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*The Question of Sustainability for Microfinance Institutions**

by J. Jordan Pollinger, John Outhwaite, and Hector Cordero-Guzmán

Microentrepreneurs have considerable difficulty accessing capital from mainstream financial institutions. One key reason is that the costs of information about the characteristics and risk levels of borrowers are high. Relationship-based financing has been promoted as a potential solution to information asymmetry problems in the distribution of credit to small businesses. In this paper, we seek to better understand the implications for providers of "microfinance" in pursuing such a strategy. We discuss relationship-based financing as practiced by microfinance institutions (MFIs) in the United States, analyze their lending process, and present a model for determining the break-even price of a microcredit product. Comparing the model's results with actual prices offered by existing institutions reveals that credit is generally being offered at a range of subsidized rates to microentrepreneurs. This means that MFIs have to raise additional resources from grants or other funds each year to sustain their operations as few are able to survive on the income generated from their lending and related operations. Such subsidization of credit has implications for the long-term sustainability of institutions serving this market and can help explain why mainstream financial institutions have not directly funded microenterprises. We conclude with a discussion of the role of nonprofit organizations in small business credit markets, the impact of pricing on their potential sustainability and self-sufficiency, and the implications for strategies to better structure the credit market for microbusinesses.

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J. Jordan Pollinger was vice president of operations at ACCION New York until December 2005 and holds an MBA from the University of Cape Town in South Africa.

John Outhwaite received his undergraduate degree and Ph.D. in physics from The University of Durham in the United Kingdom.

Hector Cordero-Guzmán is an Associate Professor and the Chair of the Black and Hispanic Studies Department at Baruch College of the City University of New York. He received his M.A. and Ph.D. degrees from The University of Chicago and is on the Board of Directors of ACCION New York and the Upper Manhattan Empowerment Zone (UMEZ).

Address correspondence to: J. Jordan Pollinger, c/o ACCION New York, 115 E. 23rd Street, 7th floor, New York, NY 10010. Tel: (917) 517-7894. E-mail: jordanpollinger.gmail.com.

Introduction

The United Nations declared 2005 the International Year of Microcredit, highlighting the current popularity of microenterprises as asset building and economic development tools. Small, medium, and large businesses utilize debt financing for a range of reasons from securing working capital to making longer-term investments. For microbusinesses—small entities with less than five employees—this is no less true. Yet due to a combination of factors including the smaller scale of operations, the product and demographic markets that they serve, their often semiformal nature, their lower capital borrowing needs, and the reluctance of formal lenders and financial institutions to work in these markets, microbusinesses do not have access to traditional sources of business financing.

In the late 1980s and 1990s, microfinance institutions (MFI) developed in the United States to serve capital markets in low-income and predominantly ethnic minority communities, stimulating what Servon (1999) calls "Bootstrap Capital." Most MFIs have some degree of "mission" component that shapes the types of borrowers that participate in the programs. Many organizations focus their lending activity on entrepreneurs whose income falls below the federally designated poverty line, or who reside or work in particular ethnic minority and/or low-income neighborhoods, or small business owners that do not have access to mainstream sources of credit or are near bankable (Servon 1997). Microfinance typically targets borrowers who do not have access to formal or mainstream financial markets (Von Pischke 2002). Individual lending mandates for each MFI typically dictate the specific distribution of loan types and population targets. In most cases, the mission and program selection criteria for MFI guarantee that they will have some significant percentage of higher risk otherwise nonbankable borrowers (and businesses) in the lending portfolio.

At present, there are more than 500 organizations in the United States that provide support to microbusiness owners, with approximately 200 lending capital, and the majority less than 10 years old.[1] Microfinance in the U.S. context is defined as the extension of credit up to $35,000.[2] For the purposes of the paper, we refer to microfinance organizations and programs that lend capital in the United States as "MFIs" and the businesses they serve as "microbusinesses," and it is important to note that for regulatory and related reasons, MFIs in the United States are not depository institutions.

Three key processes have fueled the growth in MFIs. First, changes in social welfare policies and a focus on economic development and job creation at the macro level. Second, a focus inducing employment, including self-employment, as a strategy for improving the lives of the poor (Servon 1999; Gonzalez-Vega 1998). Third, increases in the proportion of Latin American and Asian immigrants who come from societies where microenterprises are prevalent. These factors have created particular incentives and generated public and private subsidies for microlending activity in the United

[1]The 2002 Directory of U.S. Microenterprise Programs (FIELD 2002) lists 650 "microenterprise programs" of which 554 are "practitioners" that provide loans, training, or technical assistance to microentrepreneurs. There were 108 programs in the 1992 Directory. Elaine Edgcomb (2004) of the FIELD program at the Aspen Institute quotes 554 MFIs of which 230 are lenders.
[2]The FIELD program of the Aspen Institute sets the upper bounds of microfinance at $35,000.

States where most MFIs are structured as nonprofit organizations (Servon 1997).

However, despite the interest in the sector and the subsidies that have flowed into mission-oriented MFIs, it appears challenging to make an MFI viable over the long term. One survey found that 30 percent of domestic microfinance programs operating in 1996 were either no longer in operation or were no longer lending capital two years later (Bhatt, Painter, and Tang 2002). Furthermore, U.S. microfinance programs report difficulty in covering expenses without continued reliance on grants, external fundraising, or other subsidies.[3]

International counterparts appear to have fared better, but it is quite difficult to compare the different sets of market conditions. Developing nations typically have a strictly tiered banking system, a higher proportion of microbusinesses in their economy, high demand for microloans, less access to formal banking and a large tier of informal lending channels (Von Pischke 2002). As a result, international MFIs operating in countries such as Bangladesh and Bolivia have experienced much greater scale of demand for lending services and have facilitated the flow of capital to several million microbusiness owners.[4] Depository services further complicate comparison of international and domestic MFIs: Bank Rakyat Indonesia, one of the more successful international MFIs, had 26 million savings accounts in 2004 that provide some lending capital. Table 1 includes a simple comparison of international and domestic microfinance operations along four key dimensions that highlight the differences between these organizations and the contexts where they operate.

In the United States, two broad and differing perspectives characterize the debate over microfinance. Supporters of microlending argue that there is a poten-

Table 1
Overview of International and Domestic Markets

Definition	International[5]	Domestic[6]
Observations	73	25
Average Number of Borrowers	9,610	337
Average Loan Size	973	9,732
Operational Self-Sufficiency Ratio (Percent)	121	45

[3]As reported by the Microenterprise Fund for Innovation, Effectiveness, Learning and Dissemination—FIELD (2004)—and Edgcomb (2004), the average MFI covers less than half of its operational costs with income from lending operations. MicroTest, a FIELD initiative, conducted of a sample of 25 MFIs using FY 2002 data that reported average cost coverage of 45 percent. A sample of MFIs excluding the top 12 lenders by portfolio size reported only 30 percent.

[4]The Grameen Bank, founded in 1976, reported 3.7 million borrowers at July 2004. ACCION International, established in 1961, had more than 1.1 million active borrowers at July 2004. By contrast, the ACCION USA network, established in 1991, is serving approximately 5,000.

[5]As referenced from the Microfinance Bulletin in Armandáriz and Morduch (2005), p.121.

[6]As reported by the Microenterprise Fund For Innovation, Effectiveness, Learning and Dissemination—FIELD (2004).

tial profit to be realized from microlending but, for various reasons (for example, discrimination, ignorance, etc.), formal financial institutions do not see or seek out these opportunities particularly in low-income and predominantly ethnic minority communities. Skeptics argue that due to the high cost of information, high-risk borrowers, low returns on investment, and related reasons, there is no money to be made on most of these types of small loans and that microfinance will always need some form of state (or private) subsidy that should be justified on social equity, public benefit, cost effectiveness, or other grounds.

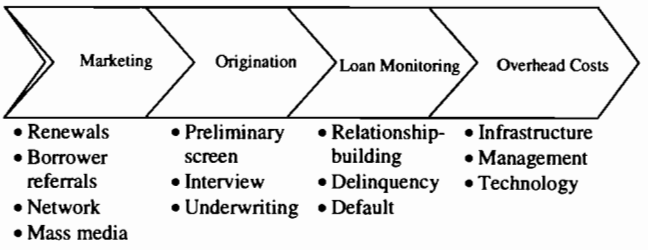
Any progress toward a potential resolution in this debate depends on a better understanding of the actual costs involved in the process of microlending, a better assessment of the profiles of borrowers and the risks involved, and the development of a lending model with concrete parameters that can then be adjusted and calibrated to local conditions, borrower characteristics, and risk profiles. Once we have a realistic estimate of the transaction costs of microfinance and the interest rates that may need to be charged for an MFI to cover its costs of lending, we can better understand their effectiveness, evaluate their needs and the levels of private and public subsidies that may be needed, and analyze why private banks and related financial actors have or have not entered these markets.

The remainder of the paper is organized into three broad sections. First, we present the elements of a microlending model and estimate the value-neutral prices needed to cover the costs of utilizing such a methodology. Second, we provide an analysis of data from a survey of real-world practices of MFIs. And, lastly, we discuss the implications of current pricing practices for MFIs and for other actors in the microlending sector.

The MFI Lending Model in the United States

In this section, we describe the process and estimate empirical parameters that approximate how the microlending model is currently applied by MFIs in the United States. We discuss each link of the MFI business model (illustrated in Figure 1) and present results derived from real-world cost inputs based on the authors' experience and industry research. In practice, we acknowledge that the level and distribution of costs may vary due to a variety of factors including geographical location, institutional strategy, and the lending efficiency of each individual MFI.

Figure 1
Relationship-Based Financing Schematic for Microfinance Institutions



Marketing

Marketing drives the business model in terms of the volume of potential borrowers that an MFI is able to access and the pool of loans it can develop. Given that MFIs do not accept deposits and have no formal prior insight into a fresh potential customer base, they must invest in attracting new borrowers. Marketing leads are generated from a variety of sources: soliciting loan renewals from existing borrowers, marketing to existing clients for referrals, "grassroots" networking with institutions possessing a complimentary footprint in the target environment, and the mass media.

At the outset of operations, before a borrower base is developed, portfolio growth is determined by the effectiveness of marketing through network and mass media channels. Once a borrower pool is established, marketing efforts can be shifted toward lower-cost marketing to existing borrowers and their peer networks. Even so, loans will likely attrite from a portfolio at a faster rate than renewals and borrower referrals can replenish it—new leads must continue to be generated through other, less effective channels.

Other sources of clients for MFIs include banks who may refer loan applicants on the grounds that MFI lending feeds successful borrowers back to the formal sector; community-based organizations, such as churches and business improvement offices that offer an alternative conduit into tight-knit communities; and Small Business Development Centers that provide services to both nascent and established businesses. Upfront investment of labor is required to establish relationships, referral expectations and procedures but is worthwhile because costly loan origination can effectively be outsourced to third parties with minimal maintenance.

The Loan Application Process

In economic terms, the loan application process represents an investment at origination with the aim of minimizing credit losses in the future. All else being equal, a greater investment in the credit application process will result in lower subsequent rates of delinquency and default; conversely, a less stringent process would result in greater rates of credit loss in the future. Setting the appropriate level of rigor in a credit application process is an exercise in analyzing loan applicant characteristics and forecasted future behaviors while being cognizant of the cost of performing these analyses.

Three steps characterize the loan application process.

Preliminary Screen. The applicant is asked a short set of questions to establish the applicant's eligibility for credit under the MFI's guidelines. This is sufficient to determine the likely strength of an application and whether an offer of credit could, in principle, be extended.

Interview. At the interview stage, due diligence is performed to ensure that the loan purpose is legitimate and that the borrower's business has sufficient capacity and prospects to make consistent repayments. Cash-flow analysis is the core of the MFI due diligence procedure and for microfinance borrowers the data is often insufficiently formal, hindering easy examination of cash flow stability and loan payment coverage. As a result, this is a less standardized, more time-consuming task than its equivalent in the formal lending markets.

MFI agents frequently perform primary technical assistance concurrently with the loan origination, helping the borrower to structure financial statements, for example. This lies within the broader social mandate of many MFIs but acts as a drag on the efficiency of core lending activities. Conversely, larger businesses may not require this type of technical help, but this is offset by the increased complexity of their businesses.

Microfinance borrowers often lack conventional collateral assets, in lieu of

which MFIs require high risk loans to be secured through guarantees by cosigners. This can be waived for low risk loans, as arranging for a cosigner presents a significant hurdle to the timely execution of the loan application. In the event of delinquency, the cosigner generates an economic benefit in excess of the cost of their recruitment by applying pressure on the borrower to repay.

The relationship can be further deepened through a site visit during which the applicant's business operations can be observed. This facilitates the accrual of information but is more time intensive. Loan officers in the field know their lending area, its markets, and the particular occupation/industry niches.

Underwriting and Approval. If a loan is recommended by an officer following the interview the application is then stress-tested by an underwriter, who validates the cash flow and performs auxiliary analysis to ensure that the loan represents a positive addition to the lending portfolio.

The dynamics of loan origination illustrate the trade-offs to be made to ensure an efficient credit process. Improved rigor could lead to a higher rate of declined applicants, and so higher subsequent portfolio quality, but at the expense of increased processing costs. For medium and larger loans, as application costs increase past an optimal point, the marginal benefit of improved portfolio quality is outweighed by the marginal expense of the credit application itself. However, for small loans there exists no such balance point—the optimal application cost is the least that can be reasonably achieved. This motivates a less intensive credit application process, administered when a loan request falls beneath a certain threshold, typically a principal less than $5,000. MFIs can disburse such loans more quickly and cheaply by fast-tracking them through a transaction-based process and context learning.

Loan Monitoring

Post-loan monitoring is critical toward minimizing loss. In contrast to the credit application process, which attempts to preempt the onset of borrower delinquency by declining high risk loans, monitoring efforts minimize the economic impact of delinquency once a borrower has fallen into arrears. In addition to the explicit risk to institutional equity through default, managing delinquent borrowers is an intensive and costly process.

When dealing with repeat clients, there exists the opportunity to leverage information captured through monitoring on previous loans, enabling the MFI to shorten the full credit application without materially impacting the risk filter. In short, there is an opportunity to reduce operational costs without a corresponding increase in future loss rates. Repeat borrowers enable the information accrued during the relationship to be leveraged to mutual benefit of MFI and borrower. In this case, much of the information required to validate a loan application has been gathered during the previous lending relationship. An MFI will also possess the borrower's payment history, a more accurate indicator of future performance than an isolated financial snapshot taken during the standard application process. The challenge, however, is that for many MFI, a part of their mission is to graduate customers into mainstream commercial banking, which would not allow the MFI to collect additional interest payments from those customers.

Overhead Costs

For an MFI to sustain itself, each outstanding balance must contribute a proportional amount to institutional costs. Institutional costs are driven primarily by the size of the portfolio being maintained. The necessary staff, tools, technology, work environment, and

management are functions of portfolio scale.[7]

We outline in Table 2 the institutional-level costs of five MFIs with varying portfolio sizes to identify the proportional cost loading necessary to guarantee that central costs are compensated for. The table shows that institutional costs increase at a slower rate than the rate at which the loan portfolio grows, so that the overhead allocation declines as an MFI achieves scale. We find that an MFI with a $500,000 portfolio will incur indirect costs of 26 percent, while an MFI with a $20 million portfolio will experience a much lower indirect cost loading of 6 percent. In the United States, the largest institution engaging solely in microfinance presently has a portfolio of $15 million.

Pricing Methodology

Given that efficient pricing is a desirable condition, a mechanism to determine the break-even price of a loan that incorporates accurate intrinsic economic costs is needed.

MFIs generate revenue through net interest income on loans—the rate charged to borrowers less the MFI cost of funding—and associated fees, including both one-off fees and those levied at regular intervals throughout the loan term. An objective measure of the value of a loan to the MFI at disbursal, V_0, is the discounted sum of probabilistic cash flows, which can be represented:

$$V_0 = \sum_{t=0}^{T} \frac{\begin{array}{c} P_{Active,t} \cdot [(r_l - r_F) \cdot v_t + f_t - \\ c_{Maint.,t}] - P_{Del.,t} \cdot c_{Del.,t} - \\ P_{Def.,t} \cdot [(1 - r_{Rec.}) \cdot v_t + \\ c_{Def.,t}] - r_{Inst.} \cdot v_t \end{array}}{(1 + r_D)^t} - C_0$$

where V_0 is the net present value of a loan; r_l the interest rate charged to the borrower; and r_F the interest rate paid by the MFI; on a balance outstanding; v_t at time t. The loan's scheduled cash flows at time t, the interest income, $r_l \cdot v_t$, interest expense, $r_F \cdot v_t$, flat fees, f_t, and maintenance costs $c_{Maint.,t}$, are weighted by their statistical likelihood of being realized, $P_{Active,t}$ and added to the statistical costs of delinquency $P_{Del,t} \cdot c_{Del.,t}$ and default $P_{Def,t} \cdot (v_t[1 - r_{Rec}])$. These quantities are discounted to determine the economic value at origination. All else being equal, the value of a loan is a function of the interest rate charged, r_l.

Under these assumptions, high rates ensure that economic value is large and positive, while low rates result in value destruction. Somewhere in between, there exists a *value-neutral* rate that satisfies the condition that the fees and interest payable on the loan are exactly sufficient to cover all expenses incurred throughout its term. The appropriate level of value for a nonprofit entity to draw from a client, when all costs have been compensated, must be identically zero. This can also be a source of competitive advantage for nonprofit organizations operating in these neighborhood-based capital markets.

Direct Costs. Direct costs are tied to the production of an individual loan and exclude centralized costs, not associated with any particular loan, such as management and occupancy. An interest rate that compensates for direct costs only can be considered as the minimum economically permissible; given sunken infrastructure costs, accepting a loan at this marginal rate will not destroy additional value.

[7]Scale refers to the achievement of sufficient portfolio size that centralized expenditure are small compared to total lending assets.

Table 2
Institutional Cost Base Required to Sustain a Loan Portfolio

Institution Size	500K	1MM	5MM	10MM	20MM
Loan Portfolio Size ($million)	0.5	1	5	10	20
Number of Loans in Portfolio[8]	65	125	625	1,250	2,500
New Originations Needed per Month	5	10	50	100	200
Renewal Spend Hours per Month	—	10	50	80	150
Referral Spend Hours per Month	—	10	80	120	400
Network Spend Hours per Month	50	50	200	300	500
Mass Media Spend per Month	500	1,500	8,000	10,000	10,000
Loan Consultants	1	2	7	10	20
Underwriters	1	1	2	2	4
Back-Office Staff	1	1	2	4	8
Collections Staff[9]	—	—	1	3	5
Annualized Direct Staff Spend ($)	110,000	145,000	435,000	690,000	1,345,000
Staff per Manager	5.0	5.5	6.0	6.5	6.5
Managers Required	1	1	2	3	6
Annualized Indirect Staff Spend[10] ($)	75,000	80,000	175,000	265,000	530,000
Occupancy Space[11] (Square Feet)	600	750	2,100	3,300	6,450
Annual Occupancy Cost ($)	10,000	15,000	40,000	65,000	130,000
Annual IT Costs[12] ($)	10,000	10,000	30,000	45,000	85,000
Annual Consumable Spend[13] ($)	10,000	15,000	35,000	55,000	110,000
Annual Running Costs[14] ($)	20,000	25,000	70,000	110,000	215,000
Annual Marketing Spend ($)	5,000	20,000	95,000	120,000	120,000
Total Annual Indirect Costs ($)	130,000	165,000	445,000	660,000	1,190,000
Overhead Allocation, $r_{inst.}$ (Percent)	26.0	16.5	8.9	6.6	6.0

Indirect Costs. Indirect costs represent expenditure associated with general operations and not directly associated with any single loan type. A price determined at this loading level ensures the transaction is fully self-sufficient—it contributes its origination, running costs and a proportional amount to infrastructure.

[8]The number of loans within the portfolio is estimated using an average loan balance of $8,000.

[9]Assuming delinquency rates of 8 percent across the portfolio, and an average of 4 hours per case per month.

[10]Indirect staff costs include management and loan agent training and administration at 10 percent of their time and time spent originating loans that do not lead to disbursal.

[11]Assuming 150 square feet per employee are required at a cost of $20 per square foot.

[12]Assuming an $2,000 IT spend per employee per year, with a minimum of $10,000.

[13]Assuming that consumables, paper, printing, meal allowance, etc. amount to $2,500 per employee per year.

[14]Assuming that running costs, utilities, depreciation, and so on amount to $5,000 per employee per year.

For purposes of this paper, borrowers are grouped into two risk categories, *low* and *high* with differing expectations of payment profiles, and five loan sizes spanning the microloan product space—under $2,000, to $5,000, to $10,000, to $20,000, and to $35,000—which drives behavior as a proxy of business size. A high risk, sub-$2,000 loan can be viewed as a mission-mandated loan, for individuals with either no or highly damaged credit. Conversely, a low risk borrower with a large loan can be said to be on the threshold of formal banking status.

The ability to offset interest income with fee income (and vice versa) yields a diverse set of pricing schemes available to MFIs. To facilitate comparison, we define the annualized percentage rate (APR) as the total income in lending, taking into account all interest rates, points, and flat charges converted into an equivalent compounding interest rate. We present our results as a margin above the relevant funding rate.

On Funding. MFI funds are usually drawn from many sources, with varying costs. MFIs may receive grants, with no expectation of repayment, although their deployment may be restricted to certain borrower types at particular terms. In this case, the cost of funds is close to 0 percent. The Small Business Administration or other governmental agencies may partner with MFIs to channel federal funds to microentrepreneurs. Such agencies may also restrict the terms that can be offered by an MFI[15] as a condition of partnership. In October 2004 for a typical MFI, SBA funding is available at 1.3 percent. Nongovernmental institutions, such as banks and for-profits, motivated by the Community Reinvestment Act, have also been a significant source of subsidized funding to MFIs.[16] Around October 2004, MFI were able to secure funding from these sources at a cost of approximately 3 percent. Credit unions providing microfinance loans will have access to demand deposits whose cost is the (usually negligible) interest paid; for simplicity, we take the cost of such funds as 0 percent. As a last resort, an MFI can buy funds on the open market—the most expensive funding source, as the market will demand a significant risk premium. We estimate this at 10.3 percent, by adding a credit-risk premium of 7 percent, equivalent to that of B-rated U.S. corporate bonds of appropriate maturity (Amato and Remolona 2003) to the risk-free cost of borrowing, the five-year T-note rate,[17] in October 2004 at 3.3 percent, as noted by Board of Governors of the Federal Reserve System (2004a).

On Interest Income. The borrower payment schedule for a basic amortizing loan can be readily calculated and, at

[15]The U.S. Small Business Administration (SBA) intermediary's cost of funds is broadly calculated after their first year of operation as the five-year T-note less 1.25 or 2 percent depending on the underlying portfolio. In extending a loan of less than $10,000, the intermediary may charge up to 8.5 percent over its cost of funds, otherwise, it may charge up to 7.75 percent over its cost of funds (SBA 2004).

[16]The Community Reinvestment Act (CRA), enacted by Congress in 1977 (12 U.S.C. 2901) and strengthened in 1995 encourages depository institutions to help meet the credit needs of the communities in which they operate. Typically, banks lend capital through MFIs at favorable rates to be on-lent to borrowers in communities in which bank branches are not located. The CRA requires that each insured depository institution's record in helping meet the credit needs of its entire community be evaluated periodically (Board of Governors of the Federal Reserve 2004b; Federal Financial Institutions Council 2004).

[17]Five years is taken as typical of the funding horizon for MFIs.

each payment period, the MFI effectively earns the interest paid by the borrower less their own interest expense on the outstanding amount. To make explicit the impact of funding subsidies, we charge the MFI the market rate for funds, before crediting back the market rate less the realized (subsidized) cost of funds. For example, an SBA-funded MFI can obtain funding at two percent beneath the five-year T-note rate, where the market would charge 7 percent over it, for credit risk, amounting to a subsidy of 9 percent. An MFI that has to go to the capital markets experiences a dramatic increase in the cost of funds compared to one that can draw on subsidized funding.

Fee Income. We include any flat fees and points charged by the lender at origination. Fees arising from third party charges in origination that are passed onto the borrower, such as uniform commercial code (UCC) filing fees, are excluded.

Other Key Assumptions. We identify the loan products available to microfinance borrowers, as characterized by their loan request, borrower risk, and borrower type. Implementing a two-fold credit application process, all loans beneath $5,000, irrespective of borrower risk and type, go through a less cost-intensive transactional-based financing arrangement. Above this threshold, new borrowers are served by a relationship-based financing approach (See Berger and Frame 2007, for a discussion of relationship- and transaction-based financing).

Restricting the loan term of smaller loans allows the MFI to both control risk and limit the maintenance costs incurred. In our analysis, loans of $2,000 are issued with a term of 12 months; loans of $5,000 are given 18 months; $10,000, 24 months; $20,000, 36 months; and $35,000 loans, 48 months. This scheme is moderated such that high risk borrowers are capped at a loan size of $10,000—their potential default with larger balances represents too significant a concentration of credit risk for most MFI portfolios.

Pricing Results

We use the model to calculate the value-neutral APR margins over funding for the product space detailed in the previous section. Product-specific direct costs are taken as outlined in the quantitative cost model section, and we include indirect costs as a proportional contribution from each loan as appropriate for an MFI having achieved a scale of $20 million in loan assets. We present the fully loaded value-neutral APRs over funding in Table 3. The APR margins exclusive of indirect costs are shown in brackets. For an organization with $20 million in loan assets, a $2,000 low risk loan should generate an APR of 34.7 percent over funding to ensure that it contributes suitably to institutional self-sufficiency.

It is instructive to decompose the rates for three characteristic microfinance products into their component parts to identify the most significant contributions to value-neutral price. The results are shown in Table 4.

Origination Charge. Though the origination charge is a significant proportion of the total APR for the $2,000 loan product, this would be significantly greater had we not applied a transaction-based process.

Maintenance Charge. Maintenance costs are fixed, and so comprise a significant proportion of the small loan APR. For each $10 of flat monthly cost incurred, the rate on a 12-month $2,000 loan must increase by fully 10 percent. By comparison, the same extra cost on a 36-month $20,000 loan, yields a rate increase of just 1 percent.

Delinquency Charge. This is a fixed cost per instance of borrower delin-

Table 3
Loaded (Marginal) Annualized Percentage Rate over Funding Matrix for a Mature Microfinance Institutions

Loan ($)	Annualized Percentage Rate Margin (Percent) New Loans		
	Low Risk	Medium Risk	High Risk
2,000	26.3 (20.3)	30.4 (24.4)	34.7 (28.7)
5,000	15.4 (9.4)	19.0 (13.0)	22.7 (16.7)
10,000	13.5 (7.5)	17.0 (11.0)	20.7 (14.7)
20,000	11.7 (5.7)	15.7 (9.7)	NA[a]
35,000	11.0 (5.0)	15.1 (9.1)	NA[a]

[a]NA, not applicable.

Table 4
Decomposition of Annualized Percentage Rate for Characteristic Microfinance Products

Contribution	$2K High Risk	$10K Medium Risk	$20K Low Risk
Origination Cost	6.1	2.0	0.7
Maintenance Charge	10.0	2.0	1.0
Delinquency Charge	6.4	1.0	0.4
Risk Charge	6.1	5.9	3.5
Equity Charge	0.1	0.1	0.1
Indirect Cost Loading	6.0	6.0	6.0
Market Funding	10.3	10.3	10.3
Total Market APR	45.0	27.3	22.0
Funding Benefit	−7.3	−7.3	−7.3
Subsidized APR	37.7	20.0	14.7
Cost of Funds	−3.0	−3.0	−3.0
APR over Funding	34.7	17.0	11.7

quency, and so has a disproportionately high cost for smaller high risk loans than for larger, less risky ones.

Risk Charge. This represents the total net present value of risk costs over the lifetime of the loan, amortized and converted into a flat rate. Note that as the product term lengthens, the relative contribution of risk charge increases as the borrower population has greater opportunity to default.

Equity Charge. All MFIs maintain a pool of equity as a reserve to protect against insolvency. This is charged at the institution's cost of capital net of the risk-free rate and has a negligible effect.

Indirect Cost Loading. Note that the indirect cost loading of 6 percent is calculated for an institution achieving significant scale of operations. For smaller institutions, the proportional allocation from indirect costs to each individual loan must be higher: 26.0, 16.5, 8.9, and 6.6 percent for institutions with $.5 million, $1 million, $5 million, and $10 million lending asset bases, respectively.

Market Funding, Funding Benefit, and Funding Cost. As discussed in the previous section, we calculate the subsidy on borrowed funds using a composite cost of MFI funds of 3 percent.

Subsidized APR. The model calculates value-neutral APRs above funding for a mature MFI, which would guarantee self-sufficiency. For the three characteristic products, these are 34.7 percent for the $2,000 high risk product, 17 percent for the $10,000 medium risk product, and 11.7 percent for the $20,000 low risk product.

We have shown how, in principle, risk and cost can be factored into a value-neutral product price, which results in high APRs for small products. MFI practitioners may be reluctant to charge such APRs for fear of overburdening the borrower with exorbitant costs of debt. We emphasize that, for small loans, high APRs translate to modest absolute monthly payments. For example, the high risk APR (including funding costs at 3 percent) of 37.7 percent on a 12-month $2,000 loan corresponds to a monthly payment of $203, with the interest-free monthly payments alone amounting to $167. An individual incapable of repaying $203 will most likely experience similar difficulty maintaining interest-free repayments of $167, and a microfinance program is probably not the most appropriate option for such an individual.

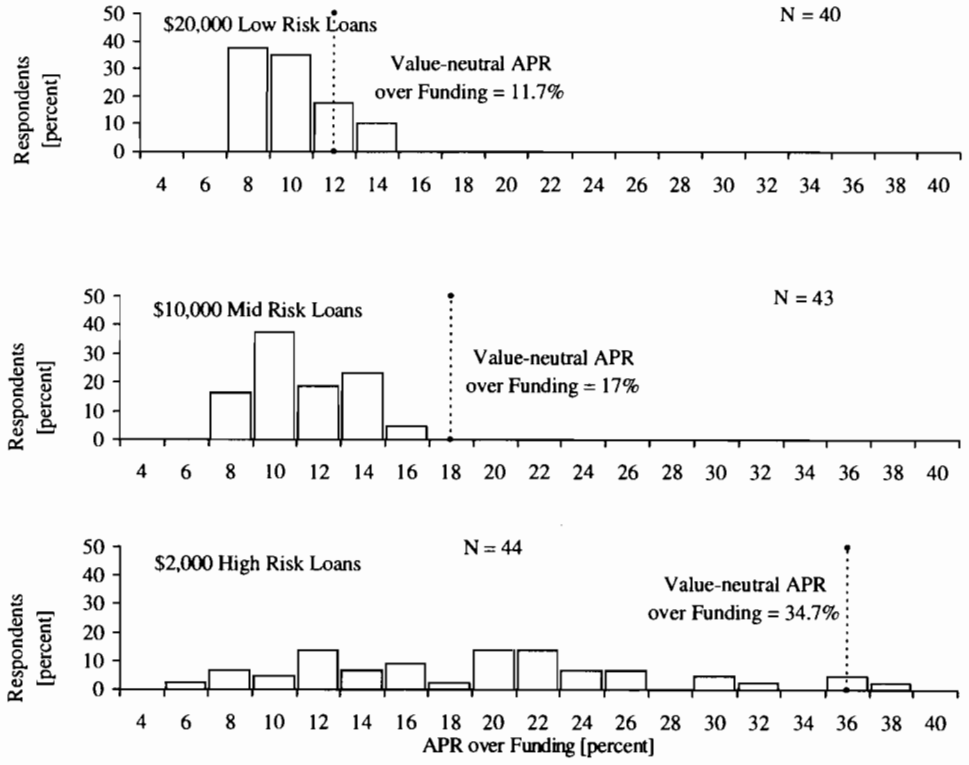
We have so far considered microfinance pricing only from a supply-side perspective. Although the near-bankable segment of the population may be price sensitive, studies have shown that riskier borrowers are less sensitive to price. In a survey of borrowers who have taken loans from both MFIs and loan sharks, Gurski (2003) suggests that high risk microfinance borrowers are largely insensitive to interest rates. This is supported by the broad spread of APRs charged to such individuals by existing practitioners, discussed in the next section.

Industry Pricing Survey

We surveyed current microfinance pricing schemes of 46 active MFIs, representing approximately 20 percent of known MFIs, to assess the extent to which the industry appears to be pricing appropriately based on the results from our model. Each institution was questioned regarding the rates and fees charged on three characteristic microfinance products. Rates and fees were then amalgamated into a single APR figure levied on the borrower using the standard methodology and presented as a margin over funding cost. We identify each institution's funding source as discussed in the pricing methodology section in order to show results independent of funding source. These are shown in Figure 2.

$20,000 Low-Risk Microfinance Loans. The APRs over funding on large, low risk microfinance loans range between 6 and 13 percent whereas the value-neutral APR over funding is determined to be 11.7 percent. Ninety percent of sampled MFIs price within five percentage points of the value-neutral rate. It is apparent that this distribution of

Figure 2
Survey of Microfinance Pricing



pricing is rather narrow—we hypothesize that this is a result of pricing pressure from the formal banking sector for loans that may be considered near-bankable.

$10,000 Medium-Risk Microfinance Loans. The APRs over funding on medium sized, moderate risk loans range between 7 and 16 percent whereas the value-neutral APR over funding is determined to be 17 percent. Seventy percent of sampled MFIs price five percentage points or more beneath the value-neutral rate; none priced at the value-neutral APR.

$2,000 High-Risk Microfinance Loans. The APRs over funding on small high risk loans range between 4 and 38 percent whereas the value-neutral APR over funding is determined to be 34.7 percent. Ninety percent of sampled MFIs price five percentage points or more beneath the value-neutral rate.

The pricing on small loans is very diffuse, with APRs spanning nearly 35 points, which we believe is attributable to the following reasons:

- *Restrictions placed by funders on product pricing.* Note that this impacts all products but is most

significant for small loans because the value-neutral APR is much higher. However, the majority of programs surveyed are not limited by such restrictions.

- *Reluctance to charge high rates.* MFIs may feel social and ethical pressure to maintain low rates for the poorest borrowers who tend to be the riskiest.
- *Lack of competitive pressure.* The lack of cohesion among APRs charged on small loans in the sample suggests a lack of market pricing pressure.
- *The leveraged impact of fees.* There is a spread of flat fees charged, which manifest as a far greater variation in APR on small products than on large products. For example, origination fees varying from $50 to $100 on a 12-month $2,000 loan add between 4.6 and 9.1 percent to the value-neutral APR. The same fees on a 36-month $20,000 loan add between 0.2 and 0.3 percent.

Finally, the data suggest that for those institutions pricing above value-neutrality on large loans, a certain degree of intraportfolio subsidization may be occurring. Such a pricing strategy could be potentially dangerous because if they have the option, lower risk borrowers being charged a premium might ultimately migrate to an institution pricing appropriately. Simultaneously, undercutting the rate for poorer-quality borrowers could lead to a net influx of riskier loans. In such a scenario, the portfolio becomes increasingly weighted to lower-quality loans, the capacity for internal subsidization diminishes with time, and the institution becomes increasingly reliant on external subsidies.

Sustainability and Self-Sufficiency

Nonprofit organizations and MFI have been increasingly pressured to adapt more "business" practices and to become more self-sufficient (Ledgerwood 1999; Christen 1998) but there is a lack of precision as to what this means. Financial self-sufficiency is often defined in practice as income derived from operations divided by the operating expenses incurred, thus excluding revenue from subsidies (Vinelli 2002). We would define sustainability as the ability to cover annual budgets including grants, donations, and other fundraising.

In fact, we suggest that MFIs generally operate in one of three different modes: survival, sustainability, or self-sufficiency. In survival mode, organizations barely cover their monthly expenses and many programs have faced a lingering decay as capital that was lent out in earlier years did not return as expected to cover future operations. Many of these organizations and programs eventually begin the process of dissolution and explain the high organization and program mortality in the sector. Most organizations seem to operate between survival and sustainability—or the ability of organizations to cover their annual budget through donations and other grants in addition to earned income from their lending operations. In our definition, self-sufficiency refers to organizations that can survive and add to their asset base wholly on the basis of income derived from their lending and related operations.

The quest for sustainability and eventual self-sufficiency is widely regarded as a best practice in the microfinance industry. Vinelli (2002) offers five supporting arguments that explain why. First, sustainability helps ensure organization survival and the continuing provision of a financial service that is desired by many microbusiness owners. Further, defaults may increase if borrowers believe that a lender is not permanent or if they believe the lender will not punish them (Schreiner and Morduch 2002; Bhatt and Tang 2001; Gonzalez-Vega 1998; Bates 1995). Second, MFIs that price their prod-

ucts at market levels will be able to attract the target population of nonbankable (but potentially viable) borrowers who do not have access to cheaper products. Third, traditional lenders may be deterred from competing with organizations that enjoy large subsidies. Fourth, sustainability facilitates the ability to raise capital from a variety of sources. And, lastly, a focus on self-sufficiency could prompt MFIs to control costs. This may run up against other MFI goals, such as serving higher risk borrowers, the lending to which may lead to higher costs, but philanthropic donors should be more likely to respond to programs that understand their pricing and consciously manage costs.

Brewer et al.'s (1996) research into the performance of Small Business Investment Companies (SBICs) between 1958 and 1996 highlighted the potential dangers of subsidized funding. Many of the institutions that failed during this period had used SBA guarantees, which allowed SBICs to issue debentures at subsidized rates. By contrast, SBICs that used little or no SBA funding comprised the most successful segment of the industry.

In terms of increasing self-sufficiency, by targeting different segments of the microbusiness population, it is easier to generate value by lending to individuals with better credit records, due to their increased ability to handle debt and lower associated default rates. However, in doing so, an MFI must be careful not to subvert its mission. Vinelli (2002) suggests that mission drift can occur when a lender seeks profit not by working harder to make better and less expensive products but rather by searching for borrowers who are easier and cheaper to serve (Schreiner and Morduch 2002; Vinelli 2002).

Regarding pricing and self-sufficiency, Gulli (1998) suggests that institutions must charge sufficient interest rates to cover their costs. Bhatt, Painter, and Tang (2002) suggest that one reason for continued institutional dependence on subsidies is an unwillingness to charge the maximum legally allowable interest rates and fees that would allow programs to cover as much expense and risk cost as possible from operations. Bhatt, Painter and Tang's survey revealed that the average MFI interest rates in California of 11 percent were significantly beneath legal and regulatory constraints, which vary from state to state.[18]

Self-sufficiency is seen as an appropriate mechanism for achieving the long-term viability of the microfinance sector. First, available resources and subsidies are too small to provide microfinance to all who might benefit from it. Second, a focus on self-sufficiency can lead to decreased costs through increased efficiency. Third, leverage is more easily attained by organizations that generate the means to repay debt. Finally, reliance on subsidies might alter a firm's incentive structure in ways that could increase the likelihood of a negative event.

[18]An informal survey of banking departments of states where MFIs operate reveals a wide range of usurious lending rate caps. For example, New York and Michigan lenders may charge up to 25 percent annual percentage rate (APR), exclusive of fees, while Colorado lenders may charge up to 45 percent inclusive of fees. Georgia has a limit of 16 percent on loans up to $3,000, but no explicit caps on loans greater than $3,000 (Georgia General Assembly 2004). Such laxity is mirrored by the credit card industry: less than half of all U.S. states cap credit card interest rates and, not surprisingly, most credit card issuers are based in states without usury laws and without interest rate caps (Bankrate 2004). With regards to lending usury caps, California is one of more lenient, providing exemptions for financial institutions as per Article 15 of their state Constitution (California Legislative 2004).

The Impact of Pricing Inefficiencies

The MFIs surveyed in this paper are not charging sufficient APRs to cover their costs in providing microfinance loans. To examine the impacts, we use the institutional-level costs presented in Table 2 and investigate the influence that a "pricing gap"—pricing beneath the value-neutral APR—can have on organizational self-sufficiency. We model two competing dynamics: economies of scale, which have a positive impact on institutional self-sufficiency, and the pricing gap, which has a negative impact. We use the best-case indirect cost loading, that of the $20 million portfolio, and apply it to all institutions, regardless of size. We then calculate the income shortfall for each portfolio size, using aggregate annual pricing gaps of 1, 2, 5, and 10 percent.

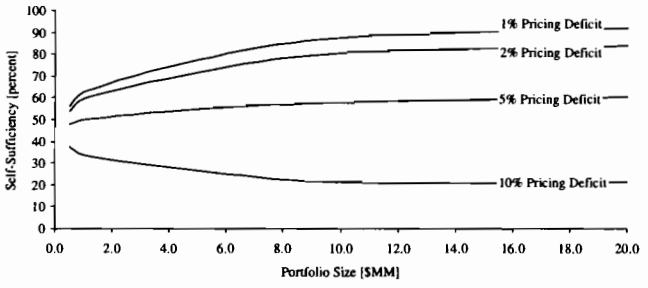
The results are illustrated in Figure 3. We find that self-sufficiency is extremely sensitive to pricing gaps. A 1 percent pricing gap on a $20 million portfolio amounts to a shortfall of $200,000 in absolute terms. This represents some 10 percent of annual institutional operating costs and thus corresponds to a self-sufficiency level of 90 percent. A 5 percent pricing gap leads to a self-sufficiency rate that increases slowly with portfolio size to a maximum of 60 percent. A 10 percent pricing gap actually leads to declining self-sufficiency with increasing portfolio size, as the absolute operating costs increase more quickly than the absolute revenues generated through such a heavily subsidized pricing scheme.

Discussion and Conclusions

We have discussed the key elements of the relationship-based financing model that is used by most MFIs in the United States. Quantifying the parameters of this model enables us to derive pricing that would theoretically cover both the direct and indirect costs of providing various microfinance products. Comparing these results with actual prices offered by existing institutions reveals that credit is generally being offered at subsidized rates to microbusinesses. The majority of MFIs do not cover their costs and it appears that cost-based pricing is a lever that MFIs are not fully utilizing. There are various possible explanations for this:

First, as previously discussed, certain funding institutions provide capital to MFIs with restrictions on the interest

Figure 3
Impact of Portfolio Pricing Deficits on Institutional Self-Sufficiency



rates and fees that can be charged. However, this alone cannot explain the low APRs in the survey, as the majority of programs surveyed are not limited by such restrictions. Second, lending by traditional institutions such as banks may create downward pressure on prices. If such pressure exists, it appears to affect only the near-bankable segment of the microfinance market. Third, there may be some price sensitivity on the part of borrowers, although the survey we have presented suggests that this may not be the case for all segments of the population. More research is needed to better understand microfinance pricing policies in the United States. Fourth, MFIs may not fully appreciate the true operational costs underlying their lending products. Organizations receiving subsidies may not be incentivized to understand their true costs and maximize their efficiency of credit delivery. MFIs must be conscious of the possibility that pricing products below market levels may lead to the misdirection of funds to more credit-worthy borrowers who would otherwise seek bank financing and, in doing so, perpetuates some degree of credit market misallocation.

Continued subsidization of credit also has implications for the long-term sustainability of MFIs. Our high-level analysis of projected self-sufficiency levels of various MFI sizes shows the importance of pricing appropriately. Even a modest deviation from the value-neutral price has a significant impact on the amount of subsidies needed to sustain the institution. As a consequence, it is imperative that MFIs rigorously analyze the true costs and review their pricing structures accordingly.

It has yet to be demonstrated that microfinance can be performed profitably in the United States. Nondepository MFIs may not have better information and/or technology to identify and serve less risky microbusinesses than formal institutions. It would therefore appear that formal institutions are acting rationally in choosing not to serve this market at present. However, MFIs have succeeded in channeling capital to microbusinesses. Still, MFIs often operate with certain public and/or private subsidies. Ultimately, more research is needed to ascertain whether the provision of microfinance offers a societal benefit in excess of economic costs. This paper is one of the first to document a very wide dispersion in the difference between value-neutral and actual pricing for a sample of MFIs. This suggests a wide dispersion in the economic subsidies inferred by these MFIs. More specifically, these subsidies are not being allocated on a consistent basis.

If subsidies are required to serve the market at palatable interest rates for lenders and borrowers, it is incumbent on the microfinance industry to demonstrate that theirs is an efficient mechanism for delivering such subsidies. Once a subsidy is justified, institutions must be motivated to improve their operational efficiency so that they may offer microfinance borrowers the lowest possible equitable prices while not jeopardizing institutional viability.

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