Economics and Sociology
Occasional Paper No. 2332

BANCOSOL
The Challenge of Growth for Microfinance Organizations

by

Claudio Gonzalez-Vega

Mark Schreiner

Richard L. Meyer

Jorge Rodriguez

and

Sergio Navajas

May, 1996

Revised August, 1996

Rural Finance Program
Department of Agricultural Economics
The Ohio State University
2120 Fyffe Road
Columbus, Ohio 43210-1099

Abstract

This paper focuses on the difficulties inherent in the prudent management of growth of microfinance organizations and on potential limits to the increased efficiency, profitability, and sustainability expected from growth and large size. The paper addresses both positive and negative implications of rapid growth for microfinance organizations. The experience of BancoSol in Bolivia is used to illustrate these questions. Building upon the successful experience of PRODEM, BancoSol was chartered as a private commercial bank in 1992. The paper discusses the intangible assets inherited from PRODEM that gave BancoSol a head start and the additional advantages that resulted from formalization as a bank, in particular from the authorization to mobilize deposits. BancoSol shows outstanding success in terms of breadth, depth, and quality of outreach and in terms of sustainability. It is the microfinance organization with the largest number of clients in Latin America and it reaches poor clients who could never expect to gain access to conventional financial institutions. The paper discusses the incentive structure associated with a lending technology that has resulted in low loan arrears and the cost-effective supply of small loans. Success is explained by a strong concern with financial viability, development of a lending technology appropriate for the market niche, a long learning period, and upgrading into a formal intermediary. As it grew, BancoSol had to face a reduction of revenues as a proportion of productive assets and an increase in the average cost of funds, which combined reduced its operating margin by 13 percentage points. This challenge was fully met by reducing operating expenses as a proportion of productive assets. While growth of PRODEM had been mostly constrained by too rigid access to donor funds, growth of BancoSol has been constrained by threats on asset quality and by diminishing marginal economies of size. Portfolio efficiency has grown steadily. This growth has been the net outcome, however, of reductions in transactions efficiency after transformation into BancoSol and of increases in average loan size. The paper explores the sources of increases in loan size and concludes that mission drift has not occurred at BancoSol. The evolution in transactions efficiency is related, in turn, to sources of extensive (installed capacity) and intensive (productivity) growth. Extensive growth has been rapid at BancoSol and it tends to dampen productivity increases. Finally, the paper reviews the pressures from growth on the original informal culture of the organization and the gradual establishment of more formal structures.

BANCOSOL
The Challenge of Growth for Microfinance Organizations[1]

Claudio Gonzalez-Vega, Mark Schreiner, Richard L. Meyer,
Jorge Rodriguez, and Sergio Navajas[2]

I. Introduction: The Challenge of Growth

This paper focuses on the difficulties inherent in the prudent management of growth of microfinance organizations and on potential limits to the increased efficiency, profitability, and sustainability that may typically be expected from growth and large size.[3]

The experience of Banco Solidario S.A. (BancoSol) in Bolivia is used to illustrate these questions. In the case of BancoSol, formalization as a bank brought with it the possibility of more rapid growth and thereby a number of challenges, unanticipated problems, new sources of cost, and second-generation adjustments. Because few Latin American microfinance organizations have grown so large so fast, important lessons can be learned from this case. The goals of the paper are to analyze how growth has occurred in the case of BancoSol, to assess the challenges that growth pre-

---

[1] Paper originally prepared for the Expert Meeting on Financial Mechanisms in Support of Participation of the Poor, organized by the OECD Development Centre, in cooperation with the International Fund for Agricultural Development, in Paris, April 9-10, 1996. Claudio Gonzalez-Vega wants to thank the organizers, Hartmut Schneider and Rauno Zander, as well as other meeting participants and the discussant, Luis Noel Alfaro, for their comments. This revised version, which also benefitted from comments from Richard Rosenberg, will be published as a chapter in Hartmut Schneider (ed.), *Microfinance for the Poor?*, Paris, OECD, forthcoming.

[2] Gonzalez-Vega is Professor of Agricultural Economics and of Economics and Director of the Rural Finance Program, Meyer is Professor Emeritus of Agricultural Economics, and Schreiner, Rodriguez, and Navajas are Graduate Research Associates, all at The Ohio State University. The individuals and organizations that made possible the research project in which this paper is embedded are too numerous to cite here, but the authors want to express their gratitude to Francisco (Pancho) Otero, Hermann Krützfeldt, Maria Elena Querejazu, Manuel Cuevas, Pedro Fardella, Rosa I. Posso, Marcia Villaroel, Javier Galdo, Jhonny Garrido, Ricardo Zegarra, Victor Cespedes, Jean Steege, Rachel Naughton, and many others at BancoSol who, with their tireless and frank collaboration, made these efforts both fruitful and enjoyable. The authors are responsible for all errors of omission and interpretation.

[3] This topic is equivalent to the questions raised in the finance literature about the existence of economies of scale and of scope in banking (Benston, Hanweck, and Humphrey, 1982; Berger, Hanweck, and Humphrey, 1987; Clark, 1988).

sents to any microfinance organization, and to identify conditions that must be met for the prudent management of growth. Given the history of the creation of BancoSol, it would be impossible to understand the lessons from this experience if the analysis did not, when appropriate, consider the earlier strides during the PRODEM period.

Growth has at least these positive implications for microfinance organizations. First, growth is the main mechanism for improvement of one of the key criteria for success in microfinance: outreach (Yaron, 1994). Increasing numbers of clients improve the organization's breadth of outreach. Given the very large numbers of poor but creditworthy firm-households in developing countries who are potential clients but who do not have access to financial services, microfinance organizations should seek opportunities for sustainable growth (Rhyne and Otero, 1994).

Second, growth is an important mechanism for improvement in another criterion of success in microfinance: sustainability. Growth in the form of the addition of new and better products, such as deposit facilities, helps the intermediary satisfy more of the demands for financial services from existing and potential clienteles. This improves the quality of outreach, and it enhances the image of the microfinance organization. Sustainable growth is a signal both to the intermediary's potential borrowers (microclients) and potential lenders (banks) about the program's strength and purpose. This image of permanency serves both to attract loanable funds from banks for additional growth and to increase the borrowers' willingness to repay loans (Gonzalez-Vega, 1994).

Third, growth of assets can help reduce average operating costs. When fixed costs are significant and if microfinance organizations can take advantage of economies of scale, lower costs as a result of larger size can help increase both outreach and sustainability. Moreover, growth in the form of new products may generate economies of scope that may also lower costs and improve profits.

Growth is not easy, however, and it may be loaded with danger. First, expanding the portfolio too rapidly may increase loan arrears and losses. These losses may result from changes in the risk composition of the clientele as well as from more opportunities for mistakes in evaluating and managing risks. Rapid growth increases the share of new borrowers in the portfolio, and new clients are potentially riskier than older, well-established customers. Moreover, given a set of potential clients with heterogeneous risk profiles, expansion may require lending to riskier borrowers as a given market is gradually saturated.

Second, because clients located further from the lender usually cost more to monitor, accelerating growth may lead to higher costs or to less oversight of borrower behavior and thus less effective prevention of default. If existing control systems become overloaded, risks and costs increase as growth accelerates.[4]

---

[4] For a detailed conceptual framework for the evaluation of the consequences of size and growth on the quality of the portfolio and on the structure of costs of microfinance organizations, see Gonzalez-Vega *et al*., planned for late 1996.

Third, too fast a pace of growth may also bring about difficult-to-solve inconsistencies between, on the one hand, large size and a rapid expansion of operations (which require formalization of structures and depersonalization of relationships) and, on the other hand, existing organizational structures (which are largely based on informal relationships), the skills of available human resources (which may not be able to handle the new, more complex tasks of running a large organization), and features of the lending technology (based on personal relationships between loan officers and borrowers). These inconsistencies may lead to a deterioration of communications, costly mistakes, and an increased vulnerability to fraud.

To address these issues properly and, at the same time, to experience healthy growth is one of the most difficult challenges faced by the management of self-sustainable microfinance organizations. An additional challenge is to avoid a process of loan-size creep (via larger loans to wealthier clients, rather than growth via larger numbers of target customers). When loan size creep happens, depth of outreach decreases, and the organization may drift from its original mission.

This paper illustrates some of the main issues associated with rapid growth by reporting on the experience of BancoSol. The choice of this microfinance organization reflects acknowledgment of its outstanding overall performance. It also reflects the opportunity BancoSol offers to identify gains and dangers from brisk expansion, given the intensity of the challenges of growth at this organization and the comparative success with which they have been addressed so far. This purpose is accomplished here through a brief evaluation of the history of the organization. In several ways, BancoSol is an excellent laboratory for the exploration of these topics.

What follows draws on the research project *Progress in Microfinance: Lessons from Bolivia* by the Rural Finance Program at The Ohio State University.[5] The purposes of the project are to examine the evolution of five comparatively successful microfinance programs in Bolivia: a private commercial bank (BancoSol), a private, non-bank regulated financial institution (Caja de Ahorro y Prestamo Los Andes), and three non-government organizations (Fundacion para la Promocion y Desarrollo de la Microempresa)PRODEM; Centro de Fomento a Iniciativas Economicas) FIE; and Fundacion SARTAWI.) Given current international standards, such as those in Christen *et al*. (1995), all five microfinance organizations show strong elements of success (Gonzalez-Vega *et al*., 1996).

---

[5] Financial assistance was received from the Organization for Economic Cooperation and Development, the United States Agency for International Development (Mission in La Paz and Cooperative Agreement on Financial Resources Management), Interdizciplinare Projekt Consult in Frankfurt, Germany, and the Department of Agricultural Economics at The Ohio State University. The authors acknowledge this support but are responsible for the results presented here. During the autumn of 1995, the field research team included the authors as well as Guillermo F. Monje, Franz Hochstatter, and Daniel Navajas. Because of limitations of space, only a few results from this project are presented here.

II. BancoSol: The Initial Conditions

Banco Solidario S.A. is a private, fully-chartered commercial bank. After a long gestation based on the earlier success of PRODEM, BancoSol began operations in early 1992. Just as any other bank in the country, it operates under the regulatory framework of the Central Bank and the prudential norms of the Superintendency of Banks and Financial Institutions. What sets it apart from other Bolivian banks is a portfolio built entirely of well-performing microloans. As such, BancoSol is an outstanding example of a financially viable banking venture into microfinance.

Although chartered as a private bank, BancoSol has strong altruistic roots. Among its shareholders are dominant NGO and donor organizations (75 percent of shares) as well as prominent, successful, and politically influential Bolivian businessmen (25 percent).[6] What makes it different from other microfinance organizations is its charter as a regulated private bank and the explicit pursuit of its altruistic mission through a profit-maximizing strategy of commercial viability. BancoSol's shareholders expect profits and they will probably reinvest them in the quest for additional outreach, as they believe that a profitable operation best serves their altruistic goals. The accompanying strong concern for financial viability within its market niche is at the roots of BancoSol's successful performance.

BancoSol's ownership structure emerged from its NGO origins in PRODEM. This microfinance organization began operations in 1987, and its rapid success made the emergence of BancoSol possible. Although PRODEM now owns about one-third of the shares of BancoSol, it has continued its own operations, with a new specialization in rural microfinance.

By 1990 the belief had developed that the sustained growth of PRODEM was constrained by its NGO status and by its lack of access to sources of loanable funds that could be more flexible than the donors.[7] Funds from the market would allow this organization to respond to substantial and clearly identifiable demands for credit and to manage its cash flows better in the presence of strong seasonal variations of such demands (Glosser, 1994). Thus, BancoSol was created as a response to anticipated constraints on the successful growth of PRODEM.

---

[6] International shareholders include several NGOs and public organizations: ACCION International, Calmeadow Foundation, Societe D'Investissement et de Developpement International, Rockefeller Foundation, and Inter-American Investment Corporation. Domestic shareholders initially included one non-government organization (PRODEM) and three private banks, three private firms, and five prominent individuals, including President Sanchez de Lozada. It was on the basis of the reputation of these prominent individuals that the prudential authorities were willing to issue a bank charter to BancoSol.

[7] The USAID Mission, however, had made substantial funds available to PRODEM and wanted to see its loan portfolio grow fast.

When BancoSol was established, PRODEM transferred a loan portfolio of US$ 3,960,000, with about 14,300 active clients, some real estate from its network of urban branches, and a PL480 loan for US$ 850,000 at eight percent per year (Agafonoff, 1994). Additional urban branches were transferred later. The total value of the outstanding loan portfolio eventually transferred was US$ 6,477,029. More importantly, PRODEM transferred to BancoSol several intangible assets that represent initial conditions that gave BancoSol a head start toward success.[8]

Among the important intangible assets transferred to BancoSol were:

(a) a lending technology, proven and improved through the investment of several years of experimentation, development, and adjustment of the program's loan production function;
(b) a stock of information capital, accumulated over several years of working in its market niche and learning to understand the environment and the clientele;
(c) the actual client relationships embodied in a large portfolio of active, well-performing clients;
(d) the human capital embodied in an experienced staff, as a result of costly training and learning-by-doing processes;
(e) a reputation as a serious organization capable of sustaining long-term relationships with its clients;[9]
(f) well-established connections with international networks (particularly ACCION) and the resulting opportunities from technology transfers and sharing of experiences; and
(g) a strong commitment to its mission, resulting from an unusual organizational culture (simmered by the leaders of PRODEM, most of whom moved into BancoSol) as well as the presence of strong shareholders with a clear vision about the role of the organization.

Formalization and upgrading to a regulated bank brought with it additional advantages:

(a) the capacity to mobilize funds in the market with greater flexibility, through either deposits from the public, inter-bank loans, bonds placed in the domestic and international capital market, or access to Central Bank rediscounts and other lines of credit;
(b) any benefits realizable from larger size (scale and scope economies);

---

[8] These intangible assets are a source of implicit subsidies for BancoSol. If properly accounted for, they would increase the organization's subsidy dependence (to be discussed below), as such consideration would raise the amount of equity and thus the level of the opportunity cost of the funds used by BancoSol. The implicit subsidy could have been eliminated had BancoSol paid a higher price for costs of organization and other intangible assets at the time of founding and when additional branches were transferred.

[9] An image of serious concern with repayment and cost-covering pricing was critical for institutional survival in a country flooded with paternalistic NGOs not concerned about their own viability. The subsidized interest rates charged by other organizations and their lack of discipline in collecting loans tended to destroy the credit culture and made the job of serious microfinance organizations more difficult.

(c) the intangible value of a bank charter in a financial market with severe restrictions on entry; and

(d) the protection implicit in more intense, professional, and rigorous monitoring of its financial performance by the prudential supervisor (Superintendency of Banks and Financial Institutions), new lenders (other banks and bondholders), and shareholders (who may have more to lose in terms of reputation after the transformation into a bank).

Even though funds from the market typically carry higher interest rates, shorter terms to maturity, and shorter grace periods than do funds from donors, the overall management of BancoSol's liabilities has become more efficient. Access to the new sources of funds has helped to avoid the high transaction costs and lack of opportune disbursement sometimes suffered during the PRODEM days.

Although mobilizing small deposits is expensive, BancoSol understands the social value of such an undertaking. The organization is in the process of adopting more efficient technologies and procedures to reduce these costs to reasonable levels. It seems that deposit mobilization is a wise investment for this microfinance organization, in terms of the preservation of the long-term relationships with its clientele, of the diversification of its liabilities, and of the independence that comes from commercial sources of funding (Gonzalez-Vega, 1994).

III. Breadth of Outreach

To judge the success of microfinance programs, this paper adapts the criteria of outreach and sustainability suggested by Yaron (1994). Outreach represents the provision of a wide array of financial services to large numbers of the poor.

At least six indicators show that, by Latin American standards, the breadth of outreach of BancoSol is remarkable. First, the average of the monthly loan portfolios outstanding from June, 1994 to June, 1995 was US$ 30 million (Table 1).[10] This outreach indicator reflected very rapid portfolio growth from the date of conversion into a bank through mid-1994, followed by some reduction of the portfolio in 1995, as the organization entered a period of consolidation. From the start of 1992 to the end of 1994, BancoSol's portfolio increased ten times in real terms. This is even more remarkable because the portfolio inherited from PRODEM was already large by Latin American standards.

Second, the annual flow of loans disbursed shows a similar trend, with growth accelerating in 1993-94 and decelerating in 1995. As an indicator of the intensity of its lending activity, BancoSol

---

[10] Averages of monthly portfolios over the year are used to correct for sharp seasonality. These and all other figures reported here are in US dollars, converted from bolivianos of constant purchasing power as of December, 1995, at the December, 1995 exchange rate of 4.93 bolivianos per dollar. This corrects for the impact of domestic inflation and facilitates international comparisons.

disbursed US$ 84 million during 1994, five times more than PRODEM disbursed in the year preceding the creation of BancoSol (Table 1).

Third, portfolio growth reflected a rapid expansion in the number of clients with active loans, from the original 14,300 transferred from PRODEM in February, 1992 to over 60,000 by late 1994.[11] No other microfinance organization in Latin America has a larger number of active clients.[12]

Fourth, the number of loans disbursed each year increased rapidly, reaching 143,037 during 1994 (Table 1).[13]

Fifth, rapid growth allowed BancoSol to add continuously to its portfolio many new borrowers (23,510 in 1993 and 30,021 in 1994). From the start of PRODEM in 1987 to June, 1995, the accumulated number of new clients was 100,539 (Table 1). Almost two-thirds of these clients were still active in the portfolio as of June, 1995, reflecting the development of long-term relationships, based on the value for them of the services provided.

Sixth, BancoSol offers valuable voluntary deposit facilities to its clients. The number of depositors has grown rapidly. Between December, 1994 and June, 1995, the average of the number of outstanding passbook accounts was 29,753. These deposits come mostly from borrowers and have a small average balance (US$ 69). The corresponding total outstanding balance was US$ 2.1 million.[14] Another US$ 3.2 million were generated by 1,049 time deposits, with an average balance of US$ 3,092, probably held by wealthier individuals or institutions, including PRODEM. The addition of voluntary deposit facilities to the supply of BancoSol's microfinancial services represents an important improvement in its quality of outreach.

---

[11] Table 1 shows averages of the monthly number of clients with balances outstanding for the corresponding twelve-month period. For the period ending June, 1995, that number was 59,745. This number of clients is larger than for the other four organizations in the Ohio State study combined (36,589).

[12] Compared to Grameen Bank in Bangladesh and Bank Rakyat Indonesia, however, BancoSol is small.

[13] Given the group-credit technology, the number of loans granted to clients is about four times larger than the number of group-loans processed. At BancoSol, loans are recorded as granted to individuals belonging to particular groups, but some of the tasks of the loan officer relate to working with groups and others to working with individuals. While these distinctions affect the structure of costs, from the perspective of outreach what matters is the number of individual clients reached.

[14] An additional 20,761 clients had compensating balances left over from earlier practices at PRODEM. Although these accounts are now, at least in theory, voluntary deposits, it is not clear that the clients have consciously decided to maintain balances in those accounts.

IV. Depth of Outreach

Depth rather than breadth of outreach connotes success in overcoming the difficulties of selling services to the target clientele. These difficulties are correlated with the poverty of the borrowers. From this perspective, the performance of BancoSol is also remarkable, as reflected by the small average size of loan granted. This average size of loan is just over one-half of the Bolivian per capita gross domestic product.

Moreover, portfolio growth has been associated more with increases in the numbers of borrowers than in the average size of loan balance outstanding. Average balances increased from about US$ 150, in the PRODEM days, to about US$ 250 in the earlier days of BancoSol, and to about US$ 500 in recent years. Similarly, the amount disbursed per loan increased from just over US$ 300 in the early days of BancoSol to over US$ 600 in early 1994, but it declined to about US$ 550 by mid-1995 (Table 1). This increase in average loan balance is one of the dimensions of growth that requires an explanation. It appears, however, that the increases have not been associated with a drift away from the target clientele of the poor.

Although BancoSol's clients are poor, they are not among the poorest of Bolivians. This fact may reflect, among other things, the precondition that the client must have operated an established business for at least one year before applying for a loan. The definition of the target market niche for BancoSol)how small the loans, how poor the clients) has been the topic of constant debate among its owners in their evaluations concerning the organization's mission. There is no doubt, however, that most of BancoSol's clients could never expect to gain access to conventional formal financial institutions and that the clients prefer BancoSol over traditional sources of informal credit. BancoSol can legitimately claim to have expanded the frontier of microfinance.

According to survey data, about 78 percent of BancoSol borrowers are women (Table 2). As a result, only 42 percent of the clients consider themselves as heads of household. This reflects the typical composition of poor households in La Paz and El Alto. In about 80 percent of the households of BancoSol clients, at least three members work, usually in different occupations, in efforts to address risks through activity diversification. A typical household arrangement may be for the men to work in manufacturing or seasonal construction and for the women to work in trade. Frequently, women market the output of their husband's industrial occupation, but they also diversify by marketing other products. Access to BancoSol's loans and deposits facilitates liquidity and risk management for the whole household.

The concentration of women in the portfolio is associated with the concentration of loans for trading. Trading was the main activity of the borrowers interviewed in 63 percent of the cases, while BancoSol's records indicate that 83 percent of the loans in the portfolio were for trading. Thus, the sex distribution of BancoSol's portfolio is not the outcome of specific targeting. Indeed, BancoSol does not target loans to women. Rather, this distribution reflects the predominance of Bolivian women in trading. In turn, the nature of the lending technology, which requires a rapid turnaround of borrower cash flows, leads to the concentration on loans for trade. Rapid turnaround of cash is

needed to allow for the frequent payments required in order to facilitate the monitoring of loan repayment.

The BancoSol clients surveyed operate in the informal economy of La Paz and El Alto. In almost two-thirds of the cases they do not keep written accounts of their revenues and expenses. This in part reflects low levels of education. Only 34 percent of the clients surveyed attended anything beyond primary school, while 33 percent either had no schooling or did not progress beyond the third grade. There is, furthermore, no separation between household and business in almost one-half of the cases (Table 2). Lack of financial statements and of other records constrains access to conventional formal financial services as much as does lack of traditional collateral (Sanchez, 1996). In this sense, the development of a lending technology that can be implemented by a bank but which does not rely on standard financial information and on collateralizable assets is a formidable innovation. This technological progress is at the roots of the outreach achievements of BancoSol.

For sustained implementation of this technology, it would be necessary to further revise Bolivia's prudential regulatory framework. Prudential regulations and supervisory norms are based mostly on ratios of the value of collateral to loan balances and on audited financial statements from the borrowers. A technological revolution in prudential practices is required to match the innovations introduced by microfinance (Gonzalez-Vega, 1996a). For BancoSol, an unusual understanding of the nature of its operations by the Superintendent has allowed much progress, but in the long run this will not be sufficient without legal reforms (Trigo, 1996).

V. Quality of Outreach

Outreach must also be evaluated in terms of the quality of the services provided. Quality is, in turn, mostly reflected in the level of the transaction costs imposed on clients and in the appropriateness of contractual terms for the particular clientele. Borrower transaction costs were not measured for BancoSol's clients, so the present evaluation of the quality of services is based on qualitative observations.

Two conflicting factors influence the quality of BancoSol's services. On the one hand, gains for the borrowers from low transaction costs emerge from several dimensions of the lending technology and the adaptation of BancoSol's services to the needs of its clientele. On the other hand, the group-lending technology introduces transaction costs for the borrowers that do not exist in an individual loan. The costs for borrowers of participating in group loans result from the peer-monitoring efforts required by the joint liability rules. These efforts attempt to avoid the obligation to pay another member's loan, when preventable difficulties are anticipated. Costs also result from the required coordination of the borrowing activities of all group members.[15] These transaction costs and the rigidities resulting from synchronous group transactions reduce the quality of the service provided, but many of BancoSol's clients may have no better alternatives, given the collateral requirements for borrowing elsewhere.

---

[15] This paper cannot resolve the debate about group versus individual lending technologies.

Simple procedures reduce transaction costs for borrowers. For the clients surveyed, on average it takes about eight minutes to reach a BancoSol branch. In addition, procedures have been designed to economize on the client's time. One-third of the clients indicated that an important reason that attracted them to BancoSol was less red tape. Furthermore, the absence of real collateral requirements is a highly appreciated attribute for one-third of these clients. As a result of these features, 91 percent of BancoSol's borrowers surveyed are satisfied with its services (Table 2). There is, of course, additional room for improvement in the quality of these services, and BancoSol has been searching for ways to offer better financial products, including individual loans, to its most advanced clientele.

VI. Loan Products

BancoSol offers its clients a number of loan products as well as three deposit products. Loans are denominated either in bolivianos or in US dollars. Loans in bolivianos are offered for shorter terms to maturity and generally require more frequent payments than loans in dollars. All loans are amortized in equal-size installments, charge interest on the outstanding balance only, and do not require compensating balances. Each of these attributes adds to the value of the contracts. For heuristic purposes, three types of loans in bolivianos are identified, according to payments every week, every two weeks, or every four weeks. Two types of loans in US dollars are identified, according to payments every two or every four weeks.

Loans in bolivianos with weekly repayments are typically for first-time borrowers, and offer four months as average terms to maturity. These loans are granted for small amounts, with a median loan size of US$ 62 and an average size of US$ 82 (Table 3). The weekly repayment averages US$ 5, and the average balance outstanding is US$ 34. The nominal interest rate charged is 4 percent per month, plus a flat up-front fee of 2.5 percent of the loan amount. For the median loan these terms imply effective interest rates of about 6.1 percent per month in nominal and 4.9 percent per month in real terms.

As clients make progress in their relationship with the bank, frequency of amortization may shift to every two weeks or even every four weeks, depending on the occupation and cash flow of the client. For loans with payments every four weeks, terms to maturity may increase to an average of six months and up to one year, average loan size grows to about US$ 103, and the effective interest rate declines to about 5.2 percent per month in nominal terms and 4.0 percent per month in real terms (Table 3). These levels of the real effective interest rates are still quite high, highlighting the importance of further reducing BancoSol's operating costs, as Schmidt and Zeitinger (1994, 1996) have argued for microfinance organizations in general.

Good repayment allows some clients to obtain larger loans, typically denominated in US dollars.[16] Average loan size grows to about US$ 1,000-1,300 and median size increases to US$ 600-

[16] This is a stylized version of actual practice, which does not follow a rigid standard sequence. In general, however, it appears that the terms and conditions of loan contracts improve as the

825. Terms to maturity can increase to a maximum of three years and the effective interest rate can decline to 3 percent per month in nominal terms and 2.5 percent per month in real terms (Table 3).

The average size of loans at BancoSol masks a size distribution made up of a large number (about three-quarters of the total) of very small loans and a smaller number of somewhat larger loans. These diverse products generate different streams of revenues and account for different shares of operating costs. It is likely that the larger loans are more profitable and that, in this sense, they cross-subsidize the cost of making smaller loans. Very small loans are expensive for both the organization and the client, but they may be a necessary investment for both to create the intangible asset of a long-term relationship. They lead to larger future loans and the totality of the relationship seems profitable for the bank. From the clients' perspective, moreover, continued relationships are strong evidence that such access is an improvement over their alternatives, despite the high costs of borrowing from BancoSol.

VII. Sustainability

A viable microfinance organization generates enough revenue over time to cover the costs of all factors of production and funds under its command, while being able at all points in time to honor the contractual obligations implied by its liabilities. This requires the ability to maintain the real value of equity. Organizations that can accomplish this without subsidies for their operational expenses, their liabilities, or their equity are commercially profitable and, therefore, are potentially self-sustainable. Sustainability is important inasmuch as future and not only present outreach matters. Because it underpins perceptions of permanency of the microfinance organization, sustainability generates compatible incentives for all those with an interest in its survival, such as clients, managers, and staff (Gonzalez-Vega, 1994).

Self-sustainability is frequently measured by some variation of Yaron's subsidy dependence index.[17] Under conventional definitions and assumptions, it can be claimed that BancoSol has been independent from subsidy since 1994.[18] Even before BancoSol was created, PRODEM had already made significant progress toward self-sustainability, as its subsidy dependence index declined from

---

organization-client relationship ages. While BancoSol operates on this principle of making loans with more attractive terms to clients with more experience, there are no explicit guidelines about the implementation of this policy.

[17] Yaron's index is defined as the percentage change in the yield on the loan portfolio needed to compensate for existing subsidies.

[18] Under more realistically stringent assumptions, BancoSol may still show a subsidy of US$ 1.19 per loan outstanding per year (Table 4). By international standards for microfinance organizations, these subsidies are very small.

115 percent in 1988 to 18 percent in 1991 (Table 4).[19] That is, while in 1988 it would have been necessary to more than double the yield on the loan portfolio in order to compensate for the subsidies received by PRODEM, just before the transfer of the portfolio to BancoSol in 1991 yields would have had to increase by only 18 percent.[20]

It is important to note that PRODEM decreased its subsidy dependence not by increasing loan interest rates but by reducing operating costs. Likewise, BancoSol decreased average costs through formalization and growth, without increasing the interest rates charged on loans. BancoSol also reduced subsidies by not seeking soft loans nor operational grants.[21] Most subsidy received by BancoSol comes from not earning enough to compensate for the opportunity cost of its equity. This subsidy poses little threat to its viability. The subsidy dependence of PRODEM, in contrast, sharply increased after the creation of BancoSol.

To compensate for all subsidies in 1995 BancoSol needed to generate a real annual yield on its loan portfolio of 27 percent. Given inflation in Bolivia, the required nominal yield was 41 percent and BancoSol was able to produce it (Table 4). The interest rates on loans required to generate this yield may still be high, compared to the marginal rates of return of some microenterprise projects that are attractive in comparison to other investments in Bolivia. Thus, additional outreach is desirable and it will become possible if operating costs fall further. The impact of growth as a mechanism to reduce average costs and the potential limits to this profitability-enhancing role of growth are the main topics of this paper.

VIII. Revenues, Costs, and Returns on Assets

During the process of growth BancoSol had to face two challenges. First, nominal revenues as a proportion of average productive assets declined from 40 percent at the time of conversion into BancoSol to about 33 percent in the last 18 months (Table 5). This reduction in the average yield on productive assets is not surprising. It resulted in part from a portfolio made up increasingly of larger loans, enabled by the good repayment history of experienced clients. These loans, however, generate lower effective interest rates than the smaller loans typical of new borrowers (Table 3).

---

[19] This ignores a subsidy dependency index of 898 percent in the initial year.

[20] This does not mean 18 additional percentage points but rather an eighteen-percent increase of the existing yield level. Thus, if the yield was 46 percent per year in 1991, it should have been 54 percent (0.46 x 1.18).

[21] Computation of the subsidy dependence index for PRODEM did not include the value of technical assistance funded mostly by USAID and provided largely through ACCION International. In the case of BancoSol, this computation did not include the implicit subsidies that may have resulted from the transfer of assets from PRODEM. In addition, a guarantee agreement between BancoSol and USAID enabled the bank to issue bonds. USAID agreed to pay bondholders 50 percent of the loss of principal in case of default, up to US$ 2.5 million.

Furthermore, BancoSol has not received grants to cover operating expenses, unlike PRODEM. Lower average revenues also reflected an increasing share of non-loan assets, such as cash and reserves, which earn lower rates of return than loans. These non-loan assets may be necessary evils of formalization, which entails meeting legal reserve requirements, and of larger organizational size, which increases the costs of funds in transit. After hiring experienced bankers, BancoSol significantly improved its non-loan asset management.

BancoSol had to face a second challenge as it switched from donor funding to market-based liabilities. This switch increased the annual average cost of funds from 4 percent at the time of conversion to the present 12 percent in nominal terms (Table 5). At the end of 1991, about 15 percent of PRODEM's liabilities were deposits, 19 percent were loans from private entities, and the remaining 68 percent were loans from public entities. By the end of 1994, loans from public entities were only 2 percent of total liabilities and equity, deposits were 66 percent, and loans from private entities were 16 percent (Gonzalez-Vega *et al.*, 1996).

Declining average revenues and increasing average costs of funds reduced BancoSol's operating margin by about 13 percentage points. This challenge was met successfully by reducing operating expenses as a proportion of productive assets from 31 percent in 1992 to 18 percent in 1994. As part of this process, the share of operating expenses in total expenses declined from 84 percent at the end of 1992 to 59 percent at the end of 1994. This rapid and substantial reduction in average operating costs enabled BancoSol to reinforce its financial sustainability. As a result, retained earnings continued to represent about 2 percent of average productive assets throughout the whole period (Table 5).

In summary, the development of client relationships with the aging of the portfolio, the formalization of operations, and the switch to unsubsidized funds reduced BancoSol's intermediation margin, but the challenge was met through an even more dramatic reduction in average operating costs.[22] This reduction in operating costs resulted, in turn, from economies of scale engendered by growth of total operations, increases in average loan size, and some increases in average terms to maturity. This allowed the bank to sustain the rate of return on its assets.

Transformation into a formal financial intermediary led to increased funding from the market, via deposits and debt instruments. As a consequence of its bank charter and of its evident success, BancoSol was able to increase the ratio of its liabilities to equity from 1.0 at the end of 1992 to 6.2 at the end of 1994. With a constant rate of return on assets, the rate of return on equity increased sharply, from 4.1 percent in 1992 to 13.8 percent in 1994, reflecting this higher leverage (Gonzalez-Vega *et al.*, 1996).

---

[22] The share of personnel costs in operating expenses remained fairly constant, at about 60 percent, while the share of general administration expenses declined from 31 percent at the end of 1991 to 22 percent at the end of 1994, suggesting possible economies of scale in administration.

Another outstanding dimension of the sustainability of BancoSol are the comparatively low loan arrears and losses. The proportion of the portfolio represented by loans with at least one day of arrears was 4.5 percent at the end of 1994. Only 1.3 percent of the portfolio showed arrears of more than 60 days. Provisions for bad loans represented 3 percent of the portfolio (Gonzalez-Vega *et al*., 1996). These low levels of delinquency are not typical of microfinance organizations, and they reflect both the commitment of BancoSol to the sustainability of its program and the strong incentives for repayment that emerge from its lending technology.

IX. Incentive Structure of the Lending Technology

Given features of the clientele (poor households undertaking highly risky, unstable and informal businesses) and the nature of their loan transactions (small, short-term, non-collateralized), most financial intermediaries find the costs and risks of lending to clients such as those serviced by BancoSol to be prohibitively high (Gonzalez-Vega, 1996b). For many microfinance organizations, losses from lack of repayment and operating costs preclude self-sustainability. In some organizations, inadequate technologies lead to high levels of default, while in others keeping arrears at reasonable levels increases operating costs too much. BancoSol has been able to strike a balance between costs and risks at a level that allows self-sufficiency mostly by refining a lending technology appropriate for its market niche.

The strength of BancoSol's lending technology is reflected in a potent set of incentives to repay that can be implemented at comparatively low costs to the organization.[23] These low costs reflect, rather than intensive screening and monitoring, emphasis on contract design and contract enforcement.[24] First, the frequent emphasis by BancoSol in communications with its clientele, corroborated by common experience among the clients, that borrowers obtain access not just to a single loan but rather to a long-term relationship with a reliable and permanent lender, is a strong incentive. The value of this relationship is high, given its expected duration, the existing borrowing alternatives for a typical client, and the features of loan contracts described below.

Second, these incentives include the sequential and substantial improvement in the terms and conditions of loan contracts for well-performing clients. In effect, borrowers with impeccable repayment records not only have access to increasingly larger loans, but also to longer terms to

---

[23] This section describes features of the technology that may contribute to BancoSol's success. It does not address dynamic questions about the appropriateness of the technology for an evolving clientele, nor does it compare it to alternative technologies.

[24] The general principles represented by these incentives are incorporated in other successful microlending technologies, even when they use a different mix of activities to evaluate creditworthiness and to enforce loan contracts.

maturity and less frequent repayments.[25] These changes in turn imply a significant reduction in effective interest rates and in borrower transaction costs. This contract design introduces potent incentives, as the quality of the credit service substantially improves with the aging of the client-organization relationship. Even a few days of arrears, moreover, are sufficient to delay progress of a given client along this sequence. This is a strong incentive for punctuality.

Third, BancoSol can monitor borrowers cheaply on the basis of frequent repayments, mostly through the immediate verification of arrears for the group. Loan officers do not make costly, deliberate visits to the borrower unless a problem has been detected. Instead, these trips are triggered by missed repayments, about which the loan officer is informed within one day. Moreover, given that BancoSol will not accept any payment from a group or any individual in the group unless the payment is enough to cover the entire amount owed by the whole group, group members are enlisted to monitor each other. To facilitate this delegated peer monitoring they are required to work close to each other.

Fourth, timely disbursements increase the value of the client-organization relationship by reducing borrower transaction costs. Applications from new borrowers are processed within a few days; there is no interruption of service for repeat borrowers because applications for additional loans are received and processed before the earlier loan becomes due. Simple procedures, adapted to the clientele, also lower transaction costs.

Fifth, demanding no more loan security than joint liability among group members represents an additional determinant of the high value of the relationship with BancoSol, at least for those clients who would not be able to offer the collateral required by other lenders. It is this feature of the technology that makes it possible for BancoSol to expand the frontier of microfinance by reaching a clientele that may not have better options.

Joint liability *per se*, however, does not guarantee repayment, as the incentives that it creates have ambiguous impacts on the group members' willingness to repay (Besley and Coate, 1995; Chaves, 1996). This results from two opposing externalities. In one case, non-defaulting members undertake repayment for defaulting members or harass delinquents to avoid the loss of their own relationship with BancoSol. In the other case, default by some members prompts default by others if the cost of repayment of the defaulter's loan are higher than the value of the relationship. Repayment depends on the stability of the groups, which may be enhanced or threatened by these conflicting effects. Understanding the net balance between these effects in the case of BancoSol would require additional research. The fact is, however, that loan arrears and losses have been very low.

---

[25] As the clients progress, they may begin to demand a quality of services that may not be possible within the group-lending technology. This represents one of the most difficult challenges faced by BancoSol.

The inevitable contract rigidities that accompany group borrowing may further reduce the value for the client of this relationship. These rigidities include, among others, the need for synchronous terms to maturity and repayment schedules, as well as the need to participate in group meetings. Joint liability may thus represent comparatively high costs and risks for borrowers who could otherwise have access to individual loans. Thus, to the burdens of joint liability must be added the inconvenience costs for the client from group credit.[26]

Sixth, the highly personalized service offered to the clients represents an additional powerful incentive for repayment. A long-term personal connection is developed between the loan officer and the borrower and powerful informal incentives to fulfill contract commitments emerge from this bond. A similar personal allegiance (which may already exist) is further strengthened among the members of a borrowing group. Moreover, BancoSol has been successful in culturally adapting its operations and personalizing the organization's image.

Seventh, contract enforcement is also enhanced by the credibility of the threats of penalties in case of lack of fulfillment of loan obligations. This credibility emerges from:

(a) the immediate reaction to arrears (as early as the next day), followed by both loan officer and group involvement in the search for a solution;
(b) interruption in the sequence of improvements in contract terms and conditions, as a consequence of arrears;
(c) denial of future loans for the whole group in case of default; and
(d) the sharing of information on default among microfinance programs, which prevents delinquent borrowers from switching to other organizations.

This discussion reveals ways in which BancoSol's lending technology has attempted to resolve difficult problems typically associated with microfinance (Gonzalez-Vega, 1996b). Its comparative success suggests that these solutions have been achieved at reasonable costs for both lender and borrowers, and this helps explain remarkable outcomes in terms of outreach and sustainability. The discussion has also suggested unresolved issues and new challenges, including the prudent management of growth.

---

[26] The paper does not claim that group credit is superior to individual loan transactions nor that group joint liability is the key determinant of BancoSol's success. There are important advantages to the client (and presumably to the organization) from individual transactions. As reported by Gonzalez-Vega *et al*. (1996), Caja Los ANDES and FIE have been able to show as good or even better repayment indicators as BancoSol, while still operating with individual clients. The argument here is only that, for a given subset of clients, the opportunity to borrow even if they do not possess collateralizable assets enhances the value of their relationship with BancoSol and thus contributes to repayment through this route, rather than via the peer-monitoring effect emphasized elsewhere (Stiglitz, 1990). Increased competition in the market challenges BancoSol to improve the quality of its contracts beyond the constraints of group credit in order to protect the loyalty of its most advanced clientele.

X. Determinants and Consolidation of Success

Several features of its organizational design and technological development have contributed to BancoSol's achievements. First, since BancoSol's creation its leaders have been deeply concerned with the organization's financial viability. This attitude was reinforced by the confirmation of its own success. In practice, this attitude gradually led, through a process of search for formalization, to self-sustainability. This concern was reflected, among other things, in the adoption of interest-rate policies that sought to cover the costs of lending and in a resolute attitude toward loan collection. Since the very beginning, BancoSol explicitly told its clients that it expected loans to be repaid.

Second, over the years the organization developed a lending technology appropriate for its market niche. This allowed it to provide financial services to a clientele that other intermediaries find difficult to reach and to do so cost-effectively for both the organization and the borrowers. The success of this technology has been reflected in low rates of arrears and default.

Third, there was a fruitful investment in experimentation and learning during the PRODEM period. Success in the development of a microfinance program rests on the accumulation of knowledge and experience about the environment in which it operates, relevant features of the clientele it serves, the individual creditworthiness of heterogeneous clients, and the comparative advantages of its own technology. This success requires constant fine-tuning and adjustment of the technology to varied local circumstances. External assistance mostly from ACCION, funded by USAID, was crucial for this purpose.

Finally, the transformation from NGO into a formal financial intermediary also contributed to BancoSol's success. It is safe to claim that, even if PRODEM had remained a successful NGO, it not would have achieved the levels of outreach and sustainability that upgrading made possible for BancoSol. The accumulated tangible and intangible assets of PRODEM, moreover, gave BancoSol a head start. Had this organization started from scratch, it would have taken much longer to reach the present levels of profitability and self-sustainability. This must be recognized in any discussion about replication of BancoSol's success.

Moreover, if learning effects are important in microfinance, it may not be advisable to be born large. Gradual growth from small origins may be a preferred strategy. This may allow for experimentation by trial and error while ensuring that mistakes are not extremely costly and that corrections are possible without leading to disintegration of the organization (Chaves and Gonzalez-Vega, 1996). The organization must also acquire the tools to deal with future problems effectively.

BancoSol's transformation into a formal financial intermediary consolidated this process of improvement in outreach and sustainability. Formalization as a bank made possible more flexible access to loanable funds. This relaxed the constraint experienced by PRODEM and encouraged a rapid expansion of the loan portfolio. So far this growth, critical for BancoSol's improved outreach performance, has been compatible with self-sustainability.

Growth has not been easy to manage, however, and opportunities for further growth at the rapid rates of the recent past may encounter severe limitations. Partly in recognition of the threats raised by pressures on arrears and on internal control mechanisms and partly in recognition of the emerging tensions between the existing culture and the new organizational structure required by rapid growth, during 1995 BancoSol reduced its rate of expansion. Instead, it focused on improving its financial management, refashioning its information systems, and redesigning its organizational structures.

XI. The Challenge of Growth

The recent experience of BancoSol highlights the costs and benefits of a process of very rapid growth and suggests the nature of potential internal and external limits to gains in productivity and profitability that usually accompany growth.

The evolution of this organization can be divided into two stages, each one characterized by a dominant limit to growth. During the first stage (PRODEM period), growth was liability-constrained. Even at the high rates of interest needed for sustainability, a substantial demand for its credit services had been identified and a cost-effective technology had been developed. Because of the NGO status of the organization, however, access to loanable funds was limited to donor finance. Moreover, its NGO status limited the extent to which equity could be leveraged with additional liabilities mobilized in financial markets (Rosenberg, 1994). Additional complications emerged from high seasonal variations in cash flows. Access to short-term money markets would have allowed a more efficient management of these cash flows.

Constraints thus emerged from the lack of flexibility of donor funding, lack of credibility of the microfinance organization due to the absence of a regulatory framework to protect potential lenders against its insolvency or illiquidity, and limited leverage, due to the absence of a bank charter to mobilize deposits from the public. The resulting inability to grow and serve the clientele as desired frustrated PRODEM's leaders.[27] To a large extent, these constraints were removed with the creation of BancoSol and the accompanying formalization.

The second stage (BancoSol period) is characterized by the threats of growth on asset quality and by the diminishing marginal economies of size and the resulting limits on opportunities to increase productivity as a consequence of growth. These limits are a challenge for microfinance organizations and are reflected in the evolution of key productivity and efficiency indicators.

XII. The Evolution of Efficiency

Efficiency is defined here as the amount of outputs per unit of cost. Costs are defined as expenses recorded in the organization's accounts along with any unrecorded expenses or implicit

---

[27] Limited access to funds in the early stages of the organization may not be a curse, however, if learning and experimentation are critical in the achievement of self-sustainability.

subsidies. Outputs of a microfinance organization may be the amount of the loan portfolio or the number of loans outstanding or the number and amount of loans disbursed.

Productivity, in turn, is defined as the amount of outputs per unit of input. Inputs may be expressed in units such as branches, loan officers, or dollars of assets. The evolution of productivity helps understand changes in efficiency, and efficiency directly influences profitability.

The most critical indicator of efficiency is the average portfolio outstanding per unit of cost: portfolio efficiency. This is measured as the monthly average portfolio outstanding divided by total economic costs, which include the organization's total expenditures, subsidy from not paying the total opportunity costs of its liabilities and equity, and other grants. Per each $100 of cost, this indicator increased from 43 for 1987, during the early PRODEM days, to 140 by 1991, before the transformation. During the BancoSol period, this indicator increased from 167 in 1992 to 224 in 1994 (Table 6). These efficiency measures mean that in 1987 it cost $ 2.35 to keep an average balance of $ 1.00 in the portfolio for a year, but that this cost had declined to $ 0.72 by 1991. In turn, to keep $ 1.00 in the portfolio cost $ 0.60 in 1992 and $ 0.45 in 1994.

The sustained growth of portfolio efficiency reflected by these ratios allowed BancoSol to - reduce its average portfolio costs sufficiently to remain profitable in the face of declining average revenues and of increasing costs of funds. To understand how this achievement was possible, it is necessary to examine the evolution of some components of this indicator.

Portfolio efficiency, measured as the ratio of the outstanding portfolio with respect to costs, can be expressed as the product of the number of loans per unit of cost (transactions efficiency) times the average size of loan balances outstanding:

Portfolio efficiency = (transactions efficiency) x (loan size)

$$L/C = (N/C)\ (L/N) \qquad \textbf{(1)}$$

where L is the total portfolio outstanding, C are total costs, and N is the number of outstanding balances. Improvements in portfolio efficiency can then be interpreted as a result of increases in the number of loans outstanding per unit of cost or of increases in loan size.

Increases in loan size dilute fixed costs over a larger balance outstanding. Transactions efficiency reflects improvements in physical productivity, that is, in the number of transactions carried out at a given level of total expenditures. Increases in transactions efficiency can be achieved by several means, including a lengthening of the average term to maturity of outstanding loans. This allows fewer procedures per outstanding balance over a period of time.

Two periods can be identified with respect to changes in transactions efficiency. During the PRODEM period, the monthly average number of loans held in the portfolio per US$ 100 of economic cost increased from 0.34 in 1987 to 0.80 in 1991 (Table 6). During this period, the number

of loans grew more rapidly (34-fold) than total costs (14-fold). This meant that the annual cost of holding one loan in the portfolio declined from US$ 292 in 1987 to US$ 118 in 1991.

During the BancoSol period, however, the number of loans per US$ 100 of cost steadily declined, from 0.67 in 1992 to 0.41 in 1994 (Table 6). This represented a reduction in transactions efficiency, and the cost of holding one loan in the portfolio increased from US$ 149 in 1992 to US$ 242 in 1994. This was due to costs increasing 4.8-fold, while the number of loans grew only 2.8-fold.[28]

XIII. Increases in Loan Size

BancoSol's portfolio efficiency improved steadily, despite reductions in transactions efficiency. This result was possible because of increases in average loan balance outstanding. These increases began in the PRODEM period, when average balance increased from US$ 124 in 1987 to US$ 162 in 1991, and then persisted during the BancoSol period, when loan balances increased from US$ 250 in 1992 to US$ 542 in 1994 (Table 1).[29] If it was this rise in average loan balance that allowed BancoSol to remain profitable despite reductions of transactions efficiency, it is important to examine the sources and consequences of growth of loan size as well as the causes of the decrease in transactions efficiency.

There are at least three reasons why loan sizes increase throughout a microfinance organization's life:

(a) policy-induced increases, due to changes in the loan-supply criteria adopted by the organization as a response to threats to its sustainability or redefinitions of its market niche. These increases may reflect the search for wealthier clients who, *ceteris paribus*, demand larger loans than poorer clients;
(b) information-induced increases, as accumulated knowledge and experience in the market and revised perceptions of risk make it possible to increase the initial loan size and/or accelerate the growth of loan size for additional repetitions along the sequence for a client with a given, imperfectly observed repayment capacity and level of poverty; and
(c) client-induced increases, as individual customers grow and both improve their repayment capacity and demand larger loans. For the organization, the maturing of its portfolio increases the share of these established clients among the total number of borrowers.

Client-induced and information-induced increases in loan size are not in conflict with outreach objectives, but policy-induced increases may be associated with mission drift. That is, if loan size

---

[28] The reduction in transactions efficiency was even more pronounced when measured with respect to numbers and amounts of loans disbursed. The cost per loan disbursed increased from US$ 49 in 1992 to US$ 93 in 1994 (Table 6).

[29] At the same time, the average amount disbursed per loan increased from US$ 156 in 1987 to US$ 317 in 1991, and from US$ 409 in 1992 to US$ 588 in 1994 (Table 1).

increases (due to the information effect) for a client with a given repayment capacity, the wealth of the given client is unchanged.[30] Also, if loan sizes increase because the borrowers are getting better off, this effect simply reflects the materialization of the desired wealth-increasing progress of the target clientele. Policy-induced increases in loan size may in some cases reflect departures from the organization's original mission and target clientele.

Policy-induced increases are usually reflected by changes in the average amount disbursed to new clients in a given year. Information-induced increases result in amounts disbursed which increase rapidly after the first few loans, but that later on grow more slowly as loan size approaches repayment capacity. Client-induced increases are reflected by continued growth of loan size after several loan cycles, when supply matches demand closely and demand growth causes the changes.[31]

In the case of BancoSol, although there were policy-induced increases in loan size when constraints on the liability side were removed, most of the expansion of the portfolio appears to reflect client-induced and information-induced increments in loan size. This result is consistent with sustained attention to the same market niche and does not represent a deviation from the organization's initial mission to assist the poor. Furthermore, increases in loan size as the client-organization relationship evolves are critical to sustain strong incentives to repay. In this sense, opportunities for increasing loan size are needed for sustainability and greater outreach over time.

The size of the first loan disbursed to a new client increased rapidly in the early days of BancoSol and later decreased to almost the original level. For a sample of 259 borrowers surveyed, the average size of their first loan increased from $ 96 in 1991 to $ 170 in 1994, but then decreased to $ 108 in 1995 (Table 8). A similar behavior was observed for each additional (second, third) loan. These changes in loan size, controlling for the number of repetitions, reflected policy revisions to the extent to which, after the transformation into BancoSol, the organization felt that it could make larger loans to its clients, once it had overcome the liquidity constraints typical of the PRODEM period. This attitude was revised in 1995, and loan size decreased to historical levels.

Changes in policy were also reflected by an increase in the dispersion of loan sizes. That is, loans to larger customers grew even faster than the rest. Reductions in loan sizes in the most recent year also reflected policy revisions, as BancoSol prudently responded to the increasing pressures on

---

[30] For example, if a client in the target group has a repayment capacity of US$ 450, but BancoSol starts at US$ 150 because it does not know enough about that repayment capacity, and then increases loan size to approach US$ 450, this does not mean that it is leaving the target clientele behind. Over time, as the organization learns more about the characteristics of its clientele, this generic information may also induce an increase in first-loan size (e.g., to US$ 200) for the same type of client.

[31] The figures are interpreted here on the basis of these non-testable assumptions, as repayment capacity is not known to the researchers and is only imperfectly observed by the lender.

loan arrears and losses that accompanied earlier increases of loan sizes, by becoming more cautious with its clients at all stages of the evolution of the organization-client relationship.

Growth of loan size with each repetition has been particularly rapid for the earlier repetitions. For the sample, on the average the second loan was 70 percent larger than the first, the third loan was 58 percent larger than the second, and the fourth loan was 41 percent larger than the third. This suggests that the information effect dominates the earlier growth of loan size. The rate of growth of loan size was 22 percent for the fifth loan, however, and between the fifth and the sixth loan it was only 5 percent. This suggests that the repayment capacity ceiling was being approached at about this time. Beyond this level, loan sizes increase mostly in response to demand growth due to client success.

By making it possible to dilute fixed costs, larger loan sizes increase portfolio efficiency. At BancoSol, the average balance for individual clients increases with additional repetitions. The average number of members in a borrowing group tends to decline over time, however, which has a negative impact on efficiency. Declining group size affects efficiency because some of the activities of loan officers deal with groups rather than individual clients. As of September, 1995, almost 58 percent of the groups had four members, 27 percent had less than four, and 16 percent had 5 to 9 members (Gonzalez-Vega *et al*., 1996).

To the extent that some of BancoSol's larger clients are attracted by more appealing contract terms and conditions offered at other microfinance organizations, the bank may be losing some of its most profitable clients to growing competition in the market. When they are willing and able to offer collateral, these customers may be attracted by the opportunity to obtain individual loans at lower interest rates.

XIV. Extensive and Intensive Growth

Portfolio growth may reflect two different processes:

(a) extensive growth, the result of increased installed capacity, leading to a larger organization and more sources of fixed cost, such as headquarters, branches, or loan officers; and

(b) intensive growth, the result of increased productivity of existing capacity, such as larger balances and/or numbers of loans per branch or per loan officer. Intensive growth results from technological innovation, from increased efficiency due to more effective incentives for staff performance, from learning and the accumulation of experience, from externalities due to having done a good job in the past, and from improved capacity utilization (economies of scale) either through larger numbers of loans or increased loan sizes.

Extensive growth can have a negative impact on the organization's productivity, for at least four reasons. First, indivisible additions to existing installed capacity (larger headquarters, new branches, new employees) typically reduce the organization's average productivity until the new capa-

city is fully utilized. New units cannot start at full capacity. For example, a new branch with the same fixed costs as an old branch has few borrowers to dilute costs initially.

Second, not all branches are equally productive, even after their installed capacity is fully utilized. The reason is that age of branch matters for productivity. To the extent to which learning effects matter, older branches are, *ceteris paribus*, more productive. Not only does it take time for a branch to reach capacity utilization, but the passage of time itself increases productivity, as information is accumulated and lessons are learned from experience.

Third, not all branches are born equally productive because location matters for branch productivity. Market potential declines as the microfinance business moves from prime locations, densely populated with flourishing microenterprises, toward marginal locations. The number of potential borrowers is less, their wealth is smaller, and the risk-adjusted returns from their enterprises is lower at marginal branches, even at full capacity utilization. Given fixed costs of branch operation, new but thinner markets reduce average productivity.

Fourth, communication costs increase as the organization expands across space, and headquarters finds it more difficult to monitor decentralized branches. These costs compensate some of the gains from economies of scale.

Extensive growth via recruiting additional loan officers also tends to reduce the organization's productivity because loan officers need time to develop their own clientele. Accumulating a complete loan portfolio requires about nine months. To the extent to which on-the-job learning matters, more experienced loan officers are more productive than the new ones. Further, the average level of skills of loan officers may decline with rapid recruitment. Finally, loan officers assigned to marginal locations must deal with a more difficult market.

Because of these Ricardian consequences of increases in the number of branches and the number of loan officers, the organization's overall average productivity will tend to decline every time a new branch is created or a new loan officer is hired. Much of this reduction in productivity will be temporary, until full capacity utilization is achieved at the new branch, but some will be permanent, as a consequence of smaller market potential at the new location. The larger the organization already is, however, the smaller the negative marginal impact on average productivity of the new branches or loan officers will be, because the reduction will be diluted over a larger base.

The general trend under extensive growth appears to be for branch productivity to decline over time, as smaller branches are created in marginal areas, and for loan officer productivity to reach a natural limit. This potential limits to growth represent a challenge that the organization must address by improving productivity via intensive growth. Extensive growth may make it possible, however, to further dilute the costs of the national headquarters and of other organization-wide functions, thus reducing average costs, as long as the resulting economies of scale are not offset by the diseconomies of communication and internal control that eventually emerge in large organizations.

BancoSol has experienced rapid extensive growth. In the five years before the transformation, PRODEM grew from one branch to four. In the four years after the transformation, BancoSol grew from 4 branches to 32. There was an exceptionally rapid creation of new branches in 1993 and 1994. Similarly, the number of employees increased from 13 to 97 during the PRODEM days and continued to grow at BancoSol, reaching 302 in 1995 (Table 7). The proportion of the total number of employees who are loan officers remained fairly constant at about two-thirds. The number of loan officers increased from 6 to 54 (1987-1991) and from 59 to 183 (1992-1995).

Following transformation into BancoSol, rapid expansion of the branch network brought with it some of the negative consequences of extensive growth on average productivity. Between 1987 and 1991, the average value of the monthly portfolio outstanding per branch had increased from US$ 69,150 to US$ 905,669. As shown in Table 7, growth of the portfolio outstanding per branch has been modest since the creation of BancoSol. Measured as the annual amount disbursed per branch, productivity increased from US$ 586,668 in 1987 to $ 4,662,133 in 1993, but it steadily declined afterwards, to US$ 2,797,648 per branch in the twelve-month period ending on June 30, 1995. The lower level of disbursement per branch was compensated by some increase in the size and terms to maturity of the loans disbursed.[32]

These reductions in branch productivity would be a cause of concern to the extent to which large volumes of operations may be necessary to dilute the fixed costs of creating and operating a branch. How critical this is depends on the level of fixed costs of operating a branch, including security, office space, salaries, and equipment. Similar trends are observed with respect to BancoSol's employee-and-loan-officer productivity.[33]

In summary, while growth during the PRODEM period was mostly intensive, growth during the BancoSol period has been mostly extensive. This allowed the organization to significantly improve its outreach, but it resulted in a slow growth of portfolio productivity per branch. Because the cost of operating a branch has not declined, extensive growth has tended to dampen efficiency and profitability. Because the cost of hiring loan officers and other employees has increased, these trends have dampened efficiency and profitability. This is a serious problem if productivity gains peter out before the organization reaches self-sustainability, but BancoSol has already become self-sustainable. Moreover, as emphasized above, reductions in productivity and efficiency do not necessarily represent poorer management. Instead, they may represent diminishing marginal gains from larger size and,

---

[32] The decline of transactions productivity per branch was even more pronounced. The annual number of loans disbursed per branch increased from 3,758 in 1987 to 14,686 in 1991 and steadily declined to 4,871 in the twelve-month period ending on June 30, 1995 (Table 7).

[33] The number of balances outstanding per loan officer increased from 87 in 1987 to 346 by 1991. This indicator increased to 351 in 1994, but it declined to 326 for the twelve-month period ending on June 30, 1995 (Table 7). Despite declines in portfolio and transactions productivity per employee and per loan officer, however, BancoSol's levels of productivity are high compared to other Latin American microfinance organizations.

therefore, the consequences of the limits to growth. The challenge is to offset these trends with additional innovations, a task that the management of BancoSol understands.

XV. Growth, Culture, and Structure

Since the creation of PRODEM and then as BancoSol, the organization has cultivated an idiosyncratic and unusually effective culture. This informal culture prevailed over PRODEM's formal structures. Indeed, to the extent the organizational structure was formally defined, it was fairly simple and flat. Instead of a rigid hierarchy, there was a conscious investment in the development of highly personalized relationship. This presumably resulted in a strong set of personal motivations, despite the absence of explicit pecuniary incentives, as well as in a climate receptive to innovation, clear commitment to the organization's mission, and a style of self-management that emphasized recognition of individual contributions to the team's effort. This culture was well-adapted to the nature of the semi-formal lending technology and to the features of the clientele.

During the PRODEM period, personal affinity and informal attachments may have contributed to high staff productivity and low operating costs in ways that are only possible in a small organization. An ardent and charismatic leadership promoted the development of a strong organizational ideology and encouraged devotion to an appealing goal: outreach via commercial viability. The approach, based on personal trust, applied both to the relationships among the staff within the organization and to those between the loan officer and the client. Threats of waste and instability emerged from continued informality, however, when the organization grew rapidly into a large, regulated financial intermediary.

The organization has believed, moreover, in the importance of consistency between its personalized culture, based on trust, team work, and peer monitoring among branch employees, and its personalized lending technology, based on trust in the client and peer monitoring among borrowers in the group. Because this consistency is believed to be an essential determinant of BancoSol's success, there has been concern that any transformation and depersonalization of the organization's culture may lead to reduced efficacy of the lending technology. Because much of the success of BancoSol is due, however, to the structure of incentives embedded in the lending technology and its commitment to self-sufficiency, as described earlier, these changes may not necessarily threaten the organization.

Rapid growth has introduced tensions in this system, nevertheless, in reflection of the agency problems that typically emerge as organizations grow.[34] A stronger foundation and scaffolding

---

[34] Agency problems emerge when those who devote resources to a particular purpose (the principals) surrender partial control over those resources to those in charge of implementing the purpose for them (the agents). Because the agents have their own objectives, the principals need to monitor and constrain their behavior to make sure that the original purpose is achieved. As the organization grows, there is a reduced ability of BancoSol's board of directors (the principals) to monitor at low cost and to constrain effectively the behavior of central

became necessary to sustain the larger organization; the links between the different parts of the system had to be defined more formally, and the lines of command and channels of communication had to be strengthened. Experienced businessmen in the Board of Directors perceived this need and a process of adjustment has been implemented during the past year.[35] The ensuing ideological debates within the organization have been both intense and fruitful. After transformation into BancoSol, PRODEM's original executive team (the visionaries) was complemented with experienced bankers and professionals in the management of human resources, assets and liabilities, information systems, and operations (the bankers).

With growth then came the challenge of how to move from the original informal culture to the new and more formal structure, without reducing the quality of service to the clientele and destroying the unified vision that has guided the organization in its evolution. High quality of service protects the value of the organization-client relationship, the most important determinant of repayment and, therefore, of the organization's self-sustainability. The challenge has been how to use an increasingly formal system to provide an inevitably quasi-informal service to a clientele that highly values personalized treatment and is bound by implicit rather than highly formalistic contracts.

The search for a solution has recognized the need to balance, on the one hand, the need to solidify the formal structure, for the sake of efficiency inside the organization, via effective information flows, decision-making processes, security, and communications, and, on the other hand, the need to preserve the personalized culture of contact with the clientele outside the organization in order to sustain the incentives that result in low costs and low risks in lending.

Moreover, the heterogeneity of the clientele makes it difficult to adopt uniform standards for the development of the organization-client relationship. Given this heterogeneity, it is impossible to anticipate all situations, and portfolio management will always require the discretionary decision-making of loan officers. Decentralization introduces problems both in measuring and in encouraging staff performance. The PRODEM-BancoSol tradition has been to encourage efficient staff performance via peer monitoring, a natural counterpart to the peer monitoring mechanisms used as part of the lending technology. The large size of the organization and the greater distance among decentralized units (such as branches opened in remote parts of the country) and between regional and central offices have multiplied, however, the dangers of poor communications and inadequate oversight.

---

and regional offices and the bank's staff (the agents). Formal structures for internal control and formal incentives for improved staff and management performance must then be created.

[35] This was one instance when the presence of private bankers in the ownership of the organization may have been important. These entrepreneurs recognized the need for more effective internal control mechanisms and better managerial skills to face the challenges of operating as a regulated commercial bank. Other owners in the board played, in turn, the role of guardians of the mission, making sure that adjustment did not move BancoSol away from the target clientele.

To address these challenges, the divisions of the central office have been redesigned as service units responding on demand to the rest of the organization. The concept of self-management has been redefined from a culture of "do as you like" to a system of "do well what you have been asked to do." This has paved the way to the introduction of performance indicators and the design of a pecuniary incentive system based on employee and branch performance.[36] Introduction of these incentives may be critical to encourage productivity growth on the intensive margin, through more efficient effort on the part of the staff. In view of the limits to growth identified above, increased productivity is crucial.

In summary, rapid growth and large size have forced BancoSol to revise its original organizational design. Private owners in the board of directors, concerned with their reputation and the safety of their investment, have taken an active role in promoting key managerial reforms and in providing tighter internal control. Altruistic owners have insisted, in turn, on preserving the integrity of the original mission, as the only justification for the investment of public sector funds in a private bank. Among the executive staff, the visionaries from the PRODEM stage have become guardians of the consistency between organizational design and lending technology, while the bankers brought in by the board have been able to use their sophisticated professional skills in a more effective pursuit of the original mission. Only time will tell how successful this unique combination will be.

XVI. Conclusions

This paper has illustrated the comparatively successful performance of BancoSol in terms of outreach and sustainability, has identified likely determinants of such success, has examined the process of rapid growth of the bank's operations, and has evaluated the organization's responses to the challenges posed by rapid growth. This concluding section attempts to derive some general lessons for microfinance organizations about how best to address the challenge of reaping the gains from large size while avoiding the dangers from the acceleration of growth.

Although BancoSol's clients are poor, not all of them are among the poorest of Bolivians. There is no doubt, however, that many of its clients could never expect to gain access to conventional formal financial institutions and that they prefer BancoSol over traditional sources of informal credit. BancoSol can legitimately claim to have expanded the frontier of microfinance.

BancoSol's success in terms of outreach and sustainability can be attributed, among other things, to the strong concern of its leaders with the financial viability of the organization, including the adoption of cost-covering interest-rate policies and a firm commitment to enforcing loan repayment. Success can also be attributed to the development of a cost-effective lending technology that is appropriate for the target clientele, because it is based on the accumulation of information and experience about the organization's market niche and about its individual customers. The high value

---

[36] In the design of these incentives, BancoSol has been careful in assigning appropriate weights to individual as well as team performance at the branch, regional, and national levels. This has reflected an effort to promote both local and global improvements in performance.

of the organization-client relationships that were cultivated was further enhanced by the clear intention of permanence that was signaled by formalization as a private commercial bank.

In turn, success of the lending technology has resulted from a potent combination of incentives to repay that have been embedded in long-term implicit contracts with the clients. These contracts can be implemented at low costs to the organization and also result in low transaction costs for the borrower. The possibility of obtaining improving terms and conditions with successive loans adds value to the organization-client relationships that are at the core of the bank's strategy. At least for the clients that continue purchasing its financial services, these terms and conditions are sufficient to compensate them for the added costs and risks of the joint liability required of the borrowers in each group.

Rapid growth at BancoSol has been based upon some unusual initial conditions, represented by the stock of tangible and intangible assets accumulated during the PRODEM stage. These intangible assets included information capital in the form of a lending technology, knowledge of its market niche, and organization-client relationships as well as the experience of its human capital at all levels of the organization. It takes time to accumulate these assets.

From the head start made possible by these initial conditions, BancoSol managed to grow rapidly, due to formalization into a regulated financial intermediary. Upgrading increased its capacity to attract loanable funds and to manage its liabilities with greater flexibility. Indeed, further growth of PRODEM had been constrained by limits on the management of its liabilities that were removed with the creation of BancoSol.

Formalization, however, was not costless, introducing difficult second-generation adjustments.[37] The switch from donor funding to market-based liabilities significantly increased BancoSol's average cost of funds. At the same time, the maturing of the portfolio and the emergence of non-loan assets reduced the average revenue earned on productive assets. BancoSol responded to the challenge of a substantial reduction in its operating margin with an impressive reduction in average operating expenses. The behavior of operating expenses resulted, in turn, from a number of either conflicting or complementary trends.

Decreasing average operating expenses reflected improvements in portfolio efficiency, measured as portfolio outstanding per unit of economic operating cost. Average economic costs had been US$ 1.72 in 1987 and had declined to US$ 0.63 by 1991, just before the transformation. This

---

[37] This discussion ignores the additional operational costs that result from the reporting requirements levied on regulated financial intermediaries by the Central Bank and the demands for additional formal administrative structures that result from application of the banking regulatory framework. It also ignores the constraints on portfolio composition (e.g., risk categories) and the associated costs (provisions for bad loans) that emerge from the norms enforced by the prudential supervisor.

average cost further diminished to US$ 0.42 in 1994 (Table 6). This reduction is difficult to achieve in any microfinance organization.

Increased portfolio efficiency, however, was the result of two opposing forces: decreasing transactions efficiency and increasing loan size. The cost of keeping a client's balance in the portfolio for a year increased from US$ 149 in 1992 to US$ 242 in 1994, in reflection of the Ricardian limits on the productivity-enhancing impact of growth. The cost per loan disbursed increased from US$ 49 to US$ 93 during the same period. The impact on costs was only partially compensated by some increase in average terms to maturity.

Reductions in transactions efficiency reflected, in turn, a shift from intensive to extensive growth. While growth during the PRODEM period was mostly intensive, resulting from gains in productivity and from increasing capacity utilization, growth during the BancoSol period was mostly extensive, resulting from rapid additions to the branch network. Accelerated creation of new branches and the accompanying hiring of new loan officers halted growth of average productivity or even decreased it. Smaller branch portfolios made it harder to dilute the fixed costs from branch operations, while the number of transactions per loan officer stopped growing. Thus, while extensive growth made major increases in outreach possible, the Ricardian limits to growth tended to dampen efficiency and profitability growth.

Thus, it was the increase in average balance outstanding that allowed BancoSol to reduce its average operating costs, despite reductions in transactions efficiency. Some of the increments in average loan size were policy-induced, with BancoSol encouraging its loan officers to grant larger loans to borrowers at all stages of the organization-client relationship, before later reversing this policy in response to increasing arrears. Most of the increments in loan size were due, however, to accumulating experience about the clientele and to increased demand from the clients themselves. These last two sources of increase in loan sizes are not in contradiction with the organization's outreach objectives and do not represent a drift from the original mission.

In addition to the limits to growth that naturally emerge from the boundaries of the lending technology, during the process of accelerated expansion BancoSol had to face challenges resulting from tension between its original informal culture and the larger size and complexity of the organization. These tensions have been addressed through the complementary roles of the earlier visionaries and the new bankers. BancoSol can boast of the human and professional quality of its executive staff. The challenges ahead will be difficult, but the quality of these managerial resources permits a positive outlook about the future of the organization.

References

Agafonoff, Alexander (1994), "Banco Solidario S.A.: Microenterprise Financing on a Commercial Scale in Bolivia," Economics Division Working Papers 94/5, Research School of Pacific and Asian Studies, Camberra: The Australian National University.

Benjamin, McDonald P., Jr. (1994), "Credit Schemes for Microenterprises: Motivation, Design, and Viability," Unpublished Ph.D. Dissertation, Georgetown University.

Benston, George, G. Hanweck, and D. Humphrey (1982), "Scale Economies in Banking. A Restructuring and Reassessment," *Journal of Money, Credit and Banking*, Vol. 14, No. 4 (November), Part I, pp. 435-455.

Berger, A, G. Hanweck, and D. Humphrey (1987), "Competitive Viability in Banking. Scale, Scope and Product Mix Economies," *Journal of Monetary Economics*, No. 20, pp. 507-520.

Besley, Timothy and Stephen Coate (1995), "Group Lending, Repayment Incentives, and Social Collateral," *Journal of Development Economics*, Vol. 46 (February), pp. 1-18.

Chaves, Rodrigo A. (1996), "Institutional Design: The Case of the *Bancomunales*," in Claudio Gonzalez-Vega, Ronulfo Jimenez, and Rodolfo E. Quiros (eds.), *Financing Rural Micro-enterprises: FINCA-Costa Rica*. San Jose: Ohio State University, Academia de Centro-america, and the Inter-American Foundation.

Chaves, Rodrigo A. and Claudio Gonzalez-Vega (1996), "The Design of Successful Rural Financial Intermediaries: Evidence from Indonesia," *World Development*, Vol. 24, No. 1 (January), pp. 65-78.

Clark, J. (1988), "Economies of Scale and Scope at Depository Financial Institutions: A Review of the Literature," *Economic Review*, Federal Reserve Bank of Kansas City (October), pp. 16-33.

Christen, Robert Peck, Elisabeth Rhyne, Robert C. Vogel, and Cressida McKean (1995), "Maximizing the Outreach of Microenterprise Finance: An Analysis of Successful Microfinance Programs," USAID Program and Operations Assessment Report No. 10, Washington, D.C.: Agency for International Development.

Glosser, Amy (1994), "The Creation of BancoSol in Bolivia," in Maria Otero and Elisabeth Rhyne (eds.), *The New World of Microenterprise Finance. Building Healthy Financial Institutions for the Poor*, West Hartford, Connecticut: Kumarian Press.

Gonzalez-Vega, Claudio (1994), "Stages in the Evolution of Thought on Rural Finance. A Vision from The Ohio State University," Economics and Sociology Occasional Paper No. 2134, Columbus, Ohio: The Ohio State University.

Gonzalez-Vega, Claudio (1996a), "Non-Bank Financial Institutions and the Sequencing of Financial Reform," in Bruce L.R. Smith and Alison Harwood (eds.), *Sequencing Financial Sector Development and Reform*, Washington, D.C.: The Brookings Institution, forthcoming.

Gonzalez-Vega, Claudio (1996b), *Microfinanzas en El Salvador: Lecciones y Perspectivas*, San Salvador: Fundacion Dr. Guillermo Manuel Ungo.

Gonzalez-Vega, Claudio *et al*. (1996), *Progress in Microfinance: Lessons from Bolivia*, forthcoming manuscript.

Rhyne, Elisabeth and Maria Otero (1994), "Financial Services for Microenterprises: Principles and Institutions," in Maria Otero and Elisabeth Rhyne (eds.), *The New World of Microenterprise Finance. Building Healthy Financial Institutions for the Poor*, West Hartford, Connecticut: Kumarian Press.

Rosenberg, Richard (1994), "Beyond Self-Sufficiency: Licensed Leverage and Microfinance Strategy," processed.

Sanchez, Susana (1996), "Matching of Borrowers and Lenders: The Case of Rural Mexico," unpublished Ph.D. Dissertation, The Ohio State University.

Schmidt, Reinhard H. and Claus-Peter Zeitinger (1994), "Critical Issues in Small and Microbusiness Finance," International Donor Conference of Financial Sector Development, Vienna (September).

Schmidt, Reinhard H. and Claus-Peter Zeitinger (1996), "Prospects, Problems and Potential of Credit-Granting NGOs," *Journal of International Development*, Vol. 8, No. 2, pp. 241-258.

Stiglitz, Joseph E. (1990), "Peer Monitoring and Credit Markets," *World Bank Economic Review*, Vol. 4, No. 3, pp. 351-366.

Trigo Loubiere, Jacques (1995), "Regulation and Supervision of Microfinance Institutions: The Bolivian Experience," paper presented to the Conference on Regulation and Supervision of Microfinance Institutions, Washington, D.C., November 1995, in Maria Otero and Rachel Rock (eds.) *From Margin to Mainstream: The Regulation and Supervision of Microfinance*, Monograph No. 11, Cambridge, Mass.: ACCION International, forthcoming.

Yaron, Jacob (1994), "What Makes Rural Financial Institutions Successful?" *The World Bank Research Observer*, Vol. 9, No. 1 (January), pp. 49-70.

Table 1. BancoSol: Indicators of Breadth of Outreach, 1987-1995.[a]

	PRODEM					BANCOSOL					
For the 12-months ending as of date	Dec 87	Dec 88	Dec 89	Dec 90	Dec 91	Dec 92	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95
Portfolio outstanding[b] ('000)	69	359	693	1,855	3,245	4,577	7,804	13,962	23,288	29,645	30,200
Number of loans outstanding[b]	557	3,094	5,288	11,394	18,681	18,333	26,310	36,573	46,755	54,681	59,745
Amount outstanding per loan[b]	124	116	131	163	174	250	297	382	498	542	505
Amount disbursed ('000)	587	1,917	3,692	9,504	16,706	22,720	35,285	59,592	76,928	84,039	80,899
Number of loans disbursed	3,758	9,486	15,245	34,093	52,626	55,571	78,370	105,238	127,922	143,037	140,864
Amount disbursed per loan	156	202	242	279	317	409	450	566	601	588	574
Months to maturity[c]	1.8	3.9	4.2	4.0	4.3	4.0	4.0	4.2	4.4	4.6	5.1
Dollar-years outstanding per loan[d]	18	38	45	54	62	82	100	133	182	207	214
Number of new borrowers	1,737	1,816	3,539	8,984	10,475	11,056	16,006	23,510	30,814	30,021	23,200
Cumulative number of new borrowers	1,737	3,553	7,092	16,076	26,551	37,607	46,525	61,117	77,339	91,138	100,539

a All currency figures are in US dollars, converted from bolivianos of constant purchasing power as of December 1995, at the exchange rate as of that date.
b Average of the corresponding figures (monthly balances outstanding, or monthly numbers outstanding, or monthly balance outstanding per loan).
c Estimated as the average amount outstanding divided by the amount disbursed for each period.
d Calculated as the average amount outstanding per loan divided by the average term of the loan, measured in months, and divided by 12.

Source: Computed by the authors from PRODEM and BancoSol records.

Table 2. BancoSol: Characteristics of Clients Surveyed, 1995.[a]

Women	78
Client is head of household	42
Education level:	
No schooling	8
Up to grades 1-3	25
Up to grades 4-8	33
Up to grades 9-12	31
Beyond grade 12	3
Number of additional persons residing with client:	
0-3 persons	22
4-7 persons	69
8-14 persons	9
Number of additional household members who are employed:	
0-1	19
2-4	78
5 and above	3
Principal occupation:	
Trade	63
Production (industry and agriculture)	20
Services	17
Client has secondary occupation	56
Products marketed when the client is a trader:	
Domestically-produced goods	69
Foreign goods	36
Own production	31
Business is separate from household	44
Type of accounting system used:	
Uses accountant	1
Simple income and expense records	37
No written records	63
Clients are attracted because:	
Simpler guarantee requirements	65
Can borrow more	48
Can obtain group rather than individual loans	39
Less red tape	33
Interest rate is lower	28
Timeliness of loan	15
Proximity	13
Terms are longer	13
Clients are generally satisfied with:	
General relationship	91
Guarantee requirements	94
Term to maturity	69
Interest rate	55
Loan size	54

a All figures are in percentages.

Source: OSU survey of microfinance clients, 1995.

Table 3. BancoSol: Terms and Conditions of Typical Loan Contracts, 1995.

Dimensions of loan product	Currency	Bs	Bs	Bs	US$	US$
	Weeks between repayments	1	2	4	2	4
	Average amount of repayment (US$)	5	10	16	39	80
	Average amount outstanding (US$)	34	42	50	338	467
Amount disbursed	Median (US$)	62	72	82	619	825
	Average (US$)	82	93	103	1,031	1,340
Length of term	Median (months)	3	4	6	9	12
	Average (months)	4	5	6	8	17
	Minimum (months)	1	4	4	6	6
	Maximum (months)	7	7	12	12	36
Interest rates	Nominal monthly contractual rate	4.0	4.0	4.0	2.5	2.5
	Flat fees and commissions	2.5	2.5	2.5	1.0	1.0
	Nominal monthly effective rate[a]	6.1	5.6	5.2	3.0	2.9
	Monthly inflation rate	1.1	1.1	1.1	0.4	0.4
	Real monthly effective rate[a,b]	4.9	4.4	4.0	2.5	2.5

a Effective rates (internal rate of return) calculated using the median values of the amount disbursed and median length of term.
b Real rates are computed as the difference between nominal rates and inflation rates divided by one plus the rate of inflation.

Source: Computed by the authors from PRODEM and BancoSol records.

Table 4. BancoSol: Subsidy Dependence Indicators, 1987-1995.

	PRODEM					BANCOSOL					
For the 12-months ending as of date	Dec 87	Dec 88	Dec 89	Dec 90	Dec 91	Dec 92	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95
Total subsidy[a] ('000)	231	296	571	681	1,046	1,314	837	1,486	106	(77)	313
Portfolio outstanding[a,b] ('000)	175	679	1,891	5,522	12,577	17,776	31,388	64,060	94,015	128,697	133,929
Nominal portfolio yield (%)	15	38	32	40	46	42	52	43	44	40	41
Interest revenue[a] ('000)	26	257	604	2,232	5,801	7,547	16,462	27,236	40,966	50,847	54,827
SDI[c]	898	115	94	30	18	17	5	5	0	(0)	1
Nominal subsidy-free yield (%)	147	82	62	53	54	50	55	45	44	39	41
Rate of inflation (%)	8	22	17	18	15	10	8	9	8	9	11
Real subsidy-free yield (%)[d]	129	49	39	29	35	36	44	33	33	28	27
Subsidy[e] ('000)	137	152	254	259	327	366	225	382	26	(18)	71
Number of loans outstanding[f]	557	2,810	5,288	11,394	18,681	18,333	26,310	36,573	46,755	54,681	59,745
Portfolio outstanding[e,f] ('000)	69	359	693	1,855	3,035	4,577	7,804	13,962	23,288	29,645	30,200
Number of loans disbursed	3,758	9,486	15,245	34,093	52,626	55,571	78,370	105,238	127,922	143,037	140,864
Amount disbursed[e] ('000)	587	1,917	3,692	9,504	16,706	22,720	35,285	59,592	76,928	84,039	80,899
Subsidy per loan-year outstanding[e]	246.84	54.24	48.10	22.72	17.50	19.99	8.54	10.44	0.56	-0.33	1.19
Subsidy per dollar-year outstanding[e]	1.987	0.425	0.367	0.140	0.108	0.080	0.029	0.027	0.001	-0.001	0.002
Subsidy per loan disbursed[e]	36.57	16.07	16.68	7.59	6.21	6.59	2.87	3.63	0.20	-0.13	0.51
Subsidy per dollar disbursed[e]	0.234	0.080	0.069	0.027	0.020	0.016	0.006	0.006	0.000	-0.000	0.001

a Figures in unadjusted bolivianos.
b Average of end-of-period and beginning-of-period net portfolio balances for 1987-1992 and end-of-period, middle-of-period, and beginning-of-period balances for 1992-1995.
c Computed according to Yaron is (1994) methodology, as modified by Benjamin (1994).
d Real yields = (nominal yields - inflation rate) / (1 + inflation rate).
e Figures in December, 1995 US dollars.
f Average of the corresponding figures (monthly number of loans or of monthly balances outstanding).

Source: Computed by the authors from PRODEM and BancoSol records.

Table 5. BancoSol: Revenues, Expenses, and Returns. 1987-1995 (percentages).

	PRODEM					BANCOSOL					
For the 12-months ending as of date[a]	Dec 87	Dec 88	Dec 89	Dec 90	Dec 91	Dec 92	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95
Revenues/productive assets:											
Revenue from lending	8	27	24	31	34	34	41	34	32	29	30
Revenue from other operations	5	10	2	1	1	4	3	2	2	3	3
Grants and extraordinary revenues	58	31	12	8	4	0	(0)	0	0	0	0
Total revenue	71	67	38	40	40	39	44	36	34	32	33
Expenses/productive assets:											
Personnel	30	24	14	11	13	18	18	12	11	10	11
Administration	13	11	6	9	8	8	7	5	4	4	4
Depreciation	4	2	1	1	1	0	1	1	1	1	1
Taxes and other expenses	3	1	2	1	4	4	3	2	1	1	1
Loan-loss provision and write-off	0	1	0	1	1	1	1	1	1	2	1
Total operating expenses	49	39	23	23	27	31	30	21	18	18	19
Interest (cost of funds)	5	7	5	5	4	6	10	13	13	12	12
Inflation adjustments	10	6	14	9	5	0	0	0	0	0	0
Exceptional expenses	0	0	0	0	0	0	1	1	0	0	0
Total expenses	64	52	43	37	37	36	41	35	31	30	31
Retained earnings: current period	7	15	(5)	4	3	2	2	0	2	2	2
Return on assets	5.6	12.3	(4.1)	3.4	3.0	2.0	2.0	0.3	2.0	1.9	1.8
Return on equity	22.5	44.6	(18.1)	12.3	9.7	4.1	4.9	1.4	11.8	13.8	12.0
Return on assets without grants	(39.7)	(13.1)	(14.3)	(4.0)	(0.9)	2.0	3.4	1.7	2.4	1.9	1.8

Source: Computed by the authors from PRODEM and BancoSol records.

Table 6. BancoSol: Indicators of Efficiency 1987-1995.

	PRODEM					BANCOSOL					
For the 12-months ending as of date	Dec 87	Dec 88	Dec 89	Dec 90	Dec 91	Dec 92	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95
Accounting operational expenses[a] ('000)	93	192	257	629	1,415	1,880	3,360	4,640	5,895	7,365	8,012
Accounting financial expenses ('000)	27	67	221	373	511	357	1,101	2,725	4,194	5,029	4,903
Accounting total expenses ('000)	120	259	478	1,002	1,926	2,236	4,461	7,365	10,088	12,394	12,915
Operating grants not registered ('000)	0	0	0	0	0	0	0	0	9	17	8
Economic operational costs ('000)	93	192	257	629	1,415	1,880	3,360	4,640	5,903	7,382	8,020
Financial subsidies[b] ('000)	43	73	69	138	271	503	627	764	860	840	863
Economic total cost ('000)	163	332	547	1,140	2,197	2,739	5,089	8,129	10,958	13,250	13,787
Economic operational costs per:											
Number of loans outstanding	166	62	49	55	76	103	128	127	126	135	134
Portfolio outstanding	1.34	0.54	0.37	0.34	0.44	0.41	0.43	0.33	0.25	0.25	0.27
Number of loans disbursed	25	20	17	18	27	34	43	44	46	52	57
Amount disbursed	0.16	0.10	0.07	0.07	0.08	0.08	0.10	0.08	0.08	0.09	0.10
Economic total costs per:											
Number of loans outstanding	292	107	103	100	118	149	193	222	234	242	231
Portfolio outstanding	2.35	0.93	0.79	0.61	0.68	0.60	0.65	0.58	0.47	0.45	0.46
Number of loans disbursed	43	35	36	33	42	49	65	77	86	93	98
Amount disbursed	0.28	0.17	0.15	0.12	0.13	0.12	0.14	0.14	0.14	0.16	0.17
Product/economic operational cost:[c]											
Number of loans outstanding	0.60	1.61	2.06	1.81	1.32	0.98	0.78	0.79	0.79	0.74	0.74
Portfolio outstanding	75	187	270	295	229	244	232	301	394	402	377
Number of loans disbursed	406	494	594	542	372	296	233	227	217	194	176
Amount disbursed	633	998	1438	1512	1181	1209	1050	1284	1303	1138	1009
Product/economic total cost:[c]											
Number of loans outstanding	0.34	0.93	0.97	0.92	0.80	0.67	0.52	0.45	0.43	0.41	0.43
Portfolio outstanding	43	108	127	150	140	167	154	172	213	224	219
Loans disbursed	231	285	279	275	226	203	155	129	117	108	102
Amount disbursed	361	577	675	767	718	829	697	733	703	634	587

a All currency figures are in US dollars, converted from bolivianos of constant purchasing power as of December 1995, at the exchange rate as of that date.

b As per computation of the subsidy dependence index.

c Product (either number or total amount of loans) per US$ 100 of the corresponding category of expenses.

Source: Computed by the authors from PRODEM and BancoSol records.

Table 7. BancoSol: Indicators of Productivity, 1987-1995.[a,b]

	PRODEM					BANCOSOL					
For the 12-months ending as of date	Dec 87	Dec 88	Dec 89	Dec 90	Dec 91	Dec 92	Jun 93	Dec 93	Jun 94	Dec 94	Jun 95
Number of loan officers	6	10	20	31	54	59	86	116	133	159	183
Number of total employees	13	19	35	60	97	96	136	184	213	260	302
Number of branches[c]	1	1	2	3	4	5	9	13	20	25	29
Loan officers/employees	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Employees/branch	13.2	19.3	17.5	21.0	27.1	18.9	16.0	13.7	10.9	10.5	10.4
Loan officers/branch	6.4	10.0	9.9	11.0	15.0	11.6	10.1	8.6	6.8	6.4	6.3
Number of loans outstanding/loan officer	87	309	267	367	346	312	307	316	351	344	326
Portfolio/loan officer (‘000)	11	36	35	60	60	78	91	121	175	187	165
Number of loans disbursed/loan officer	591	949	769	1,097	976	946	915	909	960	901	768
Amount disbursed/loan officer (‘000)	92	192	186	306	310	387	412	514	577	529	441
Number of loans outstanding/employee	42	160	151	191	192	191	194	199	219	210	198
Portfolio/employee (‘000)	5	19	20	31	33	48	57	76	109	114	100
Number of loans disbursed/employee	285	491	437	572	542	579	577	573	600	549	467
Amount disbursed/employee (‘000)	45	99	106	160	172	237	260	325	361	323	268
Number of loans outstanding/branch	557	3,094	2,644	4,022	5,213	3,606	3,095	2,726	2,387	2,202	2,066
Portfolio/branch (‘000)	69	359	347	655	906	900	918	1,041	1,189	1,194	1,044
Number of loans disbursed/branch	3,758	9,486	7,623	12,033	14,686	10,932	9,220	7,844	6,532	5,760	4,871
Amount disbursed/branch (‘000)	587	1,917	1,846	3,354	4,662	4,470	4,151	4,442	3,928	3,384	2,798

a All currency figures are in US dollars, converted from bolivianos of constant purchasing power as of December 1995, at the exchange rate as of that date.
b Averages of monthly figures.

Source: Computed by the authors from PRODEM and BancoSol records.

Table 8. BancoSol: Loan Size , by Repetition and Year when Loan was Granted, 1987-1995.[a]

Repetition	Statistic	1987	1988	1989	1990	1991	1992	1993	1994	1995	Total
1	Mean	58	271	61	109	96	131	171	170	108	142
	Median	58	271	46	79	90	104	125	117	107	108
2	Mean	146	131	116	204	231	222	297	272	199	241
	Median	146	143	124	176	178	189	213	236	203	204
3	Mean	177	187	187	332	336	328	371	437	372	379
	Median	177	187	206	270	257	337	377	365	321	321
4	Mean	260	199	184	382	421	550	534	658	488	534
	Median	260	207	184	260	361	555	496	484	357	413
5	Mean		293	185	293	603	608	779	679	697	657
	Median		286	185	298	436	292	654	487	433	457
6	Mean		298	256	387	564	834	910	735	653	691
	Median		298	257	387	558	693	770	723	438	544
7	Mean		330	327	112	604	1128	802	775	592	721
	Median		330	298	112	454	849	398	469	617	555
8	Mean			272	350	755	745	931	882	1135	871
	Median			321	350	755	671	528	502	369	502
9	Mean			364	318	346	829	1275	773	998	879
	Median			364	360	346	707	1020	713	454	562
10	Mean				374	355	832	1373	1147	701	954
	Median				438	355	951	635	812	428	468
11-23	Mean				341	438	731	1724	953	935	1010
	Median				345	481	638	998	637	464	598
Total	Mean	129	225	208	262	392	547	582	486	460	477
	Median	119	215	206	245	319	351	301	302	260	286
	n	7	16	11	48	73	118	233	383	433	1333

a All currency figures from bolivianos of constant December, 1995 purchasing power, converted to US dollars at the exchange rate of that date.

n: number of observations.

Source: OSU microfinance client survey, 1995.