Smart Subsidy for Sustainable Microfinance

Jonathan Morduch

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NYU Wagner Graduate School
295 Lafayette Street, 2nd Floor
New York, NY 10012-9604

T: 212.998.7523
F: 212.995.4162
E: contact@financialaccess.org

www.financialaccess.org

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CAPS ON INTEREST RATES

Governments in developing countries often impose caps on interest rates charged on loans for the poor. Despite their popular appeal, such caps undermine the profitability of lending and thus reduce the supply of loans.

Source: *The Economist*, The Hidden Wealth of the Poor. 5 November 2005, p. 3.

Smart Subsidy for SUSTAINABLE MICROFINANCE*

BY JONATHAN MORDUCH,
Associate Professor of Public Policy and Economics
Wagner Graduate School, New York University

INTRODUCTION

"Smart subsidy" might seem like a contradiction in terms to many microfinance experts. Worries about the dangers of excessive subsidization have driven microfinance conversations since the movement first gained steam in the 1980s. From then on, the goal of serving the poor has been twinned with the goal of long-term financial self-sufficiency on the part of micro banks: aiming for profitability became part of what it means to practice good microfinance.

Much of the excitement around microfinance stems from the possibility of achieving massive scale through highly efficient operations. And one of the fears of relying on subsidies is that it can undercut both scale and efficiency. So, a beginning point in considering smart subsidies is recognizing that the same forces driving efficient outcomes in free markets—i.e., hard budget constraints, clear bottom lines, and competitive pressure—can also be deployed in contexts with subsidies. If deployed well, there are circumstances in which subsidies can increase the scale of microfinance outreach, access to commercial finance, and depth of outreach to the poor. To make this happen, donors and recipients need to

One of the fears of relying on subsidies is that it can undercut both scale and efficiency

* This essay draws heavily on a paper presented at a conference on microfinance and public policy held in Geneva on 31 October 2005. The conference was part of a joint project of the International Labour Organization, Cambridge University, and the Réseau Universitaire International de Genève. I have also benefited from conversations with Bernd Balkenhol. The paper also draws on chapter 9 of *The Economics of Microfinance* (Beatriz Armendáriz de Aghion and Jonathan Morduch, The MIT Press, 2005). I am grateful for financial support from the Ford Foundation, but the ideas here are my own and do not necessarily represent the views of the foundation or its employees. Contact: jonathan.morduch@nyu.edu.

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be aware of the opportunities and constraints. By the same token, overreliance on subsidies and poorly designed subsidies can limit scale and undermine incentives critical to building strong institutions.

Smart subsidies maximize social benefits while minimizing distortions and mistargeting

The idea of "smart subsidy" springs from the premise that subsidies are neither inherently useful nor inherently flawed. Rather, their effectiveness depends on design and implementation. Smart subsidies maximize social benefits while minimizing distortions and mistargeting. The discussion below emphasizes the way well-designed subsidies can potentially "crowd in" other donor funds. Particular emphasis is put on subsidies that are (1) transparent, (2) rule-bound, and (3) time-limited. One further step is to institute regular, rigorous statistical evaluations of program impacts. Only then can donors evaluate the social returns on their investments—and have the information to improve impacts.

The essay focuses on possibilities, not new guidelines. Ultimately, the push for profitability will continue to be critical for microfinance. The question is whether a subset of institutions can benefit from using subsidy strategically to promote social objectives not otherwise possible. And if so, how?

OPENING CONVERSATIONS

Long-term sustainability is critical for microfinance. The desire to escape ongoing subsidization spurs institutions to innovate, cut costs, and improve products and services. The push for profitability attracts new investors into the sector, reinforcing calls for professionalism, transparency, and good governance. None of this is likely in settings dominated by subsidy.

The recently reformulated set of donor guidelines of the Consultative Group to Assist the Poor (CGAP) on "good practice in microfinance"[1] begins with the idea that "microfinance can pay for itself, and must do so if it is to reach very large numbers of people." The guidelines push the point further: "Unless microfinance providers charge enough to cover their costs, they will always be limited by the scarce and uncertain supply of subsidies from donors and governments" (CGAP, 2004, p.1). The appropriate role of subsidies is thus minimal according to the guidelines. For the most part, subsidies are to be limited to start-up funding of new institutions, after which they should be withdrawn. As the guidelines put it: "Donor subsidies should be temporary start-up support designed to get an institution to the point where it can tap private funding sources, such as deposits." (CGAP, 2004, p.1).

We have to be careful, then, in opening conversations about broader uses of subsidy—uses that may go substantially beyond "temporary start-up" support. But the risks of not discussing subsidy openly can be large too. For one thing, using subsidy continues as an ongoing part of the financial strategies of many microfinance institutions (MFIs), even institutions well beyond their "temporary start-up" phase. The *Microbanking Bulletin* of July 2003, for example, shows that 66 out of 124 micro lenders surveyed were financially sustainable, a rate just over half. For micro lenders focusing on the low-end, just 18 of 49 were financially sustainable as of the July 2003 accounting, a 37% rate. On one hand, the data show that even programs reaching poorer clients can do so while covering the full costs of transactions. On the other hand, the norm remains subsidization, particularly for those programs working in remote areas and seeking to reach the poorest households.[2]

Recent studies show that microfinance mainly serves moderately poor and low-income households, though with weaker outreach to the very poor

Another reason for opening conversations is that subsidization is not likely to end soon. "Social investors" are starting to make their mark in the sector, for example, and many are driven by the possibility of trading off profit for demonstrated social impact. Philanthropic foundations work on the same premise. Many social investors hope

to strengthen microfinance as a poverty reduction tool, and some MFIs have made a conscious effort to reach the "very poor" individuals highlighted, for example, by the UN Millennium Development Goals (MDGs). Recent studies show that microfinance mainly serves moderately poor and low-income households, though with weaker outreach to the very poor. Studies completed as part of legislation mandated by the US Congress, for example, show that in Peru, Kazakhstan, and Uganda, roughly 15% of microfinance customers were among the "poorest half" of the poor, as defined by the official poverty lines in their countries. In Bangladesh, 44% were found to be among the "poorest," a figure lower than expected. Not everyone is equally concerned about the plight of the poorest (or agrees that microfinance is the best tool to reach the poorest), but the failure to achieve deeper outreach is a growing policy concern, especially in the UN system.[3] One question raised is whether (smart) subsidies can help in achieving social goals, including poverty reduction and improvements in levels of health and education alongside better finance.

A third reason for an opening to broader deployments of subsidies arises from analytical concerns. The propositions put forward against subsidies are best seen as rules of thumb and, as time passes, the need for analytical nuance becomes clearer. With greater analytical clarity, the limits and possibilities for efficient subsidization have emerged. In particular, four important lessons have been learned:

1. Subsidized credit does not equal "cheap credit" (meaning, credit at interest rates well below rates available elsewhere in the local credit market) and the poor incentives that ensue. The early attacks on subsidized state banks centered justifiably on their "cheap credit" policies—interest rates on loans that were sometimes negative in inflation-adjusted terms and small if positive. But the jump from criticizing "cheap credit" to criticizing other kinds of subsidies has been recognized as being too great a leap. Today, cheap credit is a well-understood problem, and a first principle of smart subsidies is to avoid cheap credit.

2. Profitability does not equal efficiency. New data show that efficiency (lean management structures, low unit loan costs, and high numbers of loans per staff member) depends largely on giving staff the right incentives and using information well. The *Microbanking Bulletin*, for example, shows highly efficient institutions that are subsidized, as well as some that are profit-making. It also shows profit-making institutions that are not particularly efficient. Consider, ASA in Bangladesh, for example. ASA has implemented innovative cost-cutting management practices that have made it among the most efficient lenders in the world. But ASA achieved the cost reductions during a period in which it was also receiving soft loans from Palli Karma-Sahayak Foundation (PKSF) a local apex organization. It was (modestly) subsidized but highly efficient.[4]

With greater analytical clarity, the limits and possibilities for efficient subsidization have emerged. In particular, four important lessons have been learned

3. Profitability does not equal sustainability (as judged by the ability to survive over time). Consider a program that enjoys a temporary monopoly, charges high rates, and posts profits. It will be "financially sustainable" according to the standard measures. But the bank is vulnerable to new entrants who may skim off good clients and undermine the long-term viability of the business. In comparison, a well-run but subsidized micro bank may well be more viable over the long-term. A realistic long-term strategy is what matters most, and this is not reflected in snapshot measures of current profitability.

4. Profitability does not guarantee access to commercial finance, nor does lack of profitability necessarily foreclose such access. Profitability does not guarantee large scale, nor does subsidization necessarily limit it. In the United States, for example, most universities and hospitals operate

on a not-for-profit basis, but many obtain commercial financing for parts of their operations. Similarly, MFIs routinely mix funding sources—some subsidized, some at commercial rates.

While these arguments point to the possibility for a broader consideration of subsidy, how and when should it be done?

"CROWDING IN" AND "CROWDING OUT"

Donor funds typically constitute just one part of overall financing for a development finance institution. Given this context, donors use their resources most effectively when they act as catalysts for additional resources or social impacts. One important idea is that smart subsidies should "crowd in" funding where possible, rather than crowd it out.

Smart subsidies should "crowd in" funding where possible, rather than crowd it out

Providing guarantees is a good example (or offering subordinated debt in which the donor is willing to be repaid after other lenders are repaid). Consider the case of a recent securitization deal between India's largest private bank, ICICI, and the micro lender, SHARE Microfin Ltd.[5] For ICICI to agree to pay for a portfolio of 42,500 loans served by SHARE (SHARE continues to service the loans, but interest and principal go to ICICI), ICICI required protection against unexpected loan losses. ICICI demanded an 8% first-loss guarantee. If customers refused to repay SHARE, ICICI did not want to be left vulnerable. The eventual deal emerged when the Grameen Foundation funded most of the required guarantee by giving SHARE $325,000 in capital. SHARE, for its part, contributed about $20,000. The loan portfolio was valued at $4.3 million, so the guarantee amounted to $344,000 or 8%.

The Grameen Foundation's $325,000 was thus used to "crowd in" an additional $4.3 million from ICICI. While ICICI receives the profit from its shares, SHARE gains by spreading its risk and getting an immediate capital infusion. In this case, the subsidy (in the form of a loan guarantee) helped attract commercial capital; not only that, it helped finalize the deal. The experience undercuts the simple idea that subsidization and commercial capital are at odds. Here, in fact, they are complementary.

Guarantees are powerful not just because they reduce risk for other potential investors. They can also be powerful when they signal information about the recipient's strength and efficiency. Presumably, the Grameen Foundation went into the deal with SHARE and ICICI after reckoning that the risks were modest. By putting their money behind that belief, the Grameen Foundation could signal to outsiders that SHARE was an institution in which it is worth investing.

Similarly, making a substantial loan to an institution can signal a belief in the strength of that institution, and being willing to accept subordinated debt status goes even further. In the decision to make a grant versus a loan or guarantee, the two latter options mean bearing risk. Rather than avoiding risk, the donor can signal their belief in the strength of the institution by deliberately accepting risk—and that signal may help attract commercial investors.

The other way that donors crowd in other investors is by providing broad oversight (and perhaps even joining the board) of the recipient institution. If the donors have a strong reputation for prudent leadership and oversight, their involvement can provide additional incentives for other investors, even commercial investors, to participate. Again, the donors not only bring their own resources but also the possibility of attracting other investors.

Making a substantial loan to an institution can signal a belief in the strength of that institution

START-UP SUBSIDIES FOR INSTITUTIONS

The CGAP's donor guidelines on good practice in microfinance privileges start-up subsidies for institutions, limited to the first 5–10 years of operation. Start-up subsidies have the advantage of being time-limited and relatively transparent. By restricting

the subsidies to a limited period, the fear of dependency is diminished. This rule-based aspect of the subsidy reduces the weak incentives created by soft budget constraints—i.e., that recipients will not face the consequence of failing to achieve financial targets. Here, instead, the donor makes clear that the subsidies are only available for a short time, after which the institution is expected to become self-sufficient.

A common goal is that the subsidy allows institutions to immediately charge customers fees and interest rates at levels that will become feasible only once the institution reaches a larger scale. In the start-up stage, the subsidies make up the shortfalls—and thus prevent the full costs of the operation from being passed on to customers in the form of higher fees and interest rates.

The logic is clear. But if "start-up" subsidies are appropriate when an institution is just building its first branches, why would they be less appropriate when the institution chooses to expand to a wholly new area where it has to build up, in large part, from scratch? In the very beginning, when building the first branch, much learning-by-doing must, of course, be done, and the subsidies are particularly helpful. Later expansion should be easier and a prudent institution will put aside a part of current earnings to fund future expansion. All the same, a donor may be able to hasten the expansion process by broadening the notion of "start-up" subsidy to cover major expansions—even after the first 5–10 years of an institution's existence—without creating ongoing incentive problems.

START-UP SUBSIDIES FOR CUSTOMERS

One of the reasons start-up subsidies are justified is that an institution takes time to achieve scale economies. To a degree, this is true when working with new clients, too—at any stage in the life of an institution. New clients generally start with the smallest loans, and such loans tend to have high transactions costs per unit.

At BRAC in Bangladesh, for example, a study several years ago showed that initial loans to new customers were so small—just taka (Tk) 2,500—that BRAC lost money servicing them at the given interest rate (15% charged on a flat basis, roughly equivalent to a 30% per year effective interest rate). At loan sizes of Tk4,000 and more, BRAC recovered costs with interest earnings, but not at Tk2,500. BRAC calculated that it cross-subsidized at a rate of Tk225 on a Tk2,500 loan, suggesting that BRAC would have needed to raise effective interest rates by about 9 percentage points for small loans. BRAC's management, though, feared that effective interest rates of 40% would be unaffordable for the poorest borrowers and could undermine social goals.

The subsidies (actually "cross-subsidies" in this case) were not associated with "cheap credit" and all of the negative trappings that entails. Instead, they were strategically deployed and targeted to aid the poorest customers. They allowed the customers to begin the first stages of a relationship that ultimately was sustainable.

BRAC's IGVGD Program subsidized potential clients who were not yet ready to borrow from micro lenders at "market" interest rates

BRAC took the idea a large step further in its Income Generation for Vulnerable Group Development (IGVGD) Program which subsidized potential clients who were not yet ready to borrow from micro lenders at "market" interest rates. First, BRAC argued, these customers can benefit from an intensive period of training and time to build businesses to a minimum scale. The IGVGD Program was built around a food aid program that the World Food Programme sponsored. The resources of the food aid program were integrated into a program that provided both 18 months of food subsidies and half a year of skills training, with the aim of developing new livelihoods for the chronically poor. Participants were also expected to start saving regularly to build discipline and an initial capital base. When the training program was completed, households were expected to be able to "graduate" into BRAC's regular programs.

The program focused on households headed by women or "abandoned" women who own less than a half acre of land and that earn less than Tk300 ($6) per month. The training included

The question ultimately is whether this deployment of subsidies generates sufficient social value for the cost. And does it generate more social value than alternative social investments?

skills like livestock raising, vegetable cultivation, and fishery management. After an 80% success rate in a pilot program with 750 households, BRAC rolled out the program throughout Bangladesh, and IGVGD had served 1.2 million households by 2000.[6]

The subsidies at BRAC are not large in the scheme of things. Taken together, Hashemi (2001) estimates that IGVGD subsidies amount to about Tk6,725 (about $135 in 2001) per participant. The largest component is Tk6,000 for the food subsidy (provided by the World Food Programme), and the remainder is about Tk500 for training costs and Tk225 to support making small initial loans to participants (the first loans are typically about $50). For $135 per participant, BRAC aims to forever remove the need for participants to require future handouts. To achieve that aim, efforts to ensure sustainable impacts must be implemented and success rates improved. But even as it stands, the IGVGD is an important model for other programs. BRAC has launched a new initiative, Targeting the Ultra Poor, that builds on the IGVGD and combines training and subsidy for the very poor. The question ultimately is whether this deployment of subsidies generates sufficient social value for the cost. And does it generate more social value than alternative social investments?

PROVIDING COMPLEMENTARY INPUTS

The IGVGD began with the recognition that the problems and constraints faced by poor households are often multiple and overlapping, including the lack of access to adequate health care, skills, and education.

A different kind of time-limited, transparent, rule-bound intervention involves the delivery of nonfinancial services to current customers. Consider Pro Mujer, a micro lender in Latin America that is committed to improving the health and economic opportunities of poor women and their families. Based on feedback from their clients, Pro Mujer's branch in Nicaragua introduced an array of health services including gynecological exams, with a focus on cancer prevention and detection; self-help groups aimed at combating family violence; and health counseling by clients trained as health promoters. In 2005, Pro Mujer, Nicaragua began an innovative strategy to take health services straight to customers' communities. Health educators now travel by motorcycle to communities, offering pap smears and consultation services. In 2004 alone, 199 cases of cancer were detected among Pro Mujer's customers in Nicaragua, and the women were linked to treatment.

Such integrated models of banking coupled with social services (or other services) are not appropriate for every MFI or every location—or even most institutions and locations. Nor are they simple to implement. But Pro Mujer has demonstrated that they are possible to implement well and that they are meaningful for clients. There is no reason that customers cannot pay for most of the health services on their own (Pro Mujer is strongly committed to financial self-sufficiency), but where full cost-

recovery is impossible, strategic subsidization can improve health service quality and quantity for customers, without distorting financial mechanisms.

DEMONSTRATING IMPACT

In general, subsidies should be time-limited and rule-bound. Practitioners know that the availability of subsidies can be uncertain and unreliable. Depending on ongoing flows of subsidy is not likely to be a viable long-term proposition. But that still leaves many places where smart subsidy may help philanthropic individuals and donors achieve social objectives that are not readily achievable when working through strictly for-profit institutions.

Deploying subsidies though raises the bar on evaluations. The microfinance industry has made great strides by developing—and insisting on the use of—clear, rigorous financial measures. The same must be true for subsidies. If smart subsidies are deployed in the hope of producing demonstrable social impacts, those impacts should be measured using rigorous statistical analyses—with solid control and treatment groups and attention to measuring causal relationships. Every intervention need not be rigorously evaluated, but at present there is almost no careful evaluation (i.e., with appropriate control groups), and it is time to shift the balance.

Microfinance experts have worried, justifiably, that badly designed subsidies not only undermine the financial performance of micro lenders but can also undermine social impacts by limiting scale and the quality of services. If subsidies are deployed in the name of improved social impacts, donors should make it a priority to measure the degree to which they generate important net impacts for customers.

ENDNOTES

[1] The guidelines incorporate the views of a broad range of donor staff working to support inclusive financial systems (CGAP, 2004).

[2] Definitions of low-end vary. The *MicroBanking Bulletin*'s definition of institutions reaching the low-end of the population includes those with an average loan size of less than 20% of GNP per capita or less than $150. Some of the programs in the bulletin are young and in their start-up phase, but even established programs use subsidies.

[3] Data are from Morduch (2005). Some current microfinance customers likely started out among the very poor and have since grown less poor. Data on incoming microfinance customers (rather than current customers in aggregate) would show higher levels of poverty if that is true. Also note that these data are from just four countries and pertain to relatively small samples.

[4] For more on ASA's innovations, see Nimal Fernando and Richard Meyer (2002).

[5] Details are taken from Chowdhry, et al (2005).

[6] The data and follow-up study reported here are from research in Imran Matin and David Hulme (2003).

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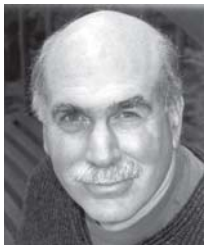
SymBanc™

A Simulator for Microfinance Institutions[1]



BY GARY HIRSCH
Consultant, Creator of Learning Environments
Wayland, Massachusetts, USA
JAY ROSENGARD
Director, Financial Sector Program, Kennedy School of Government, Harvard University, Cambridge, Massachusetts, USA
GUY STUART
Associate Professor of Public Policy
Kennedy School of Government, Harvard University
Cambridge, Massachusetts, USA
and **DON JOHNSTON, JR.**
Micro and SME Finance Consultant, Malang, Indonesia

Microfinance Institutions (MFIs) engage in a large number of small, cash transactions and rely on the constant flow of information to effectively manage their operations. As the number of MFIs increase and the scale of their operations expand, there is a growing need for managers and policy makers with the skills to operate and supervise these dynamic organizations. This presents a challenge because the best teacher of such skills is experience; yet experience can be an expensive teacher—a mistake in an MFI can directly affect thousands of lives. There is an alternative—to create a simulator that models the complex dynamics of an MFI and its environment for prospective managers and policy makers.

This is the purpose of SymBanc™, a system dynamics simulator that prospective managers can "play" to understand the interrelated nature of their decisions, the importance of having good information, and the common problems MFIs encounter as they grow. To play the game, prospective managers must make a set of initial strategic decisions regarding their target market and product offerings and, subsequently, a set of operational and financial decisions based on information that SymBanc's management information system generated.

The game is interactive in that every decision made by the manager affects the future trajectory of the MFI and the clients it serves: an initial decision to set a high interest rate may prevent rapid growth, or an overambitious branch expansion plan may run down the MFIs capital too quickly. A free version of SymBanc™, together with a user's manual, is available at http://www.ksg.harvard.edu/cbg/asia/symbanc.htm.

SymBanc™ was developed initially for the Financial Institutions for Private Enterprise Development (FIPED) Executive Program and for a degree program course on microfinance at Harvard University's Kennedy School of Government. FIPED is a 2-week program for professionals working in fields related to micro enterprise finance and commercial banking for small- and medium-sized businesses, and is designed to aid participants in the sustainable provision of financial services for micro, small, and medium enterprises (MSMEs). The course shows how to design appropriate financial

Experience can be an expensive teacher—a mistake in an MFI can directly affect thousands of lives

instruments and adopt market-oriented management approaches to serve the needs of MSMEs. The program aims to offer financial institutions the management skills and operational tools necessary to operate in a market economy, while teaching participants how to introduce and implement strategies that will enable them to profitably finance the creation and growth of MSMEs. FIPED also gives senior government officials an understanding of the macro policies and enabling environment needed to support sustainable MSME finance. [2]

BACKGROUND

The field of system dynamics offers a set of tools for people working in a complex, dynamic environment, by providing them with a way to model the environment and understand the effects of their decisions on it. The field was developed at the Massachusetts Institute of Technology almost 50 years ago and has been applied to a wide range of management problems. Economic development has been one field with extensive applications (For example, see Saeed, 1994, 1998). Other fields with rich histories of applications include commodity markets, manufacturing supply chains, and health care delivery (Sterman, 2000).

Management simulators based on system dynamics models have helped many people get a real understanding of the need to manage systems in an integrated manner rather than as a set of separate pieces. Simulators have also helped those people learn how to think about strategies for systemic management by trying different approaches and seeing what works and what does not. In this manner, simulators provide "practice fields" for understanding management in ways that textbooks and case studies cannot. Simulators such as SymBanc™ have been used in diverse fields including health care and the newspaper industry (Hirsch and Immediato, 1998; Hirsch et al, 2003).

SymBanc™ is different from other simulation tools commonly used in microfinance such as Microfin. SymBanc™ and Microfin are complementary. SymBanc™ applies system dynamics modeling to microfinance, using the software application Vensim to highlight complex relationships in designing and operating an MFI. In contrast, Microfin is an Excel template designed to increase the sophistication and comprehensiveness of an MFI's business planning and financial modeling—the primary output of which is a 5-year financial projection. Microfin is most effective when real data are used and it is integrated into an organization's operations.

The "takeaways" from the two are also very different. As noted above, users of Microfin create detailed projection scenarios that can lead to better decisions within their organizations. SymBanc™ users go through a (realistic) simulation of what it is like to actually run an MFI. Class discussion and guidance from an instructor allow course participants to understand the process of managing an MFI and the signals to look out for and the pitfalls to avoid.

The model underlying SymBanc™ represents most of the functions of an MFI serving a population of two million in a region where two thirds of the people live in rural areas. Average annual per capita income in the region is $900 with significant inequality in distribution. The lowest quintile has an average income of $200 while the highest has an income of $2,700.

Management simulators based on system dynamics models have helped many people get a real understanding of the need to manage systems in an integrated manner

The MFI is able to offer trade or agricultural loans to existing and/or new enterprises and can elect to take savings deposits as one source of funds for lending. Users of the simulator start with a single branch and its staff. They choose the target population to serve; design the loan products offered; make decisions about staffing, expansion of the branch network, investments in information systems and other capital assets; and select external sources of funds for capital. Some MFI functions, such as lending to small and medium enterprises (SMEs) and consumer loans to civil servants and other salaried employees, are excluded in this version of the simulator. These features may be added later, as would the ability to lend for trade and agriculture simultaneously.

THE SIMULATION MODEL THAT POWERS SYMBANC™

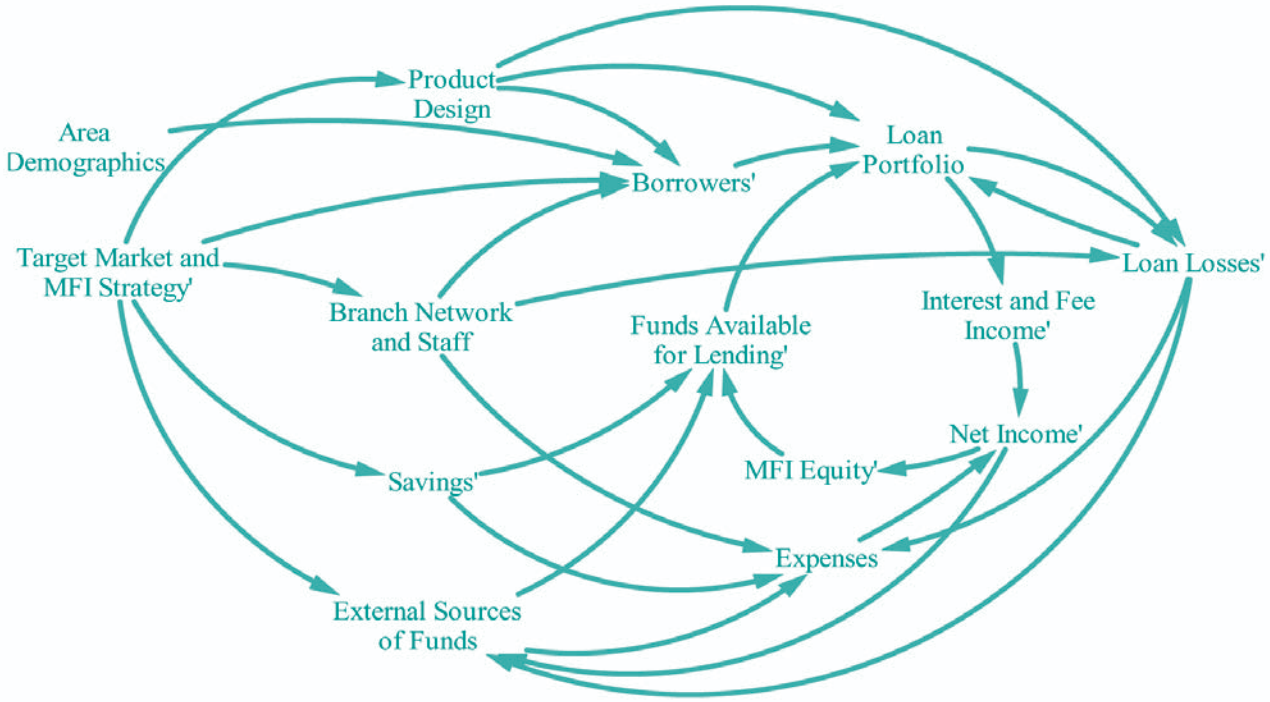


Figure 1: Overview of the Microfinance Institution's Model

Figure 1 provides an overview of the model's structure. As shown in Figure 1, the number of borrowers attracted at each point in time is the result of:

- the MFI's strategy and how it defines its target market
- the area's demographics
- design of loan products (e.g., interest rate and payment terms; group, individual, or both) and their appeal to the target market
- numbers and experience of loan officers and staff and extent of the branch network.

The loan portfolio grows as new borrowers are attracted as long as enough funds are available from both internal (retained earnings and savings) and external sources (donors, commercial banks, and governmental revolving loan funds). The size of the loan portfolio over time depends on the number of borrowers, size of loans, distribution of borrowers across three stages in which loans grow by certain increments, and extent to which borrowers are able to repay their loans.

The model contains an elaborate set of factors that determines rates of delinquency and default, including:

- loan officer experience, incentives, and effort devoted to managing relationships with borrowers
- quality of the loan portfolio
- investment in information systems that can track delinquencies
- size of loans at each stage relative to average income of the target population

The model contains an elaborate set of factors that determines rates of delinquency and default

- conditions of loans such as collateral requirements, late payment penalties, and compulsory savings
- exogenous environmental factors such as crop failures and macroeconomic shocks.

The quality of the portfolio, in turn, depends on other factors such as the interest rate and size of loans. For example, borrowers seeking large loans and willing to pay high interest rates are assumed to be poor credit risks that commercial banks and other sources of credit turned down.

The size of the portfolio and design of loan products determine the revenue stream and, in turn, the MFI's net income. Expenses include the costs of staff and operating the branch network, loan losses, interest costs on funds borrowed from external sources, and interest paid on savings. Loan losses reflect the size and quality of the loan portfolio, investments in information systems, and attention of loan officers to preventing and managing delinquent loans. Net income over time determines the value of equity in the MFI and the willingness of external agencies to make funds available for lending.

The MFI's ability to attract funds from external sources depends on its profitability (greater than 2.5% of revenue), the equity it has accumulated (equal to 12% or more of loans outstanding), and the rate of loan defaults it experiences (limited to 4%). Elements of the MFI's strategy such as its decision to serve women exclusively or people in lower income groups will also give it greater access to donor funds with more favorable terms, as long as its loan default rate remains below 5%. The MFI can also raise additional equity after several years of operations if it is profitable and can limit its loan losses.

SYMBANC™'S USER INTERFACE AND HOW THE GAME IS PLAYED

Users take their MFI from start-up through 8-year simulations. They begin by choosing the characteristics of the target market that then remain the same for the remainder of the simulation. They also select an initial set of features for the loan products they offer and make other decisions regarding hiring and branch office expansion, whether to accept savings and what interest rates to offer, and how much to invest in things such as information systems. As users move through a simulation, they have access to a rich array of information about the MFI's borrower population and loan portfolio and its financial performance. Based on this information, they can alter their decisions as often as monthly, though they more typically might change things on a yearly basis. Simulations continue for the full 8-year period unless the MFI runs out of money.

The simulator's interface has one set of screens for inputting decisions and another set that displays results as a simulation proceeds. Figure 2, for example, shows the options users have available in designing their loan products. A wide array of parameters includes size and term of loans, interest rates, frequency of payment, and other features such as collateral requirements, compulsory savings, built-in penalties for late payment, and whether interest payments are calculated on a straight interest or declining balance basis. There are similar decision screens for defining the target market, hiring staff and expanding the size of the branch network, making information system investments, offering savings accounts, and selecting sources of external funding. Figure 3 shows a results screen with profit and loss information as both a financial statement and in graphical form. The results screens have sets of buttons at the bottom that allow users to "drill down" for more detail on the variables that drive MFI performance.

They begin by choosing the characteristics of the target market that then remain the same for the remainder of the simulation

All decisions about product design have tradeoffs for the user. High interest rates, for example, bring greater revenues but may make the loans unattractive to everyone except those who are a poor credit risk and cannot obtain loans elsewhere. Large loans may also generate more income for the MFI but can be more difficult for the borrower to repay and lead to larger loan losses. (The screen displays the size of the monthly payments relative to average income of the target population.) Long terms may reduce the monthly payment but may make the loan's overall cost too high. Collateral requirements may reduce the likelihood

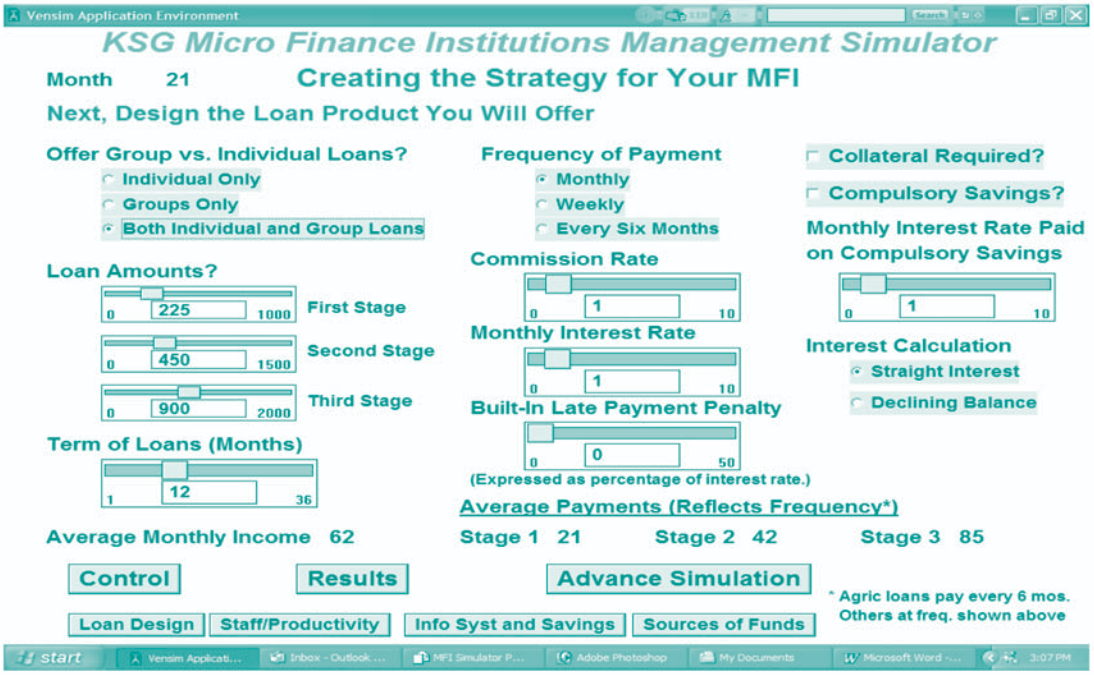


Figure 2: Decision Screen for Designing Loan Product

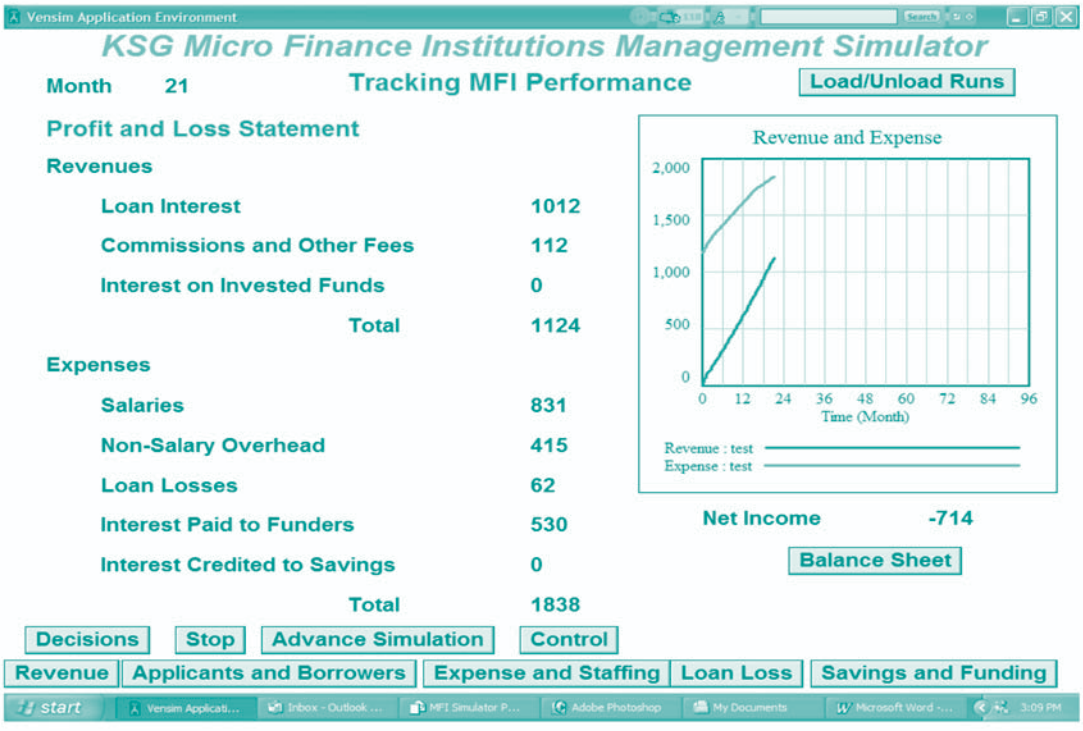


Figure 3: Results Screen with P&L Statement and Graph of Revenue and Expense

Users may take a number of simulations for them to figure out the right set of loan characteristics for the target population they have selected

of default but make the loans less attractive to potential borrowers as well as create an additional administrative burden for loan officers. Users may take a number of simulations for them to figure out the right set of loan characteristics for the target population they have selected.

The simulator also has several built-in scenarios to test the mettle of its users. The user (or instructor) can select one or more scenarios that include a limitation on available funds or various combinations of economic shocks that affect borrowers' ability to repay.

LESSONS STUDENTS LEARN FROM SYMBANC™

The lessons students can learn from SymBanc™ are summarized as follows:

- There are characteristic ways of failing such as growth outrunning capital and pursuing high volume at the expense of profit and building equity.
- There is no single right answer; instead, there are multiple ways to succeed depending on objectives.
- Strategies do require internal consistency—the right combinations of target market, product design, staffing and branch expansion, and funding sources.
- Good strategies under some circumstances may not survive economic shocks.

Table (Overview of Results on p. 14) shows some typical strategies users might follow with SymBanc™ and the results they would observe.

EXPERIENCE WITH SYMBANC™ AND FUTURE DEVELOPMENT

Participants of the FIPED course described earlier used the simulator in several exercises and generally found it to be a helpful aid for thinking about MFI strategy and exploring the strategic options open to MFIs. Use of the simulator by course participants, mostly career people already working in or with MFIs, also provided ideas on how to improve it for future use.

Initial feedback has already led to several improvements, including:

- improvements in the interface that give users more information to support decision making and make the simulator more straightforward to use
- a capability that enables users to output detailed results to an Excel spreadsheet

OVERVIEW OF RESULTS

STRATEGY	IMPLEMENTATION	RESULTS
A. Common Mistakes an MFI Might Make		
1. Low Income, More Donor Money	Target low-income population to get more donor money, but insist that borrowers take large loans to grow portfolio rapidly.	Attracts only a limited number of borrowers and experiences high default rate among those who do borrow; runs out of cash after 60 months.
2. Low Price, High Volume	Grow borrower population rapidly by charging low interest rate and going after entire market, not just low-income borrowers.	Attracts a greater number of borrowers, but cannot meet donors' profitability standard because of low interest rate.
3. High Growth	Charge competitive rate to grow gradually; build on initial success by drawing additional funds from donors and pursuing rapid branch expansion.	Rapid growth in borrowers, low default rate, and high profitability produce early break-even. But accelerated branch expansion keeps MFI from building equity required by donors and results in the MFI's running out of cash.
B. Growth Strategy That Works, but is Vulnerable		
4. Medium Growth	Same strategy as in 3, but delay branch expansion until equity meets donors' requirements.	Delaying branch expansion slows early growth in borrowers but permits MFI to build equity, meet capital adequacy standard, and draw on additional donor funds.
5. Medium Growth with Crisis	Same strategy as in 4, but simulated economic shocks cause new applications to drop and default rates to increase.	Economic shocks produce high default rate that makes additional donor funds unavailable; MFI runs out of cash.
C. Different Ways to Succeed		
6. Modest Growth, High Profit	Limited branch expansion allows less reliance on external funding.	Limited branch network attracts fewer borrowers, but enables MFI to be highly profitable and build greater equity.
7. Lower Income Sustainable	Focus on lower-income population with products (smaller loan sizes, longer terms, and higher interest rates) that help ensure repayment and higher profitability.	Properly designed products enable focus on lower-income groups to be profitable, even with slower growth than in medium growth strategy (4).
8. Lower Income Sustainable Strategy with Crisis	Same strategy as in 7, with simulated economic shocks.	Well-designed products for lower-income group enable MFI to survive economic shocks and become profitable again afterwards.

SymBanc™ continues to be a work in progress. Future versions of the simulator will include financial products such as line of credit lending to SMEs and consumer loans to civil servants and other salaried employees

- recalibration of some aspects of the model after exercise results revealed some behavior that was potentially unrealistic[3]
- adjustments to certain parameters such as productivity of loan officers and savings account productivity by branches.

Copies of the simulator have also been shared with the staffs of several international development agencies that are evaluating it.

SymBanc™ continues to be a work in progress. Future versions of the simulator will include financial products such as line of credit lending to SMEs and consumer loans to civil servants and other salaried employees. Future versions will also allow the simulated MFI to offer trade and farm loans simultaneously rather than separately as they are now. Additional planned enhancements include:

- expanded set of loan features and enabling loans at different stages to have different characteristics
- adding other types of savings products such as credit union style accounts
- the ability to serve urban or rural markets separately or together
- options to consider different forms of organization and governance
- a number of enhancements to the interface including the possibility of displaying results on maps to indicate performance by subregions
- a greater variety of market and regulatory environments
- more elaborate reflection of the country's macroeconomic environment and its effects on the MFI and its customers
- scripted scenarios including those that start with an existing MFI (rather than a start-up situation) moving from a subsidized to self-sustaining operation
- Multiuser version for network and internet use
- eventually creating a hybrid model in which certain agent-based features are added to reflect behavior of individual applicants and borrowers.

ENDNOTES

[1] SymBanc™ was financed with a grant from the Harvard University Provost's Fund for Instructional Technology, established to encourage innovation in teaching through the creative application of information technology.

[2] For more information on FIPED, see http://ksgexecprogram.harvard.edu/ProgramList.aspx.

[3] Examples of unrealistic behavior included profitable operation with high cost loans that potential borrowers would normally reject in the real world.

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