilet;
—Access to electricity;
—Type of fuel used to cook food.
Education:
—Years of school completed;
—Current attendance in school;
—Literacy.
Access to health services:
—Use of formal health care;
—Use of informal health care.

Except for indoor toilets, the urban and rural norms were the same. The Index of Fulfillment of Basic Needs (IFBN) was the simple average of the ratios of the four observed indicators x_j to their norms $x_{j\text{norm}}$:

$$\text{IFBN} = \left(\frac{1}{4}\right) \cdot \sum_{j=1}^{4} \frac{x_j}{x_{j\text{norm}}}. \tag{1}$$

The range of the ratio of x_j to $x_{j\text{norm}}$ depended on the range of answers in the nationwide assessment. The indicator for education was the average of indices for individual members of a household:

$$\text{IE} = \left(\frac{1}{N}\right) \sum_{i=1}^{N} \left(\frac{y_i + s_i}{y_{i\text{norm}} + s_{i\text{norm}}}\right) \cdot L_i, \tag{2}$$

where

IE = Index of education of the household;
N = Number of members of the household;
y_i = Years of schooling for person i;
s_i = School attendance dummy for the age of person i;

$y_{i\text{norm}}$ = Norm for years of schooling for the age of person i;
$s_{i\text{norm}}$ = Norm for attendance for the age of person i; and
L_i = Literacy dummy for person i.

The nationwide assessment set the poverty line at an IFBN of 0.9. Households below this were *poor*, and the rest were *nonpoor*. The nonpoor were subclassified as *fulfilled* or *threshold*. The poor were subclassified as *moderate* or *poorest*.

Our survey of borrowers included 56% of the indicators in the nationwide IFBN. Most of what was omitted had to do with access to health care. We believe this is highly correlated with the other indicators, so the comparison should not be biased.

4. EVIDENCE OF DEPTH OF OUTREACH

(a) *The population of La Paz*

Two features stand out about the shares of the population of urban and rural La Paz in each of the four poverty classes (Table 1). The first is the extent of poverty. In 1992, more than half the urban households were poor, and almost all rural households were poor. The second is the depth of rural poverty. Not only were 96% of rural households poor, but 74% were among the poorest. In contrast, 17% of the urban households were in the poorest class. Poverty in Bolivia, especially rural poverty, was broad and deep.

(b) *Borrowers of the five lenders*

(i) *Distribution of the IFBN*

A box-and-whisker plot (Tukey, 1977) depicts the distribution of the IFBN for borrowers of the five lenders (Figure 1). We do not have data for a similar picture for the rural and urban populations. The IFBN is on the vertical axis. The poverty line is at 0.9. The microfinance organizations are ordered from shallowest to deepest outreach.

The width of each box reflects the sample size for each lender. For example, the box for BancoSol ($n = 221$) is wider than the box of PRODEM ($n = 69$).

The height of the boxes marks the interquartile distance, the range between the second and third quartiles of the distribution. Less-dispersed distributions have shorter boxes. For example, the box for PRODEM is shorter than the box for Sartawi since the distribution of PRODEM is more clustered near the median.

The whiskers beyond the boxes bracket either the extreme points in the data or 1.5 times the interquartile distance from the median, whichever is less. In a Gaussian distribution, more than 99% of the data are inside the whiskers. The horizontal lines beyond the whiskers mark outliers.

The grey trapezoids in the center of each box bound a 95% confidence interval for the estimated median. FIE had the highest median. Half the sample of FIE had an IFBN of more than 1.02, and the other half had an IFBN of less than 1.02. A Kolmogorov–Smirnov test rejected the hypothesis that any of the distributions were Gaussian, so differences in medians were tested nonparametrically with Wilcoxon rank-sums (Hollander & Wolfe, 1973). The median of FIE (1.02) is greater than that of Caja Los Andes (0.97) with more than 95% confidence. The borrowers of these two urban individual lenders clustered just above the poverty line in the threshold class. The median for BancoSol, the urban group lender, was at the poverty line (0.90). This is less than the other two urban medians with more than 99% confidence. The median rural borrower in Sartawi (0.71) and in PRODEM (0.67) were moderately poor. The rural medians were statistically smaller than the urban medians, but they were not statistically different from each other.

The same pattern of three depths of outreach in suggested both by the Wilcoxon rank-sum tests for differences in medians and by the nonparametric Kolmogorov–Smirnov tests for differences in the distributions of the IFBN:

—Threshold group (FIE and Caja Los Andes);
—Poverty-line group (BancoSol); and
—Moderately poor group (PRODEM and Sartawi).

(ii) *Distribution of the IFBN for borrowers versus the population*

We compare the estimated distribution of the IFBN among the poverty classes for the sample of borrowers from the five lenders with the known distribution of a similar measure for all urban and rural households in La Paz (Table 1). Since the estimated share of borrowers in a poverty class is a random variable, we report nonparametric bootstrapped 90% confidence intervals (Efron & Tibshirani, 1993).

Table 1. *Point estimates and bootstrapped nonparametric 90% confidence intervals for the distribution of the Index of Fulfillment of Basic Needs among poverty classes for borrowers from five microfinance organizations in La Paz, Bolivia, and for all households in urban and rural La Paz*[a]

Range of index		Nonpoor			Poor		
	n	Fulfilled 2.0 to 1.1	Threshold 1.1 to 0.9	Subtotal 2.0 to 0.9	Moderate 0.9 to 0.6	Poorest 0.6 to 0.0	Subtotal 0.9 to 0.0
Urban La Paz	436	*28*	*17*	*45*	*38*	*17*	*55*
FIE	91	26—*35*—44	25—*34*—43	62—*69*—77	21—*29*—36	0—*2*—5	23—*31*—38
Caja Los Andes	124	14—*19*—25	40—*48*—55	60—*67*—73	23—*29*—35	2—*4*—7	27—*33*—40
BancoSol	221	12—*16*—20	27—*33*—38	43—*48*—54	42—*47*—52	2—*5*—7	46—*52*—57
Rural La Paz	152	*2*	*3*	*5*	*22*	*74*	*96*
PRODEM	69	0—*0*—0	6—*13*—20	6—*13*—20	43—*54*—64	24—*33*—43	80—*87*—94
Sartawi	83	0—*2*—5	7—*12*—18	8—*14*—20	40—*49*—58	28—*36*—45	80—*86*—92

[a] All figures are percentages. Point estimates and census parameters are in italics and 90% confidence bounds for the point estimates are in regular typeface. The figures for the population of urban and rural La Paz do not have confidence intervals since they are not estimates but rather parameters from a census (Ministerio de Desarrollo Humano, 1995). The figures for the lenders were computed from the survey by the authors. Rows may not sum to 100 due to rounding.

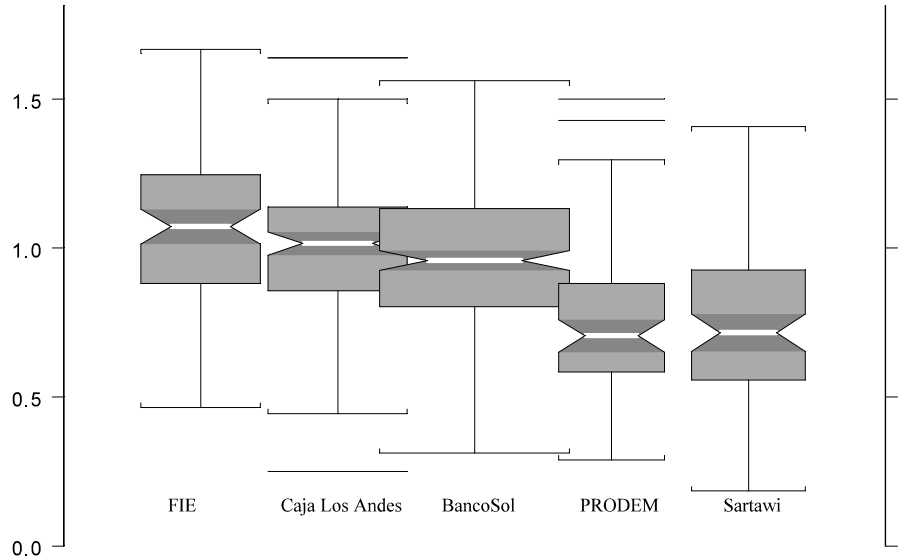

Figure 1. *Box-and-whisker plot of the distribution of the IFBN for sampled borrowers from the five microfinance organizations in La Paz, Bolivia.*

We do not expect the sample and population distributions to match since creditworthiness and demand for microcredit depend in part on income and assets. All else constant, lenders can more readily judge creditworthiness of rich people than of poor people. Suppose a lender drew borrowers at random from the subset of the population that, given its lending technology, had demand and was creditworthy. Then the profile of borrowers, compared with the population, would be skewed toward the rich.

We do not know the exact profile of demand and creditworthiness in Bolivia. Still, we can answer four useful questions. The first asks whether the poorest had the same share in the portfolio as in the population. The second asks how many of the poorest were reached. The third and fourth questions ask how depth compared between group and individual loan technologies and between rural and urban market niches.

(c) *Depth of outreach to the poorest of the poor*

(i) *The share of the poorest in the portfolio and in the population*

Of all households in urban La Paz, 45% were nonpoor (Table 1). For all three urban lenders, the point estimate of the share of nonpoor households exceeded the population parameter: 69% for FIE, 67% for Caja Los Andes, and 48% for BancoSol. The population parameter is within the 90% confidence interval for BancoSol but not for FIE and Caja Los Andes. In rough terms, this means we can reject the hypothesis that FIE and Caja Los Andes reached nonpoor borrowers in proportion to their population share, but we cannot reject this hypothesis for BancoSol. For threshold borrowers, all three urban lenders had a statistically bigger share than the population. Caja Los Andes and BancoSol had a smaller share of borrowers in the fulfilled class than did the population, and FIE had a bigger share.

For the moderately poor, the share was lower in FIE and in Caja Los Andes (both 29%) than in the population (38%). The share for BancoSol was higher than in the population (47%). For the poorest, the shares of all three urban lenders (2 to 5%) were smaller than in the population share (17%). Thus, compared with the population, the urban lenders lent less to the fulfilled and to the poorest and more to the richest of the poor (threshold) and, in the case of BancoSol, to the poorest of the rich (moderate).

The same pattern holds in rural La Paz. The nonpoor were 5% of all rural households but 14% of PRODEM and 13% of Sartawi. In all rural households, 22% were moderately poor, and 74% were among the poorest. For PRODEM, 54% were moderately poor, and

33% were among the poorest. For Sartawi, 49% were moderately poor, and 36% were among the poorest. All of the differences are statistically significant.

Except for the fulfilled class and for the moderately poor in BancoSol, the profile of borrowers of each of the five lenders is, compared with the profile of the population, skewed toward the threshold class. This does not prove much, however, about depth of outreach. What matters is not whether the microfinance organizations reached the poorest of the poor but whether they reached the poorest of those who demanded loans and who were creditworthy. Our data cannot answer this question.

(ii) *The number of the poorest in the portfolio*

If a lender has broad outreach, then it might reach many of the poorest even though they are not a big share of the portfolio (Rosenberg, 1996). Table 2 contains point estimates of the share of the portfolio in a poverty class multiplied by the total number borrowers from these lenders in La Paz.

The five lenders reached about 4,500 of the poorest, 1,900 urban and 2,600 rural. This number is derived from the relative share of the poorest in a portfolio and from the absolute size of the portfolio. For example, the share of the poorest was about 4% in Caja Los Andes and about 5% in BancoSol. With about 30,000 total borrowers, BancoSol served about 1,400 of the poorest, while Caja Los Andes, with 9,200 total borrowers, served about 370. FIE, with the lowest share of the poorest (2%) and the smallest urban portfolio, had about 120 borrowers among the poorest.

The rural lenders were smaller than the urban lenders, but the share of the poorest in their portfolios was higher. The effect of the greater share swamped the effect of the smaller portfolio. PRODEM, with about 2,500 borrowers in rural La Paz, served about 800 of the poorest, more than twice as many as Caja Los Andes. Sartawi, with about 4,900 borrowers, had about 1,800 among the poorest. This is 400 more than BancoSol and almost as many as for all three urban lenders combined.

About 4,500 of the poorest households in La Paz had debt from the five lenders in late 1995. Is this deep outreach? One way to check is *market penetration*, the ratio of borrowers in a given class in a given lender to the number of households in that class in the population (Table 3). In 1992, La Paz had about 260,000 urban households and about 160,000 rural households (Ministerio de Desarrollo Humano, 1995). Of all urban households, FIE reached about 2%, Caja Los Andes 4%, and BancoSol 12%. Of all rural households, PRODEM reached about 1%, and Sartawi reached about 2%.

Penetration in the market as a whole matters less than penetration in that part of the market with demand and creditworthiness. As before, we lack these data. Still, we know that urban lenders reached 38% of threshold households, 19% of moderately poor households, and 18% of all households. Given that not all households want debt at all times, that not all households are creditworthy, and that there are other microfinance organizations in urban Bolivia, this suggests scant room for more market penetration in urban areas. The amount of slack in rural areas is less certain. There, 12% of

Table 2. *Estimated breadth of outreach by number of clients in a poverty class for borrowers from five microfinance organizations in urban and rural La Paz*[a,b]

	Nonpoor			Poor			Total
	Fulfilled	Threshold	Sub-total	Moderate	Poorest	Sub-total	
Urban La Paz	8,500	16,000	25,000	18,000	1,900	20,000	45,000
FIE	1,900	1,900	3,900	1,500	120	1,600	5,500
Caja Los Andes	1,800	4,400	6,200	2,700	370	3,000	9,200
BancoSol	4,800	9,800	15,000	14,000	1,400	15,000	30,000
Rural La Paz	120	1,000	1,100	3,700	2,600	6,300	7,400
PRODEM	0	360	360	1,300	800	2,100	2,500
Sartawi	120	650	770	2,400	1,800	4,200	4,900
Total La Paz	8,600	17,000	26,000	22,000	4,500	26,000	52,000

[a] Source: Survey by the authors and Table 1.

[b] Rows and columns may not sum to totals due to rounding.

Table 3. *Market penetration by poverty class for five microfinance organizations in urban and rural La Paz*[a]

	Nonpoor			Poor			Total
	Fulfilled	Threshold	Subtotal	Moderate	Poorest	Subtotal	
Urban La Paz	12	38	22	19	4	14	18
FIE	3	5	3	2	0.3	1	2
Caja Los Andes	3	10	5	3	0.8	2	4
BancoSol	7	23	13	15	3	11	12
Rural La Paz	5	15	12	11	2	4	5
PRODEM	0	0.2	0.07	1	2	2	1
Sartawi	0.2	2	0.7	2	4	3	2

[a] All figures are percentages computed from Tables 1 and 2 and from Ministerio de Desarrollo Humano (1995). The figures for urban and rural La Paz are not population parameters from a census but rather totals for all the microfinance lenders in an area combined. Numbers may not sum totals due to rounding.

the nonpoor and 4% of the poor had debt when surveyed. This is much less than the urban penetration, but we do not know how much is possible because rural microcredit is more difficult than urban microcredit.

The five Bolivian lenders reached the richest of the poor and the poorest of the rich much more than they reached the poorest of the poor. This does not necessarily mean that they did a bad job. A loan that is not repaid is a gift. While there is nothing wrong with a gift, a gift in loans' clothing may backfire (Krahnen & Schmidt, 1994; Adams, Graham & Von Pischke, 1984). Moreover, outreach depends not only on depth for the poorest but also on breadth, worth to users, cost to users, length, and scope for all users. These lenders have uncommon breadth, worth, cost, and length. Furthermore, BancoSol and Caja Los Andes take deposits and so have an especially wide scope.

(d) *Depth by loan technology*

Because both rural lenders use group loans, we look at technology only for the urban lenders so as not to confound the effects of technology with the effects of market niche. Compared with the individual lenders FIE and Caja Los Andes, the group lender BancoSol had the smallest shares in the fulfilled and threshold classes and the biggest shares in the moderate and poorest classes (Figure 1 and Table 1). BancoSol also had the greatest market penetration, reaching almost one-fourth of the households in the threshold class and 15% of the moderately poor (Table 3).

As a rule, the group-lending technology has more potential for deep outreach because it can substitute joint liability for physical collateral. Joint liability has high transaction costs, and it can also have high cash costs if borrowers must repay the debts of their comrades. Still, group loans attract those who cannot or will not post physical collateral. In contrast, individual loans appeal to richer borrowers who can post physical collateral and who want to avoid the costs of joint liability.

BancoSol had both the deepest and the broadest outreach of the urban lenders. This does not necessarily mean that BancoSol had the best outreach overall because the comparison ignores cost to users, worth to users, length, and scope.

(e) *Depth by geographic market niche*

At first glance, rural lenders seem to have deeper outreach than urban lenders (Table 1). About 86–87% of the rural borrowers were among the poor, compared to 31–52% for urban borrowers. In fact, this comparison is not valid since it does not control for the different distributions of poverty in urban and rural areas.

Table 4 does control for this. Each cell is the share of the portfolio in a given poverty class for a given lender divided by the share of the population in the poverty class from Table 1. A ratio of more than 1 means that the share of clients in that class was greater than the share of the population in that class. A ratio of less than 1 means the opposite.

If the poor were more concentrated in a microfinance organization than in the population, then the ratios in Table 4 would increase from less than 1 in the leftmost columns to more than 1 in the rightmost columns. In fact, the pattern is the opposite. For all five lenders, the ratios start near or above 1 in the leftmost

Table 4. *Ratios of the IFBN for clients of the five microfinance organizations to the IFBN for the urban and rural population of La Paz*[a]

	Nonpoor			Poor		
	Fulfilled	Threshold	Subtotal	Moderate	Poorest	Subtotal
Urban La Paz						
FIE	1.2	2.1	1.6	0.7	0.1	0.5
Caja Los Andes	0.7	2.9	1.5	0.8	0.2	0.6
BancoSol	0.6	2.0	1.1	1.2	0.3	0.9
Rural La Paz						
PRODEM	0.0	4.8	3.2	2.4	0.5	0.9
Sartawi	1.6	4.4	3.5	2.2	0.5	0.9

[a] Source: Computed from Table 1 as described in the text.

column for the fulfilled and exceed 2 for the threshold class. The ratios decrease for the moderately poor and then decrease still more for the poorest. As seen before, the profile of borrowers is skewed, not toward the poorest but toward those near the poverty line.

The details of the broad pattern differ, however, for rural and urban lenders. For example, in the threshold class, no urban lender had a ratio above 3.0, while the ratio for PRODEM was 4.8 and for Sartawi was 4.4. The rural lenders mined the few nonpoor households more intensely than the many poor households.

Among the moderately poor and the poorest, the rural lenders had higher ratios and thus deeper outreach than the urban lenders. This is a puzzle. If rural lending is more difficult than urban lending, then why did rural lenders have more depth? The answer is probably that the urban lenders had not yet exhausted their nonpoor niches. In contrast, the lack of a large number of nonpoor borrowers pushed the rural lenders to the poorest. For rural lenders, the ratios of the share of the threshold class to the population share is 4.8 and 4.4, and the ratios for the moderately poor class are 2.4 and 2.2. For urban lenders, the threshold ratios are between 2 and 3, and the moderate ratios are near 1. The rural lenders serve the niches of the richest of the poor and the poorest of the rich much more intensely than the urban lenders. The absolute number of rural nonpoor households is small, however, and so the rural lenders turn sooner and more often to the most difficult of all clienteles, the rural poorest. The greater depth of the rural lenders suggests that the urban lenders may not yet reach all of the urban poorest who are creditworthy and who want loans.

In terms of market penetration (Table 3), the two urban individual lenders, FIE and Caja Los Andes, had about 1 and 2% of the poorest households in their portfolios. The urban group lender, BancoSol, served about 3% of the poorest. In rural La Paz, PRODEM reached about 2% of the poorest, and Sartawi reached about 4% of the poorest. Overall, about 4% of the urban poorest—and about 2% of the rural poorest—borrowed from microfinance organizations. Thus the average rural borrower was more likely to be a member of the poorest than the average urban borrower, but the average urban household among the poorest was more likely to be a borrower than the average rural household among the poorest.

5. SUMMARY AND CONCLUSIONS

We analyzed the depth of outreach of five microfinance organizations in La Paz, Bolivia. The first step was to construct a theoretical framework in which depth is one of six aspects of outreach. The second step was to compare the poverty of a sample of the borrowers of the five lenders with the poverty of all the households in La Paz.

We found five main results. First, improved social welfare from microcredit depends not only on depth of outreach but also on worth, cost, breadth, length, and scope. Length matters most since the drive for length leads to incentives that prompt improvements in the other aspects. Second, the lenders in La Paz tended to serve not the poorest but rather those near the poverty line. Most microfinance organizations will probably serve this same niche. The poorest are less likely to be creditworthy and to demand loans, and many of the nonpoor can borrow elsewhere. Third, because the distribution of demand and creditworthiness unconditional on supply is unknown, we

cannot say whether the Bolivian lenders had deep outreach in an absolute sense. Fourth, group lenders in La Paz had deeper outreach than individual lenders. In general, group technologies have more potential for deep outreach since they substitute joint liability for physical collateral. Fifth, the rural lenders in La Paz had deeper outreach than the urban lenders in that the typical rural borrower was more likely to be among the poorest. At the same time, the urban lenders had more market penetration among the poorest due to their bigger portfolios.

These results on depth of outreach do not tell whether the five microfinance organizations did well in terms of all six aspects of outreach. On the one hand, perhaps the drive for length and breadth is what prompted these lenders to grow and to have some depth. On the other hand, perhaps these lenders would have reached more of the poorest had they stayed small and unprofitable with a single-minded focus on depth. The theoretical framework described here can help to improve social welfare by making more explicit the judgements that back the choice of which focus to take.

The empirical results sketch some of the limits of microcredit for the poorest of the poor. They highlight the need for more scrutiny of the flood of funds budgeted in the name of access to loans for the poorest. Even when microcredit does reach the poorest, it may not increase incomes as much as smooth consumption and diversify income (Mosley & Hulme, 1998; Morduch, 1998b). Even if it turns out that microfinance organizations do not reach relatively or even absolutely many of the poorest, this shallow depth may be more than balanced by net gains that accrue to those near the poverty line.

Microcredit may or may not be a good development gamble. If donors and governments have social welfare in mind, then they should check whether microcredit is the best way to spend public funds earmarked for development. Is microcredit worthwhile or worthless? The theoretical framework here is a better way to judge this than simple measures of the number of the poorest served by a lender.

NOTE

1. This framework for outreach was first presented by Schreiner (1998) and has since been used by Gonzalez-Vega (1998).

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