


Inter-American Development Bank



# Financial Services and Poverty Reduction in Latin America and the Caribbean



Luis Tejerina  
César P. Bouillón  
Edgardo Demaestri  
*Editors*

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*Luis Tejerina*  
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*Edgardo Demaestri*  
Editors

**Inter-American Development Bank**

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Luis Tejerina is Economist and César Bouillon is Senior Economist at the Poverty and Inequality Unit, Sustainable Development Department (SDS). At the time of this writing Edgardo Demaestri was Senior Financial Economist at the Infrastructure and Financial Markets Division in SDS.

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Manager a.i, Sustainable Development Department: Antonio Vives  
Chief, Poverty and Inequality Unit: Carlos Eduardo Vélez  
Chief, Infrastructure and Financial Services Division: Pietro Masci

For additional copies of this publication, please contact:

Poverty and Inequality Unit  
Sustainable Development Department  
Inter-American Development Bank  
1300 New York Avenue, N.W.  
Washington, D.C. 20577  
USA

Infrastructure and Financial Markets Division  
Sustainable Development Department  
Inter-American Development Bank  
1300 New York Avenue, N.W.  
Washington, D.C. 20577  
USA

Email: [aurao@iadb.org](mailto:aurao@iadb.org) or [lilianal@iadb.org](mailto:lilianal@iadb.org)  
Fax: 202-623-3299  
Web site: <http://www.iadb.org/sds>

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## About the Authors

**Mauro Alem** is an Economist in the Finance and Basic Infrastructure Division, Regional Operations Department 2, Inter-American Development Bank.

**Pablo Angelelli** is a Microenterprise Specialist in the Micro, Small, and Medium Enterprise Division, Sustainable Development Department, Inter-American Development Bank.

**Tessa Bold** is a Junior Research Fellow at Oxford University.

**César P. Bouillon** is an Economist in the Poverty and Inequality Unit, Sustainable Development Department, Inter-American Development Bank.

**César Calvo** is a Departmental Teaching Associate at Oxford University.

**Edgardo Demaestri** is Senior Financial Economist in the Finance and Basic Infrastructure Division, Regional Operations Department 1, Inter-American Development Bank.

**Stefan Dercon** is Professor of Economics at Oxford University.

**Heywood Fleisig** is Director of the Research Center at the Center for the Economic Analysis of Law (CEAL), Washington, D.C.

**Javier Gavito Mohar** is Director General of the Banco del Ahorro Nacional y Servicios Financieros (BANSEFI), Mexico.

**Arturo Galindo** is Professor of Economics at the Universidad de Los Andes, Colombia.

**Carlos Guaipatín** is a consultant in the Finance and Basic Infrastructure Division, Regional Department 1, Inter-American Development Bank.

**Carlos Isoard y Viesca** is a member of the Board of Governors of the Instituto para la Protección al Ahorro Bancario (IPAB), Mexico

**Facundo Martin** is a Private Sector Development Analyst at the International Finance Corporation.

**Jorge Rodríguez-Mesa** is an Economist at the World Bank.

**Loïc Sadoulet** is Affiliate Professor of Economics at INSEAD.

**Sam Schulhofer-Wohl** is a Ph.D. student, the Department of Economics, the University of Chicago.

**Luis Tejerina** is an Economist in the Poverty and Inequality Unit, Sustainable Development Department, Inter-American Development Bank.

**Robert M. Townsend** is Charles E. Merriam Distinguished Service Professor, Department of Economics, the University of Chicago.

**David K. Walker** is Director of Policy and International Affairs, the Canada Deposit Insurance Corporation.

**Mark Wenner** is Senior Economist in the Rural Development Unit, Sustainable Development Department, Inter-American Development Bank.

## Foreword

**T**he Inter-American Development Bank (IDB) has been increasing its focus on the critical links between poverty and sectors of the economy that traditionally have not been associated with poverty reduction, such as financial markets, regional integration, and trade policy. Recently the Bank has launched a new initiative called “Building Opportunities for the Majority,” which includes *financial democracy* as one of the six priority areas for Bank activities in Latin America and the Caribbean.

This strategic emphasis on equitable access to financial services is expected to bring substantial benefits to promote productive investment, mitigate economic shocks, and reduce poverty. As the empirical evidence offered in the introductory chapter of this volume shows, there are many positive correlations between financial development, economic growth, and poverty reduction, suggesting a virtuous cycle of improved financial sector activities, leading to greater savings, more investment in human capital, improved skill endowments, greater poverty reduction, and further positive impact on financial activities.

The need for financial democracy, and for financial products and services that can help the poor, is pressing. Consider these facts. Only 14.5 percent of poor households in Latin America and the Caribbean have a savings account and only 3.3 percent have access to credit (defined as the percentage of households that obtained a loan from a formal or semiformal financial institution in a 12-month period). At the same time, a huge and growing volume of remittances from migrant workers, representing a financial inflow of more than \$60 billion per year into the region and more than 3 percent of regional GDP, only modestly involves the financial sector, weakening its potential impact on productive investment. The Bank’s current approach recognizes that reducing poverty requires complementary actions in multiple sectors, and that in order to expand the economic opportunities and the productive potential of the poor, both their productive capital (human, physical, and financial) and their market environment opportunities must be improved.

The financial sector offers multiple instruments to improve the efficiency of capital allocation in the economy, and to help households manage their exposure to economic risk, including transaction banking, credit, savings, and insurance. Given the fact that economies in the region face considerable economic volatility—both aggregate



and idiosyncratic—financial instruments, together with social insurance and protection systems, are particularly helpful in managing economic risk. Such risk is a major perpetuator of poverty, as several studies in this volume show. The work in this book strengthens the policy prescription that the promotion of equitable access to financial services—financial democracy—should be a major component of any strategy to eradicate poverty in the region.

This new approach to financial services contrasts with the more traditional and generally held perceptions that poverty alleviation mainly requires direct interventions in the social sectors—and no independent actions in other sectors. This new approach tries to enhance the ability of the poor to achieve higher living standards and escape poverty through their own efforts. In addition, by taking a more integral and multidimensional approach that goes beyond social sector issues, the Bank avoids the risk of marginalizing anti-poverty efforts by focusing exclusively on social policies.

This volume presents the papers submitted at the international conference on “Financial Services and Poverty Reduction in Latin America and the Caribbean,” held at IDB Headquarters in September 2004. The conference brought together key stakeholders and experts from ten Latin American countries, who represented not only the financial sector but several social sectors, as well. The main objective of the conference was to increase the understanding of the links and transmission mechanisms between financial market activities and poverty reduction. At the same time, the conference sought to raise awareness in the region about the impact of financial sector markets, activities, and instruments on poverty reduction. Thus some papers developed a framework to analyze the mechanisms and linkages of how financial markets can contribute to alleviate poverty.

The conference focused on three main subjects regarding financial markets and poverty. The first subject addressed the links between access to financial products and the welfare of the poor. The second subject sought to identify policy priorities to improve the poor’s access to financial services. The third subject was related to the role of the Bank in supporting countries in implementing policies and programs to increase the access of the poor to financial services.

The conference participants generated a rich discussion on each of the studies presented, and most of their comments are included in this volume. Highlights of the consensus that emerged from the discussion during the conference include the following.

First, the positive indirect effects of *financial deposit insurance* on poverty reduction should be taken into consideration more fully. Financial deposit insurance can promote greater stability of the financial sector and thereby induce economic growth. It can also help make savings and banking more attractive to poor households that have been financially excluded and that can benefit from access to formal financial instruments to manage economic risk.

Second, *adequate regulation* of banking and microfinance plays a key role in expanding the availability of services to low-income populations. In particular, the specific nature

of microfinance transactions (high transaction costs, geographical dispersion, lack of collateralization of loans) should be taken into account when regulating this segment.

Third, it is important to take better advantage of *information technology* to enhance the provision and affordability of financial services. Innovations such as the use of palm pilots and biometric instruments can help overcome geographical and language barriers. The development of efficient credit bureaus can lower transaction costs for institutions.

Fourth, the *financial literacy* of poor clients needs to be addressed, to overcome language, educational, and geographical obstacles that were repeatedly mentioned during the conference as one of the key factors preventing successful experiences in microfinance.

Fifth, conference participants raised a cautionary note regarding efforts to implement successful experiences from other regions without taking into account the idiosyncratic characteristics and institutional context of Latin American countries. Ignoring this advice might make the adoption of these experiences less cost-effective—or even unviable.

Finally, gaps in data and research need to be filled. The availability, opportunity, coverage, and comparability of *empirical evidence* about access to financial markets at the household level needs to be improved. Many relevant questions about the potential benefits of financial services to poverty reduction remain unanswered because of lack of data in the region. Although the Bank has access to valuable information about access to financial services for a limited number of countries and time periods, in the near future the Bank should give priority to promoting the systematic collection of statistical data about equitable access to financial services by IDB Regional countries, using specialized modules for household surveys and taking advantage of the regional network built by the MECOVI program with the region's National Statistics Institutes during the last decade. With a sustained effort on data collection, by 2010 the region should have a very complete picture of which countries are better off in terms of financial democracy and which have overcome financial exclusion. An area in which the Bank has started to work and that deserves more attention is the role of insurance to reduce uncertainty and spur productive economic activities.

We are confident that this volume contributes to the research and policy agendas in the region by providing policymakers, microfinance practitioners, academics, and other stakeholders with a rigorous analytical framework, useful empirical findings, and valuable comparative experiences and lessons. This publication reiterates the IDB's commitment to promote the implementation of policies and programs aimed at furthering financial democracy and reducing poverty.

*Carlos Eduardo Vélez*  
Chief, Poverty and Inequality Unit

*Pietro Masci*  
Chief, Infrastructure and  
Financial Markets Division



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## Introduction

# Access to Financial Services and Poverty Reduction in Latin America and the Caribbean

Luis Tejerina, César P. Bouillon, and Edgardo Demaestri

### Financial Sector Development, Growth, and Poverty

Reducing poverty requires actions in multiple sectors. To expand the economic opportunities and the productive potential of the poor, both the productive capital (human, physical, and financial) and the business and institutional environment need to be improved. The development of the financial sector is particularly vital because it facilitates asset accumulation, more efficient management of risk, and increased opportunities for entrepreneurial development. For the poor, there is the potential for a virtuous cycle between increased access to financial sector activities, greater investment in human capital, and reductions in poverty. Accordingly, improving financial services should be a key component of a strategy for opening entrepreneurial opportunities and in turn reducing poverty.

In Latin America and the Caribbean, financial democracy has expanded through the creation of a solid base of microfinance institutions and the use of innovative practices that take advantage of existing technologies, thereby improving outreach, given existing restrictions in information, regulation, infrastructure, and human capital. Even though these efforts are encouraging, the region is lagging behind in fostering access to the formal financial sector for the poor, the provision of complementary services and public goods needed to overcome the barriers that separate the poor from the formal financial sector, and in incorporating pro-poor considerations when designing financial sector policies.

Evidence about the importance of the relationship between financial services and the improvement of the lower-income segments of the population is well-known. There are numerous studies that focus on the importance of microcredit as an instrument to facilitate the development of entrepreneurship. There is also an extensive literature analyzing reforms and financial deepening and their effects on macroeconomic variables.

Nevertheless, the relationship between financial policies and poverty reduction has not been fully analyzed. Furthermore, studies on the relationship between poverty reduction and financial services besides credit, such as insurance, are even more scarce. The studies that do analyze these relationships often follow very different methodologies. This lack of systematic analysis is paralleled in the empirical application of financial policies, which in general are applied with macroeconomic objectives that do not explicitly contemplate their effects on poverty.

To address these important challenges, the Inter-American Development Bank (IDB) sponsored a wide-ranging research initiative to increase the understanding of the region and highlight the policy actions needed to strengthen access of poor populations to financial services and foster pro-poor financial sector policies. As the project approached its completion and because of the significant outreach obtained from the studies, the Bank decided to hold a conference in which those studies could be debated and the conclusions analyzed. Participants came from diverse backgrounds and included academics, government regulators, and practitioners from the financial sector. Some of the reviews presented at the conference are included in this volume to provide the reader with alternative points of view or complementary information from the forefront of the financial services industry.

The next section summarizes existing evidence about the financial sector and its effects, both direct and indirect, on low-income households. It also presents data about access to financial services in the region, based on a recent inventory of microfinance institutions and existing household surveys. Finally, it provides a brief description of the studies included in this volume, as well as the main conclusions from each one.

## **Evidence about Financial Services, Poverty, and Growth**

### ***Indirect Effects: Financial Sector Development, Growth, and Poverty***

The correlation between financial sector development and growth has been well documented.<sup>1</sup> Causation from financial sector development to growth and bi-directional causality has been also found in the literature.<sup>2</sup> Using time series for 16 countries, Demetriades and Hussein (1996) find that causality varies depending on the country. Few studies find weak links (see Favara 2003). Some recent studies, however, highlight the potential problems in the type of research using cross-country regressions and aggregate macro level data and propose some solutions, such as the use of micro level data.<sup>3</sup>

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<sup>1</sup> See, among others, Goldsmith (1969); King and Levine (1993); Levine and Zervos (1998); Levine (2005).

<sup>2</sup> See Calderón and Liu (2003); King and Levine (1993); Levine, Loayza, and Beck (2000).

<sup>3</sup> See Driffil (2003); Honohan (2004a); Trew (2005).

A positive relationship between financial development and poverty reduction has been found in economic studies.<sup>4</sup> Most studies measure the aggregate relation between poverty and financial sector development and thus are more adequate indicators of the indirect effects between poverty and growth. A study that more closely measures the direct effects using rural bank branch data for India found a negative relation between the number of rural bank branches and poverty and a positive relation with production (Burgess and Pande 2005). On the relationship between financial sector development and income inequality, evidence is mixed. Some studies find a negative relationship between both variables,<sup>5</sup> while others find a positive relationship.<sup>6</sup> Chapter 4 of this volume presents a general overview and a model about the use of household-level data to measure financial market development and its effects on inequality. Chapter 7 presents a model and discussion about the effects of deposit insurance as a mechanism to reduce poverty through financial sector stability.

### ***The Direct Effects of Financial Services on Poverty Reduction***

The direct effects of financial services and policies on poverty reduction are related to the increase in access of the poor to retail financial services. These services can be grouped in four categories (Porteus 2004): *transaction banking*, which includes electronic payments, debit and ATM card accounts, and the transmission and receipt of remittances; *savings*, which includes bank savings accounts, trusts funds, pensions and provident funds,<sup>7</sup> certificates of deposits, bonds, and club memberships; *credit*, which includes consumer and personal credit, mortgages, and business credit; and *insurance*, which includes life, funeral, health, agricultural, fire, robbery, flood, and hurricane insurance.

### **Enabling the Accumulation of Assets**

Protecting and accumulating assets is difficult for low-income households, especially those without access to financial services. Poor households may be caught in asset poverty traps (Carter and Barret 2006) when the level of productive assets they own is below a certain threshold. Having access to credit for productive investments may be the solution for low-income households to jump out of poverty traps and jump into a virtuous circle of asset accumulation and income generation.

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<sup>4</sup> See Jalilian and Kirkpatrick (2001); Honohan (2004b) .

<sup>5</sup> See Bittencourt (2006); Levine, Demiguc-Kunt, and Beck (2004); Clarke, Xu, and Fou (2002).

<sup>6</sup> See Banerjee and Newman (1994) and evidence from Behrman, Birdsall, and Székely (2001).

<sup>7</sup> A provident fund is a fund that pays benefits to company employees who are fund members upon the termination of their employment.



Moreover, in particularly difficult times, the poor may be forced to sell assets (household items or productive assets) to maintain a minimum level of consumption. While these strategies are effective in obtaining the needed cash in the short run, they hurt the future productivity and well-being of the household in the medium and long run. Access to financial services helps low-income households by enabling them to prevent negative income shocks through the use of insurance, and self-protect by using flexible savings accounts (Townsend 2001 and chapter 6), thus avoiding the need to sell assets under duress, usually at reduced prices. Chapters 5, 6, and 8 discuss access and use of insurance, savings, and credit for this purpose.

### Facilitating Entrepreneurship

A key channel for reducing poverty through access to financial services lies in helping poor entrepreneurs acquire basic inputs for business activity (such as machinery, land, raw materials, labor, business services) that satisfy both investment and working capital needs. The high profitability of some of their investments is demonstrated by the very high real interest rates that small entrepreneurs pay in many countries of the region to undertake these investments (see Westley 2001, table 3, and chapter 8 of this volume).

While it is generally recognized that access to credit is no panacea and that not everyone who demands credit is creditworthy (that is, likely to repay a loan, given its terms) evidence seems to indicate that there is a high correlation between wealth and entry into entrepreneurship (Evans and Jovanovic 1989). This does not necessarily mean that there are credit constraints that need to be eliminated. However, there is additional evidence of credit constraints in the form of higher returns achieved by businesses owned by low-income households. A further benefit of the creation of microenterprises in Latin America is the trickle-down effect by the creation of job opportunities for poor households that do not possess an entrepreneurial orientation (Westley 2001). Chapters 2 and 3 present an overview of literature on entrepreneurship and evidence about entrepreneurship and access to financial markets in the case of Nicaragua.

### Managing Risk

One of the stiffest obstacles to reducing poverty in the region is the excessive exposure to risk that the poor face, as emphasized in the 2000/01 World Development Report, *Attacking Poverty* (World Bank 2000) and the IDB Poverty Reduction Strategy (IDB 2003). Both reports note that the poor have no defense against idiosyncratic shocks such as illnesses, unemployment, or poor harvests, or against covariant (systemic) shocks such as economic crisis, natural disasters, or epidemics. Financial services can help the poor manage risk better by two channels (Cohen 2000; Rutherford 1999). The first are investments to reduce risk and to reduce vulnerability from risk by increasing the assets base, diversifying income sources, and adopting risk-reducing technologies. The second are resources to

cope with economic losses resulting from crises, unemployment, other covariant shocks (such as natural disasters and epidemics), and idiosyncratic shocks (such as productive shocks or illness). These strategies not only help isolate current consumption from temporary falls in income, but also help increase permanent income by allowing households to engage in riskier but more profitable investment opportunities.

Formal financial instruments are low cost, high quality alternatives to other informal instruments in times of need, such as depleting assets, pulling children out of school, or using local loan sharks. Households can avoid these costly strategies by borrowing from a microfinance institution or by accumulating precautionary savings to be used in emergencies. Insurance products are the financial products that can help the poor manage risk more directly. Although these products cannot protect the poor against all types of shocks, they can and do improve the welfare of poor households, various experiences in the region suggest (CGAP 2004a; 2004b; 2005).

Beyond protecting consumption, risk management instruments can also help poor households improve their expected income flow. In the presence of uncertainty, some households may prefer to adopt income smoothing strategies as opposed to consumption smoothing strategies (Morduch 1995). Households that adopt these strategies choose to undertake low return, low risk activities to secure a steady flow of income, compared to activities that may be riskier but have a higher expected return. The availability of risk management instruments may enable households to undertake these riskier activities and make the most of their investments. Chapter 5 presents a framework and some proposals to improve the provision of risk management tools for the poor. Chapter 7 provides a discussion of the advantages of a stable financial system, in which savings of the poor will be protected by deposit insurance programs in the case of bank failure.

## Access to Financial Services in the Region

Most of the poor in the region do not use financial services. For the moderate poor and near poor, in many cases, the low use of financial services is due to lack of access. In the absence of formal financial sector instruments, a narrow menu of these products are provided to the poor by informal, and often expensive, institutions. Microfinance institutions also provide financial services, but their scale is still small in most countries of the region, and they are not capable of pooling risks over large areas.<sup>8</sup> Evidence shows that, while traditional formal financial sector development is correlated with poverty reduction, microfinance development is not (Honohan 2004b).

The conference made evident the lack of aggregate figures based on micro data and the need for this information in order to see the big picture in terms of the links between

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<sup>8</sup> Microfinance clients represent more than 2 percent of the population in only four countries in the region (Navajas and Tejerina 2006).

**TABLE 1**  
**Percentage of Households in Latin America and the Caribbean with Access to Financial Services**

	Of the total population	Poor	Non-poor	Rural	Urban
Households with access to savings accounts	24.3	14.5	32.4	17.1	28.4
Households with access to credit	6.0	3.3	8.4	4.1	7.8

Source: Navajas and Tejerina (2006); and Tejerina and Westley (2006).

financial services and poor households. While a quality estimate of the level of access to financial services by households is absent in the region, a recent effort to measure the use of financial products by households found that about a quarter (24.3 percent) of households in the region have a savings account of some kind in a formal or semiformal institution (the latter referring mostly to credit cooperatives), and 6.4 percent of them obtained a loan from these institutions in a 12-month period. A further disaggregation of the data found that 14.5 percent of households that are considered to be poor according to national poverty lines have a savings account in these institutions and 3.3 have credit, compared to 32.4 percent and 8.4 percent of non-poor households, respectively (see table 1).

While there are problems of comparability and the sample for the above analysis is limited to 11 countries, it is clear that financial sector policies do affect the poor directly through their credit and savings. While participation of the poor in the financial sector is considerable, there are still important gaps to be closed in terms of access to financial markets. An important gap concerns the rural sector; the gaps between urban and rural areas are similar to the ones between poor and non-poor households (28.4 percent versus 17.1 percent for savings, and 7.8 percent versus 4.1 percent for credit, respectively).

### ***Microfinance and Poverty***

Microfinance refers to the financial services provided to low-income households. As of 2005, microfinance institutions in the region were reaching an estimated 5.3 million clients with an outstanding portfolio of over \$5.1 billion and achieved a yearly growth of 24 percent in number of loans between 2001 and 2005 (see Navajas and Tejerina 2006). Evidence suggests that microfinance services and programs mostly target the moderate poor, the near poor, and the non-poor, but they do not tend to reach the extreme poor.<sup>9</sup> Moreover there

<sup>9</sup> Sebastad and Cohen (2000); World Bank (2000) based on a sample of programs from Africa, Asia, and Latin America. The studies use different definitions of poverty. The international convention is that the extreme poor are individuals living in households with income per capita of less than one dollar a day, while the moderately poor live in households earning between one and two dollars a day per capita.

is evidence that institutions with the biggest impact on beneficiaries are those that lend to households that are close or slightly above the poverty line (Mosley and Hulme 1998) and that allowing extreme poor households to borrow may even have negative effects (Lego-vini 2003). Thus policies to increase access to financial services and microfinance programs cannot be substitutes, and preferably must complement policies directed to increase human capital, provide basic infrastructure, and improve business climate.

To provide precise information regarding the impact of microfinance programs on beneficiaries, a rigorous impact evaluation including a relevant control group for comparison is required. Existing impact evaluations in the region have found a positive effect of access to microfinance on the income of poor beneficiaries.<sup>10</sup> However, evaluating microfinance interventions is very difficult and the relevance of impact evaluations for the microfinance industry is subject to debate (Morduch and Armendáriz 2005) because people who self-select to participate in a program cannot be compared to people who choose not to participate because they will have different observed and unobserved characteristics (especially entrepreneurial talent). By design, these impact evaluation studies measure only the direct effects of financial services on poverty (control groups and the study of specific interventions allow isolation of indirect growth effects). It is important to note that the positive effects of microfinance programs are also driven by complementary interventions offered by these programs, such as training. Despite these issues, some efforts have been made in the region to overcome the inherent difficulties in this specific area of evaluation. Evidence is available for MiBanco and Promuc in Peru and from CRECER in Bolivia, and for the aggregate impact of microfinance in Chile and Brazil.<sup>11</sup> Results in this area, however, should be taken with caution, given the heterogeneity of programs and the difficulties mentioned above in evaluating them.

### ***Reducing Transaction Costs***

Lower transaction costs translate into improved access to financial services for the poor through many channels. For example, the average cost of sending remittances has declined from 15 percent before 2000 to 8 percent in 2004.<sup>12</sup> These declines in transaction costs contributed to the flow of remittances to the region, which by 2005 had reached \$53.6 billion. However access to financial institutions in rural areas is limited and the population is spread across large territories. Innovations in regulation, partnerships among institutions, use of improved technology, and improvements in infrastructure can help lower the transaction cost of using formal financial services.<sup>13</sup>

<sup>10</sup> See Copestake (2005).

<sup>11</sup> See Copestake (2005). Dunn and Arbuckle (2001); McNelly and Dunford (1999).

<sup>12</sup> Multilateral Investment Fund Web page: <http://www.iadb.org/mif/remittances/index.cfm>

<sup>13</sup> For an extensive review of best practices and status of rural finance in the region see Wenner, Alvarado, and Galarza (2002).

For example, establishing fixed branches in rural areas may not be cost-effective. Regulations for such branches may set minimum standards for remaining open five days a week and maintaining a minimum number of hours of operation (Jansson, Rosales, and Westley 2004). Regulations that allow for flexibility in the services provided to the poor may enable creative solutions such as mobile branches to lower transaction costs related to the use of financial services, including lower costs of transportation, infrastructure, and personnel. Investments in infrastructure may also contribute to lowering transaction costs by providing better roads and public transportation. The implementation of technology has been successful in overcoming barriers and lowering costs, such as the use of palm pilots to serve customers in rural areas (Women's World Banking 2005), the use of biometrics to solve the problem of lack of identification cards and the use of multiple languages by clientele, and low-cost ATMs that help solve cultural and educational barriers to the use of financial services (Hernandez and Mujica 2003). Chapters 6 and 8 discuss some of the problems and successful solutions to these problems.

Partnerships among institutions may be another way to lower transaction costs for financial services. For example, providing a wide range of services or reaching remote areas might be too costly and inefficient for most institutions, and most microfinance institutions lack the expertise to adequately provide insurance services to the poor. However, there have been promising experiments that bring together the expertise of insurance companies and the outreach capacity of microfinance institutions to deliver these services to the poor. Other experiences include the use of retailers or other agents as branches for carrying out payment services and capturing small deposits (see Kumar and others 2006). Chapter 5 discusses the logical framework and successful experiences in this area.

## Summary of the Book

This book, like the conference, is separated into two sections. The first presents an algorithm for policy-based research and research-based policy and three applications using data for countries in Latin America. The second provides a policy-oriented analysis of theory and empirical evidence for four topics: insurance, savings, deposit insurance, and credit.

*Chapter 1* provides a ready-to-use methodology to address policy issues using rigorous research techniques. The chapter addresses six different topics and provides a roadmap for the adequate research methodology to be used, starting from the theoretical foundations, and extending to data needed, estimation techniques, and the importance of basing conclusions and main recommendations on research results.

*Chapter 2* presents an analysis of the entry into entrepreneurship in the presence of credit constraints. The study presents a review of two types of models. Both are based on the relationship between wealth and entry into entrepreneurship, but each has a different theoretical underpinning. The study finds evidence of credit constraints in urban

areas of Nicaragua but not in rural areas. The study also finds that formal education is more important in rural areas as a condition for entry into entrepreneurship. Potential explanations for these findings may be that formal education is more important in rural areas because of the lack of substitutes, such as learning from a role model (a neighbor who already started a business and obtained a credit). An explanation for the lack of evidence of credit constraints in rural areas may be that there are many NGOs in rural areas catering to the poor, and the optimal levels of capital needed for starting a project may be low because of low levels of human capital or access to markets.

Entrepreneurship and entrepreneurial talent have been defined in many different ways for different purposes. Definitions of entrepreneurship include self-employment, nonagricultural independent activities, and even someone who is innovative as an employee. Past literature about financial markets has been forced to make strong assumptions about the relationship between wealth and entrepreneurial talent when trying to model credit constraints. *Chapter 3* presents a review of how models have attempted to solve the problems of defining an entrepreneur and the relationship between wealth and entrepreneurial talent, and the implications of the different approaches. The chapter presents a cautionary note concerning the robustness of studies to varying definitions of entrepreneurship, and presents a test, using panel data for Nicaragua under different definitions. The results are consistent with the ones found in chapter 2 in that no credit constraints are found in rural Nicaragua under the definition used in that study. However, credit constraints become evident when the definition of an entrepreneur is broadened to include farming activities in rural areas. Policymakers should take these factors into consideration when evaluating the results of research in this area.

The links between growth and the development of the financial sector have been traditionally measured through cross-country regressions that make use of aggregate data for the financial sector, such as M3 or total credit to the private sector as a percentage of GDP. *Chapter 4* makes use of micro data from household surveys to calibrate a growth model with endogenous financial sector development for Peru. The objective of this study is to model a benchmark economy that will resemble the path followed by Peru between 1985 and 2000 and take into account households' decisions in terms of participation in the financial sector. The model used effectively tracks the path of GDP growth in Peru during the 1980s and early 1990s, but over-predicts the path of financial participation measured by the percentage of households that make use of formal financial institutions. The levels of financial participation by households were negatively affected by the slow growth in the second half of the 1980s. While there was some recovery in the 1990s, it was not consistent with the recovery of the economy in general in this period. According to the measure used in this study, by 2000 the participation of households in the formal financial sector had not recovered the levels observed in 1985. The study concludes that large gains in terms of welfare might be achieved by increasing household participation in the formal financial sector. However, the benefits from this expansion are likely to fall to a larger extent on middle-income households as opposed to the poor.



The second part of the book starts with an analysis of savings for the poor. Evidence presented earlier in this introduction showed that a significant percentage of the poor indeed have savings in the formal sector. *Chapter 5* analyzes the specific needs of the poor in terms of the use they give to their savings, such as to pay for life cycle events such as weddings and funerals, as a strategy to cope with risk, and as a way to finance investment opportunities. The chapter presents problems with informal savings arrangements such as rotary credit and savings associations (ROSCAs), savings in-kind, and deposit collectors, and discusses the characteristics needed for a formal savings mechanism that provides welfare benefits such as security and accessibility. The study then presents some challenges and solutions for the expansion of savings for the poor in terms of institutional development, infrastructure, making use of available technology, and the role of donors.

Microfinancial services have focused traditionally on enabling the poor to make productive investments. However, the view of these services as risk management tools for the poor is increasing in importance as institutions gain experience in the region. *Chapter 6* focuses on risk management by first analyzing the risks that the poor face, specifically in Latin America. It then examines what strategies the poor use, and discusses the advantages and disadvantages of those strategies, based on available documentation from the literature. This chapter then proposes some available solutions in terms of provision of formal insurance to the poor. While the provision of formal insurance should not be viewed as a silver bullet to solve all risks faced by the poor, the chapter presents some efficient solutions that make use of potential synergies between different actors in financial markets.

As an example of the importance of the potential effects of financial policies on poverty—an area in which only a limited amount of research has been conducted—*chapter 7* presents the analysis of the relationship of deposit insurance systems and poverty reduction. This chapter starts with an analysis of the literature on financial market development and growth, and then considers the more direct effects of deposit insurance systems on poverty reduction. While the majority of the poor do not interact with the formal financial sector, the study concludes that deposit insurance may have an indirect effect on poverty by enhancing economic growth (to the extent that deposit insurance systems have a positive extent on growth) and a direct effect when households start using formal savings instruments as risk management tools (because their deposits are more secure). Benefits of deposit insurance systems, however, should be weighed against costs in terms of moral hazard if such systems lead to excessive risk taking by the banking sector.

Most literature on access to credit has not dealt with institutional imperfections and problems of the legal environment that result in high transaction costs for financial intermediation. This is especially the case in countries with underdeveloped financial markets. *Chapter 8* provides an analysis of legal and institutional factors that may negatively affect financial intermediation. The focus is on the use of collateral to gain access to credit, legal and institutional impediments to the use of certain types of collateral, and collateral substitutes that have been used in the region with various results. The chapter ends with

recommendations for reform in some regulatory aspects of financial institutions that may enhance the use of collateral, collateral substitutes, and overall financial market development. The chapter emphasizes that the country-specific political economy should be taken into consideration when evaluating each of the recommendations.

The participants in the conference provided a rich debate, highlighting certain topics. Many of the chapters include commentary in the form of analysis and recommendations by noted experts who participated in the conference. Adequate regulation of microfinance institutions and traditional banks was mentioned repeatedly as a priority for government action in the region, to increase the availability of some services to low-income populations. To this end, it is important to consider the specific nature of microfinancial transactions, such as high transaction costs and the geographical dispersion of clientele. Other topics often cited were the usefulness of information technology systems for providers of microfinancial services, as well as the fact that technological improvements can enhance the knowledge of clients (repeatedly mentioned as one of the main factors behind successful experiences) and overcome language, educational, and geographical barriers.

The need to take into consideration the indirect effects of financial services through the stability of the financial sector and growth of the economy was highlighted: for example, when considering the effects of deposit insurance on poverty reduction. Additionally, a cautionary note was sounded regarding the need to take into account the idiosyncratic characteristics of Latin American countries in implementing successful experiences from other regions. Ignoring this advice might make these experiences unviable. Finally, the need to gather and analyze more empirical evidence about access to financial markets was considered a priority and an area upon which the Inter-American Development Bank can focus in the future.

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**Part I:**

**Financial Services and Policies:  
Analysis of Micro Data**



# 1

## **Financial Markets and Poverty: An Algorithm for Policy-based Research and Research-based Policy**

Robert M. Townsend

**T**his chapter explores the relationship between poverty and financial markets. The document serves as a guide for operations and policy on the one hand and for research on the other. But the chapter does not distinguish between these two uses. Rather, both are merged into a common goal: policy is based on research and research is geared toward generating policy conclusions. The starting point of each section of this chapter is an explicit structural model. A list of data that would be needed to test the model comes next, followed by an outline of exactly how the data would be used: that is, what procedures or tests would be employed in the analysis. The findings of the empirical work from the analysis are then presented. Then and only then are explicit, detailed recommendations for policy offered. The final section offers a few caveats, notes some weakness, and gives some directions for further efforts along this line. References to the literature are listed by corresponding section at the end of the chapter.

The chapter is laid out by topic. The first topic concerns occupation choice and transitions into business. The goal is to use data to identify the real obstacles or barriers to trade. Wealth may appear to facilitate business formation and investment, and so the poor seem to lack opportunities—but that does not explain whether the fundamental problem is commitment and absence of collateral or moral hazard.

The second section embeds the same micro-underpinnings into a model of growth with changing inequality. An exogenously expanding financial sector is shown to have a huge multiplier effect on growth, though inequality may increase for a time along the growth path. Among those previously lacking access, the talented poor benefit the most from the expanding formal financial sector: that is, their welfare gains are large. The discussion then returns to the micro data to emphasize another feature: the allocation of risk.

The third section evaluates specific financial institutions, formal and informal, to see if they are having a positive impact on households and businesses in terms of ability to smooth idiosyncratic shocks. Then, as before, these micro-underpinnings are embedded into a model of growth with increasing inequality and taken to more macro data, in the fourth section. Policy distortions and barriers to entry are shown to slow down growth, but in this transactions cost framework, the largest gains from financial liberalization are reserved for the middle class. The gain is again quite large. The third and fourth sections provide the background for an evaluation of government development banks.

The fifth section outlines how to do the accounting, provisioning, and cost-benefit analysis, given an operating system in which credit contracts have insurance contingencies. The welfare gain from improved risk sharing through the development bank is compared to the government subsidy. The sixth section turns to another institution, village banks, as an example of how to evaluate the microcredit movement.

All the sections of this chapter draw on data from one particular country: Thailand. Multiple data bases are used. However, the methods are applicable to any country, with the proviso that there are sufficient data to test the model presented for a given topic. The methods presented in this chapter are applied to countries in Latin America in several companion chapters. Chapter 2 identifies obstacles to small business formation in Nicaragua. Chapter 4 explores growth with changing inequality and financial deepening in Peru.

## **Business Start-ups and SME Business Investment**

The assessment of this first topic is based on “Distinguishing Limited Commitment from Moral Hazard in Models of Growth With Inequality” (2003), and “Entrepreneurship and Financial Constraints in Thailand” (2004), by Anna Paulson and Robert Townsend.

### ***Model-Theory/Logic***

Three distinct models are to be distinguished:

*No credit* – Households must use their own funds (initial wealth,  $W$ ) to start up business, paying a fixed cost,  $x$ , or expand the business, the usual kind of investment,  $k$ . Thus the key financial constraint is  $k + x \leq W$ . The occupation choice is to go into business in this way and earn profits from hired labor at wage  $w$ —namely,  $\theta(k, l) - wl - x$ —or stay in the subsistence sector earning a subsistence income,  $s$ , or equivalently earn (unskilled) wages,  $w$ , (plus a potential cost of living differential, if employment is in the city). Uninvested initial savings are carried over at home at a low return; there are no financial savings. Households vary in the fixed costs  $x$  they incur. Specifically, costs vary inversely with

talent, which is unobserved but distributed in the population under a to-be-estimated distribution parameterized by  $m$ : namely,  $H(x, m)$ . A version of this model is Lloyd-Ellis and Bernhardt (2000).

*Collateral* – The model is essentially the same, except that now wealth  $W$  can be used as collateral and households lose that collateral with some probability if they default. (Of course, the advantage to default is absence of loan repayment.) Hence businesses can borrow, unlike the no credit economy, but only up to a proportion of wealth, say  $\lambda$ , where  $\lambda$  is determined by the probability of capturing the defaulter and the interest rate. Lending is asset-backed only, and other customer characteristics are not taken into account. Thus the higher is wealth, the more businesses can borrow, up to  $\lambda W$ . In Evans and Jovanovic (1989), talent is now supposed to enter multiplicatively into production, raising the marginal productivity of labor and capital: that is,  $\theta \varepsilon f(k, l)$ , where  $\theta$  is talent and  $\varepsilon$  is an ex post idiosyncratic shock. Talent  $\theta$  is distributed log normally in the population with a mean and variance to be estimated and is allowed to be correlated with measured education and with wealth: that is,  $\theta + b_1 w + b_2 edu$ , plus noise.

*Moral hazard* – Credit is now constrained by moral hazard considerations. That is, effort  $a$  in the production function is unobserved. The probability of success, high output,  $qh$ , is  $P(q^h / a, k)$ , although failure is possible even if the entrepreneur works hard. The households like consumption and leisure under a concave utility function,  $U(c, l)$ . Failure is more likely with shirking, but is not detectable. This, then, is the moral hazard problem. Success can be made more likely by talent, multiplying the probability of success by talent  $\theta$ . With presumed competition, banks are to break even on all customers on average: that is, for all  $(W, \theta)$  combinations. In effect, the ex ante expected utility of a representative household is maximized subject to zero profits. The more that is borrowed,  $b$ , the more must be repaid to the bank if the firm is successful; hence the less is the incentive for the owner to be diligent, the lower is the repayment rate, and hence the higher must be repayment upon success: that is, the interest rate is higher. Thus, as in Aghion and Bolton (1997), the poor can be screened out of the credit market entirely, although if moral hazard is the cause, it is not obvious that there is a remedy. Going in the other direction, the relatively rich can self-finance and escape the damage of the incentive constraints; credit decreases as wealth increases.

### **Data Needed Overall**

Only a subset of variables is used in certain procedures.

*Wealth* – Retrospective data on the wealth of households that were not in business at some previous year, such as five years ago. Contemporary surveys can measure wealth by asking what assets are currently held and if so, when acquired. Sales of major assets ideally should be included. A depreciation rate can be applied, given retrospective wealth at



various dates. An index of wealth can be created by principal components, if all that is known is ownership. Inheritance alone, if measured, can be used as a more or less ideal instrument.

*Business starts* – Retrospective data on business starts. This is a binary choice: in business or not. The relevant point is the transition into business from wage work or subsistence agriculture.

*Savings and borrowing* – Contemporary surveys might measure savings (possibly disaggregated into type, whether cash or in-kind) and list institutions, and also credit outstanding.

*Investment* – How much money it took to start the business.

*Measure of constraints* – Businesses are asked whether they could make more money if they could expand. If the answer is yes, whether credit is the limiting factor.

*Education* – Years of schooling of the household head, ideally the one running the business, or the most educated household member, or of parents.

*Income* – An estimate of income in the past year from a contemporary survey of individual households, distinguishing agriculture, business, livestock, and wage earnings.

*Demographic controls* – Household size; gender and age composition.

*Financial access* – Whether the subject is a customer or member of a named financial institution now and had been in the past.

## **Methods**

**Method 1** – Tabulations of business starts, investment, and net borrowing against wealth and education; nonparametric regressions, also known as locally linear regressions, of these same dependent variables as above, against each one of the covariates, as above.

**Method 2** – Probit estimates of business starts and of whether the subject is a net borrower. Also ordinary least squares regressions of initial investment and net borrowing, allowing for multivariate controls such as demographics, education, financial access, and wealth.

**Method 3** – Maximum Likelihood estimation of business starts against wealth. Each model suggests the exact form of the probability of seeing in data the observed relationship between wealth and business starts. These likelihoods are maximized by choosing the key parameters of each model—such as the tilt and/or support of the talent distribution,

the parameters of the production function, risk and work aversion, and the disutility of effort—parameters mapping talent as a function of wealth and education, and the cross-sectional variation in idiosyncratic and aggregate talent and in the distribution of wages.

## **Findings**

There is little question that credit markets are far from perfect. For business owners, collateral values average nine times the amount of the loan. For other households, the ratio is almost twice as high: seventeen times. Restricting attention to those with the median level of education (in the sample, four years) and comparing the number of households running businesses in the lowest wealth quartile to those in the highest wealth quartile, the fractions of those in business rises from 26 to 43 percent in the central region of Thailand, and from 8 to 16 percent in the northeast.

Similarly, controlling for demographic and geographic variables at the time of the 1997 survey, a doubling of household wealth five years before the interview date leads to a 21 percent increase in the number of households that went into business over the prior five years (1992–97). Likewise, the presence of financial constraints implies that entrepreneurial households that are in business invest less than the optimal amount. According to the estimates, as of 1992, a doubling of wealth in the cross-sectional sample is associated with an increase in start-up investment of 40 percent. Likewise, under financial constraints, the returns to business investment will be high for low-wealth households and will fall as wealth increases.

For the whole sample, median returns to business investment—that is, income to capital ratios—fall from a strikingly high 57 percent for households in the lowest wealth quartile to 16 percent for households in the highest wealth quartile. Entrepreneurial talent, as measured by education and whether parents were in business, does seem to facilitate business entry and the ability to exploit relatively high marginal returns, but it also appears there are a nontrivial number of talented but low-wealth households that are constrained on these margins.

Moreover, if the data on credit as a function of wealth for those businesses that report credit constraints are examined, the level of credit decreases with wealth: that is, net savings increases with wealth. Among the subsample of relatively wealthy households in the central region, a doubling of wealth leads to a 40,000 baht increase in savings. This is not true in the northeast. Likewise, the moral hazard model predicts that virtually all businesses that borrow will report some degree of constraints, whereas the asset-based lending model allows low-talent households to borrow and go into business without hitting constraints. The data reveal that being constrained is strongly associated with borrowing in the central region; nearly three-quarters (73 percent) of constrained business in the central region have outstanding debt, as compared to only about half (54 percent) of unconstrained businesses.

Constrained businesses in the central region also have more debt than unconstrained businesses: a median of 50,000 baht versus 30,000 baht. That is, businesses that

have managed to secure more credit are businesses more likely to complain about persistent constraints. Neither of these relationships holds in the northeast. The implication of some of the models that investment should increase with education and talent is strongly supported in the data, contrary to the presumption that talented households will need to invest less.

Thus physical capital and human capital are complements. More educated households will want to invest more and, holding wealth fixed, increasing education causes more households to complain of credit constraints.

### ***Policy Implications***

The policy implication is that overall wealth does limit access to credit in the northeast of Thailand in a way that might be remedied by relationship-based lending. The joint liability groups of the agricultural development bank, the Bank for Agriculture and Agricultural Cooperatives (BAAC), are not helping as much as might have been anticipated. The level of credit is still limited by wealth, and indeed entry into a joint liability group may be limited by wealth. This is not to say that the BAAC is not helping. Despite its charter and history, the BAAC does facilitate business entry and business investment. But it is doing so in a way that links its credit access and credit supply to wealth.

In contrast, neither village-level institutions nor networks of friends and families in the northeast of Thailand have sufficient resources to overcome the simple observed relationship between wealth and credit in a substantial way—despite alternative selection and lending procedures. (For a rigorous assessment of village funds, see Kaboski and Townsend 2001.) Though helping to alleviate constraints in business and agriculture, business start-ups are apparently not facilitated. Commercial bank lending is so rare in the northeast that it fails to be a consideration in business starts and investment; less than 2 percent of the population have loans.

This is not to say that one should give up on commercial bank lending. It appears that there would be a way for commercial banks to make profits in this sector, in the northeast. In the central region, BAAC credit, though still dominant, at 24 percent of all lending, is matched closely by commercial bank lending, at 21 percent, and lending from friends and relatives, at 17 percent. In the sample period, the BAAC gained more in interest income from larger, wealthier clients—precisely those households eligible for commercial banks loans. Thus it is a reasonable inference that the BAAC might be less willing to foreclose when such clients run into difficulties, potentially smoothing consumption or lessening investment fluctuations. The BAAC does have in place a risk-contingent lending system that would allow delayed repayment in some events. This should be viewed as a good thing, *a priori*, although it is not clear why this plays less of a role in business start-ups and financing in the northeast. Ways to make the BAAC risk-contingent credit system more explicit and improve the accounting so as to better assess its benefits are discussed in Townsend and Yaron (2001).

On the other hand, ample credit from the informal sector in the wealthier central region may be the key ingredient that allows for risk-contingencies in loans. When in trouble, a relative or moneylender pays for the client. Thus the Thai government should reconsider its efforts to eliminate money lending, especially if the credit instruments it promotes in government institutions or imposes through regulation are limited to simple noncontingent loans.

What matters is the nature of the financial instrument. Higher wealth households may be able to piece together a variety of financial instruments in a way that makes the whole greater than the sum of the parts. In contrast, in the northeast, households are more dependent on BAAC—if they can secure credit at all—so much attention should be given to the financial instruments currently offered by the BAAC or those to be offered by newly emerging institutions such as the People’s Bank. Optimally designed credit contracts need to take into account risk, incentives, and the ability to repay.

### *Caveat/Sensitivity/Extensions*

These models are static and hence do not capture possible interactions between wealth and talent. That is, wealth may appear to alleviate constraints but part of that may be correlated with underlying, unobserved talent. Instruments for exogenous wealth should be used where possible. Extensions underway allow for multiple lenders, making explicit a trade-off between money lenders with full enforcement and lower transactions costs, smaller loans at high interest, versus commercial banks requiring collateral and larger transactions costs, higher rates (Xavier Giné, in progress). A larger array of credit contracts allowing for blends of moral hazard and default are being estimated (Alex Karaivanov, in progress). Finally, less structure is imposed on the production function and unobserved distributions of talent in each sector (Buera 2002b). The bibliography for this first topic appears at the end of this chapter.

## **Financial Liberalization and Growth: Poverty Reduction through Improved Occupation Choice**

The assessment of this second topic is based on “Evaluation of Financial Liberalization: A General Equilibrium Model with Constrained Occupation Choice” by Xavier Giné and Robert Townsend (2004).

### *Model*

There is a sector of the economy without any intermediation (or in an extension, informal credit only). This sector is like the Lloyd-Ellis and Bernhardt (2000) economy described earlier as the no credit economy (actually it’s no credit and no financial savings). Wealth

is a constraining feature on investment  $k$  and occupation choice (particularly transitions into business).

In a second, intermediated sector, there is an endogenously determined interest rate,  $r$ , at which all households can borrow and lend—so it is as if all initial wealth,  $W$ , were put on deposit in a bank, earning  $(1+r)W$  and those who start a business borrow to cover the setup cost,  $x$ , and investment,  $k$ . Thus investment and occupation choice are not related to wealth in this sector. Production takes place in cities, and there is a cost-of-living urban/rural differential. The wage rate is common to both sectors, so migrants from the nonintermediated sector can earn wages but cannot deposit earnings in a savings account. Again, setup costs vary inversely with talent, and there are some poor talented households and some rich but not-so-talented households, among other categories.

This intermediated sector is small initially, but is presumed to grow slowly at the rate observed in the data (to move with measures of financial deepening). More specifically, the rate can be varied exogenously in the model and policy experiments can be conducted. Households choose occupations at the beginning of the period, either nonfarm investment, wage earnings, or subsistence agriculture. Initially, low wealth constrains choice, so wages are low and profits for those in business are high. End-of-period wealth is saved at a fixed rate (myopic savings) or in another interpretation, passed along to heirs (inheritance). As entrepreneurs earn rent, initial inequality grows. Over time, as wealth accumulates, more households can transit into business. Eventually, however, the wage increases and hence profits decrease. Income differentials decrease and inequality decreases as well. The model has no endogenous growth and so the match should be with GDP growth less total factor productivity. In principle, informal credit can accelerate the expansion, as could international capital inflows into the intermediated sector.

## **Data**

*Micro Data 1* – Some data are used to estimate the underlying parameters of the model: namely those of the production function, subsistence income, and the skewness of the talent distribution. These can be obtained as in Paulson and Townsend (2003); as this was described above, the list is not repeated here. In addition, standard socioeconomic income expenditure surveys can be used.

### *Micro Data 2*

- *Wealth index* – An index of wealth for a cross-section of households is created from data recording the ownership of key assets (principal components).
- *Occupation of the head* – Whether in the nonfarm business or not. It is best to use young households, headed by those between the ages of 20 and 29, who plausibly have not had time to let earnings from businesses influence current wealth.

- *Access to the financial sector* – As recorded in the socioeconomic survey as a transaction in the previous month with a named financial intermediary.
- *Wages and subsistence income.*

### Macro Data

- *Income growth over time*, as measured in national accounts.
- *Financial sector access over time*, as previously discussed.
- *Fraction of households in nonfarm business.*
- *Labor share in national income.*
- *Gini measure of inequality*, as computed for household income surveys.
- *Savings*, as measured from national accounts.
- *Total Factor Productivity*, as estimated through Solow residuals from data on capital, labor, and output.
- *International capital inflows.*

### Method

*Micro 1* – The model delivers a likelihood of nonfarm business occupation as a function of wealth (see Paulson and Townsend 2003).

*Macro 2* – A numerical algorithm takes as given an initial, estimated distribution of wealth in an initial year, 1976, although rescaled to fit the model. Occupation choice is determined in this and all subsequent years at the estimated parameter values. Wages and interest rates are found through a bisection algorithm so as to clear the labor market and the credit market in the intermediated sector, respectively, again in each year. Wealth is accumulated across household dynasties by a calibrated savings rate. Finally, the model is simulated. Remaining parameters (cost of living, exogenous growth in the agriculture sector, and savings rate) are calibrated, inducing the best fit of the model economy with the dynamic macro variables.

### Findings

Using this simple economic model, one can understand Thailand's remarkable growth from 1976–96, which averaged 6 percent and was much higher in the second part of this 20-year period. The growth rate was driven in no small part by improved financial intermediation. If, contrary to what actually happened, that expansion had been far more limited—virtually zero—then the model predicts that Thailand would not have grown much at all. The best that could have been managed would have been a low and flat 2 percent per year, and that is driven by an overestimate of total factor productivity (TFP) gains in agriculture, at 4 percent per year. The observed increase in the GDP growth rate (net of TFP growth), from the mid- to late-1980s on into the early 1990s, at 8 to 10 percent per year, can be reconciled in the model only by imagining a domestic

savings rate at astoundingly high levels. In other words, the model predicts that households would have saved a large fraction of their income, far above what was observed in that period.

However, if one progressively allows the population access to competitive financial intermediaries at exactly the rate observed in Thai data, with its surges from 10 percent with access in the mid-1980s to 20 percent by the mid-1990s, then one can track the upturn in the Thai growth rate reasonably well. More generally, the model is able to reproduce the movements of key macroeconomic variables such as the labor share, savings rate, income inequality, and the fraction of entrepreneurs observed in Thailand during the past two decades. Indeed, with the understanding of Thailand's historical experience that the model provides, one can ask who gained from the observed financial sector expansion. This issue can be addressed by comparing two versions of Thailand's history from 1976–96: the actual one, and a counterfactual one with a policy distortion that limits financial intermediation even below the observed low level.

The results confirm that not everyone benefits equally from the financial expansion. In 1978, for example, the modal gain from intermediation was between 5,000 baht and 17,000 baht per household, measured in 1997 domestic currency (the numbers depend on the specific estimation procedure used). Under the former exchange rate, this is equivalent to \$200 to \$680 per household for that year. Relative to average income, these numbers represent a 14 to 41 percent increase in the levels of income in 1978, a surprisingly high increment. Moreover, relatively low-wealth households that managed to switch occupations and go into business gained the most; the welfare numbers would be even higher if the simple arithmetic average had been used. By the year 1996, the wage is roughly 60 percent higher than it would have been without the expansion. Such price movements help determine the distribution of welfare gains and losses attributable to expansion of the financial sector.

The bottom line is that there were still substantial winners in 1996: that is, wealth accumulation had not overcome financing constraints, so the economy without intermediation suffers relative to the one with intermediation at the observed rate. The modal increase in welfare was 25,000 baht, or approximately 26 percent of 1997 average household annual income, equivalent to \$1,000. With the wage increase, unskilled laborers employed by business also gained.

However, that wage increase created welfare losses for those running firms: namely 116,000 baht each for such households, on average—roughly \$4,600. Surprisingly, capital inflows do not seem to lie behind the dramatic expansion and the welfare gains associated with intermediation. The gains are coming from access for those who previously did not have it, and not from increased credit for those who already have it. Even the addition of informal credit for those without formal access does not alter this picture. Building financial infrastructure would seem to be the key to growth, although again, there would be some who lose.



### ***Policy Implications***

If intermediaries had been allowed to expand at a faster pace, and if these same institutions had efficiently allocated credit to productive sectors, as the model assumes, then growth would have been even higher. However, in 1996, the Thai economy still displayed the same symptoms as in its earlier history, and there is no indication that the situation is any different today. That is, in 1996, the number of households with nonfarm businesses stood at only 20 percent of the population. More telling perhaps, the cross-sectional relationship between wealth and entrepreneurship was quite sharp: 8 percent for the low-wealth deciles and 30 percent for the highest.

Similarly, the number of those with transactions with a financial intermediary in the prior month stood at only 27 percent of the population in 1996, and the cross-sectional gradient was even steeper: 9 percent at the lowest deciles to 45 percent for the highest. These numbers can be adjusted so that they reflect initial conditions: for example, for the young who have most of their wealth from bequests and little from business operations. One suspects such numbers deteriorated only during the financial crisis. For example, according to the Townsend Thai data, commercial banks had only a 16 percent share in total lending in semi-urban and rural areas in 1997; this declined to 9 percent by 2000. The number of commercial bank borrowers stood at only 3 percent in 1997, and this dropped to 2 percent by 2000. The bottom line for policy is that an efficient expansion of the Thai financial system now could be an engine for much higher growth. The logic and numbers behind that recommendation are of exactly the same kind as economic/historical mechanics described above.

Still, the solution does not lie in simplistic or blunt policy instruments aimed at expanding credit and saving facilities. It is important that any such expansion take place efficiently. Specific policies need to be directed at specific institutions. Savings mobilization programs and the establishment of village funds continue to be promoted by government agencies, but unfortunately without much critical review. Not all institutions and policies are successful. For a more detailed assessment of the impact of particular institutions and particular policies, see Kaboski and Townsend (1998). Likewise, access to credit is limited and often linked to land as collateral, especially among low-wealth households and those in the northeast. Client-based lending procedures would seem to be helpful, rather than client-blind, collateral-based, asset-backed lending. These are already used, but ironically seem more effective in the central region and among higher wealth households.

For a more detailed analysis of the micro-underpinnings of credit markets and the macro economy, see Paulson and Townsend (2001). More flexible risk-contingent lending could be helpful, but the current regulatory system forces Thai policymakers to face a hard choice between seemingly popular but potential ad hoc and inefficient debt moratoria, on the one hand, versus inappropriate classification of nonperforming loans and inefficient provisioning, on the other. More generally, there seems to be poor understanding of a risk-contingency system that has served the BAAC and Thai population



well. See Townsend and Yaron (2001) for an analysis of the larger, BAAC system and how the regulatory accounting framework and the operation of the BAAC could be improved, specifically coupling accounting standards with microeconomic data. Finally, there has not been, to our knowledge, a rigorous assessment of the efficiency of commercial bank lending: an assessment that would also combine models and data, along the lines of this chapter.

In summary, Thailand has within its grasp the ability to increase the growth rate of national income and improve the well-being of talented entrepreneurial households among the poor and middle classes. What is required is a well-functioning financial intermediation system that allows such talented households to go into business or expand existing businesses. Estimation based on a formal economic model suggests that beneficial effects could be large if the financial sector reforms are well-conceived and carefully implemented.

### *Caveat/Sensitivity/Extensions*

A more realistic household-based, dynamic decision model is needed. Similarly, a richer model of the credit market might matter for dynamics. (See Karaivanov, in progress). The current model is sensitive to certain parameter values, which can cause binding corners in hired labor. The simulated paths are sensitive to the timing of the depletion of the subsistence sector, especially labor share and inequality. A bibliography for the second topic appears at the end of this chapter.

## **Risk, Safety Nets, and the Ideal Role of Financial Institutions and Financial Instruments**

The assessment of this third topic is based on “Safety Nets and Financial Institutions in the Asia Crisis: The Allocation of Within Country Risk,” by Mauro Alem and Robert Townsend (2001).

### *Model*

There are idiosyncratic shocks,  $\varepsilon$ , hitting households individually and aggregate shocks,  $\theta$ , hitting everyone simultaneously. The essential idea is that, without moral hazard or renegeing problems, idiosyncratic shocks can be shared or pooled, leaving only aggregate shocks to influence consumption. Thus, individual income movement, and other shocks, should not determine individual consumption once one controls for aggregate consumption. The basic regression equation captures this succinctly:

$$\Delta c_{t,t+1}^j = \beta_{t,t+1} D_{t,t+1} + \delta \Delta \bar{A}_{t,t+1}^j + \eta \Delta h s_{t,t+1}^j + \xi \Delta X_{t,t+1}^j + u_{t,t+1}^j$$

Household consumption change,  $\Delta c$ , is regressed on to fixed time effect,  $D$ , and household income change,  $\Delta X$ , as well as changing household demographics,  $\Delta hs$ , relative to population average demographics.

The coefficient  $\xi$  should be zero. This is the benchmark. In practice the issue is whether a positive coefficient is reduced by access to a financial institution or is lower for certain demographic or income groups.

Likewise, in a full neoclassical model, capital should be allocated across projects so as to equate the value of marginal products. Thus, individual income change should not determine investment once one controls for aggregate shocks that determine future valuation. Again, a regression equation of household investment,  $I$ , onto time fixed effects  $D$  and household income change,  $\Delta X$ , is:

$$I_{t,t+1}^j = \beta_{t,t+1} D_{t,t+1} + \delta \Delta A_{t,t+1}^j + \eta \Delta hs_{t,t+1}^j + \xi \Delta X_{t,t+1}^j + e_{t,t+1}^j$$

The coefficient  $\xi$  should be zero. This is the benchmark. In practice the issue is whether a positive coefficient is reduced by financial access or is lower for the wealthy, for example. Alternatively, change in investment should be insensitive to cash flow.

### Data

- *Household consumption* for a number of years, possibly estimated by a subset of items every year and then weighted and scaled up.
- *Household income*, as measured by gross revenue less expenses for agriculture, business, wage earning, fish/shrimp, and livestock.
- *Recall, retrospective data* on whether this past year was better or worse than the year before, and if worse, the shock or cause, and also the response.
- *Investment*, as measured by change in owned capital stock over each sector separately, excluding household durables.
- *Demographic controls* – Age, wealth, gender of the head, household size access to or membership in particular financial institutions, as measured by the household's own response, head of the village, census of nearby villages. These institutions and mechanisms include the BAAC, commercial banks, village funds, the informal sector, having rice storage, change in savings, and change in debt outstanding by institution and/or mechanism.

### Methods

- *Decomposition of income change* – Regress household-specific income change against time-specific fixed effects, within regions and overall. Regress household-specific in-

come change against level of income accounted for by each sector in the base year, or growth of income against proportion accounted for in the base year.

- *Plot histograms of income in the cross-section* and compare over time and over sector.
- *Tabulate proportions of household* claiming to have had a bad year, and fraction with particular shocks.
- *Enumerate claimed response in the face of adversity.*
- *Consumption insurance* – Regress household-specific consumption change, per capita and real, against household-specific income change, per capita and real, and also against time-specific *tambon* (county) fixed effects, a term reflecting the change in the demographic characteristics of the household relative to the *tambon* average, and household size. Do this overall and by region. Also stratify by wealth, education of the head, gender of the head, age, and by income source (primary source of income and occupation of head).
- *Investment efficiency* – The same regression with household investment (or change in investment) on the left-hand side.
- *Evaluate the financial institutions/mechanism* – Add a selection or participation equation that regresses household claimed membership in the initial year (or whether or not had savings in that institution in the base year) onto wealth, education, gender, age, household size, and also onto mean wealth of the village and mean education level of the village, and as an instrument, whether or not the headman of the village says there was access in the village to that institution in the initial year, or a smoothed average of whether other villages had access according to a village census of the year closest to initial year, or distance from the district center, or surprises (village that had access but was not predicted to have, and vice versa). Then take the predicted value of access from the participation equation and put that into the consumption or investment equation above as a right-hand side variable, interacted with income change. Use it also to create time-specific fixed effects that distinguish whether the specific household is a member or not and also the relative demographic change for members and nonmembers. Also enter demographics and wealth interactively with income change so as to better distinguish the effect of the institution interacted with income change.

## Findings

It appears that macroeconomic data painted a somewhat misleading picture of the health and well-being of the Thai population. That is, for the semi-urban and rural sample under consideration, macro shocks pale in comparison to the diversity of idiosyncratic shocks to households, villages, and regions. During the period of the financial crisis, households

and businesses were suffering from regional shocks such as floods, pests, and drought, and from idiosyncratic shocks such as illness and death in the family. More macro shocks such as fewer days worked, increases in input prices (including increases in business expenses), and decreases in output prices were present as well, but they are only part of the overall story. That is, controlling for the aggregates, one is left with striking residual movements in income, consumption, and investment. The diversity of responses across households and businesses is also striking, and among the measured responses so is use (or disuse) of the formal institutions through which the IMF, World Bank, and Asian Development Bank were implementing macro, reform, and safety net policies. This study singles out commercial banks, the government's Bank of Agriculture and Agricultural Cooperatives (BAAC), and village-level financial institutions such as rice banks and Production Credit Groups (PCG), and also focuses on the informal sector and self-insurance strategies. The bottom line is that macro crisis and subsequent policy play a role—not only directly in terms of macro shocks to income, but also indirectly through the financial institutions that might otherwise intermediate credit and ameliorate idiosyncratic shocks.

Some of the principal safety net policies put in place in Thailand at the time of its financial crisis were misdirected. Wage earners as an occupation group were not particularly vulnerable through unemployment or unpaid wages. Incomes of this group did not fall on average as much as in the other categories. On the other hand, it is important to distinguish the impact of average income on average consumption from the impact of a deviation of a household's income onto its own consumption deviation, holding aggregates fixed. Using the latter metric, it seems that wage earners (and others in agriculture) in the northeast would have benefited from some kind of within-group safety net—that is, increased within-group wage income insurance—even if this had been financed entirely within the group itself.

Further, while households with small businesses were vulnerable as a group to falling incomes, policies to promote small business formation, as though village funds, seem to have been off the mark. Business starts were relatively strong through this period, and business owners seemed to have had a surprisingly high level of within-group insurance, at least for the purpose of smoothing consumption (this had little to do with village funds). Unfortunately though, investment remained sensitive to changes in household income. Shrimp growers in Chachoengsao seem especially vulnerable to income change on both consumption and investment.

Safety net policies attempt to target particular groups. There is no apparent evidence in the panel data, which reveals particular and consistent vulnerability for the elderly, female-headed households, those with low education, or those with low wealth. There is, however, a distinct regional pattern. Apart from low education, all the other potential targeted groups do worse in investment stabilization in the northeast. But overall, those households suffering a direct consumption impact from bad years lie not in the poorer northeast but rather in the industrialized central region. There are also variations *within* regions, and drought, flood, pests, and illness compete with macro shocks such as unemployment and price movements in an explanation of investment and consumption change.

The primary source of formal credit to Thai farms is the Bank for Agriculture and Agricultural Cooperatives (BAAC), the government's primary development bank. It has in place a risk-contingency system under which loans are extended and interest and/or principal partially forgiven for farmers experiencing adverse events, both household-specific and regional. Thus one would have thought the BAAC would do a reasonably good job in smoothing consumption or maintaining investment. See, for example, Townsend and Yaron (2001) and Chiarawongsee (2000). But the analysis of the consumption and income panel data here shows that the BAAC was not particularly helpful in buffering consumption from adverse shocks. There are exceptions, mostly in the northeast. It is conceivable that outside agencies misunderstood the risk-contingency system of the BAAC, and that, as with commercial banks, they curtailed on-lending accordingly. In contrast, on the investment side, the BAAC has performed quite well in buffering investment from adverse shocks. Evidently credit from the BAAC is used to finance the levels of and fluctuations in investment.

Village funds have long been promoted in Thailand as a cooperative solution to an otherwise restricted financial system. Local, microcredit institutions have been established in many villages to expand credit to farmers or small business, as with Poverty Eradication Funds; to promote change of occupation, as with Women's Groups; to mobilize saving, as with Production Credit Groups; and to provide assistance in emergencies, as with Rice Banks. In the larger 1997 retrospective survey, Women's Groups and Production Credit Groups show up as having had a beneficial role in risk reduction, although funds in general suffer from failure and much turnover (see Kaboski and Townsend 2001). The panel data paint an interesting if complicated picture, with funds seemingly helping to smooth consumption when the BAAC does not, and helping to smooth investment when the informal sector is inadequate.

Help from friends and relatives, and from moneylenders, traders, storeowners, and others in the informal sector, shows up as particularly helpful in smoothing the effect of adverse shocks on consumption. The informal sector is less successful overall in smoothing investment, but there are many helpful exceptions, particularly business investment.

In times of global instability, self-reliance is particularly appealing. Thai farmers free from drought or flood have ample crops of rice, which they store locally, in anticipation of future shortfalls. But the data reveal little beneficial year-by-year impact, at least not in the short run. Indeed, northeastern farmers in Srisaket who escaped the El Niño drought increased their stores of rice in the early "crisis" years even as they reduced consumption. Unfortunately, this seems to have reduced insurance, thus resulting in a perverse effect from rice storage.

### ***Policy Implications***

During the financial crisis in Asian countries such as Thailand, macroeconomic aggregates were used to portray the health or state of the economy. Negative GDP growth was taken to indicate a fall in household welfare, for example. As a result, high interest

rate policies were initially used to encourage foreign (re)investment and expansionary monetary and fiscal policies were used later. Moreover, as commercial banks and finance companies were thought to be culprits in instigating the crisis, financial sector reforms were also implemented. The focus was on increasing capital adequacy ratios and reducing nonperforming loans. Finally, safety net policies recognized that particular groups or sectors might be more vulnerable than others to downturns, if not to the adverse effects of tight policy. Thus, a government agricultural development bank was used as an engine of growth, and the government savings banks was used to promote village funds and small household business.

From this discussion, several related points deserve emphasis. First, macro policy, financial sector reform, and safety nets work in varying degrees through the financial system, sometimes through the very same financial institutions. Yet these policies were implemented without a common conceptual framework. Indeed, there has been little theory-based assessment of the financial institutions or the safety net policies. Nor has there been an integration of any such assessment with the construction of improved macro models.

All of this suggests an obvious alternative strategy: explicitly incorporate the diversity of shocks, use the theory of an optimal allocation of risk-bearing as a benchmark to evaluate the role of the financial system, and thus appraise financial sector reforms and safety net policies, both for their own importance and to formulate improved macroeconomic policy, both in crisis periods and in the long run. This study utilizes a unique set of panel data for Thailand, and the advantage of hindsight and analysis, to establish and carry out this agenda. More specifically, it should not be presumed that in times of macro crisis and structural reform that macro shocks per se are the main source of the problem, nor that the poor are suffering relatively more. In Thailand, the larger effects on consumption were in the industrialized developed region. On the other hand, investment effects were worse in the semi-arid and poorer northeast. Finally, within the northeast, but not the central region, a better case could be made for targeting. That is, low-wealth households in the northeast suffered income fluctuations in consumption more, and female-headed households and low-wealth households suffered income fluctuations in investment more.

Targeting by occupation group is treacherous. Average wages and remittances did not fall as much as in other sectors, and concerns about unemployment were misplaced. On the other hand, within the group of wage earners, or those within agriculture, there were relatively uncovered idiosyncratic fluctuations. So within-group insurance might be envisioned. In contrast, while profits from nonfarm business and shrimp farmers fell substantially, perhaps justifying efforts to safeguard and encourage small business, within-firm insurance was surprisingly high. It is important to discover what mechanism is at work. Still, fish farmers suffered both relatively uncovered income-induced consumption and investment fluctuations.

Thus idiosyncratic shocks retain their importance even in the macro crisis, and though measured aggregate shocks were not large, the associated macro policies and

financial sector reforms may have impeded the ability of the financial system to play its traditional risk reduction role. Under the threat of nonperforming loans and regulatory tightening, commercial banks reduced on-lending dramatically, yet this left household more vulnerable than they might otherwise have been. Ironically, reduced savings accounts did provide ample buffer stocks, though symptomatic of the disintermediation. This suggests that banks be evaluated and regulated on broader criteria, such as diversification, and that banks be encouraged to make explicit contingencies, or create contingencies in their credit contracts.

The BAAC does have such instruments, as documented in Townsend and Yaron (2001), and it did play a more constructive risk-reduction role in the crisis, with exceptions. Still it was under pressure to reduce loans judged as nonperforming, using a mechanism inconsistent with its own operating system.

Informal sector credit rose in the period, and was quite helpful. The government should view the informal sector and financial markets more generally as co-partners in risk reduction efforts. An enhanced allocation of risk-bearing through formal financial institutions can have a direct, positive effect on growth, as is made clear in the work of Townsend and Ueda (2001). Thus risk reduction is not a simply safety net issue, but rather has consequences for long-run efforts to alleviate poverty.

### *Caveats/Extensions*

Ideally, the risk-sharing regressions should control for labor/leisure choices and employment should be considered jointly with consumption smoothing. Much work remains to be done with the investment equations, distinguishing by sector and purpose, but also modified to include adjustment costs.

It must be emphasized that the standard being employed here is overly strong. A priori, one would not expect many households or businesses to pass the stringent tests of full insurance for consumption and neoclassical efficiency in production. The observed degree of deviation, while a good standard for evaluation, begs for an explicit alternative model that incorporates impediments to trade, private information, limited legal enforcement, or other transactions costs. With these models, one could better gauge whether alternative macro or regulatory policies could have improved matters. Moreover, there is no attempt in this study to explain movements in the macro aggregates, in consumption, or in investment, for example. Rather, deviations around measured aggregates are used in the full insurance tests. An alternative, more explicit macro model with explicit micro underpinnings and impediments to trade would presumably have something to say about movements in these aggregates. Indeed, the facts that are reported in this study could be used along with risk-bearing analysis to guide the construction of such models. A bibliography of the third topic appears at the end of this chapter.



## Expansion of Financial Services and the Allocation of Risk: Growth with Optimal if Inevitable Inequality

The assessment of this fourth topic is based on “Transitional Growth with Increasing Inequality and Financial Deepening,” by Robert Townsend and Kenichi Ueda (2001).

### Model

Households maximize the discounted expected utility over their lifetime (infinite horizon in the model) by choice of how much to save,  $s$ , each period, and how much to invest in a risky as opposed to safe occupation or asset  $\phi$ :

$$E_1 \left[ \sum_{t=1}^{\infty} \beta^{t-1} u(c_t) \right].$$

Households investing in the risky enterprise, such as nonfarm business, experience idiosyncratic shocks,  $\varepsilon$ , and aggregate (macro) shocks,  $\theta$ . Thus the law of motion for capital is:

$$k_{t+1} = s_t [\phi_t(\theta_t + \varepsilon_t) + (1 + \phi_t)\delta].$$

The financial system provides two benefits. First, idiosyncratic risk is shared better. It is completely pooled, as if setting all idiosyncratic shocks to their zero mean; this is achieved by lenience on loan repayments in adverse years. Second, producers and households receive advance information (through the experience of others in the financial system) on shocks  $\theta$ , so that they can choose technologies or occupations under much better information than for those in autarky. But there is an initial fixed participation cost,  $q$ , a fixed cost upon entry (learning cost or physical infrastructure), and also a marginal transactions cost,  $c$ , per unit transaction. This delivers a critical level of wealth,  $k^*$ , below which households will decide to not gain access. All agents save, as in a neoclassical model of growth with linear and high-return technologies, but the relatively poor save as well, to buffer adverse idiosyncratic shocks and to smooth consumption against eventual entry costs. Over time, households make transitions into the financial sector, and this changing fraction of the population with access is correlated with income growth and inequality change. Those in the financial system tend to experience high growth, and co-movement of consumption. Those outside the financial system experience slower growth, depending on the mix of traditional to high-risk technologies. Lack of risk-sharing can push them toward safer technologies, but the nonconvexity of the entry decision can push them toward risky if uncovered enterprise, with some failing and falling back. Those outside the formal financial system experience uninsured income fluctuations. Thus this transition economy grows with high and widening income differentials and inequality typically increases. But if the expansion is not restricted, this change in



inequality is inevitable. That is, there are not enough resources to instantaneously create financial infrastructure. In the steady state, which is achieved quite slowly, insurance is complete and (without a surprise redistribution) inequality is locked in.

### **Data**

- *Wealth* – Estimated from a cross-sectional income and expenditure survey, using data on ownership of a list of financial assets.
- *Income* from farming or subsistence wage earners, and from nonfarm entrepreneurs.
- *Capital*, as measured by ownership of agricultural, business, household, and livestock assets.
- *Income to capital ratios* for these occupations to mimic average returns to the risky and safe asset.
- *Measures of whether or not a household is participating in the financial sector in initial years*, as measured by a transaction in the prior month with a named intermediary.
- *Participation over time in the financial sector.*
- *Gini measure of inequality over time.*
- *GDP growth, over time.*

### **Method**

Solve a dynamic stochastic optimization problem using the value function approach for each household separately as a function of current wealth. Optimally, this uses the value functions for those in the financial system and those artificially prohibited from ever entering the financial system, creating upper and lower bounds on returns, as well as a good approximation to value functions: functions for high and low capital values. Capital is gridded to a large, finite number of values within these bounds, and value functions within this range are approximated at each step by polynomials and integrated by Gaussian curvature methods. Income to capital ratios are set at observed values. Risk aversion and the intertemporal discount rates are set at typical values, as in the real business cycle literature. Idiosyncratic and aggregate shocks are entered with nontrivial variances (though these will be estimated in subsequent work). Marginal transactions costs are set at plausible values.

For a household not in the financial sector, the decision is how much to save and how much to invest between the safe and risky assets. For a household in the financial

system, advance information is very good and the only decision is how much to save. A solution thus yields endogenous portfolio and savings policy functions and critical values of capital necessary for entry. As an initial condition, start the economy at the initial date with a wealth distribution as measured in the data in the initial year, but centered so that at the derived critical value of capital, the observed participation rate is mimicked.

Next, characterize the mean, analytic path, and the central tendency path of the economy based on the derived policy function, taking expectations over shocks. Plot those dynamics against the observed data on growth and participation for the (Thai) economy. Finally, simulate the same economy 10,000 times and pick the small set of paths from models that are closest to the actual dynamic Thai path, comparing the Gini measure of wealth inequality, the participation rate in the financial sector, and the growth rate of income. Alternatively, pick the paths that are closest to the observed Gini coefficient and growth rate of income, and then construct confidence intervals for the range of financial participation predicted from the model, to be compared to the actual participation rate.

## ***Findings***

The model at given and nearby parameters tends to under-predict the growth of income, especially during the second decade, the 1986–96 period, though its prediction for Thailand is of high growth in the long run, with the associated nontrivial inequality. Income differentials between sectors widen over time. Growth and income inequality are created by shifts in the population to the intermediated sector over time. But at these values, the model tends to over-predict substantially the fraction of the population participating in the financial system. Making households substantially more risk-averse and giving them a higher preference for current consumption tends to slow growth, thus lowering participation; but the model's simulation still substantially over-predicts the actual lower rate of participation in the Thai population, as historically observed. The conclusion is that something in Thailand was impeding the construction of a far-reaching financial infrastructure that households and businesses would have been willing to pay for. One suspects that otherwise well-intended Thai policy is responsible.

## ***Policy Implications***

The model tries to capture the impact of the wide array of restrictive policies that existed in Thailand up to the early 1990s, by crudely and exogenously restricting entry to those with even higher wealth: higher than the model without restrictions would predict. It is as if commercial banks and other financial institutions were underinvesting in middle-wealth regions, for example. The welfare losses associated with such restricted policies can then be estimated. These losses are nontrivial—averaging from 4 to 10 percent of wealth—and positive for virtually the entire Thai population, except those high-wealth individuals and businesses already in the financial system by 1976, and those so poor that without some other form of redistribution, eventual entry would be extremely dis-

tant. The magnitude of this loss from restricted policies is thus quite large. This is the main lesson learned from the model exercise.

In addition, the concentration of losses in the population is not uniform; it tends to be skewed to the middle class: those with wealth not too far from the imposed value. That is, those that gain the most are those middle-class households and medium-scale enterprises that would be willing to pay fees and enter the system, or obtain yet more credit and insurance, if only Thai financial policy were to permit it.

This concentration of gains among the middle class is the second lesson. The policy recommendation is that Thailand take steps to liberalize its financial system further. In particular, access should be increased in semi-urban and rural areas, with the cost passed on to business and households in the form of higher fees. Widely used macroeconomic and financial ratios, such as M2/GDP, possibly indicative of financial deepening or inflation pressures, can be misleading because they do not capture the underlying disparities in access. Similarly, the financial system needs to play the role envisioned in the model, with better pooling of information on project success and enhanced insurance or credit-guarantee schemes, although again these indemnities should be funded with adequate self-generated premia. Current regulatory efforts concentrating on nonperforming loans have underplayed disclosure and underplayed the risk reduction achievable with portfolio diversification and adequate risk contingencies.

### *Caveats/Extensions*

There is a need to model better, and make a distinction between occupation choice and portfolio choice. Investment in education also needs to be included. Transactions costs need to distinguish households by region and socioeconomic status. Although sensitivity analysis is conducted, some of the parameters need to be estimated from the cross-sections, rather than imposed. As a transition economy, the construction of confidence intervals is also problematic. The model takes the paths of inequality and growth that best fit the Thai data out of the 10,000 simulations at calibrated parameter values, looks at the final value of participation for that subset of paths, clips off the tails—2.5 percent of each tail—and thus plots for the remaining economies a 95 percent band within which the model economy lies. A bibliography for this fourth topic appears at the end of this chapter.

## **Government Development Banks and Other Financial Institutions: An Assessment though Operating Systems and Financial Accounts**

The assessment of this fifth topic is based on “The Credit Risk-Contingency System of an Asian Development Bank,” by Robert Townsend and Jacob Yaron (2001).

The intermediary is lending to finance short-term inputs into production (farming and business), long-term investment in these occupations, and credit to smooth consumption and investment from fluctuations from adverse idiosyncratic shocks. The model can allow for interim communication of unobserved shocks to borrowers, costly interim and ex post verification of those shocks, and some nonreneging, or the imposition of continued participation constraints for borrowers. The contract with the intermediary thus consists of a bundle of attributes: capitalization or investment, recommended or induced action, repayment of loans, and insurance against shocks. With competition, such contracts would be fairly priced in the market, and intermediaries would break even. Competitive equilibria would be Pareto optimal. However, target groups such as rural farmers at risk might be given lump sum transfers or grants: for example, for the purchase of insurance. These grants might come from intermediaries, which therefore take losses. Compensation for losses requires transfers from the government, financed in the end by taxpayers—and possibly falling on nontarget groups. In particular, the idea behind provisioning is that not all loans will be repaid, and the intermediary needs to provision against nonpayment, adding to costs. Estimates of nonpayment, or delayed payment in which interest is lost, can vary with client groups, particular branches, or types of idiosyncratic (local or regional) shocks, and vary over time with aggregate shocks. Historical experience can be used to estimate default rates, and priced with risk premia, according to what the market would require. Costs might be covered by higher on-lending rates, as if a premium were charged, or alternatively, covered by transfers from the government.

### **Data**

- *Annual balance sheets.*
- *Income statements.*
- *Annual reports.*
- *Interviews with staff in main office and in district offices.*
- *Schemata of operating system and procedures.*

### **Methods**

Review and summarize the intermediary's actual operating system and try to match internal procedures with observed accounting entries. Then compare to what theory and better practice would require. Thus examine required, regulated provisioning rates against the historical time profiles of arrears. Use supplementary material to identify historical events and orders of magnitudes. Likewise, identify in the income statements government

inflows to compensate for losses, ideally distinguishing the purpose of the transfer. Estimate the overall level of subsidy and the subsidy-dependency index, and the amount on-lending rates would need to be increased in order to break even.

## **Findings**

The BAAC makes loans to its client farmers, and the bulk of the revenue on its income statement comes from interest paid on its loan portfolio. Yet the BAAC has also developed a system under which clients under duress can request more time for repayment without accrued interest. Typically, a credit officer goes into the field to verify the claimed situation and relief is granted. A handwritten notation is made in the client's loan history. Further, in the case of local shocks such as floods, interest payments for a relatively large group of clients may be reduced and part of the principal may even be forgiven, paid by the government to the BAAC as if paid by the farmers themselves. This was true for the southern storm of 1989 and the floods of 1995 and 1996, for example.

Thus the BAAC has combined two financial instruments: simple credit, on the one hand, and insurance with indemnities, on the other. Neither instrument can be said to be better than the other. Both instruments are important. Indeed, the combination of instruments more resembles relatively sophisticated financial instruments such as futures contracts and options. The option—release from full repayment—is triggered by well-defined events, as verified in the field, if not already evident from the weather. Alternatively, farmers have entered into a hedge, having arranged to receive an indemnity from the insurance contract when principal and interest are due.

The government subsidy dependency index (SDI) for the BAAC stands at about 30 percent, so the BAAC is not breaking even. On the other hand, it is more self-sustaining from deposits than many other rural development banks. A risk-contingency system is in place, as described earlier. That allows delayed repayment so that most loans are repaid eventually. Penalties of 3 percent are charged only against willful default, as judged by relatively costly field visits from branch staff; and only 1 to 4 percent of loans are in litigation. Provisioning can be excessive, according to some of the branches. This could undercut the insurance function of the bank, and it would appear that costs of operations are high. But subsequent adjustments are hard to disentangle in the accounts. In any event, the required schedule of provisioning for overdue loans is flat, with 10 percent per year to be provisioned over 10 years. This is unlike what is seen in actual, historical repayment data. Instead, most of the loans come in early and more nagging problems show up later. Thus provision rates should not be flat, but rather rise with the age of arrears. The costs of provisions are not covered by user/client fees, and instead are covered by government transfers. Sometimes large transfers are made for regional shocks, such as floods in 1992 and southern storms in 1989. However, the line item for transfers mixes up the transfers that are government-paid premia with transfers for special government projects. The latter are at on-lending rates that are lower than the BAAC average rate on its own, more standard loans. There is thus no cost-benefit analysis within the BAAC system.

## ***Policy Implications***

A bank making loans with the expectation of timely and complete repayment of principal and interest should be assessed and regulated differently from an insurance company that takes in premia ex ante and pays out indemnities to clients that experience adverse events. Similarly, a for-profit commercial bank has as its bottom line the profits it makes for its owners and shareholders, while a government-operated bank must be concerned with public welfare. Hence one should not consider the bottom line of a development bank's income statement as the sole criteria for assessing its contribution to rural welfare.

The Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand falls between these kinds of extremes. It makes loans with the expectation of eventual repayment, but it also services its client farmers by granting them relief in hard times. It tries to cover its costs in the long run and to avoid excessive reliance on government subsidies, but it also receives transfers from the Government of Thailand, to cover the shortfall of revenue created by its implicit insurance system and the failure or decision not to charge sufficient premia. It is thus not at all surprising that BAAC can be misunderstood and that policies toward it have generated some controversy. Is its primary role to make loans to farmers or is it to grant them relief in hard times? How does one trade off the BAAC's own profitability, and hence its long-run sustainability, against the welfare of the farmers that it serves, and the interests of Thailand more generally?

The work here offers some surprisingly straightforward and simple answers to these questions. To regulate a financial institution, evaluate its impact, and formulate appropriate policy, it is necessary to understand the operating procedures of that institution and the contracts and implicit arrangements it has with its own clients. This is what is meant by international best practice.

First, just as financial institutions that are intimately tied up with volatile international financial markets, such as New York banks, are now encouraged to develop and utilize their own risk metrics and risk assessment systems, so should the BAAC be encouraged to document (and modify) its credit, risk-contingency system as its client farmers continue to experience aggregate shocks such as drought, flood, pests, and fluctuating prices, as well as idiosyncratic shocks such as fire and personal illness.

Second, socioeconomic survey data can be used with economic models to estimate the welfare gain made possible by the provision of insurance: that is, by the same risk-contingency system. Third, the operating system and accounts of the BAAC should be made more transparent so as to allow one to estimate the cost to the Government of Thailand of running the risk-contingency system. Fourth, one can use these estimated benefits and costs to do a cost-benefit analysis and then, if necessary, modify BAAC policy accordingly.

The insurance indemnities can help Thai farmers smooth consumption and maintain investment and the use of productive inputs even during bad years. This is a service Thai farmers might be willing to pay for. At the very least, one can assess the value of

that service. As a start on this, Townsend and Ueda (2001) model financial institutions as offering such insurance contracts, and calibrate the parameters of the model with socioeconomic survey data. They find that otherwise restrictive policies in Thailand, which apparently impeded the insurance and banking function, may have caused a welfare loss as high as 7 percent of household wealth, on average. Such numbers can then be compared to government transfers to financial institutions such as the BAAC, which offers such services—using the Subsidy Dependence Index (SDI) methodology developed by Yaron (1992).

Unfortunately, however, the magnitude of the government transfer is not yet clear. If there is a probability that a given farmer or group of farmers will not repay principal and interest, then the BAAC needs to provision accordingly: that is, to enter as a cost the amount it estimates that will not be repaid on a timely basis. In principle, the provisioning and cost accounting could be done using the data the BAAC already has, looking at past histories of actual repayments and magnitude of arrears by age. Moreover, this could be done by type of event, location of the branch, and the state of the national economy (in a recession or not). In practice, both previously and under the new crisis-related change, the BAAC uses some fixed formula for provisioning that is not directly related to the data that it has. However, if provisions were done optimally and costs were entered more accurately, then one would better know the magnitude of the gap between these costs and current revenue. It is that gap that would need to be covered either by increased revenue—with premia paid by the farmers themselves—or by the Government of Thailand, with tax revenue, as a subsidy.

Acknowledgement of the risk-contingency system and its associated costs, and hard-nosed accurate accounting of the same, is the way to derive the magnitude of the government subsidy: a number to be compared to the welfare gain estimated from the micro data. In practice, however, the government subsidy to the BAAC covers not only the risk-contingency system but also the costs of various government special projects, many of which are acknowledged to be making losses, and which in any event should be assessed with a similar but separate accounting system.

With the costs and benefits of the risk-contingency system made clear, a simple cost-benefit calculation would reveal whether the government-paid portion of the insurance is warranted, given the estimated benefit. The larger point is that the government role in the provision of aid to farmers would be rationally assessed as part of a larger well-defined system and not driven in an ad hoc and ill-measured way by year-to-year political pressures.

### ***Caveats/Extensions***

Provisions need to take into account temporal variation and the possibility of large unanticipated shocks. Malfeasance could limit insurance, and full insurance is not reasonable, based on a moral hazard model. The welfare measurement of gain from micro data needs to be improved. Finally, the political situation in Thailand is changing, with pressures for



debt moratoria and hence for larger losses. Finally, the BAAC should not be thought of in isolation from other financial institutions or other mechanisms. A bibliography for this fifth topic appears at the end of the chapter.

## **Microenterprise Institutions: Assessment of Local, Village Funds (and Other Financial Institutions)**

The assessment of this sixth topic is based on “Policies and Impact: An Analysis of Village-level Microfinance Institutions,” by Joseph Kaboski and Robert Townsend (2005).

### ***Model***

The intermediary can provide credit and/or insurance so as to facilitate smoothing of consumption in a bad idiosyncratic year, smoothing of investment in a bad idiosyncratic year, facilitate going into business and occupation transitions, alleviation of credit constraints in agriculture, alleviation of credit constraints in business, reduction of reliance on money lenders, and facilitate asset accumulation.

### ***Data***

*Household* – Use household retrospective data from village surveys:

- Whether or not in business and when
- Timing of occupation transitions
- Whether potential or actual client claims to be constrained in operation of business or farm
- Whether had to decrease consumption in bad year in last five due to adverse shock
- Demographics (age of head; years of schooling of head; gender of head; number of adult females, males, and children; wealth)
- Whether or not the household participates in a financial institution or agricultural cooperative, or uses a money lender
- Village-level average wealth, education.

*Government village census data* on the availability of institution, village by village, for various years.

*Institutional survey* using accounts, local records, and interviews:

- Founding (date, funding)
- Training



- Policies on borrowing
- Policies on saving
- Membership criteria
- Emergency services, and retrospective data on growth of members, history of borrowing, history of lending, and past failure.

*Headman, key informant survey on the history of village institutions*

### **Methods**

*Direct* (naïve, without correction for selection). The impact on a household of its use of a financial institution. Run a probit on: whether the household went into business in the last five years (yes, no) onto demographic controls (age of head; age squared; education of the head; gender of head; number of males, females, and children in the household), wealth of household six years ago, wealth squared, and use of the institution in question (village fund), as well use of other institutions (BAAC, commercial banks, and money-lender); and onto village controls (average wealth, average wealth squared, fraction of village population that are rice farmers, average education); and finally onto whether the village in which the household resides has ever had a village institution (using retrospective data, including events after the primary retrospective date). Also run probits on occupation transition, if any, in the past five years, whether it the household was constrained in business, whether it was constrained in farming, had to reduce consumption in a bad year in the last five years (yes, no), and whether was a customer of a money lender. Run an ordinary least squares regression on asset accumulation using retrospective data.

*Correction for individual selection.* Predict whether the household was a member six years ago, with the dependent variable from the household survey using household demographics, schooling of the head, wealth, and wealth squared six years ago; whether the village had village institutions six years ago; and use of other institutions six years ago. For access to a village-level institution on the right-hand side, use headman's retrospective history or a GIS measure of availability of village institutions at the retrospective year, using a smoothed probability surface. Then combine the impact equation and the individual selection equation, using simultaneous equation maximum likelihood methods or two stage least squares.

### **Findings**

Institutions have had very mixed experiences. Many institutions fail within the first year or first five years, while in others, membership lending and savings services grow. Some of these experiences are related to chosen policies. The model finds support overall for the positive impact such institutions can have, under some circumstances. The mea-

sured impacts on households can be significant and sizable. Village funds may reduce the probability of a household using a moneylender, and in some estimates, increasing asset accumulation. The latter is measured in the survey by creating a retrospective history of all household, business, and farm assets, and also land: that is, date of acquisition, value, and possible depreciation. When specific types of institutions are examined, the model yields more specific advice:

- Women's groups and production credit groups (PCGs) have the most helpful impact. Women's groups have significant impact on increasing asset growth rates. Being a member of a women's group increases the probability of switching jobs and lowers reliance on moneylenders. PCGs have a sizable impact on asset growth and lower the probability of having to reduce consumption or production inputs in low-income years. The latter is based on the household's self-assessment of their response to the worst year of the last five years.
- Rice and buffalo banks appear to have a negative impact (but this may be due to a negative village selection effect). Despite the fact that more households were members of rice banks than any other institution, effects on asset growth and consumption in a bad year might be statistically significant and perverse. Buffalo banks have a negative impact—that is, a statistically significant and perverse effect—reducing the growth rate of assets and increasing the probability of reducing consumption in a bad year. Open-ended survey answers indicate that the buffalo banks may have suffered because of their small-scale, village-level operations. Some ceased operation if buffaloes died or failed to give birth, for example.

However, certain policies offered by some of these institutions can be helpful—even the less successful variations. Indeed, when specific policies are examined, the analysis can yield rather specific advice:

- Institutions offering lending services tended to experience growth in the number of members and promote occupational mobility. However, the impact analysis indicates that they had a negative impact on asset growth and business start-ups. Institutions that used the amount of savings as a criterion for loans lowered the probability of household customers needing to reduce consumption or inputs in bad years.
- Institutions offering emergency services were able to assist households in smoothing consumption and input-use in response to adverse shocks, but raised the probability that households would turn to moneylenders. So in this instance, moneylenders and emergency services were complements.
- Institutions that provide training tended to have both lending and savings services, and these policies produced higher asset growth and less borrowing from moneylenders, and lowered the chance of adverse impacts in a bad year.

- Institutions that offer pledged savings accounts were more likely to experience increases in savings services, and had a favorable impact on asset growth rates, the ability to start businesses, and job mobility, and produced less reliance on moneylenders.
- Institutions that offer standard savings accounts helped households smooth consumption in bad years but experienced declines in membership, and appear to have made households go to moneylenders.

### ***Policy Implications***

The tentative recommendation is that the promotion of rice banks and buffalo banks, as currently configured, be discontinued. On the other hand, certain types of policies are particularly helpful. This study recommends that institutions offer training to potential customers and to staff. Institutions should also be encouraged to offer lending services when they are able to do so, by their own assessment. This study's advice on the provision of savings is more qualified; it depends on the local objective. Pledged savings are a surprisingly good vehicle, although the benefits may have more to do with the simplicity of administration and the minimization of transactions costs than the nature of the pledge itself. Standard savings, with more flexible withdrawal, offer benefits similar to those of emergency services.

This analysis is nonexperimental in this sense; the controls that are used in the evaluation are statistical controls. Unlike a scientific experiment, this study could not solicit from villagers whether or not they wanted to have a village fund, or have a fund with a specific set of policies. That is, the study could not solicit volunteers and randomize the placement or treatment among the group of volunteers so that there would be a treated group and a control group. Rather, the study groups villages by whether they had *ever had* village institutions or not. "Ever had institutions" meant a village had an institution in the distant past, at a retrospective time about which the study asked questions or measured certain variables; or was to have an institution in the future, after that retrospective data was collected but before the actual interview data was amassed. Such "ever-had" villages were found to be more agricultural (that is, to have more household members who are rice farmers or agricultural workers); less wealthy (that is, to have households with fewer overall assets and fewer business assets in particular); have more credit, especially loans from family or the BAAC; and have more instruments for saving, especially for emergency reasons. These village characteristics must be controlled for in doing the evaluation; otherwise it would appear that village funds are having a negative, perverse aspect.

For example, households living in villages with village financial institutions were less likely to have changed jobs: that is, to have switched out of agriculture. Likewise, the analysis must control within a village for who decides to become a member of the institution and who does not. This is done by finding variation in institutional membership that has little to do with the household's own choice and much more to do with simple availability; that is, the village happened to have an operating financial fund at the time of the retrospective interview data, and was surrounded by other villages with active

funds, as promoted by a distinct CDD office, for example. Only when these controls are included does the analysis begin to estimate positive, beneficial effects.

We would also recommend the continuation of this kind of evaluation, especially in *tambons* and *amphoes* (districts) in which local officials are inclined to promote village funds. More generally, our analysis would be complemented by the gradual expansion of the villages' funds simultaneously with the implementation of evaluation procedures. Typically, funds cannot be promoted in all villages in a given area all at once, since without training and careful implementation, eventual failure rates would be high (as our evidence shows). Staggered introduction, even with the eventual goal of universal access, would allow randomize experimental controls: that is, initial random expansion. This would allow a much more accurate overall evaluation, with the information gained available to help those villages that get funds later in the implementation process. It would also be possible to evaluate specific policies further, such as deliberate variation in the type of savings accounts that would be appropriate given the mixed evidence presented above. A bibliography for this sixth topic appears at the end of the chapter.

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# 2

## Entrepreneurship and Financial Constraints: The Case of Nicaragua

Luis Tejerina\*

**T**his study seeks to identify the different underpinnings of market failures that influence access to credit and entry into entrepreneurship in Nicaragua. The methodology used follows that described in chapter 1 (Robert Townsend's "Algorithm for Policy-based Research and Research-based Policy").

With 5.3 million inhabitants and an income per capita of around \$500, Nicaragua is one of the smallest and poorest countries in Latin America. Although Nicaragua experienced a period of uninterrupted growth in per capita terms from 1993 to 1998, averaging 1.8 percent every year for five years, inequality, as measured by the Gini coefficient, increased from 0.57 to 0.60 in that period. Given the high initial level and the relatively small variability of this index, this is a considerable change. The findings in this study might help to identify some of the reasons why the poor did not benefit from this growth proportionately.

The development and understanding of entrepreneurship has been recognized as a key area for economic development. An environment that welcomes new enterprises is fundamental for developing countries (Stern 2001). Besides benefiting entrepreneurs, small enterprises in Nicaragua also benefit the poor indirectly since they are one of the most important sources of employment. More than two-thirds of workers (67 percent) in Nicaragua are employed in enterprises with fewer than five workers, and more than three-quarters (76 percent) are employed in enterprises with less than 10 workers, a recent study by the International Labor Organization found (Trejos Solorzano 2000). This

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chapter adds to the literature on the determinants of entrepreneurship: specifically on the empirical relationship between wealth and entrepreneurship.

## Literature Review

Lucas (1977) is probably the first to give some structure to the theory of occupational choice in a model to explain the distribution of business firms. In this model, agents are heterogeneous in entrepreneurial talent and the decision to start a business depends on entrepreneurial talent and wages.

Evans and Jovanovic (1989) and, more recently, Blanchflower and Oswald (1998) trace the debate on the nature of entrepreneurship to Frank Knight and Joseph Shumpeter. While Knight implies that entrepreneurs must finance and bear the risk of new projects themselves, Shumpeter differentiates the role of entrepreneur (identifying arbitrage opportunities) and capitalist (financing the entrepreneur and bearing the risk). Evans and Jovanovic reevaluate the issue, estimating an empirical maximum likelihood model using data from the National Longitudinal Survey of Young Men and find evidence in support of Knight's view. That is, after controlling for observables, they find that there is a positive and significant effect of wealth on the probability of becoming an entrepreneur. The nature of the underlying financial constraint in this model is limited commitment; agents are limited to borrowing only a share of their current wealth.

Lloyd-Ellis and Bernhardt (2000) develop a dynamic model of occupational choice in which because of moral hazard, potential entrepreneurs depend on the bequests inherited from their parents as collateral to finance investment in capital for business start-ups. In this model, the low frequency of talented entrepreneurs and the high borrowing constraint (loan to collateral ratio) can generate counterproductive cycles in the economy.

Aghion and Bolton (1997) develop an occupational choice model in which the return on savings is endogenously determined by the equilibrium between the supply of savings and the demand for loans. In this model, agents and projects are homogeneous and differ only in initial wealth (bequests). Because of moral hazard, the probability of success for an entrepreneurial project (and therefore the expected ability to repay) increase with wealth. Eventually the distribution of wealth converges to a distribution that is independent of the initial state. This distribution is suboptimal because of entrepreneurs who are credit-constrained by their level of wealth. Aghion and Bolton also find that permanent, progressive transfers improve efficiency.

An implication of the models that use moral hazard as the underlying financial constraint is that the share of the investment that must be paid to the lender acts as a disincentive to exert effort to achieve a successful outcome from the project. Accordingly, interest rates will be higher for poorer people. As wealth increases, people will tend to borrow less.

## Models

### Moral Hazard

The structure and implications of the moral hazard model developed below come from Paulson and Townsend (2004), who present a generalized version of the Aghion and Bolton (1997) dynamic model of occupational choice. A simplified model appears below, based on Aghion and Bolton (1997) and Lehnert (1998). Entrepreneurial talent is introduced as a factor affecting the probability of success of the project, in a similar way to that in Paulson and Townsend (2003). The presentation of the models in this study is meant to illustrate the differences between the moral hazard and the limited commitment models. For a detailed description of the models on which the implications used in this study are based, see Paulson and Townsend (2003).

The model consists of a continuum of risk-neutral agents with wealth,  $z$ , and entrepreneurial talent,  $\theta$ . Each of these agents can enter a project that requires a level of investment,  $k=1$ , and gives a payoff according to the following function:

$$(2.1) \quad P(k, p) = \begin{cases} r & \text{with probability } p\theta \\ 0 & \text{with probability } (1-p)\theta \end{cases} \quad \text{when } k=1,$$

where  $r$  is the return if the project is successful, and  $p\theta$  is the probability of success of the project. This probability is influenced by entrepreneurial talent,  $\theta$ , and the level of effort,  $p$ . For analytical purposes, the level of effort affects only the probability of success and not the payoff. Both  $p$  and  $\theta$  take values between 0 and 1. Given capital  $k=1$ , if the project is not successful, the payoff to the entrepreneur will be zero. Also, effort is costly according to the following function:

$$(2.2) \quad C(p) = \frac{rp^2}{2a},$$

where cost is increasing according to the size of the payoff of the project,  $r$ , and the level of effort,  $p$ , and  $a$  is a parameter of the function. When the agent's wealth is less than the amount needed to begin the project, s/he will have to borrow an amount  $(1-z)$ , at the equilibrium rate of interest equal to  $\rho(z)$ . The bank will offer a contract to the borrower in which s/he will have to pay the corresponding rate of return,  $\rho(z)$ , times the amount of money borrowed,  $(1-z)$ , if the project is successful, and zero otherwise. Hence the revenue function for the bank for a loan given to an individual of wealth  $z$  and talent  $\theta$  will be:

$$(2.3) \quad R(p) = \begin{cases} (1-z)\rho(z) & \text{with probability } p\theta \\ 0 & \text{with probability } (1-p)\theta \end{cases}$$

If the project succeeds, the bank will get  $(1-z)$  times the equilibrium interest rate. If it fails, the bank will get 0.

The agent is risk-neutral and needs to choose effort  $p$  to maximize expected utility:

$$(2.4) \quad \max_p \left\{ rp\theta - \theta p(1-z)\rho(z) - \frac{rp^2}{2a} \right\}.$$

Expected utility will be equal to the payoff if the project is successful,  $r$ , times the probability of success ( $p\theta$ ), minus the expected amount to be repaid to the bank, minus the disutility from effort. The expected amount to be repaid is equal to the amount borrowed,  $(1-z)$ , times the probability of success,  $p\theta$ , and times the interest rate for the given level of wealth,  $\rho(z)$ , and minus the disutility of the level of effort,  $C(p)$ . The solution for  $p$  then is:

$$(2.5) \quad p = \left[ 1 - \frac{(1-z)\rho(z)}{r} \right] a\theta$$

From this equation it is easy to see that keeping  $\rho(z)$  fixed, the optimal amount of effort is increasing in wealth. That is, the more money people need to borrow to start the project, the less effort they are willing to make.

The expected rate of return for the bank,  $A$ , will be determined in equilibrium by the supply of funds. The supply of funds will be determined by two groups. Wealthy people will supply the funds they own in excess of what they need to self-finance their projects through savings in the banks. Poor people who cannot borrow enough to start projects will save their wealth. Thus the savings of the very poor and the very rich will determine the supply of funds to entrepreneurs. The model assumes that banks compete against one another and drive down extra-normal profits to zero, so this expected rate of return will have to be constant for all levels of wealth. If the rate of return is set to a higher level, other banks would have an incentive to enter the market and lower the price to the equilibrium level,  $A$ . To have a constant rate of return, the banks must charge higher interest rates to people who exert less effort and have lower probabilities of success. Low levels of effort will have to be compensated by high interest rates according to:

$$(2.6) \quad A = p(z)\theta\rho(z).$$

This equation sets the expected return rate of the bank to the constant,  $A$ . Combining equations 2.5 and 2.6 yields:

$$(2.7) \quad \left[ 1 - \frac{(1-z)\rho(z)}{r} \right] a\theta^2\rho(z) = A.$$

Solving for  $\rho$  yields:

$$(2.8) \quad \rho(z) = \left[ 1 - \sqrt{1 - 4 \frac{(1-z)A}{ra\theta^2}} \right] \left[ \frac{r}{2(1-z)} \right].$$

For this equation to have a real solution, the term inside the square root must be greater than 0. Solving for this term yields:

$$(2.9) \quad z - 1 + \frac{r\theta^2 a}{4A} \geq 0.$$

As can be seen from equation 2.9, wealth and entrepreneurial talent will be positively correlated with the probability of starting a project. Figure 2.1 presents a graph of equation 2.9. An arbitrary value for  $a$  was chosen for illustrative purposes. The shaded area shows points in which the equation will have a solution as a function of wealth and talent. In the reduced form estimations, one should see a relationship between wealth and entry to entrepreneurship, and entrepreneurial talent and entry to entrepreneurship. Also, since richer individuals are able to self-finance, this model implies that wealthy entrepreneurs should be less dependent on credit and more likely to be net creditors.

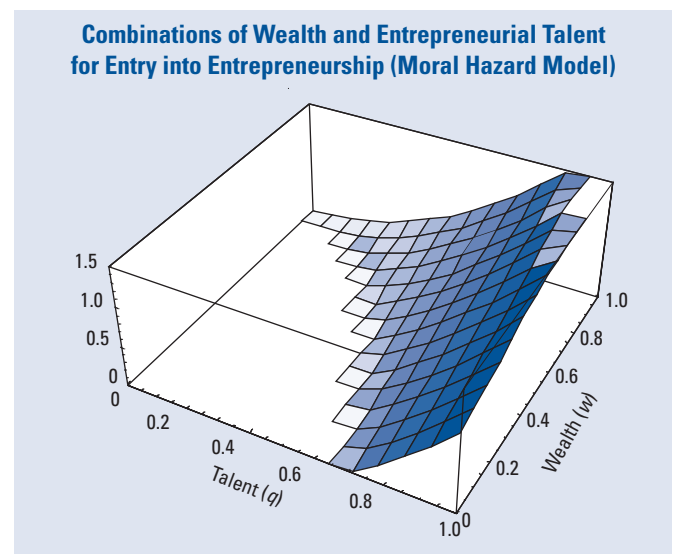
In the model presented in this study, the size of the project was assumed to be constant. However, Paulson and Townsend (2003) provide a numerical simulation of a version of the model in which the size of the project is endogenously determined by the model. One of their findings is that as wealth increases, the level of effort will initially increase, until a certain threshold. After this threshold and, since wealthy households will prefer to enjoy more leisure, the level of effort will decrease. If effort and investment are complements, the level of investment will also decrease. Their findings validate the implication that wealthy households will be more likely to be net creditors when moral hazard is present.

### Limited Commitment

The limited commitment model also comes from Paulson and Townsend (2003), who use the model developed by Evans and Jovanovic (1989) to differentiate the

FIGURE 2.1

Combinations of Wealth and Entrepreneurial Talent for Entry into Entrepreneurship (Moral Hazard Model)





empirical implications of a limited commitment model from those of a moral hazard model.

The Evans and Jovanovic model belongs to the occupational choice literature. The basic objective is to test for the existence of liquidity constraints in the process of entry into entrepreneurship. The model works as follows:

An individual makes the choice of being employed or becoming an entrepreneur. If s/he chooses to be a wage-worker, s/he will have a payoff according to:

$$(2.10) \quad w = \mu x_1^{\gamma_1} x_2^{\gamma_2} \xi,$$

where  $x_1$  is work experience,  $x_2$  is education,  $\gamma_1$  and  $\gamma_2$  are their respective elasticities,  $\mu$  is a constant, and  $\xi$  is a disturbance, with  $E(\xi)=1$ . The person can also choose to enter into an entrepreneurial project and receive a payoff according to:

$$(2.11) \quad y = \theta k^\alpha \varepsilon,$$

where  $\theta$  is the level of entrepreneurial ability,  $k$  stands for capital invested, and  $\varepsilon$  is a disturbance, with  $E(\varepsilon)=1$ , and  $\alpha \in (0,1)$ . The net income for an entrepreneur is given by:

$$(2.12) \quad y + r(z - k),$$

where  $z$  is the level of wealth of the entrepreneur, and  $r$  is one plus the exogenously given interest rate. The second term will be positive for net lenders and negative for net borrowers.

The model's key assumption is that agents can borrow only up to a fixed percentage of their wealth. In the model, this percentage is given by  $\lambda$  minus one. Therefore, the maximum amount that the person can invest in a given project is given by  $\lambda z$ . The maximum amount they can borrow is  $z(\lambda-1)$ . The model assumes that entrepreneurs never default even if the project does not turn out well. To choose the optimal level of capital, the person will maximize expected profits from the enterprise and compare them with expected profits from wage labor. The problem becomes:

$$(2.13) \quad \max_{k \in [0, \lambda z]} [\theta k^\alpha + r(z - k)].$$

Solving for  $k$  yields:

$$(2.14) \quad \text{E.O.C: } k = \left( \frac{\theta \alpha}{r} \right)^{\frac{1}{1-\alpha}}.$$

As long as the term on the right is smaller than or equal to  $\lambda z$ , the entrepreneur will be able to invest the optimal amount of capital into the project. Given all the other param-

eters, this decision will depend on talent  $\theta$  and wealth  $z$ . Setting the amount of optimal capital to be smaller or equal to  $\lambda z$  and solving for  $\theta$  yields the following expression:

$$(2.15) \quad \theta \leq (\lambda z)^{1-\alpha} \frac{r}{\alpha}.$$

Whenever  $\theta$  is smaller than the term on the right, the entrepreneur will be able to start an unconstrained business. In this model, higher talent will always be positively correlated with entry into entrepreneurship. However, excessively high talent will cause the optimal amount of capital needed to invest in the project to be higher than the amount that can be obtained with the collateral available.

Replacing equation 2.15 in the production function yields:

$$(2.16) \quad y = \begin{cases} \theta^{\frac{1}{1-\alpha}} \left( \frac{\alpha}{r} \right) & \in \quad \text{if } \theta \text{ satisfies (2.15)} \\ \theta (\lambda z)^\alpha & \in \quad \text{otherwise} \end{cases}$$

Using this production function to calculate the expected payoff from entrepreneurship and compare it to the expected payoff from wage work yields two more conditions:

$$(2.17) \quad \theta \left( \frac{\theta \alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} + r \left[ z - \left( \frac{\theta \alpha}{r} \right)^{\frac{1}{1-\alpha}} \right] \geq \mu x_1^{\gamma_1} x_2^{\gamma_2} + rz \quad \text{Unconstrained}$$

$$(2.18) \quad \theta (\lambda z)^\alpha + r(z - \lambda z) \geq \mu x_1^{\gamma_1} x_2^{\gamma_2} + rz \quad \text{Constrained}$$

If any of the two conditions above are satisfied, the person will choose entrepreneurship as his/her occupation. Depending on 2.16, the enterprise will be constrained or unconstrained. Solving each condition for  $\theta$  yields:

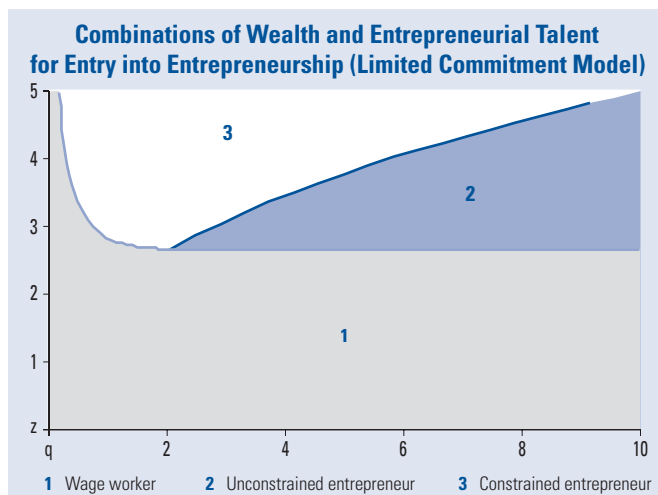
$$(2.19) \quad \theta \geq \left[ \frac{\mu x_1^{\gamma_1} x_2^{\gamma_2}}{\left( \left( \frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} - r \left( \frac{\alpha}{r} \right)^{\frac{1}{1-\alpha}} \right)} \right] \quad \text{Unconstrained}$$

$$(2.20) \quad \theta \geq \frac{\mu x_1^{\gamma_1} x_2^{\gamma_2}}{(\lambda z)^\alpha} + r (\lambda z)^{1-\alpha} \quad \text{Constrained}$$

The intuition of equations 2.15, 2.19, and 2.20 can be seen in figure 2.2, where the curves that satisfy each condition with equality are graphed. In this figure, the area labeled 1

corresponds to those who do not have the combination of talent and wealth to satisfy any of the conditions above; therefore they become wage workers. The area labeled 2 corresponds to those who can become entrepreneurs and can borrow the optimal amount of capital for their level of talent. The area labeled 3 corresponds to those who will become entrepreneurs but cannot achieve the optimal level of capital for their talent; these are the constrained entrepreneurs. A feature of the model that will be used in the analysis is that constrained entrepreneurs will be borrowing at their limit; if their wealth were to increase, the level of borrowing would also increase.

FIGURE 2.2



this is not necessarily the case in Nicaragua, as far as these variables are correlated, one would expect to find a positive correlation between talent and entrepreneurship, as it can be seen in figure 2.2 In the Evans and Jovanovic model, one would also expect to find that the most talented entrepreneurs are more likely to be constrained than the less talented ones.

Policy recommendations consistent with limited commitment models will be related to reducing transaction costs and improving the quality of collateral (increasing  $\lambda$ ). Policies consistent with moral hazard models will be related to improving the verification of effort in projects (joint liability groups or credit bureaus).

## Data

Currently there is much need for detailed data for Latin America on the interactions between households and financial markets; this would help better identify market failures and make policy recommendations that would allow entrepreneurs to make productive investments, despite lack of personal wealth or well-defined property rights. While the information on established enterprises acquired through surveys is useful, much could

be learned from the behavior of potential entrepreneurs who fail to enter entrepreneurship because of various constraints. Living Standards Measurement Surveys (LSMS), for example, could be a way to capture information about these potential entrepreneurs and also to capture information about the informal sector, which plays an important part in Latin American countries.

The data for this study come from the 1998 Nicaraguan Living Standards Measurement Survey and general information from the Instituto Nacional de Estadística y Censos de Nicaragua. This dataset was chosen because of the particularly high level of detail in which financial information is recorded, such as defaults on payments, information on households that applied for loans that were denied, the reasons for not soliciting a loan, retrospective information on assets (the year the asset was acquired, purchases and sales of land, and the like), and sources of financing. The survey consists of a representative sample of 4,209 households in both urban and rural areas, and all the regions in Nicaragua. After dropping observations with incomplete information for the relevant variables, this study ended up with a sample of 3,993 observations, out of which one-third (33 percent, or 1,321) have businesses in the household. Of these, 2,097 observations come from urban areas and 1,780 observations come from rural areas.

Compared to nonbusiness owners, income and wealth for business owners are roughly 116 percent and 24 percent higher, respectively (see table 2.1). A big difference between households that have a business and those that do not is that in all the regions business owners have a much greater tendency to keep their savings in the formal financial sector than nonbusiness owners. Overall, roughly 11 percent of business owners reported that they had a savings account in a financial institution, compared to 4.5 percent of nonbusiness owners. For the whole sample, the percentage of business owners with a loan that was overdue was 3.41 percent, while the percentage for nonbusiness owners was 1.7 percent. Business owners seem to play a more prominent role as lenders; 7.42 percent of business owners have lent money to third parties, compared to 3.48 percent of nonbusiness owners. Business owners are more likely to have loans from financial institutions: specifically, twice as likely when compared to nonbusiness owners in urban and rural areas. The presence of nongovernmental organizations (NGOs) that tend to cater to the poor is very high, especially in rural areas. An impressive 60 percent of business owners in rural areas in the sample have borrowed money from an NGO, compared to 37 percent of nonbusiness owners and 32 percent of business owners in urban areas. In relative terms, 21 percent of the loans in the sample are held by NGOs in rural areas, compared to 9.2 percent in urban areas.

Some 58 percent of the businesses operate in commercial activities, and almost 80 percent of the sample is concentrated in the manufacturing, commerce, and/or services industries. The disaggregated occupations by industry can be seen in table 2.2. In urban areas, business owners concentrate on commerce. In rural areas, they concentrate on agriculture and food processing and commerce.

Table 2.1 also shows information about the period when the businesses in the sample were started. More than half (56 percent) of the household businesses were started

**TABLE 2.1**  
**Summary Statistics**

	Whole Sample		Urban		Rural	
	Business	No Business	Business	No Business	Business	No Business
<b>Observations</b>	1,321	2,673	959	1,138	361	1,419
<b>Years of schooling: head (percent)</b>						
0–6 years	73	80	67	63	88	93
7–12 years	22	17	27	30	10	6
12 + years	5	4	6	7	1	0
<b>Wealth</b>						
Mean (córdobas)	74,316	59,857	88,122	63,659	37,733	60,116
Wealth ratio business/no business	n.a.	1.24	n.a.	1.38	n.a.	0.63
Median	24,655	11,330	28,420	14,880	15,220	10,290
<b>Savings in financial institutions</b>	10.91	4.42	12.83	7.73	5.82	1.76
Loans owed to household (percent)	7.42	3.48	8.13	4.39	5.54	2.75
<b>Defaults (percent)</b>						
Have missed a payment for more than 30 days for loans taken in the last 12 months	5.6	2.8	5.9	2.6	4.7	3.2
Default financial	3.4	1.7	3.8	1.1	2.5	2.2
Default commercial	18.4	18.3	18.0	16.0	19.5	21.7
<b>Year established (percent)</b>						
1–5 years ago	55.8	n.a.	52.8	n.a.	64.7	n.a.
6–10 years ago	18.6	n.a.	19.8	n.a.	15.3	n.a.
11 + years ago	25.6	n.a.	27.4	n.a.	20.1	n.a.
<b>Financial liabilities (last 12 months)</b>						
<b>Liabilities (percent who have)</b>	<b>24.6</b>	<b>10.9</b>	<b>26.5</b>	<b>14.6</b>	<b>19.7</b>	<b>8.7</b>
Cash obtained against crop	0.5	1.5	0.1	0.3	1.4	2.5
Debt to commercial banks, cooperatives, and NGOs	38.4	22.4	41.7	38.8	39.4	14.9
Debt to relatives, individuals, other	34.1	28.5	31.7	12.9	59.0	37.3
	27.5	49.1	26.6	48.3	1.6	47.8
	100	100	100	100	100	100
Median size of financial credit (córdobas) <sup>a</sup>	1,621	1,000.0	1,761	1,250.0	1,472	870
Debt commercial credit (percent who have)	12.4	6.6	12.7	8.8	11.4	4.9
Median size of comercial debt (córdobas) <sup>a</sup>	434.0	287.5	417.0	380.0	475.0	270.0
<b>Have family workers in business (percent)</b>	87.6	n.a.	86.0	n.a.	92.1	n.a.

Source: 1998 Living Standards Measurement Survey of Nicaragua.

n.a. not applicable

a. For those who have credit or debit.

**TABLE 2.2**  
**Business and Nonbusiness Share by Industry**  
*Percent*

	Whole sample	Urban	Rural
Agriculture and food and beverage processing	4	4	7
Mining oil extraction, gas	1	1	1
Manufacture	12	12	12
Servicies	8	9	5
Construction	7	8	6
Commerce	58	57	62
Transport	5	5	4
Financial and real estate	0	0	0
Entrepreneurial activities	2	2	1
Research	0	0	0
Public sector	0	0	0
Education	0	1	0
Leisure, others	2	2	1
Total	100	100	100

*Source:* 1998 Living Standards Measurement Survey of Nicaragua.

less than five years ago. This information is used to fix the endogeneity problems that are likely to arise because of the increase in income and wealth once the household starts earning the profits from its business. A nice feature of the data is that it allows for the construction of a proxy of wealth before starting the business. To control for these problems,<sup>1</sup> this study followed the methodology used in Paulson and Townsend (2002). Land purchases (sales) within the last five years were subtracted (added) and household assets that were bought more than five years ago were appreciated at a rate of 10 percent per year, therefore obtaining a proxy.

Since the data in the survey allows one to proxy wealth only five years in the past, all the business that were created before that time were dropped from the sample. Households that started a business within this five-year period but already had another business were dropped because having a business will probably lower the costs of opening another one (presumably such households know how the system works and probably have a history with financial institutions). Because of these dropped observations, the sample is smaller for the reduced form estimation. Thus the final sample includes only those households that did not start a business at all (business=0) and the households that started

<sup>1</sup> This would cause one, erroneously, to attribute the higher income coming from the household business to financial market failures.

their first business less than five years ago (business=1). Applying this filter yielded 2,976 observations, of which 658 own a household business. The jump to entrepreneurship was bigger for the rural areas; about half (53 percent) of existing businesses in urban areas were started within the last five years, compared to about two-thirds (65 percent) in rural areas. Very little information is available about businesses that might be owned by more than one household, but 97.2 percent of the businesses in the sample report that they are completely owned by one household. The final analysis measures the effects of pre-business wealth, education of the head of the household, and other characteristics on who will become an entrepreneur in the years between 1993 and 1998 and on which businesses consider themselves to be constrained.

Tables 2.3 and 2.4 show some characteristics of the sample of business owners disaggregated by quartiles of wealth. When the poorest and richest quartiles are compared, entrepreneurship always increases with wealth, although this is not the case in some of the points in between. The increase in entrepreneurship with increasing wealth seems to be more pronounced in urban areas.

Table 2.4 shows the ratio of monthly income of the business to business assets. Poor business owners seem to have consistently higher returns on their assets. This seems

**TABLE 2.3**  
**Entrepreneurship and Constraints by Wealth and Education**  
*Percent*

Schooling	Wealth			
	Lowest quartile	Second quartile	Third quartile	Fourth quartile
<b>Whole Sample</b>				
0–6 years	12.94	17.90	20.29	21.16
7–12 years	19.87	28.57	23.53	32.43
12+ years	18.52	23.08	4.35	37.31
<b>Urban</b>				
0–6 years	21.32	24.28	30.55	32.63
7–12 years	19.09	30.00	28.57	34.90
12+ years	23.81	25.00	4.76	35.48
<b>Rural</b>				
0–6 years	9.91	15.17	13.03	12.94
7–12 years	25.71	25.93	0.00	28.57
12+ years	0.00	25.00	0.00	60.00

Source: 1998 Living Standards Measurement Survey of Nicaragua.



**TABLE 2.4**  
**Median Return on Business Assets (monthly gross income/ business assets)**

	Wealth			
	Lowest quartile	Second quartile	Third quartile	Fourth quartile
Whole sample	190.0	160.0	124.1	82.6
Urban	107.5	133.3	124.1	76.0
Rural	266.7	197.1	127.7	110.7

Source: 1998 Living Standards Measurement Survey of Nicaragua.

more pronounced in rural areas and could be an indicator that poor entrepreneurs are not able to invest the optimal amount of capital in their businesses.

### ***Who Is an Entrepreneur?***

While Blanchflower and Oswald (1998, p.1) argue that “the simplest kind of entrepreneurship is self-employment,” the definition of entrepreneur varies from those who declare themselves to be self-employed (Evans and Jovanovic 1989; Mesbha 1998), to someone who creates employment opportunities or someone who has made a business investment in order to obtain profits (Gentry and Hubbard 2001). In the Nicaragua 1998 LSMS survey, the respondents were asked specifically if they had a household business, were self-employed, or provided services independently. Those who answered yes to this question *and* listed a positive amount of business assets were classified as business owners.

### ***Who Is Constrained?***

A constrained entrepreneur cannot borrow enough money to invest the optimal amount of capital for his or her project. One reason for this may be moral hazard (Lloyd-Ellis and Bernhardt 2000; Aghion and Bolton 1997); an entrepreneur cannot commit ex ante to exert the optimal level of effort to have a successful outcome. Another reason may be limited commitment; credit is restricted to a proportion of the wealth of the entrepreneur, regardless of his or her level of talent or effort (Evans and Jovanovic 1989).

To classify households as being constrained, this study used three factors. First, in the Nicaragua survey, households were asked if they had solicited a loan in the last 12 months; those who solicited a loan but did not get it were classified as constrained. Second, those who got a loan but answered yes when asked if they wanted a bigger loan at the same rate and term were classified as constrained. Third, those who did not solicit a loan were asked the reason for not soliciting a loan. Those who did not have access to financial markets for various reasons (that is, they did not know how to solicit a loan, or loans are not offered in the community) were classified as constrained.

This definition of being constrained is very broad and should be thought of not only as a proxy for constraints on credit but also as a proxy for constraints on savings and insurance.

This proxy is far from optimal, but it would be hard to improve without observing the production function and talent of the individual entrepreneurs. Table 2.4 presents some data to show that this proxy is capturing some the level of constraints. Assuming a production function with diminishing returns to capital—as in Aghion and Bolton (1997) and Evan and Jovanovic (1989)—the returns to capital should be higher for those entrepreneurs who cannot invest the optimal amount of capital than for those who can. In this case, the rate of return is measured as gross monthly income in the business divided by the level of business assets. Table 2.4 suggests that for most of the cases, constrained entrepreneurs have higher returns than unconstrained ones. Poorer households tend to have higher returns to assets than richer households. This seems to be valid especially for the third and fourth quartiles in all the regions.

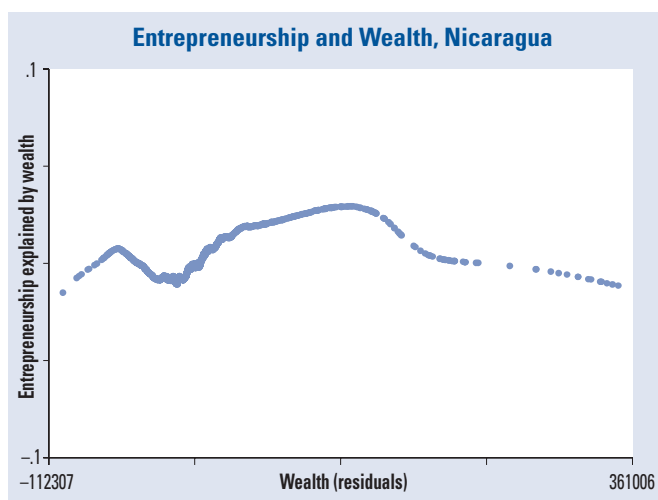
## Methodology

### *Non-parametric Estimation*

This study used non-parametric techniques to estimate the role played by education and wealth on entrepreneurship. This was done to present graphically a complete picture for all levels of the independent variables. For the non-parametric estimation, the study used a locally weighted regression model. The idea behind these models is that they do not assume a functional form for the relationship between two variables. One weighted regression is run for each observation, assigning the highest weight to one observation at a time and decreasing the weights as the rest of the observations get farther from it.

The weights to be used in the estimation are determined by a discount function that will assign smaller weights to observations that are farther away than the one under analysis. Sometimes a bandwidth is used for these models; this means that a certain percentage of the observations will not be used in the estimation of the coefficient corresponding to a certain value. For example, if the independent variable were the numbers from 1 to 100 and a bandwidth of 0.8 was used, the first step would be to run a regression with the number 1 as the central value, assigning a smaller weight to the number 2 and an even smaller one to 3, and so on. In this first

FIGURE 2.3



regression, the number 81 would be excluded because the bandwidth includes only 80 percent of the observations. Then a second regression would be run using 2 as the central value and assigning smaller weights to 1 and 3. The final regression should take 100 as the central value and discard all the numbers from 0 to 20, assigning the smallest weight to the number 21. For each regression, the predicted value is recorded. All the predicted values are graphed against the dependent variable. In this case, the study used the tri-cube weighting procedure with a bandwidth of 0.8.

To control for other variables, the study used the double residuals procedure. The dependent variable was regressed using ordinary least squares (OLS) against all the explanatory variables except for one (the excluded variable). The residuals of this estimation were calculated for each observation within the sample. Then a regression was run of the excluded variable against the same set of explanatory variables. The residuals were calculated for each observation in the sample used. Finally a regression was run of the residuals of the first regression against the residuals of the second regression. The resulting graph corresponds to the relationship between the dependent variable and the excluded variable after controlling for the rest of the variables.

The results of this estimation can be seen in figures 2.3, 2.4, 2.5, and 2.6. Tick marks for certain centiles were included to give a better idea of the distribution of observations. When the urban and rural graphs are combined, each independent variable is multiplied by the mean in the respective area to reflect the differences in wealth and education between these areas.

FIGURE 2.4

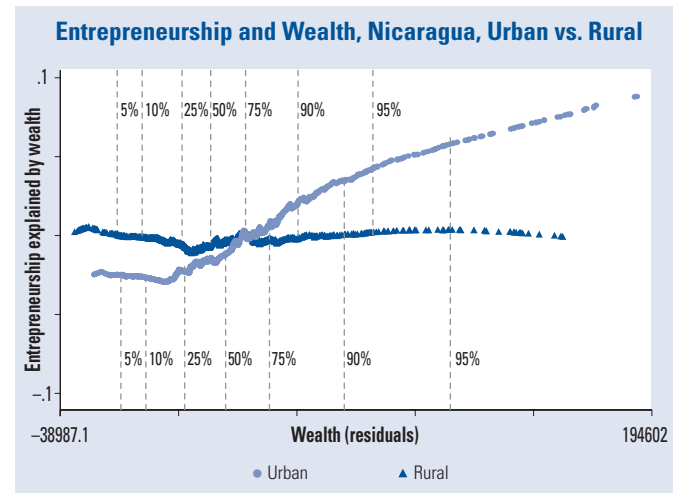


FIGURE 2.5

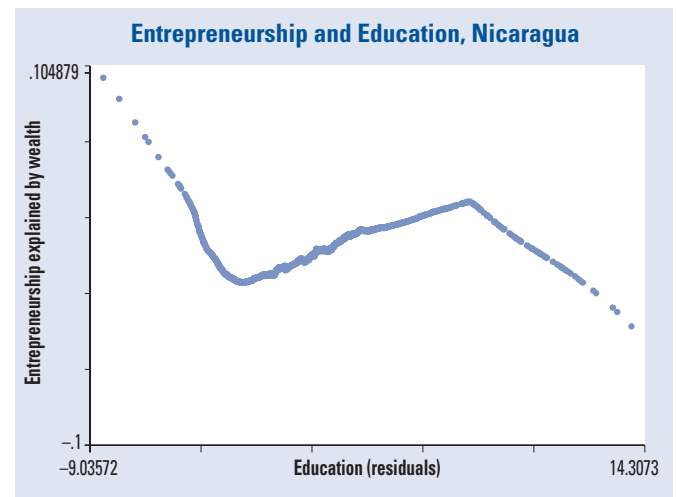
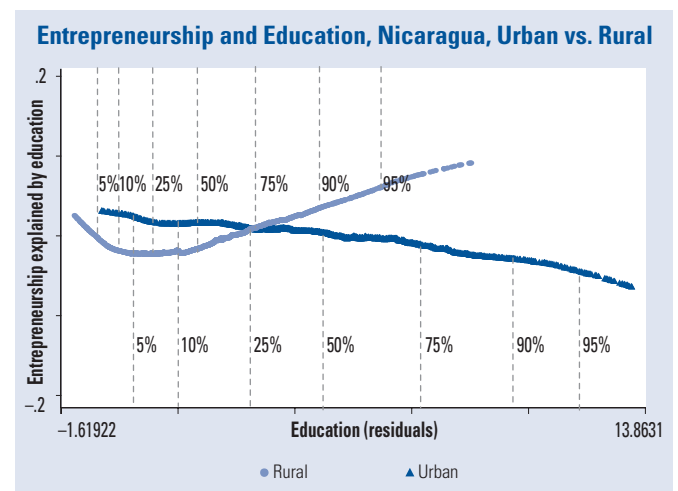


FIGURE 2.6



### **Reduced Form Estimation**

The equation to be estimated is:

$$(2.21) \text{ prob}(y_{ij} = 1) = \Phi(W_i\alpha_1 + W_i^2\alpha_2 + Ed\alpha_3 + X_i\beta_1 + \psi_j + \varepsilon_{ji})$$

where  $y_i$  is a dummy variable that takes the value of 1 if the household has started a business in the last five years and 0 otherwise.  $W$  is a proxy for the level of wealth of the household five years prior to the survey (that is, before starting the business).  $Ed$  is the years of education of the head of the household.  $X$  is a set of descriptive characteristics, including the number of adult males, adult females, and children in the household; age of the head of the household; and membership in a financial institution.  $\psi$  is the fixed effect of living in municipality  $j$ .

The purpose of equation 2.21 is to determine the effect of wealth and education on the probability of becoming an entrepreneur and starting a business. Although the other variables provide some interesting results, they are meant only as controls. The analysis below concentrates only on the coefficients mentioned before. The coefficients presented are the marginal effects of an infinitesimal change in the independent variable for continuous variables and the effect of a discrete change from 0 to 1 for dummies. To find these coefficients, the statistical package STATA evaluates the other variables at their mean values. The standard errors were calculated using the robust command in STATA, which uses the White/Sandwich formula to calculate the robust variance covariance matrix.

As pointed out repeatedly in the literature (Evans and Jovanovic 1989; Blanchflower and Oswald 1998; Hurst and Lusardi 2004), a problem arises if ex ante wealth and entrepreneurial talent are positively correlated. The idea is that highly talented entrepreneurs will also be more talented than other individuals in accumulating wealth before entering entrepreneurship. If this is the case, one would get a positive coefficient for wealth even if there were no liquidity constraints. For example, abler entrepreneurs would have been able to accumulate wealth by earning higher returns as wage workers. Since this study does not observe entrepreneurial talent directly and does not include it in the regression, the analysis may have an omitted variable bias and would erroneously be attributing the effect of higher entrepreneurial talent on wealth<sup>2</sup> to the effect of wealth on entrepreneurship. Hence to the extent that entrepreneurial talent and nonbusiness wealth are correlated, a positive coefficient on wealth in equation 2.21 would mean not that the households need to save prior to starting a business but that households that will eventually open a business will have higher earnings both as wage earners and as

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<sup>2</sup> If entrepreneurial ability is positively related to the generation of income as a wage worker, then each future entrepreneur will have accumulated more wealth regardless of his or her need to self-finance a project or part of a project. This relationship would lead to a positive coefficient on wealth even in perfectly functioning financial markets.

entrepreneurs and therefore will accumulate more wealth. However, recent studies that have considered this have not found evidence that a positive relationship exists between these two variables.<sup>3</sup>

## Results

### *General Results*

The age of the head of the household seems to be positive but not always significant. This would be consistent with the view that self-employment might not be an option for young workers (as in Evans and Jovanovic 1989). The number of females in the household seems of little importance, except in rural areas, where it is positive and significant. There is wide evidence that females in Nicaragua are much more entrepreneurial than men. In a study using a survey of entrepreneurs and members of credit unions in Nicaragua, Mesbha (1998) reports that 70 percent of entrepreneurs interviewed are women, and 82 percent of women are entrepreneurs in her sample, but Trejos Solorzano (2000) finds that these women are usually concentrated in low productivity enterprises. Therefore, this study estimated a set of equations including a dummy variable for the sex of the head of the household. This variable is equal to one if the head of the household is male and zero otherwise. (The results are not included but are available upon request.) The coefficient on this variable is negative and highly significant. The effect of having a female heading the household increases the probability of owning a household business by 4.3 percent. The other coefficients are robust to the inclusion of the gender variable.

### *Entrepreneurship and Wealth*

The results of the reduced form estimation of equation 2.21 can be seen in table 2.5. The results presented in this table are the effect of an infinitesimal change in wealth on the probability of owning a household business. The coefficients on wealth are multiplied by the median value of household wealth for business owners. The effect of wealth on

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<sup>3</sup> Evans and Jovanovic (1989) assume the following relationship as part of a larger model of occupational choice:  $\ln \theta_i = \delta_0 + \delta_1 \ln z_i + \eta_i$ , where  $\theta_i$  is (unobservable) entrepreneurial talent for agent  $i$ , and  $z_i$  is the level of wealth in the beginning of the period. Entrepreneurial talent enters the model as part of their entrepreneurial earnings function:  $y = \theta k^\alpha \varepsilon$ . Using data from the Panel Study of Income Dynamics PSID, they find that  $\delta_1$  has a negative value. Paulson and Townsend (2003) estimated the parameters of a similar model using data for Thailand and including the years of education of the head of the household as an independent variable. They find that the relationship between wealth and talent may be positive, although the estimate of this parameter is small and very imprecise or negative at some points of the sample. They also find a comparatively much stronger and positive relationship between the years of education of the head of the household and entrepreneurial talent.

**TABLE 2.5**  
**Probability of Having Started a Business in the Last Five Years**

	Nicaragua		Urban		Rural	
	dF/dx*	z	dF/dx*	z	dF/dx*	z
Age of head	0.005*	2.16	0.004	0.99	0.006 #	1.83
Age of head squared	0.000*	-2.56	0.000	-1.51	0.000*	-2.05
Years of schooling head	0.002	1.20	-0.007*	-2.60	0.011*	3.21
Adult females in household (no.)	0.030*	3.62	0.013	1.04	0.037*	3.12
Adult males in household (no.)	-0.003	-0.42	0.009	0.74	0.002	0.19
Children (< 18 years) in household (no.)	-0.001	-0.15	0.000	-0.08	0.002	0.42
Wealth five years ago	0.014*	2.65	0.028*	3.18	0.006	0.97
Wealth five years ago squared	0.000*	-2.50	0.000*	-2.69	0.000	-1.32
Pseudo R <sup>2</sup>	0.089		0.0967		0.1055	
Number of observations	2,769		1,402		1,170	

Source: 1998 Living Standards Measurement Survey of Nicaragua.

Note: The coefficient on wealth is multiplied by median wealth of median household.

\* Significant at the 5% level.

# Significant at the 10% level.

the probability of becoming an entrepreneur (table 2.5) for the whole region is positive, concave, and significant at the 99 percent level. The effect of an increase in wealth of 25,000 córdobas (the current value of median wealth) is an increase of 1.43 percentage points in the probability of owning a business.<sup>4</sup> This would translate into a 7.9 percent increase in the observed percentage of business owners in the sample. When the sample is separated between urban and rural areas, the coefficient for the urban areas is positive and highly significant. Doubling the median level of wealth would result in an increase of 2.84 percentage points in the probability of owning an enterprise. If the amount of assets of the median household business were doubled, the effect would be to increase the percentage of observed businesses in urban areas by around 5.4 percent. The effect of a similar increase in wealth in rural areas is insignificant: only 0.63 percentage points.

The results of the double residual/non-parametric estimation can be seen in figures 2.3 and 2.4. These results confirm the Probit findings for wealth. Overall, a positive/concave relationship can be seen between entrepreneurship and wealth. The urban and rural area estimates (figure 2.4) also show a relationship consistent with the Probit. There is a

<sup>4</sup> In 1998, a U.S. dollar was roughly equivalent to 10 córdobas.

positive relationship between wealth and entrepreneurship in urban areas and no relationship in rural areas. Centiles of the residual in the horizontal axis are included in each figure to give an idea of the distribution of observations.<sup>5</sup>

One reason for the difference between urban and rural areas might be the high presence of NGOs in rural areas that cater specifically to the poor. The nonexistent relationship between entrepreneurship and wealth in rural areas might be a sign that the NGOs are doing a good job in terms of reaching their target clients. Also, while there is evidence for other countries that entrepreneurial talent is not correlated with wealth before entry into entrepreneurship, one cannot rule out the possibility that there is a positive relationship in Nicaragua, which might be behind the positive and significant coefficient on wealth in urban areas.

### ***Entrepreneurship and Education***

In the reduced form equations for the whole sample (table 2.5), the coefficient on education is positive, although not significant. Education seems to be a relatively more important factor in rural areas. The effect of an extra year of education of the head of the household in rural areas is to increase the probability of owning a household business by 1.1 percentage points (p value=0.002). In urban areas, the result is the opposite. The coefficient on education is negative and significant (p value=0.01). The opposite effects of education on entrepreneurship in urban and rural areas can also be seen in the graphs from the double residual/non-parametric estimation (figure 2.6). This is also consistent with the results obtained in Paulson and Townsend (2002) for the comparison between the area they identify as being more urbanized and the less urbanized one.

Since there is evidence of liquidity constraints in urban areas, it will be more likely that the effect of education will be to lower the probability of entering entrepreneurship<sup>6</sup> compared to rural areas, where there is no evidence of liquidity constraints. The results are also consistent with Shane's (2003) argument that there are positive externalities in terms of skill learning for entrepreneurs in urban areas. These would act as substitutes to formal education in urban areas and lower the rate of return in entrepreneurial activities. The lack of these substitutes could be the reason why education is important in rural areas.

<sup>5</sup> The vertical axes of the figures are scaled up, keeping the range between them the same for purposes of comparability.

<sup>6</sup> This happens because the additional year of education will increase the returns for an employee compared to the returns for an entrepreneur under liquidity constraints. The effect on returns on an entrepreneur will be diminished by the limitations to increasing the amount of capital needed for investment: that is, the credit constrained entrepreneur will not be able to invest the new (higher) optimal level of investment for his level of education. For a detailed discussion of this process, see Tejerina (2004).



### *Identifying the Source of the Constraint*

So far this study has tried to analyze the presence of various types of constraints in different areas of Nicaragua. The next step is to try to identify the types of constraints in order to set priorities for policy intervention.

In the rural areas, there seems to be no evidence of liquidity constraints. Poor households are able to finance their investment opportunities. This could be the result of the relatively high presence of NGOs in the rural areas or of the effectiveness of joint liability groups. However it seems clear that there is an educational constraint in these areas. The liquidity constraints might not be binding precisely because of the lack of education. This lowers the optimal capital level to start a business.

The identification of constraints becomes trickier in the urban areas, where there seems to be a financial constraint related to the wealth of the household. In the first section, two types of financial market failures were identified: limited commitment (as in Evans and Jovanovic 1989), and moral hazard (as in Aghion and Bolton 1997). Paulson and Townsend (2002) work out a series of implications of the different models and are able to identify the type of financial constraints affecting different areas of Thailand. These models are also relevant for the case of Nicaragua, since they help to explain periods of growth with increasing inequality—which has been the case in Nicaragua. The discussion that follows tries to use some of these implications to identify the source of financial constraints in Nicaragua to develop policy recommendations consistent with these constraints.

One way to identify the type of market failure is to analyze the household's net savings behavior. While models of limited commitment predict that borrowing should increase with wealth, models of moral hazard predict that it should go down. Table 2.6 presents some data on the median wealth levels of households with and without debt. For rural areas, there is no significant difference between wealth levels of these households. For urban areas, there is evidence in favor of the moral hazard model, since the wealth levels of households without debt seem to be significantly higher than those with debt.

**TABLE 2.6**  
**Median Wealth by Households with and without Debt**  
*Córdoba*

Net Debtors	With debt	Without debt	Test differences
Whole sample	20,720	27,675	Supports moral hazard*
Urban	24,007	35,750	Supports moral hazard*
Rural	13,520	10,158	Supports limited commitment

\* Significant at the 10% level.

**TABLE 2.7**  
**Net Savings (Savings–Debt)**

	Whole sample dF/dx*	Urban dF/dx*	Rural dF/dx*
Age of head	51.99	166.90	–117.10
Age of head squared	–0.48	–1.62	1.11
Years of schooling head	–269.11	–364.85	73.43
Adult females in household (no.)	–1,273.51	–1,761.05	–53.99
Adult males in household (no.)	401.95	771.32*	96.66
Children (< 18 years) in household (no.)	62.59	117.53	–45.93
Wealth five years ago, constrained businesses	0.01	0.01	–0.01
Wealth five years ago, unconstrained businesses	0.01	0.01	0.02
Constant	–322.53	–1,356.17	1,557.10
Pseudo R <sup>2</sup>	0.10	0.12	0.35
Number of observations	515.0	343	172

Source: 1998 Living Standards Measurement Survey of Nicaragua.

Note: The coefficient on wealth is multiplied by wealth of the median household.

\* Significant at the 10% level.

In the reduced form regressions in table 2.7, various characteristics are regressed on the net savings of the household. The coefficient in urban areas has the expected positive sign, although the sign seems to support the moral hazard model. The coefficient is not significant at conventional levels. The intuition is that since people get disutility from borrowing money and having to pay interest, as wealth goes up they will lower their net debt (increase their savings).

Table 2.8 reports the results of a Probit regression of the probability of being a net borrower on various characteristics, including a dummy that takes the value of one if the household is constrained and zero otherwise.<sup>7</sup> The sign in urban areas is not significant, but the sign seems to support the moral hazard model: that is, households that report being constrained are more likely to be net borrowers.

<sup>7</sup> For this table, all the observations that were classified as constrained because of lack of access to financial markets were dropped. Because of the nature of this variable, there would be a downward bias on the coefficient of being a constrained household, given that any household without access to financial markets will not be a net borrower.

**TABLE 2.8**  
**Probability of Being a Net Borrower (narrow definition of constrained)**

	Whole sample dF/dx*	Urban dF/dx*	Rural dF/dx*
Constrained business	0.4209*	0.3945*	0.5061*
Age of Head	-0.0093	-0.0107	0.0025
Age of Head Squared	0.0000	0.0001	-0.0001
Years of Schooling Head	0.0115	0.0143 <sup>#</sup>	-0.0041
Adult Females in Household (no.)	0.0136	0.0057	0.0470
Adult Males in Household (no.)	-0.0866*	-0.0918 <sup>#</sup>	-0.0651
Children (< 18 years) in household (no.)	0.0000	0.0077	-0.0106
Wealth five years ago	0.0000	0.0000	0.0000
Pseudo R <sup>2</sup>	0.17	0.15	0.25
Number of observations	283	206	77

Source: 1998 Living Standards Measurement Survey of Nicaragua.

Note: The coefficient on wealth is multiplied by wealth of the median household.

\* Significant at the 5% level.

<sup>#</sup> Significant at the 10% level.

## Conclusion

This model has tried first to identify various types of constraints that may be affecting poor households in Nicaragua in their ability to become entrepreneurs and then to identify the type of market failure present in each region, to make sound policy recommendations. Overall, education seems to be an important determinant of entrepreneurship in rural areas. Wealth seems to be a key determinant in urban areas. Older heads of household and women who are heads of the household seem to be more entrepreneurial than men. A higher number of males in the household seems to work against the probability of being an entrepreneur. Conversely, a higher number of females seems to affect this probability positively. Education programs, especially at the secondary level, seem to be important in the rural areas for the creation of enterprises. The reason could be that they enable the head of the household to interact with financial markets that cater to the poor. One reason why wealth does not show up in the rural regressions might be precisely that because of the low levels of education (if education is related to the optimal amount of capital for an enterprise), the optimal capital level of these entrepreneurs might be lower than in urban areas. In the urban areas, the relationship between wealth and entrepreneurship seems underpinned in moral hazard.

Policies designed to overcome these problems should be oriented to improving clients' selection mechanisms for financial institutions. For example, the expansion of joint liability programs and the improvement of credit bureaus that lower lending costs increase the possibilities of matching the type of the applicant to a particular loan. However the evidence on this issue is only indicative.

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# 3

## Wealth and Entrepreneurship: What Can the Data Tell Us?

Sam Schulhofer-Wohl\*

**A**n economy cannot achieve the highest possible growth rate unless resources—capital, labor, natural resources, and so forth—are used in the activities where they are most productive. An inefficient allocation of resources “leaves money on the table”: relatively unproductive activities waste inputs, while highly productive opportunities lie abandoned. Because small businesses and farms make up a large fraction of most economies, major theoretical and empirical literatures have investigated whether markets efficiently allocate resources to small enterprises. The allocation of capital is of particular interest and importance. Without smoothly functioning credit markets, the only capital available to an entrepreneur is his or her own wealth. Changes in the distribution of wealth can therefore dramatically affect whether capital is used in the most productive activities, and thus how fast the economy grows.<sup>1</sup>

One commonly used test for an efficient allocation of capital starts from the observation that if access to credit is imperfect, poor people will be less likely to start businesses because they cannot provide the necessary capital themselves. Thus a researcher can estimate the probability that a person starts a business as a function of his or her wealth. If the probability increases with wealth, then the results might be interpreted as evidence of credit constraints, as in Evans and Jovanovic (1989).

Such a test presumes that people’s skill at entrepreneurship is unrelated to wealth. Otherwise, the probability of starting a business might increase with wealth simply because wealthy people are more talented entrepreneurs. This theoretical problem accompanies a practical concern: who counts as an entrepreneur? For example, what fraction of a rural

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\* For helpful comments, the author thanks Robert Townsend and Sergio Urzua. Portions of this study circulated previously under the title “Testing for Credit Constraints in Entrepreneurship.”

<sup>1</sup> Well-known models of the relationship between wealth distribution and economic growth include Banerjee and Newman (1993), Galor and Zeira (1993), Aghion and Bolton (1997), and Lloyd-Ellis and Bernhardt (2000).

Similarly, the total earnings of a household that chooses wage work are  $g_w(\theta|x, b) \equiv w(\theta, x) + R(b)$ . The difference in profits between the two occupations is  $g(\theta|x, b) \equiv g_e(\theta|x, b) - g_w(\theta|x, b)$ , and the household chooses entrepreneurship if and only if  $g(\theta|x, b) \geq 0$ . It is assumed that  $g(\theta|x, b)$  is a monotonically increasing function of  $\theta$  for each pair  $(x, b)$ . Therefore,  $g$  can be inverted to find a critical ability level  $\theta^*(x, b)$  such that a household with characteristics  $x$  and wealth  $b$  chooses entrepreneurship if and only if it has ability  $\theta \geq \theta^*(x, b)$ .

This model is essentially the economy of Roy (1951). If  $g_e$  and  $g_w$  are one-period profit and earnings functions, then it is a static model. But it equally well describes the instantaneous choice of occupation in a dynamic model such as that of Buera (2006), if  $g_1$  and  $g_0$  are viewed as the value functions of households in each sector.

If there are perfect credit markets, the household can borrow or lend arbitrary quantities of capital at a constant interest rate  $r$ . That is,  $R(k) = rk$  for all  $k$  positive or negative.

Then

$$(3.2) \quad g_e(\theta|x, b) = \max_k [f(k; \theta, x) - rk] + rb$$

and

$$(3.3) \quad g_w(\theta|x, b) = w(\theta, x) + rb$$

The difference in profits between the two occupations is

$$(3.4) \quad g(\theta|x, b) = \max_k [f(k; \theta, x) - rk] - w(\theta, x),$$

which does not depend on wealth  $b$ . The critical ability level  $\theta^*(x, b)$  therefore also does not depend on wealth when there are no credit constraints. Credit constraints of any sort imply that  $R(k)$  is a nonlinear and possibly nonfinite function. If the household can lend but not borrow, for instance, then  $R(k) = -\infty$  for  $k < 0$ . Nonlinearities in  $R(k)$  mean that  $g(\theta|x, b)$  and  $\theta^*(x, b)$  depend on  $b$ . The form of this relationship depends on the specific source of credit constraints. A test for credit market imperfections using choice data amounts to a test of whether  $g(\theta|x, b)$  and  $\theta^*(x, b)$  depend on wealth. One can determine whether credit constraints exist only if one can determine the form of  $g(\theta|x, b)$  or  $\theta^*(x, b)$ . A researcher who computes the probability of starting a business as a function of wealth, say by estimating a probit model or a nonparametric relationship, is implicitly trying to estimate  $g(\theta|x, b)$  and  $\theta^*(x, b)$ .

Let the cumulative distribution of ability conditional on wealth and other observables be  $H(\theta|x, b)$ . Since the data include the occupation choice  $d$  as well as  $x$  and  $b$ , the



Similarly, the total earnings of a household that chooses wage work are  $g_w(\theta|x, b) \equiv w(\theta, x) + R(b)$ . The difference in profits between the two occupations is  $g(\theta|x, b) \equiv g_e(\theta|x, b) - g_w(\theta|x, b)$ , and the household chooses entrepreneurship if and only if  $g(\theta|x, b) \geq 0$ . It is assumed that  $g(\theta|x, b)$  is a monotonically increasing function of  $\theta$  for each pair  $(x, b)$ . Therefore,  $g$  can be inverted to find a critical ability level  $\theta^*(x, b)$  such that a household with characteristics  $x$  and wealth  $b$  chooses entrepreneurship if and only if it has ability  $\theta \geq \theta^*(x, b)$ .

This model is essentially the economy of Roy (1951). If  $g_e$  and  $g_w$  are one-period profit and earnings functions, then it is a static model. But it equally well describes the instantaneous choice of occupation in a dynamic model such as that of Buera (2006), if  $g_1$  and  $g_0$  are viewed as the value functions of households in each sector.

If there are perfect credit markets, the household can borrow or lend arbitrary quantities of capital at a constant interest rate  $r$ . That is,  $R(k) = rk$  for all  $k$  positive or negative.

Then

$$(3.2) \quad g_e(\theta|x, b) = \max_k [f(k; \theta, x) - rk] + rb$$

and

$$(3.3) \quad g_w(\theta|x, b) = w(\theta, x) + rb$$

The difference in profits between the two occupations is

$$(3.4) \quad g(\theta|x, b) = \max_k [f(k; \theta, x) - rk] - w(\theta, x),$$

which does not depend on wealth  $b$ . The critical ability level  $\theta^*(x, b)$  therefore also does not depend on wealth when there are no credit constraints. Credit constraints of any sort imply that  $R(k)$  is a nonlinear and possibly nonfinite function. If the household can lend but not borrow, for instance, then  $R(k) = -\infty$  for  $k < 0$ . Nonlinearities in  $R(k)$  mean that  $g(\theta|x, b)$  and  $\theta^*(x, b)$  depend on  $b$ . The form of this relationship depends on the specific source of credit constraints. A test for credit market imperfections using choice data amounts to a test of whether  $g(\theta|x, b)$  and  $\theta^*(x, b)$  depend on wealth. One can determine whether credit constraints exist only if one can determine the form of  $g(\theta|x, b)$  or  $\theta^*(x, b)$ . A researcher who computes the probability of starting a business as a function of wealth, say by estimating a probit model or a nonparametric relationship, is implicitly trying to estimate  $g(\theta|x, b)$  and  $\theta^*(x, b)$ .

Let the cumulative distribution of ability conditional on wealth and other observables be  $H(\theta|x, b)$ . Since the data include the occupation choice  $d$  as well as  $x$  and  $b$ , the

probability  $\Pr(d = 1|x, b)$  that a household chooses entrepreneurship given characteristics  $x$  and wealth  $b$  is identified. By the definition of the critical ability level  $\theta^*$ ,

$$(3.5) \quad \Pr(d = 1|x, b) = \Pr[\theta \geq \theta^*(x, b)|x, b] = 1 - H[\theta^*(x, b)|x, b].$$

Thus if  $H$  is invertible and its form is known, the critical ability level  $\theta^*(x, b)$  can be recovered from the probability of choosing entrepreneurship:

$$(3.6) \quad \theta^*(x, b) = H^{-1}[1 - \Pr(d = 1|x, b)].$$

Conversely, without some assumptions about the distribution of ability  $H$ , it is impossible to identify the critical ability level  $\theta^*(x, b)$ . Any proposed function  $\theta^*(x, b)$  can be made consistent with the data by choosing an appropriate distribution  $H(\theta|x, b)$ : just pick  $H$  to satisfy equation 3.6 for each pair  $(x, b)$ . Without assumptions about  $H$ , the model thus is nonparametrically unidentified.

A lengthy empirical literature attempts to solve the identification problem. One solution is to look for variation in wealth that is unrelated to ability. Bequests have been the most commonly used source of variation; see, for example, Blanchflower and Oswald (1998) and Holtz-Eakin, Joulfaian, and Rosen (1994a, 1994b). But exogenous variation is hard to find. For example, Hurst and Lusardi (2004) show that entrepreneurial activity is correlated not only with past bequests but also with future bequests, suggesting that bequests may be related to ability.

Another solution is to study a people for whom wealth is assumed to be independent of ability. Matzkin (1992) shows that the occupation choice model is nonparametrically identified under this assumption. Late in the life cycle, ability is likely to be correlated with wealth either because those with high ability earn rents or because those with high ability save more money in order to be able to start businesses, as in the dynamic model of Buera (2006). Young households, which have not had much time to accumulate wealth, are the leading candidate for a group where wealth and ability are independent; see Jeong and Townsend (2003). However, because young people have had little time to acquire wealth on their own, what wealth they do have may come substantially from their parents. If parents can transmit some entrepreneurial ability to children, either genetically or in the course of child-rearing, then wealth will be related to ability even among young households, and this identifying assumption will be incorrect.

A third method concedes that some relationship between talent and wealth is unavoidable and attempts to model this relationship. In this structural approach, the researcher investigates whether a particular parametric relationship between talent, wealth, and other variables and particular forms of the profit functions  $g_1$  and  $g_0$  are sufficient to explain the observed relationship between entrepreneurship and wealth. Evans and Jovanovic (1989) assume that entrepreneurs' profits are log-linear in capital and that ability follows a log-normal distribution whose mean depends monotonically on wealth  $b$ .

Paulson, Townsend, and Karaivanov (2006) allow the mean of ability also to depend on education.

Results using the structural approach depend crucially on the accuracy of the assumed parametric relationship. Incorrect distributional assumptions can attribute either too much or too little of the variation in entrepreneurship to variation in talent, rather than variation in wealth. This can lead to mistaken conclusions about credit constraints. Consider the following four structural models:

1. Ability is normally distributed, with mean 0 and variance 1, regardless of wealth  $b$  or other characteristics  $x$ . The critical level of ability for starting a business is  $\theta^*(x, b) = -x'\beta - \gamma b$  for some parameters  $\beta$  and  $\gamma$ .
2. Ability is normally distributed, with mean  $x'\beta$  and variance 1, regardless of wealth  $b$ . The critical level of ability for starting a business is  $\theta^*(x, b) = -\gamma b$ .
3. Ability is normally distributed, with mean  $\gamma b$  and variance 1, regardless of other characteristics  $x$ . The critical level of ability for starting a business is  $\theta^*(x, b) = -x'\beta$ .
4. Ability is normally distributed, with mean  $x'\beta + \gamma b$  and variance 1. The critical level of ability for starting a business is  $\theta^*(x, b) = 0$ .

In all four of these models, the probability of starting a business is

$$\begin{aligned}
 (3.7) \quad \Pr(d = 1|x, b) &= \Pr[\theta \geq \theta^*(x, b)|x, b] \\
 &= \Pr[\theta - E(\theta|x, b) \geq \theta^*(x, b) - E(\theta|x, b)|x, b] \\
 &= \Pr[\underbrace{\theta - E(\theta|x, b)}_{\sim N(0,1)} \geq -x'\beta - \gamma b|x, b] = \Phi(x'\beta + \gamma b),
 \end{aligned}$$

where  $\Phi$  is the standard normal cumulative distribution function. Thus a researcher would estimate the parameters  $\beta$  and  $\gamma$  of any of these four models by estimating a probit equation relating occupation choice to characteristics  $x$  and wealth  $b$ ,

$$(3.8) \quad \Pr(d = 1|x, b) = \Phi(x'\beta + \gamma b).$$

The only difference between the models is in how the resulting estimates of  $\beta$  and  $\gamma$  will be interpreted. According to either the first or the second model, if  $\gamma > 0$ , the critical ability level  $\theta^*$  increases with wealth  $b$  and there are credit constraints. In the third and fourth models,  $\theta^*$  does not depend on wealth, implying that there are no credit constraints, but if  $\gamma > 0$ , then mean ability rises with wealth. The identification problem is simply that the data cannot tell us which of the four models is correct. A positive coefficient on wealth in the probit equation does not prove that there are credit constraints unless one assumes a priori that the mean level of ability does not depend on wealth.

## Defining an Entrepreneur

The model in the previous section assumes that all people can be clearly classified as either entrepreneurs or not entrepreneurs. Researchers investigating entrepreneurship in developing countries have often viewed farming as a default or subsistence occupation, so that only nonfarm enterprises count as businesses. The definition of a business, however, must be sensitive to the details of a country's economy. This study uses panel data from Nicaragua to illustrate the importance of these details.

Nicaragua not only has subsistence farmers but also large coffee and banana plantations. Counting the wealthy owners of these plantations as subsistence farmers may lead to mistaken conclusions about the effect of wealth on starting a business. This study compares two definitions of a business:

**Definition 1.** *A business is any nonfarm enterprise.* This is the definition used by Paulson and Townsend (2004; see also chapter 1 of this book by Townsend) in Thailand, and by Tejerina (chapter 2) in Nicaragua, among others.<sup>2</sup>

**Definition 2.** *A business is any nonfarm enterprise that uses capital, as well as any farm that sells output for cash and employs physical capital, such as machinery or buildings.* About a third (32 percent) of farming households in Nicaragua in 1998 qualify as businesses under this definition.

The second definition undoubtedly includes some farms that are not really businesses, just as the first definition undoubtedly excludes some farms that are businesses. Because it may be impossible to draw a perfect dividing line, a test for credit constraints should be robust to changes in the definition.

## Data

If, in a cross-section of people, the wealthy are more likely to own businesses, it is impossible to know whether wealth made it easier for them to start businesses or whether they grew wealthy precisely because they had already started businesses. Wealth therefore must be measured before entrepreneurship. This study analyzed panel data from the 1998 and 2001 Living Standards Measurement Surveys (LSMS) conducted by Nicaragua's National Institute for Statistics and Census, measuring households' wealth in 1998 and their business activity in 2001.

The 1998 survey covers 4,237 households throughout Nicaragua. In addition to basic demographic data, households reported the current value of numerous assets and liabilities and their participation in business and farming. This study computed household net

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<sup>2</sup> Tejerina (chapter 2) counted a household as having a business only if the household said it invested capital in the business during the five years before the survey.

worth in 1998 as the sum of the value of owned home, household durable goods, business and farm assets, and financial savings, minus household debts to all creditors.<sup>3</sup>

Some 300 households did not report certain assets and liabilities, and this study could not compute their net worth.

For 14 more households, data on the age of the household head, financial participation, or business ownership are missing. Sampling weights reflecting the stratified survey design are missing for 33 more households. This study dropped the 347 households with missing data and was left with 3,890 families in 1998. Among these 3,890 families, only 2,932 were interviewed again in 2001.<sup>4</sup> To account for this attrition, this study reweighted each household interviewed in 2001 by the inverse of the probability that a household with similar characteristics in 1998 would remain in the sample three years later.<sup>5</sup>

This procedure is adequate if households that were and were not interviewed in 2001 differ only in observable attributes, or if any unobservable differences are unrelated to starting a business. If any unobserved differences are related to starting a business, the results will be biased in an unknown direction. To investigate the importance of attrition, this study computed results using different weights and ignoring attrition altogether; the results did not substantially change. Some of the 1998 households split into multiple households by 2001. All of the 2001 households that originated in a single 1998 household were treated as single families.

## Results

Table 3.1 summarizes the data. Changing how farms are classified is likely to matter more in areas where there are many farms, so this study divided the households according to

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<sup>3</sup> Households reported the value of any of 25 durable goods that they owned, from clothing, irons, and toasters to boats and cars. Business assets included inventory, raw materials, vehicles, furniture, machinery, buildings, and land. Farm assets included land, livestock, tractors, tools, silos, chicken coops, and 22 other categories of equipment and buildings. If a household owned less than 100 percent of a business, this study multiplied the value of the business assets by the share that the household owned. Savings included funds deposited in banks and savings cooperatives; with friends, relatives, or store owners; or kept in the home. Debts included money owed to banks, finance companies, credit cards, cooperatives, moneylenders, and friends and relatives, as well as trade credit.

<sup>4</sup> The attrition may be in part a consequence of Hurricane Mitch. The November 1998 storm, one of the worst ever to hit Central America, came shortly after the 1998 survey was completed and left 1 million Nicaraguans—about one out of five people—homeless.

<sup>5</sup> Specifically, the 1998 sample was divided into cells by head's age (three terciles), number of household members (three terciles), wealth (three terciles), education of the most educated adult in the household (above or below median), whether the household operated a farm business in 1998, and whether the household operated a nonfarm business in 1998. The probability within each cell was then computed that a household interviewed in 1998 would be found in 2001. This study assigned to each household found in 2001 an attrition weight that is the inverse of this probability. Because the data also include sampling weights reflecting the stratified survey design, this study multiplied the attrition weights by the sampling weights to produce the correct weights for estimation.

**TABLE 3.1:**  
**Household Business Ownership and Wealth**

	Urban	Rural
<b>Full Sample</b>		
Households with complete data in 1998	2,120	1,770
Households still present in 2001	1,620	1,312
Weighted fraction operating nonfarm business in 1998	0.45	0.22
Weighted fraction operating any business in 1998	0.49	0.51
1998 net assets (córdobas)		
Median	20,000	10,680
Mean	61,868	32,629
Standard deviation	240,159	78,247
<b>Households without Nonfarm Business in 1998</b>		
Households still present in 2001	852	1008
Weighted fraction operating nonfarm business in 2001	0.35	0.2
1998 net assets (córdobas)		
Median, households with business in 2001	16,030	12,070
Median, households without business in 2001	14,450	9,455
Median, all households	15,150	10,470
Mean, all households	53,820	32,333
Standard deviation, all households	227,647	80,875
<b>Households without Any Business in 1998</b>		
Households still present in 2001	775	542
Weighted fraction operating any business in 2001	0.37	0.53
1998 net assets (córdobas)		
Median, households with business in 2001	15,600	8,160
Median, households without business in 2001	13,730	3,765
Median, all households	13,786	5,500
Mean, all households	42,953	16,261
Standard deviation, all households	124,215	44,023

*Source:* Author's calculations based on LSMS data.

*Note:* Data used for estimating probability of starting a business as a function of wealth. Net assets include value of home, household durable goods, business and farm assets including livestock, and financial savings, minus debts. In 1998, one U.S. dollar was worth approximately 10 córdobas. All statistics except sample sizes computed with sampling weights adjusted for attrition.

whether they live in rural or urban areas. (Slightly less than half of Nicaraguan families live in rural areas.) Households whose net assets in 1998 were less than or equal to zero were dropped because these asset values are likely to result from measurement error. The summary statistics show the relationship between wealth and starting a business. For both definitions of a business, and in both urban and rural areas, households that started businesses between 1998 and 2001 had higher median wealth than households that did not start businesses.

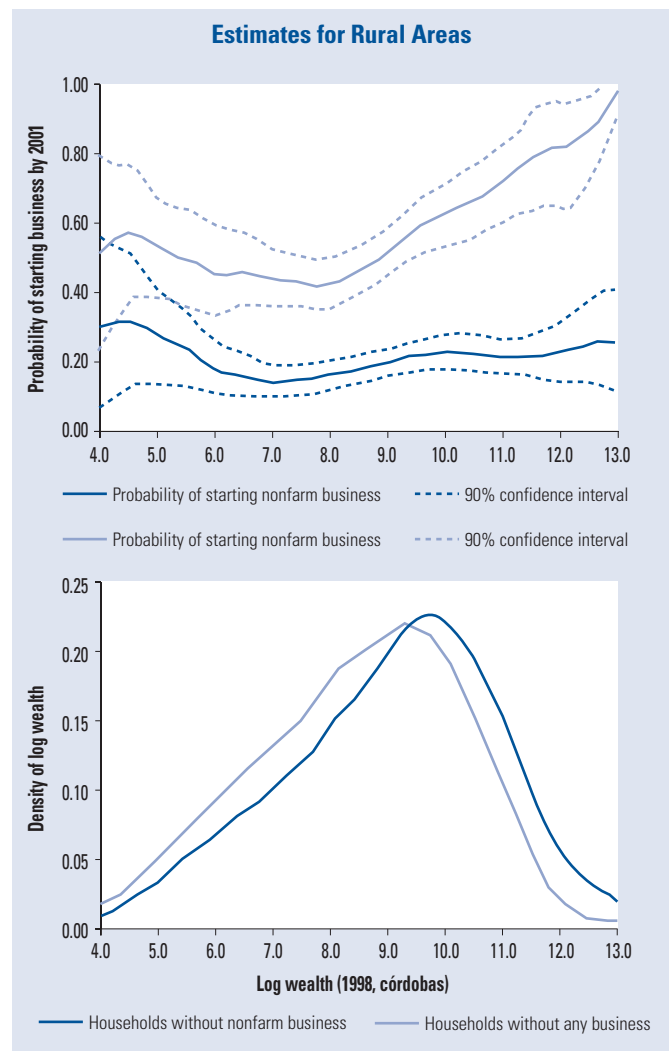
The relationship can be seen more precisely by estimating the probability that a household owned a business in 2001, given that it did not own a business in 1998, as a function of wealth in 1998. This study used nonparametric local linear regressions (Fan 1992) to estimate this function, using each of the two definitions of a business in turn. The estimates for urban areas are insensitive to the definition and are not reported here.

Figure 3.1 displays the estimates for rural areas. The top panel shows the estimated probability of starting a business as a function of wealth, under each definition. The bottom panel shows the estimated density of wealth among families that did not own a business in 1998. (The asymptotic variance of the local linear regression estimator is lowest where the density is highest.) The probability of starting a nonfarm business increases only slightly with wealth, if at all. An analyst using Definition 1 thus would be unlikely to conclude that substantial credit constraints exist in rural Nicaragua. However, the probability of starting any business, including a farm business, slopes sharply upward. An analyst using Definition 2 would conclude that credit constraints have a large effect in rural Nicaragua.

## Conclusion

This study reviewed the strong conditions under which an observed relationship between entrepreneurship and wealth can constitute evidence of capital market imperfections. It showed that even if these conditions hold, estimates of the relationship between wealth and entrepreneurship are extremely sensitive to the definition of a business. In rural Nicaragua, the study found little evidence of credit

FIGURE 3.1





constraints when only nonfarm enterprises were counted as businesses, but strong evidence of credit constraints when some farms also were counted as businesses.

Policymakers aiming to improve credit markets need to know not only whether credit constraints exist but, if so, what market failure causes them. Appropriate policies for one sort of market failure may be useless against other market failures. Further work is thus needed to find ways of identifying and distinguishing credit market problems without the strong assumptions required in occupation choice models. Direct measurements of the capital prices faced by different businesses seem particularly promising in this regard, as in Banerjee and Duflo (2004) and Schulhofer-Wohl (2004).

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## COMMENT

**Understanding Entrepreneurship in Latin America***Pablo Angelelli and Carlos Guaipatín*

For several decades, the Inter-American Development Bank (IDB) has carried out operations and activities to support the creation of companies and foster entrepreneurship.<sup>1</sup> Yet it was only in the mid-1990s that projects pursuing the creation of new companies and fostering entrepreneurship began to spread rapidly. However, with occasional exceptions, no policy of support for entrepreneurship has been formalized, nor has the Bank had a line of action designed with that explicit purpose. Accordingly, the Bank's efforts have been articulated out of an experience very rich in content, albeit somewhat scattered. That experience has made clear the need to understand entrepreneurship more precisely, to be able to adjust tools to more clearly defined needs.

Thus the first analytical study of business creation in the region began in 1999. The results of this first study, published by the IDB under the title *Entrepreneurship in Emerging Economies: The Creation and Development of New Enterprises in Latin America and East Asia* (Kantis, Ishida, and Komori 2002), were a key element in deepening knowledge of the entrepreneurial process in the region. A later version included Chile and El Salvador, and extended the international comparison to two European countries, Italy and Spain. The new study also examined instances of best practices in policies and programs for promoting new enterprises in Europe and Latin America. This comment summarizes the results of that work (Kantis, Angelelli, and Moori Koenig 2005).

The 2005 study reveals the existence of a new generation of enterprises whose main features distinguish them from both less dynamic enterprises and traditional small and medium enterprises (SMEs). Dynamic enterprises quickly swelled the ranks of the SME sector.<sup>2</sup> In their third year in business, they employ an average of 26 workers, and annual sales are around \$800,000. On average the enterprises bill slightly more than \$30,000 per employee. Initial investments of the enterprises surveyed tended to be small. In most cases, creating an enterprise required investing less than \$100,000 during the first year. On average, only one in five firms exceeded that amount.

The domestic market constitutes the main platform for new businesses. The main source of opportunities for starting dynamic enterprises has been product differentiation. A little more than half the enterprises have based their new ventures on offering differentiated products or services. Firms that took advantage of opportunities for price competition or that introduced innovations have been less common.

<sup>1</sup> More information about the IDB's activities on entrepreneurship and SMEs is available at [http://www.iadb.org/sds/mic/index\\_mic\\_e.htm](http://www.iadb.org/sds/mic/index_mic_e.htm).

<sup>2</sup> The period referred to in these studies ranged between 1999 and 2001, depending on the country.

The main customers of the new Latin American firms are other businesses, but outsourcing is not a widespread source of business. It may be that high transaction costs, the limited level of industrial and technological development, and the productivity gap between small and large companies limit the division of labor and articulation of production (Katz 1986). On average, only one in four firms was created to take advantage of this kind of opportunity. The new enterprises sell to large firms as well as SMEs, but their relative importance as customers varies by country. In general, SMEs tend to be more important as customers of new enterprises in countries where the industrial sector has greater weight.

Most of the dynamic enterprises examined in the study were created by teams of entrepreneurs. Cases of sole proprietorships are uncommon, especially in Argentina, Brazil, and Chile. The typical entrepreneur is a young, highly educated, middle-class man. Participation of women is limited, especially in Chile and Costa Rica, but significantly greater in El Salvador (slightly less than 1 in 4 cases, compared to 1 in 10, on average). Half the entrepreneurs come from homes where the father worked independently as a businessman, a professional, or was self-employed. That may have influenced the career projection of entrepreneurs, even unconsciously.

Before beginning their entrepreneurial career, the entrepreneurs most often worked in another company in a similar sector (supplier or customer) or were involved in a line of business related to that of the company started. The entrepreneurs had experiences in small, medium, or large firms in relatively similar proportions. People who were between 31 and 45 years old (36 to 37 years old, on average) started most of the enterprises studied. But the idea of going into business appeared much earlier in most cases: around age 26, on average. Indeed for around half, the idea appeared at an even younger age. The three main reasons for going into business are positive: the desire for personal fulfillment, to apply one's knowledge, and to improve personal income. Motivations based on negative factors, such as being unemployed or not having been able to study, were less frequent among dynamic entrepreneurs.

### ***Differences between Dynamic and Less Dynamic Enterprises in Latin America***

Dynamic enterprises stand apart in various performance-related variables, both in the number of jobs created and in sales. In their third year of life, their average sales were almost six times that of the less dynamic group, and the spread tended to widen in later years. However, while to some extent significant contrasts could be expected to appear between the number of jobs created by dynamic enterprises and others—because of the different criteria of selection used by the authors in the enterprises of the two groups—the dynamism gap becomes clear very early.

*Family influence.* Does family background distinguish dynamic from less dynamic entrepreneurs? While these questions cannot be answered conclusively because of the

multiplicity of direct and indirect factors that ought to be considered and because of their multiple relationships, the study found some evidence of the influences that these factors exercise in the countries of the region. For example, in El Salvador, Mexico, and Peru, being a child of an entrepreneur is more common among dynamic entrepreneurs than in the other countries; and as is also the case in those countries and Costa Rica, less dynamic entrepreneurs are more likely to be children of salaried employees.

*Education.* In almost all the countries, the entrepreneurs have high levels of education. However, there tends to be no significant differences between specific levels of higher education and different degrees of dynamism, except in Chile and Mexico. Whereas in Mexico those surveyed emphasized the university's contribution to giving them the skills to go into business, the extent of such recognition was far lower in Chile and El Salvador than the regional average. In most countries, the university contributed to the acquisition of technical knowledge, especially for the more dynamic entrepreneurs, but not of other skills necessary for entrepreneurship.

*Previous work environment.* The main "incubation context" of entrepreneurs and enterprises are the firms where they previously worked. The contribution of these firms to creating vocations and skills is key. That experience is the most frequently acknowledged source of learning because of its distinctive contribution among the more dynamic entrepreneurs. They also highlighted its fundamental role in gathering information on businesses ideas.

*Networking.* The study considers three basic situations in which interaction with other people plays a notable role: identifying the business opportunity on which the new venture is based (gestation stage), accessing funds (startup stage), and the first moments in the life of the company (early development stage). Entrepreneurs mentioned that during these periods, communication and support networks were important for dealing with the problems and challenges of management (Johannisson 1998). Entrepreneurs also cited the role of social networks (relatives, friends, and acquaintances), business or production networks (suppliers or clients), and institutions that support businesses (business associations and universities).

*Project and strategy.* There are major differences in the profiles of the new ventures taken up by firms of differing degrees of dynamism. Early sales reflect the fact that some businesses are more growth-oriented from the outset. First-year sales averaged between five and six times more in the dynamic group, the proportion of projects totaling at least \$100,000 was double, and the average team size was almost 30 percent larger. In addition, dynamic entrepreneurs showed a greater propensity to export. Even so, for most of the enterprises—even for those exporting—the domestic market constitutes their main business base, and subcontracting is far from widespread.

*Financing.* Most of the entrepreneurs financed the business startup with personal savings, and support from family and friends. As a rule, dynamic entrepreneurs used a larger number of sources than the less dynamic ones. Dynamic entrepreneurs especially used their own capital, but they also made more intensive use of other sources, thereby enabling them to avoid the constraints on access to bank financing. For example, they used help from suppliers and/or purchased used equipment. This behavior of dynamic entrepreneurs is known in the international literature as “bootstrapping” (Winborg and Landstrom 2000).

### ***Policy Areas for Promoting Entrepreneurship in Latin America***

The conclusions of the study help reveal the main areas in which policymakers in Latin America should be working. The particular features of the entrepreneurial process in each country make it possible to reflect more specifically about the policies and programs needed for each country.

1. **Broaden the social and gender base from which dynamic enterprises emerge.** Latin American entrepreneurs belong to middle and upper-middle class sectors and are highly educated; hence they come from a narrow social base. To increase the sources of economic wealth, increase the number of dynamic entrepreneurs, and enhance routes to social mobility, access to opportunities for entrepreneurs ought to be more equitable.
2. **Expand the number and quality of business opportunities.** Possible alternatives for dealing with this problem include promotion of: creativity through special courses, subcontracting, and outsourcing businesses; technology transfer; competitive import substitution; local research and development efforts; and outside markets. In countries where large numbers of people have emigrated to more developed nations, entrepreneurs ought to take advantage of this potential as a source of information and export-business opportunities.
3. **Facilitate potential entrepreneurs’ access to work experience.** Policies aimed at promoting the development of entrepreneurial competencies should make it easy for potential entrepreneurs to acquire relevant work experience.
4. **Foster the development of entrepreneur teams and networks.** Entrepreneur development policies and activities should focus on using entrepreneur teams or motivate and facilitate their formation. The entrepreneur development policies and activities should likewise adopt and promote networking in everything they do.
5. **Improve access to financing.** More must be done to deepen financial markets in the region and design new financial products adapted to the needs and characteristics of Latin American entrepreneurs, in accordance with the level of development of markets in each country or region.
6. **Enhance the entrepreneurial process in local areas.** Improving the growth possibilities of the new business ventures, especially in non-local markets, and making

them more innovative, should be key aspects of entrepreneurial development programs. Strengthening connections with non-local networks and broadening sources of innovative technological expertise should be given special consideration.

7. **Take advantage of the transformation power of knowledge-based businesses.** In promoting knowledge-based businesses, consideration should be given to the following aspects: formation of human capital, focusing efforts on university students/graduates and trained employees in medium and large companies; providing access to specialized financial resources; providing backing for developing strategic alliances and relationships of entrepreneurs with large companies; supporting research and development; and encouraging broad and diversified entrepreneur networks. Actions to foster the emergence of such enterprises and entrepreneurs ought to be part of the government's science and technology policies.
8. **Generate environmental conditions more favorable to the growth of new enterprises.** Latin American enterprises face a variety of unfavorable conditions. Addressing this issue should continue as a priority as part of the public policy agenda in Latin America.
9. **Adopt a systematic approach based on institutions' complementarity.** Policy initiatives adopted in isolation will undoubtedly be less effective than strategies based on a more comprehensive focus that takes into account the critical factors that impact the entrepreneurial process and stimulate or hinder the creation and expansion of new enterprises.
10. **Make development of entrepreneurs a social investment with a long-term vision.** Promoting entrepreneurship should be conceived as a long-term strategy. The maturation of an entrepreneurial project from the beginning of the motivational process until the business is created takes several years. Broadening the base of dynamic entrepreneurs in a society is as important as building roads or bridges. Entrepreneurs must be socially valued as "strategic human resources."

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# 4

## Financial Infrastructure and Income Inequality: Evidence from Peru

Mauro Alem\*

Many Latin American economies experienced rapid growth with increasing inequality during the 1990s. At the same time, the degree of financial deepening expanded significantly, according to typical indicators such as M3/GDP and share of credit to the private sector. The goal of this study is to interpret this process through the lens of a model of economic growth based on individual saving/investment decisions that incorporates the cost of the expansion of financial infrastructure. The analysis employs household data from Peru to calibrate the model and provide implications for the role of the financial sector in GDP growth and its interaction with observed increasing inequality.

There is much empirical literature on the contribution of the financial sector to GDP growth (King and Levine 1993) and inequality (Forbes 2000). These studies run simple cross-country regression analysis to estimate the correlations of alternative *aggregate* measures of financial sector expansion with GDP growth or inequality. But standard regression analysis cannot pin down the true relationship among these variables when the process of economic expansion with financial deepening is taken into account as transitional. As elaborated in Townsend and Ueda (2001), the non-stationary nature of time series invalidates simple regression analysis and necessitates an alternative quantitative approach. A main contribution of the approach of the

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\*This study is an application to the case of Peru of Townsend and Ueda (2001). The bulk of the analysis in this chapter was carried out in the last year of the author's graduate studies at the University of Chicago, with the guidance and collaboration of Professor Robert M. Townsend. The author would like to thank Natalia Ramondo and Kenichi Ueda, former colleagues at Chicago, for their patient help in running the programming codes.

Townsend and Ueda paper (2001) is that it recognizes actual data as transitional, and embeds a simple but endogenous financial structure onto a standard model of growth to interpret the data.

The approach in this study explicitly models each household's saving/investment problem taking into account its particular position in the "initial" wealth distribution observed in Peru in 1985. In this artificial, simplified model, households accumulate additional savings to pay a fixed cost to participate in the formal financial sector and, in effect, benefit from higher returns and insurance against idiosyncratic shocks. Thus, given initial inequality in the wealth distribution and the parameters of technology and preferences, the aggregate paths of income, inequality, and financial participation are simulated, taking realized draws of idiosyncratic and aggregate shocks. Household savings and portfolio investment decisions are the stationary aspects of the model. But aggregate measures of growth, inequality, and financial expansion are not stationary time series even after taking logs and lags. Aggregate time paths are all endogenous and all determined by these underlying shocks and decisions in complex and nonlinear ways. These complex dynamics are also found in other theoretical models that depict endogenous financial deepening, inequality, and growth.

This study uses household data to estimate investment technology parameters and the support of idiosyncratic shocks. A nationally representative household survey, the Encuesta Nacional sobre Medición de Niveles de Vida (ENNIV) of Peru, is used to estimate wealth, income, and productive capital stocks for a sample of 4,913 households in the "initial" year of 1985. A unique advantage of ENNIV is that it incorporated a financial module with detailed information regarding financial transactions of households. The model is solved using numerical methods based on specific realizations of idiosyncratic and aggregate shocks. The aggregate paths of the economy are then obtained by picking the simulated economy that best matches actual average GDP growth.

The calibrated model captures the actual path of GDP growth and inequality in Peru from 1985 to 2000 reasonably well. The model's predictions are consistent with observed income growth and increasing inequality experienced since 1991. The success is more limited for the 1985–90 period, when inflationary processes may have played a role in the financial disintermediation observed in those years. Still, inequality in the calibrated economy is greater than the observed path. With respect to the financial participation rate, the benchmark economy largely overestimates actual financial participation in Peru in 2000: 19 percent, compared to 7 percent. This finding remains even after including the role of the informal financial sector: 31 percent, compared to 22 percent. To a great extent, this over-prediction seems explained by the significant reduction in the number of households saving in formal financial institutions observed in the household data: from 26 to 10 percent from 1985 to 2000. The findings suggest that there are large welfare gains from expanding (or recovering past) levels of formal financial participation. In the model, however, those welfare gains are more likely to benefit middle-wealth groups rather than the poor, who may take much more time to accumulate the required wealth to participate in the formal financial sector.

The model of growth with financial structure is described in the next section. The third section presents the data, briefly describes some relevant facts of the Peruvian economy, and stresses the empirical significance of using aggregate data, as opposed to household level data, to measure formal financial sector expansion. The fourth section outlines the calibration strategy and the fifth section presents the results. The sixth section presents final remarks and potential directions for future research.

## The Model

A brief discussion of how the household saving/investment decision is modeled follows. The discussion minimizes technical aspects and instead focuses on providing economic intuition for the key features of the model used to interpret the results. Readers interested in the technical properties of the model should see the detailed presentation in Townsend and Ueda (2001).

In the model, there is a continuum of households in the economy. At an initial date,  $t=1$ , households are all identical in preferences and technology, with an initial wealth endowment of  $k_t$ . There also is an initial distribution of wealth,  $k_t$ , which will then be estimated using household data. The decision problem of the household with wealth,  $k_t$ , at the beginning of period  $t$  is to choose consumption,  $c_t$ , and savings or investment,  $s_t$ , in period  $t$  so as to maximize expected discounted utility

$$E_t \left\{ \sum_{t=0}^{\infty} \beta^t u(c_t) \right\},$$

subject to

$$c_t = k_t - s_t.$$

The discount rate is  $\beta$  and the utility function  $u(c_t)$  will take the form of constant relative risk aversion (CRRA). That is,  $u(c_t) = c_t^{1-\sigma}/(1-\sigma)$ , where  $\sigma$  is the risk-aversion parameter. The instantaneous utility function is increasing,  $u' > 0$ , and concave,  $u'' < 0$ . Note also that  $u$  is continuous in its domain. The utility function satisfies the Inada conditions. That is,  $\lim_{c \rightarrow 0} u'(c) = \infty$  and  $\lim_{c \rightarrow \infty} u'(c) = 0$ . Thus at each  $t$ , optimal consumption never becomes zero (and savings never equals all wealth).

There are two investment technologies in the economy. The first is a safe, constant return to scale technology that produces output in the next period at a rate  $\delta$ . The second is a risky technology that returns output at a per unit but variable rate of  $\theta_t + \varepsilon_t$ , where  $\theta_t$  is a common shock across technologies and  $\varepsilon_t$  is an independent identically distributed (i.i.d.) project-specific idiosyncratic shock with mean zero. The cumulative distributions of  $\theta_t$  and  $\varepsilon_t$  are time-invariant and denoted  $F(\theta_t)$  and  $G(\varepsilon_t)$ , respectively. The lower and upper bound of the distribution functions are specified in assumption 1.

**Assumption 1:** Let  $\Theta = [\theta_L, \theta^U]$  and  $F: \Theta \rightarrow [0,1]$ . Let  $\varepsilon = [\varepsilon_L, \varepsilon^U]$  and  $G: \varepsilon \rightarrow [0,1]$

### *Participation in the Financial Sector*

A key decision for the household at the beginning of each period is whether to participate in the financial system. There are transaction costs to join a financial institution, as in Townsend (1978). There is a one-time entry fee (fixed cost),  $q > 0$ , incurred at time  $t$ . Then, in each period, a participant incurs a variable cost,  $(1-\gamma)$ , where  $\gamma$  is in the interval  $[0,1]$ . The variable cost is proportional to the rate of return.

Households, constrained by their accumulated wealth,  $k_t$ , also choose whether or not to join the financial sector. *Nonparticipants* invest a portion  $\varphi_t$  of total savings  $s_t$  at date  $t$  into the risky technology. Their capital stock at the beginning of the next period  $t+1$  is

$$k_{t+1} = s_t [\varphi(\theta_t + \varepsilon_t) + (1 - \varphi_t)\delta].$$

Total savings is non-negative,  $s_t > 0$ , and the share invested in the risky technology is between zero and one,  $0 \leq \varphi_t \leq 1$ . Next period capital stock,  $k_{t+1}$ , and consumption,  $c_{t+1}$ , are functions of the history of shocks through date  $t$ , not contemporary shocks  $t+1$ .

*Participants*, on the other hand, deposit  $s_t$  in a bank and then borrow to finance a project under advice from the bank. Debt repayment is allowed to vary with idiosyncratic shocks. When risky projects are undertaken, low  $\varepsilon$  households pay less (as if receiving insurance) and high  $\varepsilon$  household pay more (as if paying premia) so as to repay  $\theta$ , on average. As mentioned, there is a one-time fee,  $q$ , to access bank credit and a variable cost  $\gamma$  in each period per unit of project return  $r(\theta)$ . Thus when a household deposits  $s_t$  in the bank, at the end of period  $t$ , its wealth (capital stock) next period is

$$k_{t+1} = s_t [r(\theta_t)].$$

An alternative interpretation is that participant households purchase shares of a financial institution, and then let the institution make the decision about the type of their project(s). But before the bank pays interest (next period), the bank discovers the true aggregate return  $\theta_t$  (by sampling a very large but finite number of projects, then using the law of large numbers). The bank pools the returns on the individual projects it operates to smooth away completely idiosyncratic shocks  $\varepsilon_t$ . The returns on shares of projects then vary only with the aggregate state.

Townsend (1978) and Greenwood and Jovanovic (1990) show that under certain assumptions, this return is consistent with competitive markets among financial intermediaries. This specification of the financial sector is too extreme, however. One could imagine less than perfect risk sharing, constrained by default or private information considerations. Also, the specification of transaction costs is simplistic. One could allow for heterogeneity across different households based on the idea that costs may depend on

the location (urban/rural) and education of the household. The model employed here follows Greenwood and Jovanovic (1990) and assumes that the bank has an informational advantage despite marginal costs, and that the risky technology is profitable enough to attract positive investment.

**Assumption 2:**  $E[r(\theta_t)] > E[\theta_t] > \delta > 0$ .

The model implies unbounded growth, so it is necessary to limit the expected return to be smaller than  $1/\beta$ . After adjusting by the risk aversion parameter, the required assumption is the following:

**Assumption 3:**  $\beta E[r(\theta_t)^{1-\sigma}] < 1$ .

This assumption applies only to participants. This condition is not necessary for nonparticipants because everyone eventually participates in the financial system. Since the focus is on perpetual growth, a sufficient condition is indeed needed to make the safe return high enough: that is, greater than  $1/\beta$ .

**Assumption 4:**  $\beta\delta > 1$ .

### *Households' Optimal Policies*

Following the notation of Greenwood and Jovanovic (1990),  $V(k)$  defines the value for those who have already joined financial intermediaries today,  $W(k)$  is the value for those who have not joined today but have an opportunity to do so tomorrow, and  $W_0(k)$  is the value for those who are restricted to never joining the financial sector. Formally, these value functions are expressed as follows:

$$\begin{aligned} V(k_t) &= \max_{s_t} u(k_t - s_t) + \beta \int \max[W(k_{t+1}), V(k_{t+1})] dF(\theta_t). \\ W(k_t) &= \max_{s_t, \phi_t} u(k_t - s_t) + \beta \int \max[W(k_{t+1}), V(k_{t+1} - q)] dF(\theta_t) dG(\varepsilon_t). \\ W_0(k_t) &= \max_{s_t, \phi_t} u(k_t - s_t) + \beta \int W(k_{t+1}) dF(\theta_t) dG(\varepsilon_t). \end{aligned}$$

The assumptions of the model guarantee that participants never terminate their relationship with formal financial institutions. (See the proof in Townsend and Ueda 2001.)

The entry cost is a one-time fixed cost. This introduces a fundamental nonconvexity. In particular, the value function might not be concave. The value function  $V(k)$  is concave after entry and  $W(k)$  is concave before entry, but still the region of the outer envelope that determines the entry point might not be concave. Consequently, if the value



function has a nonconcave part, the optimization problem is not strictly concave and it is not apparent that the policy functions are single-valued.

The risky technology, however, allows the required convexification. Under quite general assumptions, the optimal portfolio choice by a household makes the value function concave and thus policy functions are single-valued, Townsend and Ueda (2003) show. Sufficient assumptions to make this mechanism work are hence large variation of the risky return and strong risk aversion.

The optimal choice of portfolio shares between risky and safe assets convexifies the objective function. That is, those risk-averse households shift toward risky technologies as their capital stock approaches a critical value. This fact complicates the transitional dynamics and implies that changes in inequality are not monotonic on the growth path.

Households join the financial sector whenever  $W(k) = V(k - q)$ . Thus let  $k^*$  denote the *critical capital level* at which both value functions coincide. This level is uniquely determined. A household will be outside the financial system when its level of capital is smaller than  $k^*$ . As the household accumulates wealth, its level of capital will approach  $k^*$ . Eventually the household will join the financial system when its capital becomes equal to  $k^*$ .

Since nonparticipants prepare to pay the future fixed entry fee  $q$ , their savings rate will be higher than participants' savings rate. Although it can be shown that everyone eventually joins the financial system, those who have very little wealth act as if they would never be able to join. Very poor households have almost the same value and policies as those who never have the opportunity to join the bank. That is, in the short run, households with very small capital levels spend little effort to accumulate capital to join the bank. Hence their savings policy will be similar to those households already in the financial system.

In the growth path, the model predicts that more and more households join the financial system. As a result, along this path, there will be an increase in inequality across the very rich and the very poor segments of the population. The intuition is that both groups have the same savings rate, while the former face a better distribution of returns on their investments.

## Data

The basic justification to choose the economy of Peru is data availability. The estimation of model parameters and the calibration procedure require information at the household level for a reasonably long period. In particular, it is essential to have financial transaction information at the household level for a year *before* the exceptional period of GDP growth experienced in many Latin American countries during the 1990s. To the best of the author's knowledge, this requirement is met only by Peru, where a nationally representative household survey was carried out in 1985.

## Aggregate Data

Peru experienced rapid growth and increasing inequality during the 1990s, as shown in figure 4.1. The economy grew at an average annual rate of 3.8 percent from 1991 to 2000, as measured by real per capita GDP. The erratic movements of real GDP between 1985 and 1990 were due largely to high inflation, especially by the late 1980s. Inequality is measured by the Gini coefficient in 1985 as calculated by the World Bank, and for 1991, 1994, and 1997 as calculated by Székely (2001) at the Inter-American Development Bank. The data points are linearly interpolated to show the trend.

The increase in inequality is clearly evident when other measures of inequality are analyzed, such as the share of expenditures in income by deciles or the number of households below the poverty line. The shares in total consumption in the income of households in the lower deciles were persistently reduced. For example, the share of the poorest 10 percent of households in total income fell from 1.95 percent in 1985 to 1.83 percent in 1994 and to 1.59 percent in 1997. Similarly, there was a more than thirteen-fold increase in the households below the poverty line (measured at \$32.74 a month) from 1985 to 1996 and a four-fold increase, if the poverty line is measured at \$65.48 a month.

FIGURE 4.1



Source: Author's calculations, based on the Encuesta Nacional de Hogares sobre Medición de Niveles de Vida (ENNIV).

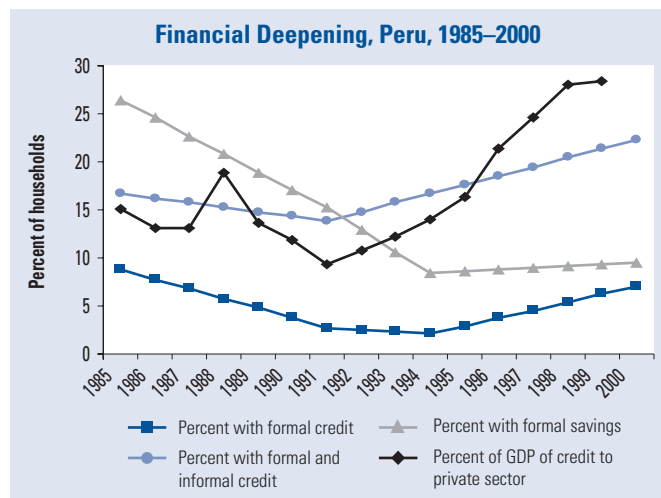
## Financial Participation

The main point to stress here is the empirical significance of using household data instead of aggregate time paths to measure financial sector expansion.

At the aggregate level, monetary aggregates such as the total amount of domestic credit to the private sector are typically used to measure the degree of financial deepening in an economy. Credit to the private sector as a share of GDP greatly increased during the period of rapid growth that started in 1991, more than tripling from 9 to 28 percent in 2000 (figure 4.2). A pattern of growth with strong financial sector expansion is clearly verified in the aggregate data. Another aggregate indicator (not shown in the figure) is the domestic credit provided by the banking sector as a share of GDP, which also rose sharply, from 11 percent in 1991 to 28 percent in 2000.

The pattern is somewhat different when financial deepening is measured from household data, particularly when measures of households' participation in the formal financial sector (banks, cooperatives, and finance companies) are used. Although the same pattern of financial deepening during the growth period is observed, the trend is

FIGURE 4.2



Source: Author's calculations, based on ENNIV household surveys for 1985, 1991, 1994, 1997, and 2000.

clearly evident only when the informal financial sector is included in the indicator. Formal financial sector expansion, although evident, does not appear to be strong in the household data.

Figure 4.2 shows three microdata indicators of financial sector expansion using ENNIV household surveys for 1985, 1991, 1994, 1997, and 2000 (described in detail below). Each indicator measures the share of households in the representative sample that: has outstanding credit from formal institutions; has a saving account in formal institutions; and has outstanding credit from both formal and informal institutions. The pattern of financial deepening with growth is observed only when the informal sector is

included (credit from relatives, friends, enterprises, and the like). Credit from formal institutions, though increasing, did not reach the initial level of 1985 in 2000. The number of households with saving accounts in formal institutions fell dramatically from 1985 to 1994.

### Micro Data

The source of micro data is the household survey, Encuesta Nacional de Niveles de Vida, carried out for the years 1985, 1990–01, 1994, 1997, and 2000. This is a nationally representative survey of approximately 5,000 households that measures household characteristics, income, expenditures, and financial transactions. In particular, the last section of the survey questionnaires requests information about the characteristics of loan transactions by household, measuring interest rates, collateral, and other aspects for the formal institutions providing credit.

The methodology of the Living Standard Measurement Survey (LSMS) was developed by the Poverty and Human Resources Division of the World Bank. The 1985–86 Peru Living Standard Survey provides data for 4,913 households selected from the entire country, with the exception of the departments of Ayacucho, Apurimac, and Huancavelica, which were considered emergency zones because of terrorist activity. All stages of the survey were implemented by the Statistical Institute of Peru (INE), with the technical and financial support of the World Bank and the Central Bank of Peru.

The survey collects household socioeconomic data at the individual and the household level. The household is defined as the person or collection of persons, whether related or not, that habitually live in the same dwelling, occupying it in part or in whole, and that tend to satisfy their life's needs in common. The unit of observation for the cat-

egories used in this study (housing, consumption, agricultural and business production, wealth) is the household.

The survey is directed to the head of the household. The head of the household was the person whom the other members of the household recognized as such, whether a man or a woman. The survey was implemented in two visits. The sample is probabilistic, multi-stage, and independent in each domain of study. The household selection was systematic, with probability proportional to the number of individual households. The sample is self-weighted for the levels of inference.

### Measurement of Variables Used

The variables used in the analysis were constructed as follows.

*Wealth* was estimated using data on ownership of a list of financial assets. Measures of household durable assets—land, livestock, and savings—were employed. For the case of durable assets, households responded to the following question: Do you have in your household (list of good)? The list of goods consisted of: radio, refrigerator, sewing machine, car, bicycle, floor polisher, telephone, television, washing machine, knitting machine, motorcycle, record player, blender, gas stove, others. The year the asset was acquired, the price paid, and the actual market price were recorded.

*Income* was measured taking into account the monetary value earned in agricultural activities, in business production, and as wage earners. The total value of production in agricultural activities was obtained by multiplying the amount of crops produced by their market price at the time of the interview. Income from business sources was the result of gross amount of sales of products and services during a typical month. This value was annualized by multiplying by the number of months that the enterprise operated during the 12 months before the interview.

*Capital stock* was also estimated using data on ownership of a list of productive assets. For farming equipment, households were asked whether during the 12 months before the interview they had their own (type of equipment). The list of farming equipment consisted of: plough for animals, tractor, milking machine, harvesting machine, seeding machine, electricity motor, tiller, truck/van, and other agricultural equipment. For the case of nonfarm self-employment, households were asked whether they owned any of the following equipments at the time of the interview: inventories, tools, vehicles, furniture, machinery or equipment, land and buildings, other durable goods, and any other productive assets.

*Financial participation* was measured as a binary variable regarding whether households had any consumption credit available to the household or enterprise owned by the households, such as credit cards or credit through cooperatives. A second measure for

household financial participation was used as an alternative: whether the household had any saving accounts in banks, cooperatives, or “other” during the 12 months before the interview. In addition, the survey contains a section on the characteristics of the loan(s) to the household (lender, amount, interest rates, collateral). This was used to construct measures of credit outstanding by lender, including relatives, friends, and enterprise credit to measure participation in the informal sector.

### Access to Credit by the Poor

The theoretical model is based on the premise that access to credit is limited by wealth. Some summary statistics on the access to credit of Peruvian households for the initial year, 1985, follow. The purpose is to provide some evidence on the wealth-constrained access to the financial system.

Table 4.1 reports the proportion of households with access to the financial sector by region (metropolitan, urban, and rural). Relatively poor rural regions of Peru had the lowest shares of participants in the financial sector. The proportion of household that had access to formal credit in 1985 was 11.1 percent for the poorest rural regions, while the corresponding proportion in the relatively richer urban and metropolitan regions was 20.0 percent and 22.4 percent, respectively. The difference was even larger for the proportion of households with saving accounts in financial institutions: 9.4 percent for rural areas, but 33.2 percent and 47.6 percent in urban and metropolitan regions, respectively.

At a more individual level, one can classify households by terciles of income, household assets, and education of the head of the household to study whether relatively high-income households have better access to financial institutions. Table 4.2 presents the tabulations from the survey. Households with greater income, assets, and more educated heads had more access to formal credit. The difference in the shares between the lower and the upper terciles was particularly large when the share of households with

**TABLE 4.1**  
**Access to Financial Sector by Region, 1985**

	Metro	Urban	Rural
Avg. household assets (\$)	211	198	36
Number of households	1,346	1,409	2,226
Percent with saving account	47.6	33.2	9.4
Percent with loans	25.6	28.9	17.4
Percent with access to formal credit	22.4	20.0	11.1
Number of loans	493	546	471

Source: Author's calculations, based on ENNIV household surveys.

**TABLE 4.2**  
**Access to Credit by Poor Households, 1985**  
*Percent*

	Lower tercile	Middle tercile	Upper tercile
By household income			
With saving account	14.3	21.2	43.4
With access to formal credit	9.9	13.8	26.0
By household assets			
With saving account	8.9	20.5	49.6
With access to formal credit	10.5	13.5	25.9
By education of the head			
With saving account	10.5	26.4	45.7
With access to formal credit	10.0	14.3	26.5

*Source:* Author's calculations, based on ENNIV household surveys.

saving accounts is examined and stratified by household assets. The proportion of upper tercile households is more than five times larger than households at the lower tercile. This evidence lends support to the main premise of the theoretical model: wealth constrained access to the financial system.

## Calibration Strategy

This section briefly outlines the numerical algorithm used to compute the theoretical model and then discusses the estimation/calibration of the key parameters of the model in detail.

### Numerical Algorithm

The numerical algorithm computes the optimal policy functions, the savings rate, the portfolio share, and the value functions for the household's saving/investment decision problem for a given grid of capital stocks. Then, the actual initial distribution of wealth in 1985 is introduced to simulate the dynamics of the economy for a distribution of idiosyncratic and aggregate shocks.

The value function iteration method is used to obtain the values and policies functions. Since the model uses continuous utility functions and continuous distributions of shocks, some computational difficulties arise. The computer can handle only discrete data, and approximation of the functions is required. To obtain the value and policy

functions, the algorithm chooses the initial function  $Z^0(k)$  on a given interval  $[k_L, k^U]$ . Basically, any continuous function that is between  $W_0$  and  $V$  is appropriate. Second, the programming constructs an approximation for  $Z^0$  by using the Chebyshev method. This interpolates between special grid points employing the information of all the grid points, and the fit is almost the best possible.

Third,  $W_0(k)$  is calculated at each grid point by solving the following expression:

$$W(k_t) = \max_{s_t, \theta_t} u(k_t - s_t) + \beta \int Z^0(k_{t+1}) dF(\theta_t) dG(\varepsilon_t).$$

Here a Gaussian quadrature method is used to get the approximate value of the integral. The Gaussian quadrature utilizes the orthogonal polynomial approximation and calculates the integration quickly and accurately. Maximization over  $s_t$  and  $\varphi_t$  is conducted by a grid search with successive refinements and the simplex method.

Finally, the value of  $Z^1(k)$  is defined as

$$Z^1(k) = \max\{W_1(k), V(k - q)\}.$$

From this,  $W_2(k)$  is calculated and then  $Z^2(k)$  is constructed. Iteration takes place until  $Z(k)$  converges to a fixed point.

### ***Setting the Parameters***

Income to capital ratios from the household data were employed to estimate the technology parameters for those households not participating in the financial system. The survey shows that the average return from capital investment in subsistence agriculture for those without access to formal credit was 6.6 percent in 1985. For the risky project, the income to capital ratio in nonagricultural business was calculated, again, for those without access to the financial sector; it averaged 21.7 percent in 1985.

The difference between the top and bottom 5 percent returns was used to set the support of the idiosyncratic shock  $\varepsilon$ , which resulted in the interval  $[-0.5, 0.5]$ . The support of the aggregate shock  $\theta$  was estimated by using the difference between the minimum and the maximum value for the real per capita growth rate from 1985 to 2000, which was approximately 10 percent. According to the model with transaction costs, underlying variation of the aggregate shocks would be yet larger. Thus the range for the aggregate shock  $\theta$  was set at  $[0.895, 1.145]$ . To estimate the mean of the aggregate shock  $\theta$ , the model was simulated for different values of the mean of  $\theta$ . The one that minimized the sum of squared difference between the actual Peruvian growth rate and the predicted path from the model was picked.

The value of the discount rate was set at  $\beta = 0.96$  by following the business cycle literature. The log utility case is reported first, but to check for robustness of the results, different specifications of the utility functions, particularly for different risk-aversion parameters  $\sigma$ , were analyzed—although not reported.



TABLE 4.3  
Benchmark Parameter Values

$\sigma$	$q$	$\delta$	$\theta$	$\varepsilon$	$\beta$	$\gamma$
1	5	1.06	[0.895, 1.145]	[-0.5, 0.5]	0.96	0

The fixed cost  $q$  is a free parameter. Following Townsend and Ueda (2001), this study takes it to be  $q = 5$  in model units of capital. Model units can be converted to actual data units by comparing the critical capital level  $k^*$  and the critical capital level in the actual data. The critical capital level  $k^*$  in model units was obtained by computing the value functions. The critical value of capital in the actual data was estimated using the household survey and the observed fraction participating in the financial system in 1985. According to the survey, the proportion of the population that had access to the financial system was 16.6 percent in 1985. The cumulative distribution of wealth for 1985 shows that 8.76 percent of the population had more than 67,700 pesos in wealth, thus defining the critical level of capital necessary to join the formal financial sector.

Additionally, these parameters must satisfy assumptions 1 through 4 described in the second section. The model was calibrated for a benchmark set of parameters and then sensitivity analysis were performed to check for robustness (not reported). Benchmark parameter values are presented in table 4.3.

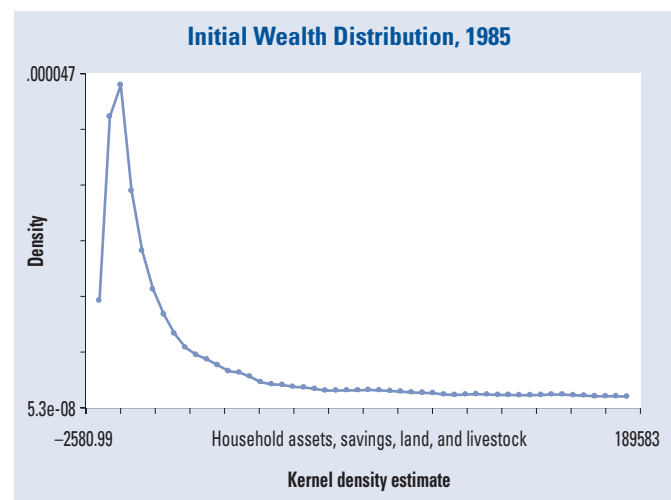
## Results

The wealth distribution employed to initialize the calibration of the model is presented first below, followed by the value and policy functions. Finally, the prediction of the model is contrasted with the Peruvian economy actual time paths.

### Wealth Distribution

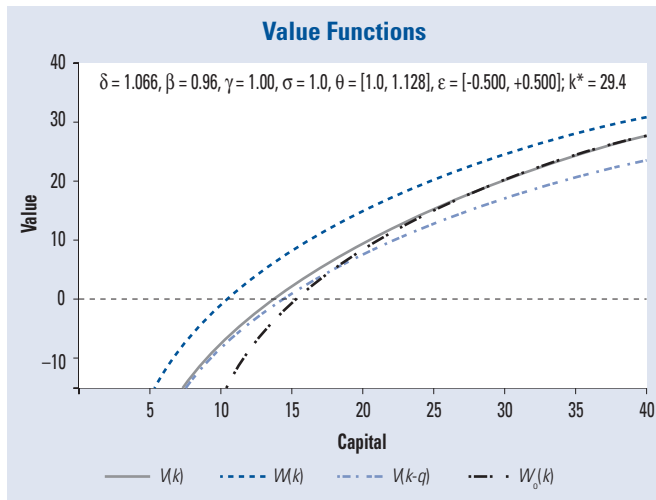
Figure 4.3 shows the kernel density estimate of the initial distribution of wealth measured using the household data from Peru in 1985. The wealth distribution is particularly skewed, showing the effect of a few households that concentrate relatively large levels of wealth. The model was then calibrated using the measured distribution of households' wealth as its starting point. The distribution of

FIGURE 4.3



Source: Author's calculations, based on ENNIV household surveys.  
Note: Units = Intis.

FIGURE 4.4

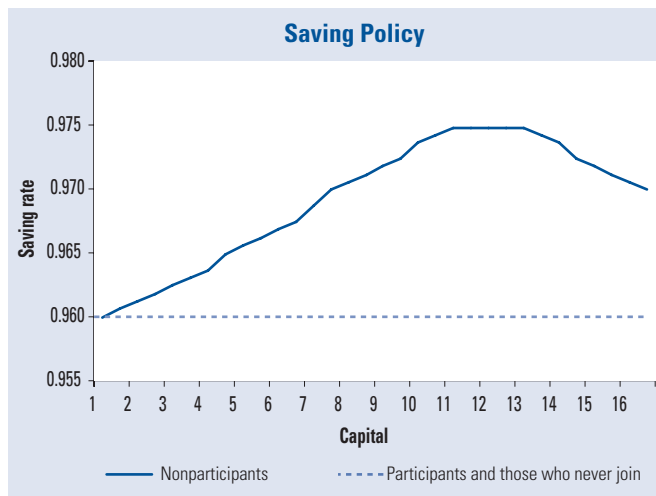


Source: Author's calculations, based on ENNIV household surveys.

Note: A unit of the model is equal to 6,583 intis.

approaches  $W_0(k)$  as  $k$  tends to zero, and approaches  $V(k-q)$  as  $k$  goes to  $\infty$ , as discussed. The critical level of capital to join the financial system is found where  $W(k)$  and  $V(k-q)$  cross. This level of capital is approximately 12 in the units of the model. When this value is converted to Peruvian currency using a scaler or “exchange rate,” the level of capital in Intis is approximately 79,000.

FIGURE 4.5



Source: Author's calculations, based on the ENNIV household surveys.

Note: A unit of the model is equal to 6,583 intis.

nonparticipants put their wealth in the risky asset as a natural lottery to convexify their lifetime utility (value function). As discussed, the entry cost introduces a nonconvexity in the lifetime utility of households. This implies that the value function might not

wealth was matched to a grid of 800 points to initiate the simulation of the dynamics of the economy. To check for robustness, a larger grid of 1,600 points was employed; the results of the calibration were unchanged.

### Value Functions

Computed value functions are shown in figure 4.4. Recall that  $V(k)$  is the value for those who have already joined the formal financial sector today,  $W(k)$  is the value for those who have not joined today but have an opportunity to do so tomorrow, and  $W_0(k)$  is the value for those who are expected to join the financial sector in the very long run.

$W(k)$  is always between  $V(k)$  and  $W_0(k)$ . It

### Policy Functions

The results for the policy function—savings rate and portfolio shares—are shown in figures 4.5 and 4.6. The savings rate of nonparticipants increases with their wealth level, up to near the critical level of capital that determines the entry decision. Households start saving well before the payment of the fixed entry cost. After entering the financial system, the savings rate decreases slightly. This pattern of savings is due to consumption smoothing.

Similarly, the portfolio share of the risky technology increases at first and then decreases. It is almost always larger than the portfolio share of those who never join the financial system,  $W_0(k)$ , which reflects the fact that

be concave. The optimal portfolio choice by households convexifies the value function.

### **Actual vs. Predicted Time Paths**

The predictions of the calibrated model to the actual data are now compared. Following Townsend and Ueda (2001), two metrics were employed to measure goodness of fit of the model-predicted economy: the analytical (expected) path, and Montecarlo simulation.

#### **Analytical (average) Prediction**

The simulated wealth evolution over 20 model periods, corresponding to 60 calendar years, was analytically derived period by period, using a grid for possible capital values and the computed, numerical approximations to the nonparticipants' optimal policies as a function of wealth. This is not a particular realized sample path but rather is the expected evolution. Since the actual path of the Peruvian economy is imagined here to be just one realization of the many possible histories of the model economy, the actual Peruvian paths of income, inequality, and financial participation rate should differ from the above, expected path.

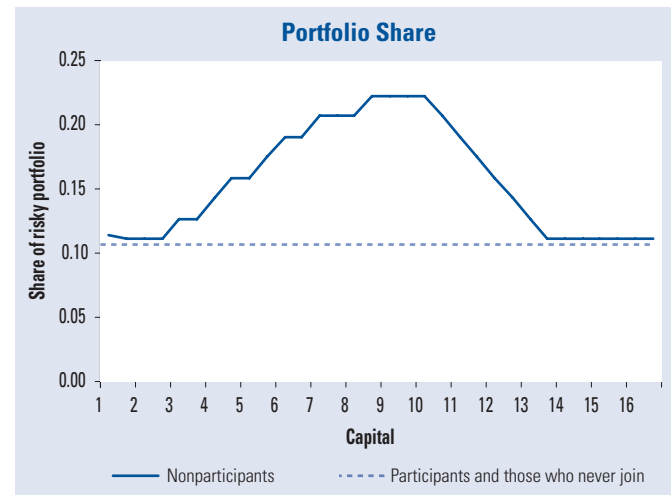
A detailed reporting of experiments performed to check whether the model's average predictions are robust to other variations around the chosen benchmark parameters is not presented here. Some of the experiments produced sensible changes in the average predicted paths and thus are briefly discussed.

First, raising the risk-aversion parameter from  $\sigma = 1$  to  $\sigma = 1.5$  lowers the savings rate initially and lowers the fraction invested in risky assets. The dynamic path of the model show slightly less growth and less participation but raises the trend of predicted inequality. Second, lowering the variance of idiosyncratic shock also lowers the saving rate, raises the fraction invested in risky assets, and accelerates financial participation rates. Finally, higher marginal transaction costs lower both savings and growth.

### **Montecarlo Simulations**

The goal here is to investigate the simulation that best fits the actual Peruvian data. As is conventional in the calibration exercises, benchmark parameter values were picked based on evidence outside the model. The model economy was simulated for specific shocks that trace the actual data well. Using the whole history as one sample, a metric that measures closeness of fit was constructed (for a detailed discussion, see Townsend and Ueda 2001). For this experiment, a large sample ( $N = 1,000$ ) was chosen so that the

**FIGURE 4.6**



Source: Author's calculations, based on the ENNIV household surveys.  
Note: A unit of the model is equal to 6,583 Intis.

FIGURE 4.7a

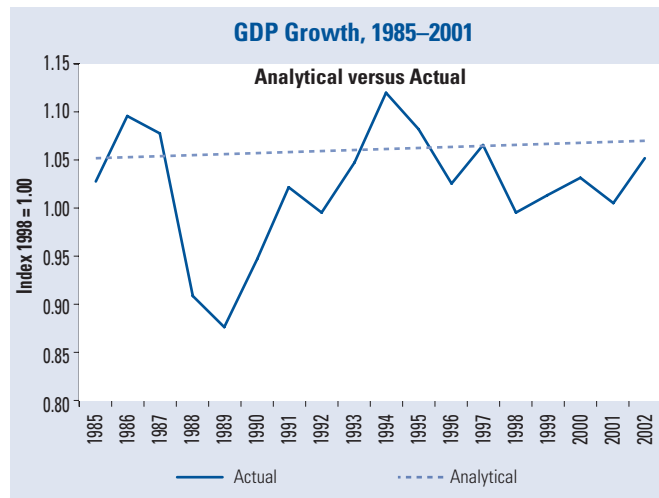
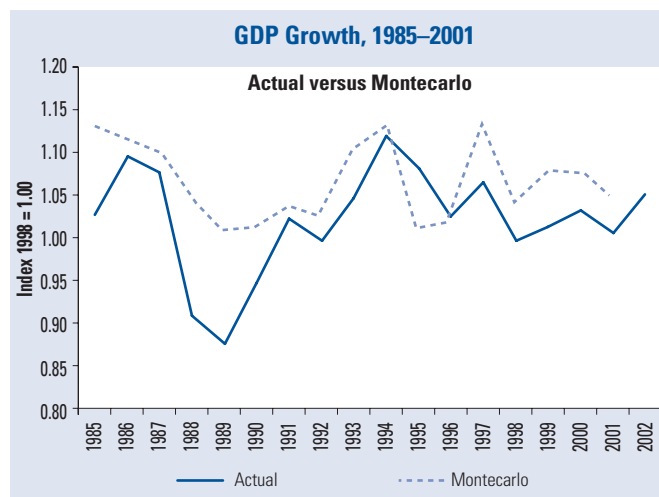


FIGURE 4.7b



Source: Author's calculations, based on ENNIV household surveys.

population average of idiosyncratic shock was virtually zero. The model economy was simulated from 1985 to 2000 ( $T = 16$ ) by drawing idiosyncratic and aggregate shocks. For every sequence of aggregate shocks, the economy  $S = 100$  times was simulated for the  $N = 1,000$  people, thus getting various possible realized sample distributions of idiosyncratic shocks drawn from the underlying distribution  $G(\varepsilon)$ , i.i.d. over the (finite) population and over time. This procedure was repeated for  $M = 40$  aggregate shocks. With the particular metric employed in Townsend and Ueda (2001) to measure goodness-of-fit, the best fitted simulation was picked out of 100 for each realization of the aggregate shock, and then the overall best simulation was picked among  $M = 40$  possible aggregate shock paths.

Panels A and B of figure 4.7 compare the results of the analytical and Montecarlo simulation to the actual path of GDP growth. Except for the profound recession in the late 1980s, the average path of GDP growth is successfully captured in the calibrated economy. In particular, the Montecarlo simulation seems especially successful in tracking the path of the Peruvian economy.

Although it seems that the simulated economy over-predicts the path of inequality, the acceleration in the growth rate of increasing inequality during the 1990s is well

captured by the simulation data, as shown in panels A and B of figure 4.8. The poor fit of the model coincides with the problematic late 1980s, reflecting the failure of the simplified structural model to capture other structural problems evident in the Peruvian economy between 1985 and 1990.

The benchmark economy largely overestimates actual participation in the formal financial sector (figure 4.9, panels A and B). Participation rates from the predicted economies are substantially greater than actual ones. In the last year of the simulation exercise, the difference in the participation rates is 19 percent versus 7 percent. Again, the failure to track the actual path of financial participation seems largely explained by the first five years between 1985 and 1990, when financial participation was actually decreasing. However, the predicted and the actual paths of financial deepening show a

similar trend during the rapid growth period after 1994. In sum, the result is quite mixed, from a poor match early in the period under analysis to a notable success by the late 1990s.

As an alternative experiment, the same analysis was performed but those households with credit from informal sources were included as participants in the financial sector. To save space, the results are presented in the appendix, in the figures. The results are similar to the ones just discussed, with a relative success in tracking GDP growth but some difficulties in tracking inequality and financial participation in the early years. Once again, the exercise had relative success in mimicking their trend after the early 1990s.

## Final Remarks

The analysis in the study shows the relative success of a simplified growth model of household saving/investment in mimicking the actual path of a rather complicated economy. The model articulates specific relationships between GDP growth, inequality, and financial participation that were verified in the calibration results. There are some failures to account for certain dynamic paths, particularly in matching inequality and financial participation in the late 1980s. It is evident that some other important structural features of the Peruvian economy were abstracted out in the model. A more comprehensive understanding of these paths under inflationary processes, for example, would require further research.

It is interesting to note, however, that the lack of success in tracking financial participation is associated with a process of financial disintermediation. The disintermediation process is particularly strong when financial participation is measured by the share of households with saving accounts in formal financial institutions. This share was 26 percent in 1985, 15 percent in 1991, and less than 10 percent in 2000. Unlike typically used aggregate measures such as credit to the private sector as a share of GDP, household saving in formal institutions remained relatively flat during the 1990s.

FIGURE 4.8a

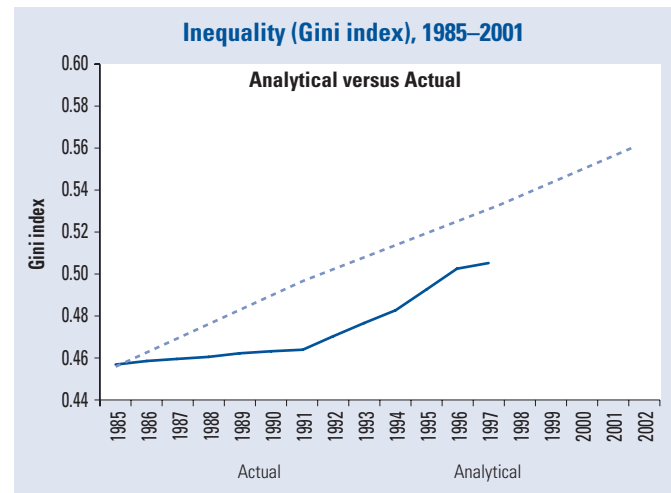
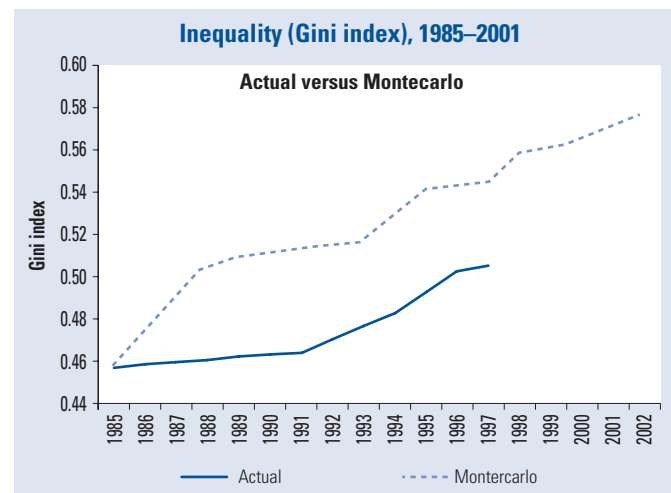


FIGURE 4.8b



Source: Author's calculations, based on ENNIV household surveys.

FIGURE 4.9a

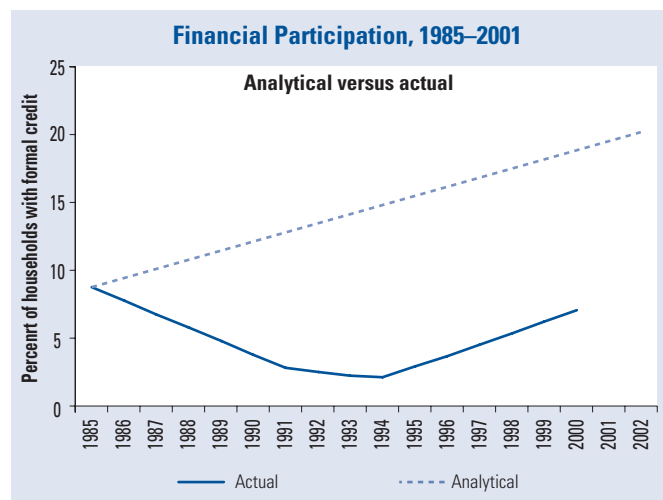
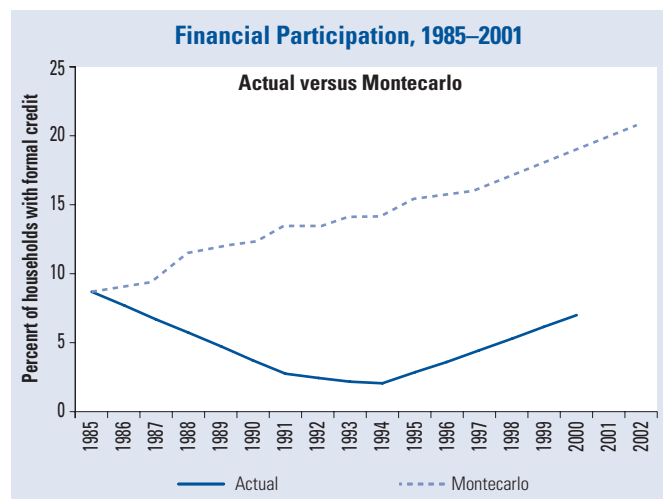


FIGURE 4.9b



Source: Author's calculations, based on ENNIV household surveys.

This finding helps to rationalize the inadequately low levels of financial infrastructure observed in the Peru. Quick expansion of the formal financial sector can be costly, but the results in this study show that it is desirable and that large welfare gains may more than compensate for the incurred costs. However, welfare gains from financial deepening are more likely to benefit more middle-wealth groups rather than the poor. Expansion (or recovering past levels) of financial participation by encouraging households to save may improve the situation even of the very poor, as they will be able to use accumulated savings to buffer idiosyncratic shocks and eventually participate in the formal financial sector.

## Appendix

TABLE A4.1

**Loan Size, Interest Rate, Percent of Loans at Zero Interest, and Collateral by Lender**

	Number	Loan size (intis)	Interest rate (percent)	Percent zero rate	No collateral (percent)
Individual	408	1,690	18.6	82.6	90.2
Bank	241	13,125	38.2	10.4	22.7
Cooperative	246	4,050	21.1	20.3	47.8
Enterprise	443	4,650	15.0	75.1	75.2
Other	156	2,559	10.9	83.2	90.7

Source: Author's calculations, based on ENNIV household surveys.

TABLE A4.2

**Purpose of Loan, by Lender**  
Percent

	Individual	Bank	Cooperative	Enterprise	Other
Trade/business	26.5	10.3	9.6	21.9	13.0
Agriculture	8.6	65.3	21.1	2.0	10.6
Education	3.7	1.0	4.8	5.4	8.1
Household consumption	56.6	21.1	57.0	68.3	64.0
Other	4.7	2.5	7.6	2.5	4.3
Total	100.0	100.0	100.0	100.0	100.0

Source: Author's calculations, based on ENNIV household surveys.



FIGURE A4.1a

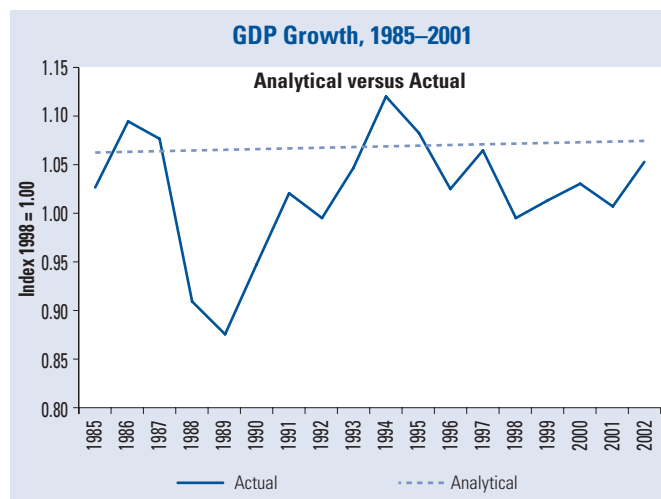


FIGURE A4.1b

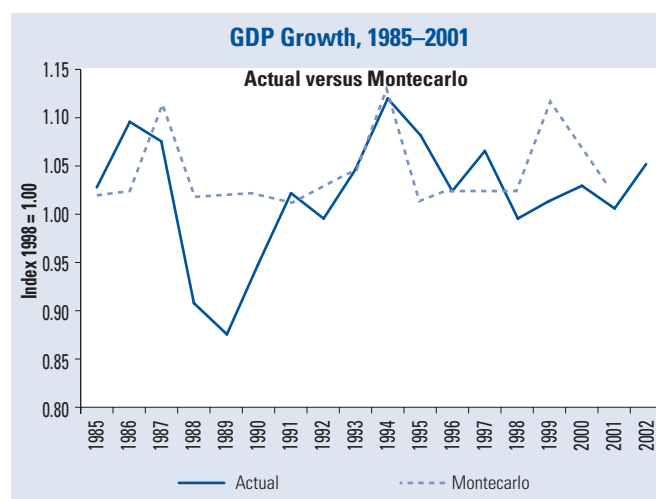


FIGURE A4.2a

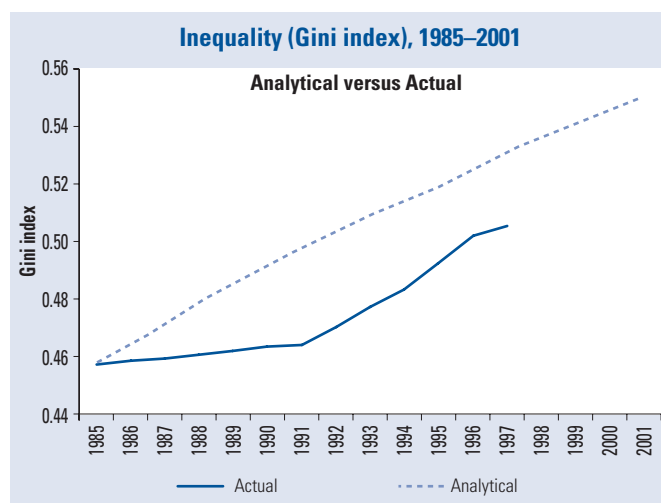


FIGURE A4.2b

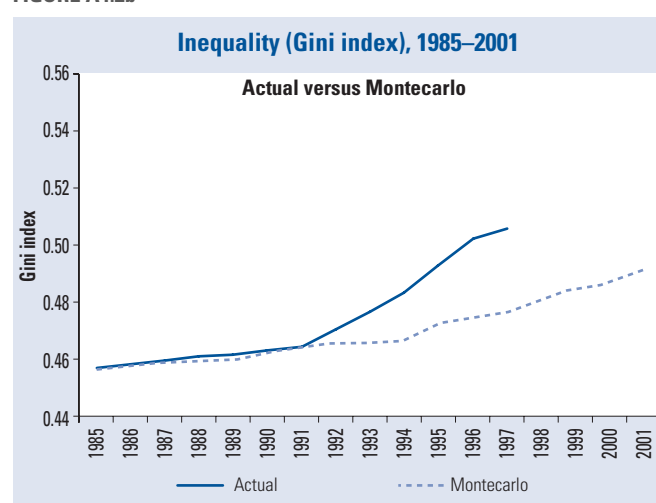


FIGURE A4.3a

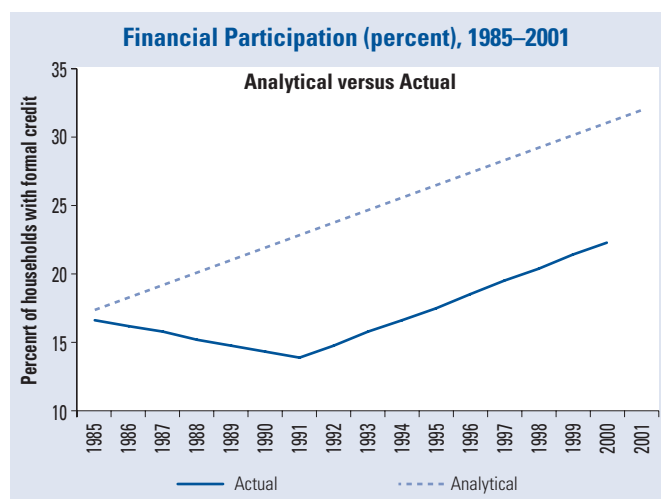
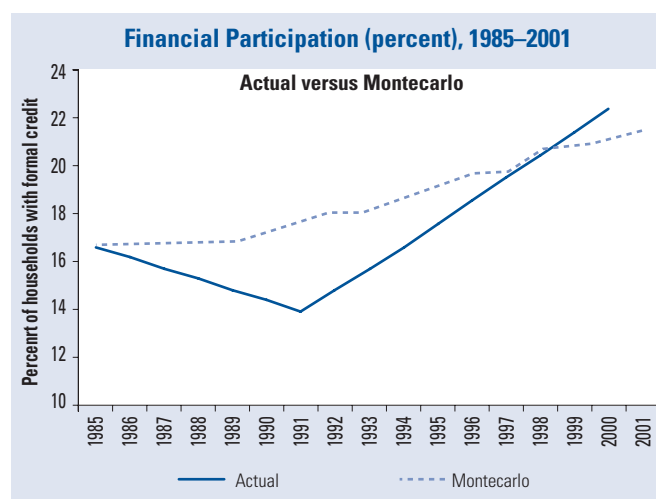


FIGURE A4.3b



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## **Part II**

# **Financial Services and Policies: Select Topics**



# 5

## Insurance for the Poor?

Stefan Dercon, Tessa Bold, and César Calvo

**H**ouseholds in developing countries are exposed to high risks, with important consequences for their welfare. Risks range from those specific to the individual (such as illness, theft, or unemployment) to those that affect the wider economy (such as drought or recession). These risks have important implications—not least for the poor, including short-term effects on consumption and nutrition—resulting in calls for and the establishment of safety nets or other social security mechanisms.

This study goes beyond this view by arguing, first, that the costs related to these risks are much higher than a simple consideration of short-term costs, and secondly, that expanding insurance provision for the poor could be an important instrument with substantial long-term welfare benefits. Most importantly, it discusses the scope and problems related to the expansion of insurance mechanisms and products, with a focus on Latin America, starting from a consideration of how risk affects the poor and the ways in which they respond to it. The chapter discusses the most promising products, institutional setup, and the required regulatory framework to successfully expand insurance for the poor.

In addressing the case for extending insurance to the poor, a number of key questions need to be answered. First, is risk prevalent, and if so, what are these risks? Thinking about the design and promotion of specific insurance products requires a careful understanding of the risks the poor face, and their consequences. Recent surveys have highlighted the variety of risks that the poor face (Morduch 1995; Townsend 1995; World Bank 2000; Dercon 2002; Fafchamps 2003). Some are relatively straightforward to insure, such as funerals, serious health problems, or unemployment, while for others, such as a countrywide recession or crime, several factors come into play.

Any discussion about insurance for the poor must acknowledge the shortcomings of an insurance-related approach and the need for alternative mechanisms to deal with the implications of particular shocks. This study argues that there is a need to think in terms of complementarities with other mechanisms to reduce and cope with risk, including safety nets in the form of employment schemes or social funds. A related issue, and a crucial one for Latin America, is that much of the existing literature related to the

risks facing the poor tends to focus largely on rural settings, mainly in Africa and Asia. Part of the reason is that worldwide, most of the poor live in rural areas, and drought or flooding risks are the most commonly studied when considering the impact of risk on the poor. The relatively higher urbanization rate of Latin America implies that urban risks are crucial for this discussion. The first section of this study takes up these issues in more detail.

The poor do not just passively endure the high risk in their environment; rather they actively try to manage it and cope with its consequences. A study of the strategies to manage and cope with risk sheds light on the implications of risk for welfare, as well as for the design of policy responses, including insurance. Much research has been conducted in recent years on these strategies and their implications, although more work is definitely needed. These strategies typically involve households trying to shape the risk they face by changing their activity and asset portfolios so less risk is involved. A typical example is diversification of activities, whereby imperfect correlation between the return to activities is exploited to reduce overall exposure to risk. Yet moving to a less risky portfolio typically entails forgoing a higher mean return—which effectively increases or perpetuates poverty in the long run. Other strategies involve risk-coping mechanisms, such as trying to overcome missing or imperfect credit and insurance markets by entering into “self-insurance” through savings, in which assets are accumulated in good years to be depleted in bad years, or entering into informal mutual assistance arrangements within families or neighborhoods. Most evidence suggests that risk management and coping is rather imperfect, and that shocks result in substantial fluctuations in welfare outcomes, thereby undermining the asset base of households needed for the creation of future wealth, not just in terms of physical and financial assets, but also in terms of nutrition and human capital (Morduch 1995; Dercon 2002; Dercon and Hoddinott 2004).

The evidence that risk strategies result in lower long-term income and that shocks significantly undermine the ability to grow out of poverty has important implications for the welfare costs involved in risk. The overall result is not only fluctuations in welfare levels, but also a loss of *efficiency*, in that the poor are induced to use their assets less efficiently than the rich. Theoretical models such as the one by Banerjee and Newman (1993) build on this feature to show that risk may well result in poverty traps: a situation in which those who cannot escape poverty by their own means end up living in permanent poverty, even if other sectors of the economy are growing. The implication is also that there is no trade-off between equity and efficiency when measures are taken to avoid those poverty traps. In other words, there is a case for providing insurance at subsidized rates so that some do not slip into poverty. The second section of this study expands on this point.

Although public policy and interventions can reduce risk (even if it is by means of subsidies), this does not necessarily settle the issue about the appropriate form of such interventions. Indeed, it still would need to be shown that insurance is the right solution. The third section makes the case for strengthening insurance and insurance substitutes,



but it also acknowledges that insurance products can be costly and, more importantly, that they cannot solve all problems facing the poor. Alternative (complementary) measures are discussed as well, not least in response to the realization that insurance markets usually cannot insure for some economic shocks or social and political risks—or that alternative measures may be more cost-effective. Still, the scope for insurance products for the poor remains strong.

The fourth section discusses general issues related to the design of insurance for the poor. A key issue is ensuring that the poor are effectively reached, which suggests the need to involve local and grassroots organizations with established links with the poor. Equally importantly, the system should be able to provide a cost-effective service and be sustainable. Insurance provision is a specialized service, and should involve private and possibly public sector institutions with the experience and financial capacity to operate such schemes. A partner-agent model is most likely the most effective institutional arrangement.

The fifth section discusses possible products, addressing the risks that are most suitable for insurance-based protection, focusing on life, health, property, and weather insurance. Examples from Latin American countries such as Colombia, Guatemala, and Mexico are used to illustrate key problems and solutions related to the design and delivery of these products. The sixth section centers on the role that different institutions should play, and focuses on the required regulatory framework. The final section analyzes the potential role of local social institutions already providing informal insurance.

## **Risk and the Poor**

There are a number of ways of classifying risks faced by the poor. Two issues are relevant for purposes of this study: the extent to which the poor are affected by these sources of risk, and the extent to which developing more insurance is an appropriate response. To discuss the first point, the covariance of risks across a population and the frequency of risks over time are relevant. Insurance contracts are most easily offered if risks within the relevant population are not covariate, so that only some of those covered put in a claim at the same time. Furthermore, insurance for rare and infrequent events is also typically more difficult to offer. Taken together, if these rare events are also covariate—that is, typically occurring to large population at the same time (such as a flood, hurricane, or an economic recession)—then insurance contracts are most difficult to offer. These considerations are important for the rest of this discussion.

When looking at how the poor are affected by risk, the observations presented on which risks affect living standards the most are largely based on evidence that takes into account the mechanisms people use to manage and cope with risk. For example, it may be the case that the lack of old age security is not quoted as a serious risk in a particular poor community since the community is still using intergenerational transfers as an ef-

**TABLE 5.1.**  
**Percentage of the Poor Living in Urban Areas**

<b>Africa</b>	<b>Percent</b>	<b>Asia-Pacific</b>	<b>Percent</b>	<b>Latin America and the Caribbean</b>	<b>Percent</b>
Algeria (1995)	32.1	Bangladesh (2000)	14.7	Bolivia (1999)	50.5
Cameroon (1984)	70.3	Cambodia (1999)	19.4	Brazil (1999)	69.7
Chad (1996)	73.8	Fiji Islands (1990)	64.5	Chile (2000)	84.4
Egypt (1996)	49.1	India (1999)	25.8	Colombia (1999)	56.8
Ghana (1992)	32.4	Indonesia (2002)	35.0	Costa Rica (1999)	42.5
Guinea Bissau (1991)	16.2	Kazakhstan (2002)	39.4	Dominican Rep. (1997)	55.4
Kenya (1992)	18.0	Kyrgyz Rep. (2000)	29.7	El Salvador (1999)	45.0
Lesotho (1993)	10.2	Lao PDR (1997)	11.9	Guatemala (1998)	30.1
Madagascar (1994)	15.7	Malaysia (1999)	25.5	Honduras (1999)	40.7
Morocco (1999)	34.1	Maldives (1998)	10.9	Mexico (2000)	47.7
Niger (1993)	17.7	Mongolia (1998)	48.8	Nicaragua (1998)	57.9
Nigeria (1993)	34.2	Myanmar (1997)	34.8	Panama (1999)	61.5
Senegal (1991)	14.3	Nepal (1996)	5.2	Paraguay (1999)	43.2
Sierra Leone (1989)	27.1	Pakistan (1998)	20.5	Peru (1999)	48.8
Tunisia (1990)	37.3	Papua New Guinea (1996)	5.1	Venezuela (1994)	78.5
Zambia (1993)	2.5	Philippines (2000)	29.2		
Zimbabwe (1991)	10.3	Sri Lanka (1995)	8.5		
		Thailand (2000)	35.3		
		Vietnam (1998)	5.0		
Sample average	31.4	Sample average	23.4	Sample average	58.4

*Sources:* Authors' calculations, based on African Development Bank (2003); Asian Development Bank (2003); ECLAC (2002).

*Note:* Urban population shares are those implicit in urban, rural, and national poverty rates. Sample averages are weighted by 2001 total (poor) population figures. The African sample is arguably more urban.

fective mechanism to support the elderly. Furthermore, it may be that the development of market-based pension funds may crowd out these community-based mechanisms. This may even lead to some being more exposed to risk than before (Attanasio and Rios-Rull 2000). This has two important implications. First, one needs to carefully study the way individuals, households, and communities cope with risk. Second, problems of crowding-out and their possible welfare implications should be discussed in more detail. The third and fourth sections analyze these points further.

Turning to the typology of risks, in recent years a number of studies have highlighted the risks facing the poor. Nevertheless, the focus has largely been on data from South Asia and, more recently, from Africa (Morduch 1995; Dercon 2002). One key difference between these regions and Latin America and the Caribbean is the degree of urbanization; more specifically, the substantial urban nature of poverty. Whereas poverty is mainly a rural phenomenon in Africa and Asia, the urban share of population in Latin America and the Caribbean is large enough to ensure that urban areas account for most of the poor.<sup>1</sup> Table 5.1 reports figures for a sample of countries with available data. Chile and Brazil are extreme cases, where 84 percent and 70 percent, respectively, of the poor live in urban areas.

Urban poverty is different from rural poverty. There are risks that are specific to the urban poor but not to the rural poor, and vice versa—or at least risks that have a different intensity than in a rural setting.<sup>2</sup> Examples are sanitation and public health risks related to overcrowding, or risks related to crime. Thus an analysis of risk and insurance for the poor in Latin America and the Caribbean will necessarily diverge in some way from most previous studies based on African or Asian experiences and focused, almost exclusively, on risks in rural areas. The focus here will not be on urban risks only, but an attempt is made in this discussion to give at least equal weight to both types of settings.

Few studies have systematically tried to record the sources of risk faced by the poor. As part of a more extensive World Bank study on poverty in Guatemala, the analysis by Tesliuc and Lindert (2002) provides a unique insight into those sources and their consequences in this country, based on a specifically designed household survey combined with focus group interviews, conducted in 2000. Guatemala is one of the most rural economies in Latin America, presenting the lowest percentage of urban poor (table 5.1), so their findings need to be supplemented by other sources for a more complete picture. Although no serious economic crises or natural disasters occurred in 2000, Tesliuc and Lindert found that about half (53 percent) of the households interviewed reported one or more shocks: 23 percent mentioned a “natural” shock (from pests to forest fires and floods); 17 percent reported an economic or other manmade shock; and 13 percent reported both. The commonly reported shocks were related to agriculture, but many different types of shocks were identified (table 5.2). Some of these shocks were largely rural; pests, lost harvest, and drought are the obvious ones. Others are common in urban areas, including crime and job loss, which had more than double the incidence in urban areas. Accidents and floods have similar incidence in rural and urban settings, with no apparent

<sup>1</sup> While the *incidence* of poverty in rural areas reaches 64 percent in the region, it falls to 48 percent in urban settings (ECLAC 2002). Ravallion (2001) dwells on the link between urban shares in total and poor populations.

<sup>2</sup> The urban poor face *different* risks, not *more* (or less) risks. For example, in a Living Standard Measurement Survey (LSMS) in Peru in 2001, 30.1 percent of urban households reported to have suffered a shock. In the rural sample, this percentage was nearly identical: 29.6 percent (Chacaltana 2002).

**TABLE 5.2.**  
**Incidence of Reported Shocks, Guatemala, 2000**

Frequency reported (percent)	Type of shock
15 or more	Pests, lost harvest
6–14	Income drop, accident of breadwinner, job loss, drought
2–5	Loss of terms of trade, crime, floods
0–2	Hurricane, bankruptcy, land slide, death of breadwinner, enterprise closure, land dispute, fire, earthquake

Source: Tesliuc and Lindert (2002).

differences in the overall reported incidence of shocks across both areas. Other studies in the same period confirm the high incidence of shocks. For example, Gaviria and Pages (1999) report that in the first semester of 2000, 36 percent of urban Guatemalans reported a shock as causing loss of income. A study of Peru (Chacaltana 2002) reported about 30 percent of households faced a significant shock to income or wealth in 2001. In short, all available evidence suggests that shocks are prevalent in both rural and urban households in Latin America and the Caribbean.

The study by Tesliuc and Lindert (2002) has other striking findings. First, in 2000, all

these shocks were typically idiosyncratic: that is, only a subsection of a local population was affected. This was largely a year without serious large and covariant shocks. During the previous five years, some shocks had a much higher incidence, including hurricanes (notably, Hurricane Mitch), with 44 percent reportedly being affected, while forest fires hit 17 percent at least once over a five-year period. These types of risks are largely covariant, typically affecting whole communities or neighborhoods. Secondly, there was a rather high incidence of households being affected by more multiple shocks—a phenomenon Tesliuc and Lindert call “bunching” of risk—which may exacerbate the consequences of shocks. Agricultural shocks, such as drought and pests, tend to come together, as do economic shocks, such as job loss and accidents or death of a breadwinner. Tesliuc and Lindert also find that the poorest are typically hit harder by shocks in terms of loss of assets or welfare. This is especially the case for shocks related to agricultural risks.

Tesliuc and Lindert (2002) did not analyze health shocks in their survey—which does not mean that such shocks are irrelevant. For example, in a sample in rural Mexico (Ibarra 2003), it was found that about 48 percent of households reported a shock in wealth or welfare related to a drop in yields (largely due to weather-related events), while the second main cause was illness of the farmer or a member of its family (reported by about 15 percent of households). This is consistent with surveys from across the world, where illness is typically the second most frequent risk in rural settings after crop failures (see Dercon 2002), and before many other risks (such as loss of livestock, crime, or fire).

In sum, a discussion of the risks faced by the poor in Latin American and Caribbean countries will need to consider those risks with high incidence and with serious consequences. *Natural risks* clearly top the list, but not only for rural settings. Some risks are obviously rural, such as those related to harvest losses due to drought or pests, but floods or hurricane risks and other large-scale natural disasters are also relevant to urban settings. Data on the impact of large-scale natural disasters over a 30-year period (table 5.3)

**TABLE 5.3.**  
**Effects of Natural Disasters in Latin America and the Caribbean, 1970–2001**

	Caribbean	Central America	South America	Total
Affected (000s)	19,774	20,146	104,980	144,900
Killed (000s)	5	85	156	247
Injured (000s)	8	202	276	486
Homeless (000s)	971	2,664	4,240	7,875
Damage (\$000s)	10,187,949	23,121,364	35,192,517	68,501,830
Annual damage (\$000s)	318,373	722,543	1,099,766	2,140,682

Source: From Chacaltana (2002), based on Centre of Research in the Economics of Development (CREDE) data.

suggest that their impact on households is substantial, and ranges from death, injury, and homelessness to physical damage.

Other risks, not least *health, disability, and mortality risks*, should also be given center stage. Health care costs cause significant stress among the poor. In one of the most careful studies on risks faced by the poor in an urban setting—in the Self Employed Women's Association (SEWA) data from India (Chen and Snodgrass 2001)—illnesses are the most common shocks. In Peru, the LSMS of 2000 shows that health expenditure adds up to 8.9 percent of total monthly expenditure of the poor when a household member is ill.

Illness is a more pervasive risk in areas where public health services are inadequate. Careful qualitative work for the World Development Report 2000/01 for a number of Latin American and Caribbean countries suggests that both the urban and the rural poor feel they have little access to good quality health services, although the issue is mentioned more frequently by the rural poor (World Bank 1999). According to the LSMS from Peru, 46.8 percent of the urban poor have access to a doctor, while this percentage falls to 39.6 percent among the rural poor.

In the case of disability, illness creates additional health care costs, but also a permanent effect through the loss of income-earning capacity. Even a temporary disability may result in job loss; the low-income period may last until the household member finds a new job. This is especially harmful to the urban poor, as unemployment is a greater threat to them. The death of a family member brings about significant economic costs. Some of them are one-off outflows (burial costs) while, more importantly, others are permanent (loss of a source of income).

Risk of illness is often closely related to particular environmental risks, linked to inadequate waste disposal, water supplies, and sanitation. In a study of urban vulnerability and risk, Moser (1998) calls these risks *environmental hazards*, and considers them as one of the “three characteristics of urban life often identified as differentiating urban from rural areas,” along with “*commoditization*, and *social fragmentation*.” For example, in

qualitative studies in Bolivia related to the World Development Report 2000/01, lack of access to public services (water, sewage) was ranked among the urban poor as their greatest problem, while poor environmental conditions were also important in urban areas in Ecuador: “Children fall into the mud. The river is full of garbage...People have no bath. All the garbage goes into the river. It is dangerous because of the tides. The water flows inside” (World Bank, 1999, p. 38). When trying to determine possible interventions to address health risks, it is impossible not to take into account these issues or consider insurance and other forms of protection.

A number of largely *economic risks*, such as job loss and lower income, also require attention. Qualitative surveys on perceived risks stress the central importance of the wage

labor market, not least in urban areas (Zaffarino 1999; World Bank 1999). A related risk is caused by relative price changes and general inflation. Urban households are typically much more exposed to these risks, since they rely more on the market, a fact Moser (1998) calls “commoditization.” For example, it is easier for the rural poor to withdraw from the market during spells of inflation. In Peru, 13.8 percent of the urban households considered the economic crisis a shock in 2001, compared to only 2.8 percent of rural households (Chacaltana 2002).

Finally, a discussion of risks faced by the poor needs to address some crucial *social risks*, including crime and lack of protection and rule of law. One of the key findings of the qualitative studies conducted as part of the World Development Report 2000/01 was that crime especially affects the poor—which is, for the most part, linked to a poorer protection by the police and judiciary system.

Brazilian *favelas* are an evident and extreme example of the threats that crime imposes on the urban poor. In urban areas in Argentina, “insecurity is constant and daily...There is more insecurity...in the slums, because they do not have material resources to face insecurity nor support from the government...‘The police does nothing’” (World Bank, 1999, p. 28). In rural villages, “security is not mentioned [as an issue]. Their perception of security is influenced by the news received from big urban

**TABLE 5.4.**  
**Victimization Rates in Some Latin American and Caribbean Cities, 1996–98**

	City size		
	Small	Medium	Large
Argentina	19.4	30.8	40.3
Bolivia	—	33.9	35.5
Brazil	42.2	43.7	40.2
Colombia	—	35.5	44.4
Costa Rica	35.4	45.5	—
Chile	11.6	28.6	33.2
Ecuador	40.1	45.3	62.3
El Salvador	42.8	52.2	—
Guatemala	50.3	51.5	—
Honduras	38.5	53.5	—
Mexico	29.0	43.6	53.4
Nicaragua	35.5	45.3	—
Panama	26.1	38.9	—
Paraguay	29.4	36.9	36.6
Peru	25.6	32.8	41.9
Uruguay	20.0	30.1	36.9
Venezuela	38.1	47.0	54.7

Source: Gaviria and Pages (1999), based on Latinobarometer data.

Note: The data give the probability that at least one member of each household interviewed was victim of crime at least once during the previous year.



centres: ‘They have everything but they are worse because of crimes and drugs; we sleep with open doors here in the inland’” (World Bank, 1999, p. 24). Table 5.4 shows victimization rates in a number of Latin American and Caribbean countries. Although there are always objections to this type of statistics, they reveal higher rates in larger cities.

The perceptions of these risks on the part of the poor are often closely linked to the absence of property rights and the rule of law because of poor enforcement or even abuse by police or the judiciary system. In particular, lack of legal ownership exposes the poor to sudden losses as the authorities force them to leave their homes, or to plain abuses from corrupt officers. In Argentina, the urban poor complain that ‘not only they [police-men] do not protect us, but they also chase us and treat us badly’ (World Bank, 1999, p. 28). Similarly, theft is reportedly as a constant threat to the assets of the poor, whose neighborhoods usually have no police protection.

## **Market Failures and Household Responses to Risk**

If these risks are substantial and the consequences are as serious as suggested above, the question is why insurance markets are not offering insurance contracts to the poor. There are a number of reasons why this may not be happening. First, the usual information asymmetries apply. Insurance contracts are exposed to adverse selection (hidden information) and moral hazard (hidden action). In particular, these problems have been pointed out as the cause for the failure of crop insurance systems (Braverman and Guasch 1986; Binswanger 1986). Similarly, health risks are often hard to insure in a comprehensive manner, as are substantially covariate risks, such as natural disasters or economic recession. However, it remains to be explained why these asymmetries could be more perverse when policyholders are poor. In fact, they also plague contracts in more developed markets.

Insurance providers mitigate information asymmetry by promoting group insurance (against adverse selection) and by requiring co-payments and deductibles (against moral hazard). Although insuring large groups is a feasible strategy, co-payments and deductibles may well discourage the poor from buying the product. In any case, these payments and deductibles will probably need to be lower than the values needed to separate “good risks” from “bad risks” (the so-called second-best, separating-equilibrium values). As contracts will still allow for significant moral hazard, insurers will require high premiums and discourage the poor.

A related issue is that because the poor do not usually participate in the formal economy, formal insurers also face enforcement problems and/or the poor confront extra costs. For example, claiming for home insurance when there are no formal titles to land or homes imposes extra verification costs, which discourages firms from offering contracts to the poor or makes them less attractive. Similarly, the assets of the poor may be of relative low value, so the transactions costs involved in valuation would be relatively high relative to the size of the contract. Costs related to birth and death certificates may make insurance contracts less attractive to the poor as well.



Supplying the poor with insurance implies further high transaction costs. For instance, microcredit experiences suggest that the poor find it easier to deal with frequent repayment in small installments.<sup>3</sup> This suggests that payments of premiums may also ideally occur in small installments, adding transaction costs to insurance provision.

Furthermore, it has been suggested that the poor sometimes have difficulty in properly understanding their rights in insurance contracts. McCord, Isern, and Hashemi (2001) report several cases where the poor did not file claims after being affected by an event covered by their policies. In other cases, some policyholders expected coverage beyond the scope of their contract.

Finally, many of the most serious risks faced by the poor may well be covariant, and therefore not easily insured by an emerging insurance market. The fact that a sizeable part of the population is dependent on agriculture, and that macroeconomic instability is substantially higher in developing countries than in more developed ones (resulting in serious covariate shocks in the economy), is bound to limit the emergence of private insurance focused on poorer segments of the population.

The lack of market-based insurance could, in principle, have been compensated for by “social insurance”—or the provision of public sector-based insurance as part of broader social security programs. In practice, the coverage of these programs for the poor is minimal in most Latin American and Caribbean countries. For example, a recent review of Guatemala’s social insurance system concluded that the “system provided minimal coverage of the population, risks financial crisis, faces allegations of corruption and is regressive” (World Bank, 2003, p. 131). The Instituto Guatemalteco de Seguridad Social (IGSS) covers workers in the formal private and public sectors only, and runs a number of programs. Programs analyzed, such as the accident-maternity-sickness (IVS) program, were shown to be not only deficit but also regressive in terms of the incidence of benefits.

The lack of formal insurance or social insurance systems does not mean that the poor are passive toward the risks they face. Much of their livelihood is centered around ways to reduce, mitigate, and cope with risks. The poor use risk management and risk coping strategies to alleviate risks. Table 5.5 describes these strategies and their shortcomings. By risk management it is meant that the poor try to reduce the exposure to risk or mitigate the risk of some income sources by combining them with others. Diversification of crops and other sources of income is one typical example. Other common strategies involve migration and relative specialization in low-risk activities, even at the cost of lower returns. Risk coping strategies effectively try to smooth consumption, given income fluctuations linked to risk. These strategies include self-insurance: building up suitable liquid assets in good years that can be depleted during a bad year. An alternative strategy is to enter into informal risk sharing arrangements: informal insurance arrangements based on reciprocal gifts or contingent credit.

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<sup>3</sup> Armendariz and Morduch (2000) argue that theoretical literature on microcredit has exaggerated the focus on joint liability and dynamic incentives and neglected the importance of the repayment schedule. This comment is bound to be relevant for insurance provision, as well.

**TABLE 5.5.**  
**Risk Management and Coping Strategies**

Strategy	Examples	Shortcomings
Managing and reducing risk resulting from changes in sources of income	Crop diversification Specialization in low-risk activities Migration of some members of the household	Sacrifice of expected income
Asset management	Savings as self-insurance	Lack of suitable saving assets (risky or bulky assets, insecurity) Focus on liquid, less productive assets Long building-up time Covariance in asset price and income
Informal insurance	Reciprocal gifts/loans from friends/relatives	Incomplete protection Vulnerability to covariant risks
Market-based	Insurance	Typically not available

Source: Based on Dercon (2002), Holzmann and Jorgensen (2000), and World Bank (2000).

Risk management and coping strategies are always present in the life of the household. However, if a serious crisis occurs, households resort to more extreme actions or survival strategies: “emergency” actions to be taken when a reduction in income is unavoidable. Table 5.6 summarizes such strategies. More information can be found in Dercon (2002), while the Social Risk Management Approach is discussed in Holzmann and Jorgensen (2000) and in World Bank (2000).

**TABLE 5.6.**  
**Survival Strategies**

Strategy	Examples	Shortcomings
Changes in sources of income	Child labor	Sacrifice of human capital
Asset management	Selling/pawning of real or productive assets	Long time to replace them
Informal insurance	Charity	Incomplete protection Vulnerability to covariant risks
Market-based	Bank loans for consumption credit	Usually not available

Source: Based on Dercon (2002), Holzmann and Jorgensen (2000), and World Bank (2000).

**TABLE 5.7.**  
**Exogenous Shocks and Household Responses in Peru, 2001, Percent**

Household response	Urban	Rural	Total
Did something to solve the crisis	87.5	71.0	81.7
Self-help	76.1	65.3	72.3
Informal insurance	28.6	13.0	23.1
Public sector	1.0	4.3	2.2
Market-based	0.5	0.1	0.3
Other	8.8	5.7	7.7
Did nothing to solve the crisis	12.5	29.0	18.3

Source: From Chacaltana (2002), based on ENAHO 2001-IV.

Much of this literature was developed using data from Asia and Africa, but many of these responses can also be found in sources for Latin American and Caribbean countries. A few striking conclusions emerge, which are common to the empirical literature on this issue. First, households cope with risk by using income-based strategies, such as diversifying income sources, and managing assets to buffer consumption. They also use informal insurance and credit, but only in a relatively limited number of cases.

For example, in Peru, most households (72 percent) dealt with shocks on their own (Chacaltana 2002). They either changed their portfolio of income sources (an additional household member entered the labor market) or managed their assets (they used their savings or sold or pawned their assets) (see table 5.7, based on Chacaltana 2002). Informal insurance is not widespread in Peru. Only 23 percent of households resorted to informal insurance through loans or gifts from relatives or friends. Interestingly, although one would expect rural villages to develop stronger social networks, this type of insurance is more common in urban areas in Peru. However, it is unclear that the same pattern should be expected in other countries. Similarly, in Guatemala, Tesliuc and Lindert (2002) found that self-help accounted for more than half the responses about how households coped with a shock, and informal insurance through transfers accounted for only about 13 percent of the responses. Government transfers and support were minimal in both countries. The most significant support came for the rural poor in Peru, but even there, “relying on State support” still accounted for only about 4 percent of the responses reported.<sup>4</sup>

<sup>4</sup> These are the responses obtained after a shock occurred. Households that successfully avoided shocks by directing their efforts toward those activities that offered more stability would not have faced as many shocks as those that did not, implying that the percentage relying on income-based strategies is actually higher than data would suggest.

These strategies are not without cost. As has been widely documented, both income- and asset-based strategies imply efficiency losses in the generation of income, and thus may lead to poverty traps (see, for example, Rosenzweig and Binswanger 1993; Rosenzweig and Wolpin 1993; Dercon 2002).<sup>5</sup> Lack of formal or informal insurance forces households to choose a safe portfolio of activities and assets, which typically implies a lower mean return. The poor have no access to insurance, and lack of insurance precludes the poor from taking risks and increasing their income, thus perpetuating their poverty. The process is exacerbated since asset holdings are difficult to rebuild after they are depleted. In emergency cases, households are also forced to sacrifice human capital, as is the case when children drop out from school and start working (Pizarro 2001). In Peru, Jacoby (1994, p. 159) finds that “children from households with lower income...and greater childcare responsibilities begin withdrawing from school earlier.” In urban areas, issues of privacy in the household arise, as families rent out rooms, or children come back to the parental house and rent their own space (Zaffaroni 1999). After analyzing data on Guatemala, Tesliuc and Lindert (2002, p. 37) concluded that “the poor have lower resilience than the rich to the effects of shocks. The probability of restoring household income to the level that prevailed before the occurrence of the shock rises with income.”

In short, risk strategies tend to result in efficiency losses, and since the poor must resort to them more than the rich, such losses are especially borne by the poor (Rosenzweig and Binswanger 1993). It also means that the welfare losses caused by lack of insurance are well beyond those in terms of fluctuations and other transient effects in consumption and other welfare indicators. They involve permanent or chronic effects on poverty, implying substantially higher welfare costs and lower efficiency. These efficiency losses also mean that specific interventions could be implemented if there is no trade-off between efficiency and equity, and if, by increasing equity (spending focused on the poor), efficiency is increased. It implies that schemes to promote insurance for the poor may well have a subsidy element that could enhance efficiency. If providing insurance would mean that the poor can take on more risky but higher-return activities, then in principle, these schemes may be able to pay for themselves in efficiency terms. This makes the case for interventions to encourage insurance with public (and aid) money for reasons that go beyond the promotion of equity (see Dercon 2004).

## Scope for Insurance Provision to the Poor

The previous section analyzed the benefits of facilitating and enabling efforts to ensure that risk and its consequences are reduced for the poor. It also identified a number of risks that especially affect the poor (natural, health-related, economic, and social risks).

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<sup>5</sup> Most studies focus on poverty traps in the rural sector. Hence the effect of risk exposure on urban investment decisions remains to be explored. Such research would be especially relevant for Latin America.

Indeed, there may be an *efficiency* case for government action in the form of providing financing and subsidizing these efforts, beyond obvious *equity* arguments for supporting the poor. Still, this does not address the question about the form these efforts should take. More specifically, is it “insurance” that provides the answer, or should other mechanisms be considered? The lack of an insurance market is the underlying cause for risk-induced hardship, so efforts could focus on establishing or fostering such a market. Still, this is not the typical policy answer observed. The more traditional method for dealing with “risks” has been to provide safety nets: systems of targeted interventions focused on particular groups affected by hardship, including those produced by shocks. In fact, this is typically the *only* option considered.

This focus has some justification: insurance market failures are not easily addressed. For example, if asymmetric information is the root cause for the lack of private insurance markets, there is little reason, *in general*, for the public sector to resolve problems related to information. Similarly, even if those problems could be partly resolved, transaction costs resulting from providing insurance to the poor are likely to be high, as discussed. The administrative cost of insurance provision may become excessively expensive, with efficiency losses that may offset any gains that may be obtained as a result of better protection against risk. Also, large covariate and catastrophic risks are unlikely to be easily insured, unless the development of international reinsurance markets for catastrophic risks in developing countries is fostered. Until then, public safety net systems, financed by taxes and aid, are likely to be more reliable and sustainable. Furthermore, the advantage of simple safety nets in the form of targeted and redistributive transfers is that they may be able to address many of the causes that trigger poverty and hardship within one system. For example, hardship could be linked to low assets or to a bad shock. Also, risk has a more substantial impact on the poor because of their lack of assets and resources to cope with shocks, which excludes them from credit markets. A safety net or other redistributive effort focusing on those with currently low income would not need to distinguish between hardship caused by a particular shock, low assets, or any other form of exclusion from markets.

A singular focus on safety nets has serious problems, as well. First, they may not be the most cost-effective means for addressing the problem of risk. Typically, they offer support only after an uninsured risk has already caused serious hardship. Second, they are characterized by serious problems resulting from their functioning and inclusiveness, which is also the case in Latin America (Lustig 2000). Indeed, the discussion in the second section suggests serious shortcomings in the protection offered at present. From the point of view of the poor, current safety nets are a source of uncertainty at best; at worst, the poor are excluded or support comes too late. If insurance against risk is supposed to allow the poor to engage in risky activities that may, at the same time, increase efficiency and have a high return, then safety nets would not properly achieve this objective.

The problems related to safety nets and broader insurance provision suggest that a complementary balanced approach that incorporates both elements would be desirable. A more detailed analysis would be needed to understand the optimal balance of insurance-related activities and safety nets. In fact, a number of alternative policies should also be considered

in the design of a comprehensive system of protection against risk-induced poverty. Broadly speaking, the system should consider ex ante instruments and ex post measures.

Ex ante measures would provide incentives and means for the poor to protect themselves against hardship. Better insurance products for the poor are the obvious instruments, but they should also support self-insurance through savings, and provide access to credit to facilitate the building of assets and the proper management of those risks that might affect income. Ex ante measures should also focus on reducing risk itself.

Ex post measures would provide a genuine safety net, appropriately targeted to the poor but large enough in scale and coverage to provide broad social protection to assure a minimal and sustainable standard of living. Such measures could be part of a more general welfare support system, or be specifically targeted to respond to risk-related hardship.

The potential role of these complementary ex ante measures should be stressed here. A first set of measures involves directly reducing the risks faced by the poor: for example, policies for basic health prevention and sanitation. Better information systems on prices and weather conditions could have substantial benefits, while investments in technology could reduce certain types of risk. Irrigation systems and drought-resistant crops are very good examples. Indeed, this type of measure could make certain very large or highly covariate risks, for which it is currently not viable to offer insurance, more easily insurable in a cost-effective way. They clearly highlight the need for multisectoral approaches to deal with risk and insurance.

Other financial products can also play a role in coping with risk. Savings instruments have been largely undervalued as an effective instrument for protection against hardship (Dercon 2002; Morduch 2004). While credit provision to the poor has received much attention, relatively little has been directed to savings, even though savings presents many advantages as an area for subsidized intervention and regulation. For example, savings instruments are not affected by the information or reinsurance problems affecting credit and insurance, and transactions costs involved in these operations, while not negligible, are likely to be largely restricted to the administrative handling of the savings. Yet financial savings instruments typically are not tailored to the poor, offer low or negative returns, and impose extremely high transaction costs on the saver. These instruments are also risky if inflation risks are high. The typical products are tailored to long-term deposits, with highly punitive returns for those looking for flexible instruments to respond to unexpected hardship.

Credit products could also help to provide better protection against risk. Credit can act as an insurance substitute, and products for this purpose should be part of the standard portfolio of financial instruments offered to the poor. Furthermore, credit can help diversify the source of income and build up assets. It can also increase income, reduce risk in income, and enhance the ability to cope with shocks that might affect income. Financial products for the poor should be flexible and take into account the fact that they face substantial risks. Linked credit and insurance contracts are one option: for example, linking credit and health insurance. This form of insurance is not the focus of this study, but there is definitely a need for more research on such products.

As part of a general system of protection against risk-induced poverty, there is a clear scope for insurance targeted at the poor. The next section identifies in more detail risks that can be addressed by providing insurance to the poor. This is followed by a discussion of the type of insurance products that could be offered. A number of successful experiences are presented as well, focusing on strategies to deal with the particular challenges of selling insurance to the poor. Based on this analysis, it can be argued that unsubsidized insurance for the poor is unlikely, except for life insurance. The State should still have an important role to play in this regard, since it is its responsibility to create a regulatory environment that fosters insurance and financial intermediation. Furthermore, evidence suggests that the best method for offering insurance to the poor is the partner-agent model, in which an established insurer, possibly with public sector support, cooperates with local microfinance institutions. This points to the importance of existing informal institutions as potential agents, a point that is discussed in the last sections of this chapter.

Insurance involves the pooling of risk over a large number of similar units and is most appropriate for uncertain and high losses, which are greater than what a household can save for or repay. When the loss and the degree of uncertainty decrease, insurance loses out to credit and saving. Insurance therefore involves exchanging the uncertainty of large losses for the certainty of small regular payments. Policyholders pay for the losses incurred by others, while the insurer assumes the costs and risk. For less uncertain or smaller losses, savings or credit may be more appropriate.<sup>6</sup>

Brown and Churchill (2000a) suggest that there is scope for insurance provision only when the following six criteria are met: a large number of similar units are exposed to risk; policyholders have limited control over the insured event; an insurable interest exists; losses can be identified and measured; losses should not be catastrophic—reinsurance becomes increasingly difficult with increasing covariance across people (such as a hurricane or a flood); historical information is available about a sufficiently large number of people or property exposed to the same risk, so that probability of loss can be estimated; and premiums are affordable. Brown and Churchill propose a rule of thumb: if the probability of a loss exceeds 40 percent, premiums will be too high to be affordable.

Many insurance schemes have been introduced without meeting these criteria. One of the most infamous examples was the crop insurance programs introduced in the early 1980s in different parts of the world. Many of the criteria included above apply to poor and rich insurance clients. However, some of them make it particularly difficult to profitably insure the poor. The need for premiums to be economically affordable often means that the policy portfolio cannot actually be covered by contributions, or that insured amounts are so small that they make little difference to the vulnerability of the poor.

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<sup>6</sup> This feature may also explain why the poor in Latin America may be unwilling to purchase some of the existing formal insurance products available and instead prefer to rely on autarkic solutions, including self-insurance, since the lack of appropriately targeted and designed products would make existing products relatively too costly for the poor, possibly outweighing the benefits.



SEWA, an Indian health and life insurer, is a case in point, with payouts so low that they only cover about 10 percent of losses caused by shocks related to illness. Insurance to the poor is traditionally fraught with high per-unit transaction costs because premiums need to be small and collected frequently, while the total amounts of policies are also small. Problems such as moral hazard and adverse selection are not necessarily more damaging among the poor, but the higher transactions costs in dealing with them may mean that these issues make insurance unprofitable. Nonetheless, a number of small-size (micro-finance) institutions, including some in Latin America, already cater to the poor. Their successful experiences may help to develop some best practice guidelines for potential entrants into the small-scale insurance market that want to target the poor.<sup>7</sup> Some of these lessons are discussed in the fourth and fifth sections.

A key lesson is that *ex ante* measures, in the form of a savings, credit, and insurance systems, may provide substantial protection to the poor, but ultimately they cannot fully insure individuals and families. In short, some *ex post* measures that entail transfers to those affected by uninsured risk would still be necessary as part of a comprehensive system to protect the poor against risk. Insurance products for the poor need to be simple, insuring only specific, highly observable risks with measurable losses. High-risk groups may need to be excluded for the scheme to be sustainable.

All self-protection strategies require some outlay beforehand, and self-insurance fails if shocks occur in successive periods. Credit as a substitute for insurance may not be available, either. Certain highly covariate and rare events are very difficult to insure. This means that some catastrophic natural risks, such as floods, may not be easily covered by a pure insurance system. Other risks require the application of other types of measures; market-based insurance products are unlikely to be the most sensible or only response. Social risks such as crime or enforcement of property rights are examples. While it is possible to design products that insure against the consequences of these risks, they address only part of the problem.

But even if there are clear limits to the provision of insurance for the poor as a solution for their vulnerability to risk, insurance is definitely an option worthy of consideration. In particular, life and health insurance, as well as forms of property and asset insurance, are within the possibilities—and even insurance against some covariate risks, such as drought or, in general, weather insurance. The next few sections discuss a strategy to implement such insurance schemes in more detail.

## Implementing Insurance for the Poor

Some key issues pertaining to insurance management need to be addressed when implementing insurance programs for the poor. This section addresses institutional

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<sup>7</sup> The survey by Brown and Churchill (2000a) provides a number of examples.

arrangements and issues such as financial management, premium calculation, distribution of services, and reinsurance, with a particular focus on targeting the poor.

It is paramount that agents involved in insurance schemes have very close contact with the poor. This is unlikely to be achieved by either government agencies or by standard private insurance providers. As such, institutions with close links to grassroots organizations or NGOs may be ideal agents, such as microfinance institutions (MFIs), which are relatively widespread within developing countries.

Since purchasing insurance involves a payout only in the case of an adverse shock, it is critical that insurance customers clearly know and understand the benefits to which they are entitled. This requires a simple and clearly stated policy, swift processing of claims, and careful financial management of the insurance portfolio by the insurance provider. To inspire trust among the clientele, adequate reserves need to be held and financed through underwriting, reinsurance, and investment. To be financially viable, insurers need to have a sufficiently diversified investment portfolio. This is something that MFIs or other institutions working closely with the poor may often find hard to achieve.

A partner-agent arrangement, in which a local institution or the MFI undertakes only the distribution of insurance services, linked with a private or possibly public sector insurance provider, may therefore be more appropriate when targeting poor customers. One of its advantages is that it eliminates agent risk and allows the institutions involved to focus on their particular strengths. It also allows local institutions and MFIs to offer greater benefits to policyholders at a similar cost. The most important drawback of this model is the limited availability of potential partners. Fostering these relationships is an issue that public policy should address, by providing a clear institutional and regulatory environment. This point is discussed in further detail in the sixth session. Within the context of a partner-agent arrangement, mutual insurance funds may overcome some of the resistance against insurance, since they mimic features of informal insurance arrangements in which funds are often distributed to members at regular intervals. Exiting informal arrangements may, however, become a part of an MFI's established set of procedures.

Turning to the issue of premium setting, most of the existing insurers surveyed by Brown and Churchill (2000a) calculated their premiums either in-house or by partnering with an established insurer to gain access to the required expertise. Brown and Churchill also found that MFIs that cooperate with established insurers are usually able to offer coverage at better prices. In Peru, IF OCC searched for partners with the actuarial expertise they lacked, but they were unable to find an established insurer willing to provide a product to the low-income market. Instead, they used their own simple calculations based on historical mortality statistics within their credit portfolio. ASA in Bangladesh, however, followed a different and far more risky approach and based premiums on customer demand, starting out with very high premiums on their mandatory insurance policy. Their clients lodged numerous complaints, so they successively lowered premiums until complaints stopped. While this ensures that clients are able to afford premiums and are satisfied with the rates offered, it obviously entails a higher risk than the calculation of premiums based on actuarial principles.

As Rutherford (2001) points out, one of the most important demands the poor make on their financial services is easy access and regular small payments, which impose the necessary payment discipline. An agency employing home service distribution and collecting premiums on a weekly basis would be well suited to the needs of low-income households, although it may incur high transaction costs. Integrated distribution, as practiced by SEWA in India, where life insurance is distributed through existing fixed deposit accounts, could help curb these costs.

Reinsurance is one element that is almost completely absent in microinsurance and similar insurance institutions focused on the poor. Among its many benefits, it can improve the ability of insurers to grow, helps to stabilize financial results, protects against catastrophic losses, and improves underwriting expertise. Reinsurance in low-income markets can also open up markets for some large-scale covariant risks, such as many natural disasters (Skees and others 2004). However, to attract reinsurance, it is critical that primary insurers have sound pricing policies and control against abuse. According to respondents in the Brown and Churchill (2000a) survey, all partner institutions in partner-agent arrangements and some cooperative insurers were likely to have reinsurance contracts. However, few of the MFIs and other smaller organizations in their study have reinsurance, which leaves them highly exposed to sudden increases in claims and prevents them from having access to a potentially valuable source of expertise.

## **Insurance Products for the Poor**

This section focuses on four types of products—life, health, property-related, and weather insurance—and discusses their strengths and problems.

### ***Life Insurance***

Life insurance is a relatively low-risk product and the one most widely available to the poor. Most existing schemes offer mandatory term-life insurance as part of an outstanding loan or savings account, thus minimizing their distribution costs. The majority of the institutions surveyed by Brown and Churchill (2000b) also limit coverage to only those policies that are not in arrears when the policyholder dies. Certain causes of death are also excluded, such as AIDS. While such life insurance for outstanding loans with simple terms works reasonably well, it often protects the MFI more than the client, since many MFIs would otherwise write off losses due to death regardless of the availability of insurance.<sup>8</sup> Additional benefits, such as insurance tied to savings rather than credit, and

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<sup>8</sup> It is plausible that if MFIs used reinsurance properly, the cost of mandatory life insurance linked to outstanding loans would be much lower for customers than it is at present. In many ways, this form of insurance is a cost that derives from inefficiency, and not a benefit for customers.

stand-alone term and endowment policies, offer coverage that is more focused on the needs of the policyholder than the institution. ACODEP's life saving insurance in Nicaragua is a good example, since the policies give the client's beneficiaries a benefit that is double the amount held in savings. In Venezuela, COOPERAR's basic product provides a benefit equal to the amount held in savings, with the option of increasing the coverage to double the amount for an increased premium. In this sense, and although their availability is limited, these are better options for the promotion and development of insurance for the poor.

In theory, endowment life insurance can provide low-income households with complete protection against death risks and, through a saving and loan component, partial insurance against other risks and needs during their life cycle. Delta Life in Bangladesh has been a pioneer in marketing this kind of product to the poor. However, Delta Life has experienced difficulties in managing its loan portfolio, potentially jeopardizing its ability to pay out the promised bonuses as the policies mature. Such a product requires that larger reserves be held. It also necessitates more sophisticated actuarial expertise in its management. Still, Delta Life's case is an interesting one, and the promotion of such products could be worthwhile. But, once again, it should be stressed that a partner-agent model with a sufficiently strong partner is the best option.

An important question when offering insurance to the poor is whether this can be done profitably. All life insurers surveyed by Brown and Churchill (2000b) are profitable, but institutions with the benefit of access to actuarial expertise in calculating premiums appear to offer greater value, for lower premiums. Reserve holdings differed greatly, from 1.9 times the level of claims to several hundred times for very similar policies. Ten to twenty times annual claims may be an advisable reserve holding. All insurers had expense ratios well below 60 percent (claims expenses+operating costs/annual premium revenues). For example, IF OCC (Peru) used 44 percent of its premium income to cover claims, and just 5 percent to cover operating expenses (due to integration within its credit operations). Thus it seems reasonable that various forms of outstanding balance insurance can be profitable in low-income communities. Table 5.8, taken from Brown and Churchill (2000b), gives some preliminary performance guidelines for institutions offering life insurance.

**TABLE 5.8.**  
**Guidelines for Institutions Offering Life Insurance**

	<b>Claims ratio</b>	<b>Distribution costs</b>	<b>Reserves</b>	<b>Claim-processing time</b>
Preferred range	< 60 percent of annual premiums	< 10 percent of annual premiums	More than twice annual claims level	< 10 days

Source: Brown and Churchill (2000b).

## ***Health Insurance***

Insuring health risks poses different and more complex challenges for providers than offering life insurance outright. Insurance of health risks may suffer from adverse selection and moral hazard and usually entails the provision of health care. To avoid moral hazard and adverse selection, various mechanisms are used. For example, two Ugandan health insurance institutions, UHC and FINCA Uganda, require that more than 60 percent of the members of a group agree to enroll before coverage is extended to a cooperative, trade union, MFI, or village bank. COHI Benin charges a small initiation fee to new members and has a one-month waiting period after receiving the first premium before policyholders can receive health care coverage. To control for escalating treatment costs, some insurers implement mandatory reference systems that encourage patients to use the lowest cost treatment facility first. Few of the institutions surveyed required formal underwriting before a family purchases a policy. But some providers have not designed their schemes properly. ASSABA in Guatemala did not enforce the requirement that all members of a family be enrolled, so some enrolled only those members most likely to be ill, with a highly negative impact on the sustainability of the scheme (see box 5.1). ASSABA also did not impose any waiting time before policyholders could benefit from in-patient care.

To provide the right incentives to the service provider, various payment mechanisms can be used. When good quality control is in place, one form of payment that works well is capitation payment: the insurance scheme pays the provider a fixed amount per member and the provider agrees to provide care, as defined in the policy, for any member who needs it during the period. By paying for the number of people instead of the number of services offered, the scheme reduces the provider's incentive to provide more, possibly unnecessary, services. ASSABA in Guatemala used this scheme. However, it also places risk solely on the provider if there is excessive usage and the provider is unwilling to agree to such a scheme. Therefore, fee for service may be more practical. Alternatives are fixed cash subsidies given to each member to pay for health expenses, regardless of actual claims.

Three different methodologies are employed to fund health-care services provided for by their policies: salaried service provision, dedicated health-care facilities, and indemnity coverage. Naturally, there are strengths and weaknesses to each of these approaches. Salaried service provision, whereby health services are provided by staff working exclusively for the health plan, often provides the most convenient access. ASSABA used this system. However, many types of health care services cannot be provided in a cost-effective manner by salaried personnel serving only members of a certain health plan. If they are provided locally, dedicated health care facilities can offer convenient quality care, but this approach requires a higher degree of administration to monitor the services provided and how members use services covered by the policy. Indemnity coverage reduces administrative costs for the health plan, but gives it less control over the quality of care. Also, it may not provide effective coverage for members who cannot afford to pay for services up front and receive reimbursement later.

**Box 5.1.****A Problematic Health Care Financing Scheme:  
The Case of ASSABA, Guatemala**

In poor rural communities, access to basic health care is often severely limited. This problem is being addressed by community initiatives to generate health care financing through voluntary prepayment schemes. The example of the Asociación por Salud de Barillas (ASSABA) in Guatemala helps shed light on this issue. Ron (1999) compared the ASSABA experience with a study of a similar scheme (the ORT Health Plus Scheme, OHPS) in the Philippines that was more successful.

ASSABA started a community health financing scheme in 1994, following suggestions from the World Health Organization. Preliminary estimates were made on current costs and out-of-pocket health care expenditures in public and private facilities. The concept involved the identification of a contribution level that would be affordable to the vast majority of families, as opposed to a contribution that would cover all the costs of an optimal benefit package. Donor funding was then mobilized to cover start-up costs. Limitations on benefits were imposed, and particular illnesses that were not considered emergencies were excluded.

ASSABA, as a grassroots, participatory community association created to improve the health of its members, was better organized in comparison to similar arrangements in other places, such as the Philippines. However, at the design stage, ASSABA was not yet established as an administrative body. By the time it was finally registered as a legal entity, local conflicts made progress difficult, since the local Catholic Church—also a health care provider—contested the capitation contract of ASSABA with a hospital sponsored by the Protestant Church in the United States. Furthermore, ASSABA was attempting to provide community health insurance before the national authorities in Guatemala had come out with a clear policy. Although ASSABA implied that all members of a family needed to register, this was not stated explicitly in the registration rules, exposing the ASSABA scheme to adverse selection. The design of the benefits package also posed a serious disincentive to potential members. In contrast to the original design, inpatient care was limited to three days. Additional charges would fall on the patients, who in the majority of cases would not be able to afford them. This clearly contributed to the failure.

One of the lessons that can be drawn from the ASSABA experience is that the regulatory framework needs to be firmly established, and that potential problems at the local level should be taken into account before setting up a scheme. The benefits package should be designed with the needs of potential members in mind, while contributions should be kept sufficiently low. Rules for registration (group or family membership) need to be strictly enforced; individual family members should not be allowed to register. A minimum period of membership prior to service can also be helpful in protecting against adverse selection. Benefits should not be changed.

*Source:* Ron (1999).

Unfortunately, health insurance schemes targeted at relatively low-income customers are often liable to serious losses. For their survey, Brown and Churchill (2000b) had access to financial information for four providers. They found that three of those four providers were not covering their costs. One had expense ratios of 216 percent, which reflected the challenge of profitably offering health care insurance to low-income households. Only COHI (Benin) was able to avoid losses, since it only offers very limited coverage with many exclusions and restrictions.



### ***Property-related Insurance***

Property-related insurance covers against fire or theft or other property loss or damage. Few providers have experience with this type of insurance for the poor. This is unfortunate, as property loss is a big risk, especially for the urban poor in Latin America. A key issue is likely to be insufficiently defined property rights and titles that are difficult to enforce. If assets are identifiable, their value is likely to be relatively low, which would increase valuation costs relative to the value of the policy. The experience of La Equidad in Colombia may nonetheless be helpful when designing new products. La Equidad offers comprehensive coverage on many types of risks after conducting substantial market research about the needs of its clients. As a consequence, its property insurance is not tied to an outstanding loan. Policyholders themselves determine the value of the asset. Since the premium is tied to the insured value of the asset, policyholders have an incentive to state the true value. This mechanism simplifies the sales process greatly. La Equidad determines premiums according to the risk exposure of their clients and their type of business: service, trade-related, or manufacturing.

In the case of property insurance for the poor, premiums are not adjusted according to the preventive measures that might be in place, most likely because of obvious enforcement problems. Instead, La Equidad offers regular group meetings for policyholders to train them about basic preventive they could take. To prevent against moral hazard, two mechanisms are used: deductibles and claims inspectors. However, all insurers indicated that sending inspectors was too expensive for small claims. There is little information on the financial performance of property insurance, since it is so rare. Also, and more than with other types of insurance, low-income households appear to be slow to embrace the idea of purchasing insurance on their valuable assets. This may be because property risk is less certain, in contrast to death or the health problems that clients may have to deal with eventually.

### ***Weather Insurance***

Another insurance product that is not often offered but is receiving much attention is weather insurance (see Skees and others 2004). Risks in agriculture that relate to drought or other weather events remain some of the most important ones facing the poor. In general, systems to insure crops have generated high costs and have failed. Thus there is a continued interest in finding alternative insurance mechanisms. Many factors are responsible for those failures, but moral hazard and the high costs of the loss verification process after specific weather events are key in this regard. The high covariance involved in agricultural risks and reinsurance compound these problems.

However, there have been innovative theories for the design of systems that may not be so liable to some of these problems. The idea is to supply insurance based not on the assessment of crop losses, but on weather indexes. Given the observability of weather indexes, such a system could avoid moral hazard and adverse selection issues, and in general save on transactions costs. The recent evolution of international markets for unusual

and catastrophic risk suggests that reinsurance by international markets may become feasible (Skees and others 2004).

Experience in Mexico with agricultural insurance over the last few decades may help to illustrate the potential and possible drawbacks of weather insurance to provide protection to the poor whose livelihood depends on agricultural activities. There have been various systems of agricultural insurance in Mexico since the 1940s. Most have been largely unsustainable due to the recurring serious financial problems that caused their collapse. The system in place since 1990 has been more stable, providing cost-effective crop insurance. For example, the loss ratio (the ratio of payouts relative to premiums) has been rather high: often above 80 percent. AGROASEMEX, a government-owned insurance and reinsurance company, was in charge of managing the system. Until 2001 it provided direct insurance to farmers, although it now focuses largely on providing reinsurance to *fondos*. A *fondo* is a group of farmers in a more or less homogenous area that provide mutual insurance to one another. An important portion of insurance and reinsurance is effectively linked to credit operations, as well. But its relative success is largely due to its focus on the highly productive and financially viable sector of large-scale commercial agriculture, as its key mechanism to save on costs on transactions and monitoring of moral hazard and adverse selection. The system is not suitable for providing insurance to the poor. For small-scale and poor farmers, FONDEN is the only scheme available in Mexico; it is a simple disaster-relief scheme functioning as a safety net, since these relatively small farmers do not have access to credit or formal insurance (Ibarra 2003).

It has been suggested that weather-indexed bonds could encourage agricultural insurance systems to start offering services to poor and small farmers. In this case, problems of asymmetric information are largely resolved. For example, insurance could be based on small mutual insurance groups that can obtain rainfall reinsurance through these bonds. The bonds could be priced for reinsurance, since historical data on rainfall are available, and the bonds could even be traded internationally. Even without reinsurance by international markets, there is still a case for reinsurance through governmental budget and assistance: the fact that an instrument may be available that can be provided at low transaction costs to poor farmers supports the idea of subsidizing for equity reasons, and possibly for efficiency reasons as well.

One should nevertheless be careful not to idealize the benefits of rainfall insurance. To reach the poor, substantial transactions costs will surely be involved, while to be effective, the correlation between rainfall measured at reliable stations and local yields will need to be high. The latter is not necessarily guaranteed, since rainfall stations are not very common in agricultural areas with low potential and limited commercial farming interests. Also, the sustainability of the scheme will depend on the relative predictability of certain events. While some weather phenomena, such as global warming or El Niño, affect pricing, they are not well understood. The high covariance involved will require premiums with high frontloading (adding an extra sum to the premium to handle the non-zero probability of the scheme failing), making insurance more expensive for the poor. Overall, however, such new products deserve experimentation and further analysis to understand the pos-



sibilities for effective delivery of weather-related insurance to the poor. Programs being implemented in Mexico for the use of weather-based indexes will provide helpful insight, as will current experimentation in other countries, such as India (Skees and others 2004).<sup>9</sup>

## Regulation of Insurance Provision to the Poor

The previous section identified a number of products that could be successfully offered to the poor. The partner-agent model was identified as the best mechanism for these products to effectively reach the poor. This model takes advantage of the strengths of the different parties involved in insurance provision to the poor. The partner is an established insurer, with experience and interest in broadening its insurance portfolio to include products suitable for the poor. For it to be a successful operation, it will need to design contracts that provide the appropriate incentives for the insurance arrangements to be sustainable, while also being credible to agents and its clients. Earlier, the argument was made that the problems related to risk-induced poverty traps implied a preference for subsidized insurance, efficiency being the main argument. This does not mean that the implementation of subsidized insurance is straightforward: the case for subsidies or other government intervention opens opportunities for rent-seeking on the part of the partner toward the government, not least given the political economy consequences of a scheme focused on service provision to the poor.

The agent will need to be provided with the appropriate incentives to maintain the sustainability of the portfolio. These agents are likely to be financial institutions with close contacts with the lower-income segments of the market. Microfinance institutions have been established with this purpose, although their involvement in the insurance segment has been limited. Existing microfinance institutions could be encouraged to branch out into more widespread insurance, or assistance could be given to certain microinsurance providers to enhance their products.

There is substantial scope for the government to effectively support the insurance market serving the poor. A favorable policy environment can support the proliferation of insurance services among the poor by facilitating the establishment of local (micro)

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<sup>9</sup> This study does not explicitly consider price insurance, even though forms of price stabilization have often been implemented for their insurance value, while futures contracts effectively provide insurance to farmers in an increasing number of countries. Pure price insurance schemes are less common, but they might yield good results if they were properly designed. Since price shocks are highly covariate, some of the issues related to designing and delivering price insurance are similar to those related to weather insurance. Collier (2004) discusses the possibility of price insurance offered to producers of internationally traded commodities, whereby, given its private and social (growth) benefits, donors could underwrite this insurance and subsidize administrative costs. Collier argues that the benefits of such price insurance schemes may well be larger than weather or other quantity insurance schemes. Experimentation with these types of schemes would be highly beneficial.

finance institutions, and making insurance provision to the low-income segment of the market more attractive to established insurers. The strategy is unlikely to involve large-scale subsidies, but government spending will need to be directed toward establishing the necessary infrastructure, institutions, and regulatory environment to promote this segment of the market. Unfortunately, such a policy environment does not exist in Latin America. Some of the existing regulations actually present a bias against the use of finance and insurance products targeted to the poor.

Jansson and Wenner (1997) identify the following regulatory requirements as being biased against small-scale (micro) insurance providers in Latin America: high capital requirements, high capital adequacy standards, ownership restrictions, and the requirement of new financial institutions to be capitalized by cash contributions.

Capital requirements in Latin America are often prohibitively large for MFIs, although actual requirements differ widely. Even if the required sum could be raised, few MFIs would be able to gather a client base large enough to fully leverage their capital. In Colombia, regulated insurers are required to maintain a minimum investment of \$3.2 million, as well as additional paid-in capital based on the size of their insured portfolios. Recent surveys among insurance executives, including some in Colombia, revealed that they did not serve the low-income market because they did not believe they could achieve the volume of business required to earn a sufficient return on their investment (Brown and Churchill 2000b). As governments increase minimum capital requirements over time to maintain a financially stable insurance industry, insurers with healthy finances and serving low-income markets can be chased out of business. In Bolivia, recent government demands for insurers to increase minimum capital led to the dissolution of Crucena, an insurer that had served low-income Bolivians for 24 years and that, in 1997, had a pretax profit of \$640,000.

To get around these excessive capital requirements, some Latin American countries have created different institutional forms for MFIs, but these are often severely limited in the type of activities they are allowed to undertake. Alternatively, low-income insurers sometimes offer insurance, as member benefits, through cooperatives or credit unions, which are financed through interest payments on outstanding loans. However, the risk is that such institutions may no longer have any external requirements for maintaining financial integrity. Regulation in the form of capital requirements is required to ensure sustainability but, in its current state, does not take into account the specific needs and problems of microfinance institutions. Alternative arrangements, such as agent-partner relationships with established insurers providing reinsurance to MFI's portfolio, could result in the same degree of sustainability and protection.

A second issue that is important for local MFIs when trying to enter the market and forming a new financial institution is the requirement of capitalization by cash contributions. This is an obstacle, since MFIs are usually established by NGOs with existing loan portfolios, and insurance is in the first instance offered as part of existing credit relations. In these cases, NGOs are required to transfer cash and clients to the new institution, which in turn is required to repay individual loans to the NGOs, making the creation of

an MFI extremely expensive. Jansson and Wenner (1997) suggest that a possible way to facilitate the set-up of a new MFI would be to allow NGOs to use the net present value of the existing loan portfolio to capitalize the new institution, as long as this value is adequately and independently evaluated.

Restrictions on ownership of financial institutions can also be an important obstacle to the creation of regulated microfinance entities. In Honduras, for example, institutional ownership is not permitted, so NGOs cannot own MFIs.

It is clear from this discussion that existing regulation hampers the provision of financial services to the poor. Often it does not even achieve the desired result of ensuring the financial stability of MFIs, but instead forces them to circumvent regulation and avoid external portfolio auditing. It may therefore be advisable to adapt some of the existing regulation, for example by lowering capital requirements for microinsurers, allowing NGOs to be owners of MFIs, and loosening the requirement to be capitalized fully by cash contributions.

This is not to suggest that the accountability and financial health of MFIs should in any way be compromised, but rather that regulation needs to take account of the different needs of MFIs and their customer base. But substantial financial regulation makes sense when viewed in the context of providing stability and credibility to the entire financial system, even if it appears to go against the needs of a niche in the system. While some efforts to adapt regulation to the circumstances of the MFIs are necessary, lifting all these regulations would not be advisable, even if MFIs typically would consider these rules as being against their interests. The same degree of sustainability and credibility for microinsurers could be achieved by relaxing some of the rules for MFIs, in combination with incentives and possibly requirements for MFIs to foster links with established insurers as part of partner-agent institutional models. In any case, even in the current regulatory climate, careful use of the partner-agent model could provide a solution for MFIs to properly expand their activities by following the requirements imposed by the regulator.

## **Local Institutions and Insurance Provision to the Poor**

One should be careful not to idealize the ability of MFIs to provide insurance to the poor easily and effectively. While they may be a crucial intermediary for established insurers to enter the low-income segments of the market, their own ability to effectively reach the poor should not be taken for granted. Their record of reaching the poor has not always been impressive. Formal institutions have typically had difficulties in reaching poor communities and individuals, who end up being largely dependent on their own risk coping strategies, even if seemingly appropriate alternatives are available. Any program aimed at including the poor should be sensitive to these problems.

One route to consider would be trying to mobilize existing informal savings and insurance institutions to assist in “crowding in” financial services, including insurance, into these communities. A plethora of local informal institutions run by their members

exist, such as Rotating Savings and Credit Associations (ROSCAs) and Accumulating Savings and Credit Associations (ASCAs), which provide an opportunity for credit, saving, and insurance. More informal groups appear throughout the world, such as mutual support networks and funeral associations. The key issue is whether they can be integrated into more formal insurance projects as potential local agents in a partner-agent framework with the following hierarchical structure: an established insurer that contracts a microfinance institution, which in turn involves a local informal institution dealing with the clients. The key advantages of mobilizing these local informal institutions are their local expertise, reputation, and informational advantage in the local community.

It is worth carefully considering how this might work. Two points are crucial. On the one hand, offering insurance or other products from outside the local community might be done more effectively using these local institutions, resulting in net benefits to the community. On the other hand, introducing outside agents might crowd out any local informal insurance or other beneficial interactions. These incentives need to be discussed, focusing on the overall benefits of the scheme.<sup>10</sup> These concerns could be present even if the model is simply an agent with close contacts in the local community (the MFI) that is directly trying to introduce formal insurance on behalf of the established insurer. Several studies have examined the possible interaction of explicit incentives—those that can be externally verified and thus become the basis of a contract—and implicit incentives in principal-agent contracts. Understanding this interaction could assist in the design of credit contracts in the presence of local informal risk sharing. Conning and Kevane (2004) discuss the case of obtaining a loan to undertake a risky project whose success—observed by the financial institution—depends on the amount of effort (unobservable to the outside financial institution) that the borrower exerts. As with all problems of moral hazard, any contract that is to encourage diligence must offer the agent a higher expected utility under project success than under failure, so as to give the agent an incentive to want to raise the probability of success through diligence. For this to be the case, the villager, who is assumed to be risk-averse, must be made to bear the risk. The feasibility of such a contract between the villager and the financial institution thus depends on the cost of diligence. Conning and Kevane consider a theoretical example, whereby households in the village have the ability to enter into side-contracts for the purpose of mutual insurance that are based on observed effort. They show that this increases the set of feasible contracts, since the side-contract can provide more risk-smoothing to the households who took out the loan, without disrupting incentives. The reason is that the monitoring by other households keeps the latter diligent in circumstances where otherwise they

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<sup>10</sup> It is sometimes argued that crowding-out of local institutions, such as credit and insurance systems, should be avoided at all cost. However, as Morduch (1999) argued, the key issue is the overall welfare benefit of the scheme: the benefits to individuals from formal financial intermediation should outweigh the costs of the disappearance of informal mechanisms. However, there may be distributional effects as well (other people benefit from those that lose); these require careful consideration, not least if the poor suffer more.

would have had no incentives to be diligent. This is an example where local informal insurance can crowd in outside financial intermediation. This rests on the assumption that monitoring is costless, that local agents have better information than outside agents, and most importantly, that they do enter into an insurance side-contract.

Literature on self-enforcing contracts, however, shows that this need not be the case. Since informal insurance is not enforceable, contracts must be self-enforcing, which requires that the one-time gain from deviation is smaller than the expected benefit of continuing in the arrangement. This means that informal insurance is not always feasible. Furthermore, its feasibility is affected by the pay-off from renegeing on the agreement, which in turn is affected by the availability of outside financial intermediation. However, even if the pay-off from renegeing is increased through the access to outside credit, this may not necessarily lead to a break-down of existing informal insurance arrangements. Introducing an outside safety net or other form of insurance that is well targeted not only increases utility compared to autarky but also affects the distribution of wealth in a community, hopefully making it more equal and facilitating reciprocal transfers, where before, income differences would have been too large to make risk-sharing possible (Coate and Ravallion 1993). Even better results can be achieved when the availability of outside financial services is made conditional on participation in a local informal risk sharing arrangement (Attanasio and Rios-Rull 2000). In other words, this implies that there could be ways to increase informal risk sharing by extending formal financial services, including insurance.

While the above has focused on bilateral risk sharing, local informal institutions usually comprise larger groups (albeit rarely the whole community) and often hold substantial amounts of assets.<sup>11</sup> Genicot and Ray (2003) show that these informal groups will always be of limited size because of the requirement for self-enforcing arrangements in the absence of legally binding contracts. This opens up the possibility of offering reinsurance to such groups. This would have a direct beneficial effect of reducing the claim variance an informal institution faces. Since the size of such groups is constrained by the possibility of deviation during periods of illiquidity, an indirect benefit may be that larger groups achieve stability, thus increasing diversification against risk within the informal institution. An added benefit of offering reinsurance to existing groups is that it does not change the payoffs in autarky but affects only those of remaining in the group, so that there is strict complementarity between informal and formal insurance. Furthermore, funds of such informal institutions may be used as collateral to crowd in loans from outside financial institutions, as suggested by Conning and Kevane (2004).

In short, these theoretical arguments suggest a number of avenues in which extending financial services such as formal insurance to local communities and through local institutions could have substantial benefits. But all these models include restrictions on the type of contracts and arrangements between MFIs and the local community. To put it

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<sup>11</sup> Burial insurance, which is a simple type of life insurance, is often organized in this manner.

simply, schemes may still result in overall negative welfare effects. Furthermore, if there are different levels of wealth among villagers, the benefits and costs may well be borne by different people, adding further complexity to the evaluation. These considerations point to the need for a careful design of insurance products and their delivery that should take account of the functioning of existing local mechanisms. The analysis above suggests that sensible directions for integrating local informal schemes into broader insurance provision to the poor could include offering group policies or reinsurance to existing groups, using their funds as collateral for loans, while also making use of their local expertise in reducing transaction costs and asymmetry of information.

## Conclusion

The poor in Latin America face substantial risk in the form of natural, health, social, and economic risks, and are also more likely to be affected by them. The high degree of urbanization and commoditization in Latin America makes the region different from other developing regions. In general, the poor use sophisticated mechanisms to cope with this risk, but these are not enough. Welfare losses are substantial; the coping mechanisms themselves come at an additional cost in terms of long-term welfare. As such, risk and how the poor respond to it contribute to the persistence of poverty. There is a clear need for further policy work to reduce risk and its consequences, as current systems do not provide sufficient protection. Indeed, there may well be an *efficiency* argument for providing subsidized insurance and protection, given risk-induced poverty traps.

This study has argued for fostering insurance provision, not as a panacea to solve all problems, but as part of a comprehensive system. The current focus on ex post measures in the form of some safety net is not cost-effective or sufficient to reach the poor. Other components of a comprehensive system would be ex ante measures to stimulate and protect self-insurance through savings, to reduce risk and foster credit for the poor as a form of insurance, and to allow a stronger asset base to grow. These efforts need to be supplemented by a careful and well-designed safety net, since some risks, including certain covariate economic or catastrophic risks, should not be addressed by ex ante insurance-related mechanisms. A high proportion of risk, including economic and social risk, is also largely manmade. Reducing the impact of these risks requires actions to address the causes of these risks. Inflation, crime, or waste-related risks are examples. Providing protection only against the consequences of these risks is unlikely to be cost-effective.

In terms of the basic institutional setup for insurance provision, the partner-agent model appears to be the most suitable. Under this arrangement, an established insurer (the partner, from the private sector, possibly in partnership with the public sector) would link up with an institution with local financial connections, such as a microfinance institution (MFI). This arrangement offers several advantages; it would include a mechanism to provide easy access and terms to the poor, while reducing costs and



protecting sustainability through reinsurance and by contracting with an established insurer. Judging from case studies, it appears that a number of products might be suitable for promotion, including life, property, health, weather, or price insurance, possibly linked with credit. By its covariate nature, weather or price insurance requires mechanisms of reinsurance, either internationally or through government budgets or aid. Much progress has been made in recent years to develop workable models.

Nonetheless, one should be cautious about the likely success of these schemes. In terms of types of coverage, the experience of existing insurers that cater to the poor shows that it is difficult to offer profitable comprehensive coverage to low-income households. In part, this can be explained by the financial capacity of clients and the lack of opportunities for diversification. Term life insurance is the most sustainable type of insurance, but the support of governments, donors, and NGOs is necessary to branch out into other profitable products. Product features should include group policies, mandatory insurance, and incentives to cope with moral hazard and adverse selection, for example by rewarding members who do not submit any claim during the year.

As an indirect benefit, the provision of sustainable insurance services creates natural incentives for insurance companies to encourage risk prevention, as in the case of La Equidad, in Colombia. Many existing schemes have proven costly—but have also clearly lacked expertise and reinsurance mechanisms to reduce costs. The partner-agent model is therefore likely to be the most efficient way to proceed.

While subsidized insurance for the poor can be an attractive option on efficiency grounds, an important role for the government would be to establish a more effective regulatory framework to foster the establishment of microinsurers at the local level, while maintaining overall stability and credibility of the entire financial system. While relaxing entry requirements for MFIs to enter the insurance market may be beneficial, incentives should be also provided so that MFIs partner with established insurers, through the partner-agent modality.

MFIs can easily and effectively provide insurance services to the poor, but it is important to acknowledge the presence of local insurance and other finance-related institutions. There is a clear scope for involving these institutions as intermediaries in insurance provision, since they possess knowledge of local conditions and an established reputation.

Finally, objectives should be clearly defined when providing more insurance to the poor. Uninsured risk means that poverty is perpetuated, with the possibility that a risk-induced poverty trap might occur. More insurance, as part of a credible comprehensive system of social protection, should allow the poor to sustain their assets and to enter into more profitable, risky activities. In short, it would allow the poor to focus on long-term strategies to get out of poverty.

Of critical importance are the credibility and sustainability of insurance provision as part of a broader social protection system. The issue is not who should provide the services as part of the system: different agents could play a significant role, including NGOs, community organizations, or the private sector. There is a key role, however, for



the government in the development of and support to an appropriate regulatory and institutional framework for such programs, and sustainable and transparent institutions to monitor these activities.

This issue cannot be underestimated. Often, institutions in developing countries, including those in Latin American and the Caribbean, are not transparent or sustainable, and therefore well-intentioned measures may lack the credibility and public support to succeed. Credibility cannot be easily acquired, and governments face an uphill struggle in this regard. International aid and the donor community have an important role to play in enforcing these measures so that the benefits of insurance products targeted to the poor can be improved by enhancing their long-term effect on reducing poverty.

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## COMMENT

**The Role of Governments and Donors in Insurance***Mark Wenner*

Stefan Dercon's study, *Insurance for the Poor?* (chapter 5), proposes the thesis that unmitigated risk exacerbates and perpetuates poverty. These risks translate into losses in terms of both welfare and efficiency in use of assets. The study proposes that these two problems can be solved through a variety of instruments, such as effective multisectoral development, savings and credit products, safety nets, and insurance products via a partner-agent model that links financial intermediaries with insurers.

The poor do not always face the same risks. The urban poor are more likely to face personal risks (accidents, illness, death, loss of job, fire, robbery); economic risks (recession, price changes, inflation, currency devaluation); environmental risks (inadequate waste disposal, inadequate sanitation, pollution, contaminated water); and social risks (crime, corruption in the provision of government services). The rural poor are more likely to face highly covariant risks (drought, flood, earthquakes, hurricanes); idiosyncratic production risks (pest, diseases, livestock mortality, fire, equipment failure); personal risks; and economic risks (increasing volatility in input and output prices for farmers integrated into market economies).

The study proposes a series of solutions, entailing different risk management instruments for the poor. For example, in the case of safety nets, the study argues that there is a need for better targeting, better timeliness in delivery of support, and wider coverage. For the delivery of insurance products, the study proposes a partner-agent model in which a microfinance institution acts as the delivery mechanism for health, life, and credit insurance products from traditional insurance companies. It also proposes parametric insurance products for agriculture, using weather indices and area yields as exogenous parameters to ameliorate moral hazard problems.

The study argues that the sources of market failure in insurance markets (asymmetric information, low capacity of the poor to pay, high transactions costs, high monitoring costs) are a justification for government subsidies and intervention. While government intervention may be acceptable for some areas such as product development, training of staff, adequate supervision/regulation, and the provision of reinsurance, it might be ill-advised if the government subsidizes the premiums, especially for multiple peril products. The history of subsidized crop insurance is less than satisfactory in terms of efficiency, equity, and sustainability. Fiscal restrictions exist, and the use of subsidies for insurance premium may not be cost-effective. Decisions should be based on cost-effectiveness and cost-benefit criteria and the need to demonstrate viability. These criteria are important to avoid rent-seeking and waste. Ideally, donors and governments should support market research and market development and avoid premium subsidies.

Unsubsidized insurance is possible and profitable for agriculture. There are examples of agricultural insurers in Argentina, Germany, Italy, and the United States that can successfully provide single peril or named risk insurance (hail, wind, fire). Existing pilots for parametric products (India, Mexico, Morocco) suggest viability—but limited appeal outside of India and high information and contract design costs. The biggest issue with this type of insurance product is the existence of basis risk. Other types of unsubsidized insurance that target low-income households are profitable, such as term life, credit insurance, and auto.<sup>1</sup>

The most problematic types of insurance are health and agricultural. For these types of insurance, it is difficult to get broad or universal coverage without massive government subsidies. Health insurance, however, is quite different in nature from agricultural insurance. The problem with health insurance is high and escalating treatment costs over time. The problem with agricultural yield insurance is large, covariate risks that can easily surpass the capacity of primary insurers—making reinsurance essential. Price insurance (futures, options) is not intrinsically problematic. The biggest constraints are institutional: the need for deep and well-functioning commodity exchanges, good grading standards, good warehousing facilities, and good contract enforcement capacity.

In conclusion, the role of the government should be that of a regulator, market developer, and reinsurer. For example, government should support the creation and maintenance of information databases that would permit insurers to measure and evaluate risks, training and education programs, and product development activities. The government should avoid politicization and minimize subsidy outlays for premiums, since fiscal constraints exist in many low-income countries. Mixed or fully private systems are better than government monopolies. All insurers should abide by the eight Golden Rules of Insurance,<sup>2</sup> pursuing a layering strategy in which risks with high frequency but less severity are retained by the individuals and banks; risks with medium frequency and severity are assumed by the insurance sector plus international reinsurers; and low frequency but high severity risks are covered by catastrophic insurance financed largely by governments and donors.

<sup>1</sup> Property insurance (to cover theft and fire) is not popularly demanded by the poor in developing countries. In developed countries, property insurance is profitable because mortgage lenders make it a requirement for housing financing, thereby inducing higher demand. In low-income countries, few low-income people have mortgages.

<sup>2</sup> The Golden Rules are conditions that determine insurability: (1) symmetric information; (2) large number of similarly exposed units; (3) statistical independence of risks; (4) calculable frequency and magnitude of loss; (5) actual losses must be determinable and measurable; (6) potential losses must be significant and an insurable interest must exist; (7) limited policyholder control over the insured event; and (8) premiums should be economically affordable (that is, the annual premium cost must be substantially less than the potential benefit offered by the policy).

The use of microfinance institutions as a delivery platform for insurance products should be closely examined. It is likely to work for term life and credit insurance products that are simple to understand and simple to administer, but delivering other types of insurance, especially health, depends on the density, quality, and proximity of health care facilities: matters that are outside the control of the microfinance institution and could affect uptake. The delivery of parametric agricultural crop insurance via microfinance institutions has been successful in India, but the product must be well designed.



# 6

## Savings and Deposit Services for the Poor

Loïc Sadoulet

**T**he tremendous expansion of microcredit programs—and their impressive overall success in providing credit in markets in which financial institutions had repeatedly failed previously—has led to long debates and explorations as to how to improve credit services for the poor. However, a tenacious group of academics and practitioners has long stressed that credit is only *one* of the financial services that the poor need, and probably not even the most important one. Indeed, to face uncertainty, the poor need access to a full range of financial services and, in particular, savings (Bouman 1983; Adams 2002; Robinson 1995; Rutherford 2000b; Wright 2002). Vogel (1984), in his now-famous quotation, called savings “the forgotten half of rural finance.” Yet until recently, the microfinance agenda remained focused on streamlining the dominant credit-only models in an effort to increase their financial sustainability and to replicate them in various social, cultural, and economic contexts (Musonsa and Coetzee 2001).

Lately, however, the development community has turned toward the provision of wider financial services to the poor. This interest stems partly from a desire from the microfinance industry to limit costly client turnover and narrow outreach in microfinance, which have been traced to the industry’s insistence on uniform products that are not particularly adapted to the needs of the poor, especially the poorer segments of the targeted clientele (Wright 2002; Meyer 2002). The other concern is a more general effort to reduce the vulnerability of the poor in the face of uncertainty (Sadoulet 2004). The recognition that the poor are a heterogeneous group with varied financial requirements has pushed academics, policymakers, and institutions to contemplate how to respond better to the needs of the poor. New products and delivery mechanisms, and new processes to build synergies that enhance outreach and financial sustainability, are thus emerging in the field.

This chapter examines one type of these financial services: deposit and savings schemes.<sup>1</sup> The aim is to develop a framework that can be used to evaluate the impact of changes in financial sector practices on poverty alleviation through these schemes. To do so, this chapter examines the linkages between savings and poverty mitigation (why the poor save) to identify the principal characteristics of “good” savings products (discussed in the second section). It then identifies three levers that can be used to influence the quality of services provided: product design, complementary infrastructure, and regulation (see the third section). The resulting framework helps identify important trade-offs in the choice of reforms (see the fourth section).

## Why Intervene in Savings Markets?

The poor are looking for safe, accessible, flexible savings opportunities that provide them with positive returns. They need saving facilities to build a buffer of cash.

One of the important changes of perceptions over the past ten or twenty years is the realization that the poor not only do save, but want to save (de Soto 1998; WOCCU 2002; CGAP 2003a). The poor need buffers to deal with variable income streams while still meeting their regular consumption requirement. Moreover, other expenditures require access to resources that are much greater than the amounts of money that households typically have available on-hand from income flows. Rutherford (2000b, p. 9) classifies this need to access “usefully large lump-sums of cash” into three general categories of events.

The first is for life-cycle needs (predictable events). There are events in life that are relatively predictable, yet require resources that far exceed current income. The financing of these events thus requires accumulating income over time. Some of these events can be relatively short-term, such as consumption smoothing between harvest and lean seasons, purchases of durable goods, or purchases for religious events. Others, such as social celebrations or gatherings (childbirth, marriage, or funerals) or other life-cycle needs (education, retirement), usually require accumulation over a longer length of time.

The second category of events is emergencies (unpredictable events). Emergencies, either personal (sickness, theft, loss of employment) or wide-spread (war, floods, drought, epidemics, other regional phenomena) require a sudden and unanticipated need for cash to meet expenditures—often correlated with a concurrent loss of current income.

The third category is the need to finance opportunities. In addition to occasional large cash *needs*, the poor have *opportunities* to spend large amounts to finance indivis-

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<sup>1</sup> “Deposit services” and “saving facilities” are used interchangeably as general terms for deposit and savings schemes. “Savings” refers to the stock of resources set aside, and the verb “saving” refers to the act of putting those resources aside.

ible purchases, such as durable goods, land, or investment in an existing or new business or home. Accumulating savings, in the form of money or other assets, helps prepare the required buffer for these expenditures. However, saving at home is risky. Individuals face physical risks, such as the theft or loss of their cash savings (including from fraud). There are also financial risks, such as inflation. In addition, saving must compete against other pressing claims, such as those made by relatives, neighbors, landlords or other creditors, or frivolous spending instead of accumulating into large funds (Bouman 1983). Alternative strategies that reduce the need for savings (such as mitigating risk by farming low-risk/low-return crops, tied labor, shared tenancy) can often prove costly (Townsend 1995). For example, biases in investment toward low-risk activities come at the price of higher returns, making it difficult for individuals to escape the cycle of poverty. There is thus a strong need for outside saving schemes. However, these schemes must correspond to the frequent, small, and variable transactions pattern that characterize the poor.

The poor need to be able to save when they have the opportunity to do so, to withdraw when they need their savings, and to do this without depleting their savings over time. Thus, savings services must have four properties (Rutherford 2000b; FAO 2002): safety, accessibility, flexibility and positive returns.

*Security:* Saving in kind or at home is risky. Individuals face physical risks, such as the theft or loss of their cash savings (including from fraud). There are also financial risks, such as inflation. But, most importantly, saving must compete against other pressing claims. Because the point of saving is to have money on-hand in case of need, savings must be protected from depletion.

*Accessibility:* Small and variable transactions mean that the poor need to be able to save tiny amounts, when they have them, at low transaction costs. Thus an important feature of savings products is to be able to capture quick-to-vanish income surpluses by having access to regular and frequent *opportunities* to save small amounts. Accessibility includes proximity and convenient opening hours, speed of processing, and flexibility in deposit amounts: anything that minimizes the transaction costs of accumulation.

*Appropriate liquidity to meet the need for withdrawal (flexibility):* Having a buffer is not of much use unless it can be accessed in case of need. This means that savings must be close at hand, available, and easily convertible into cash (if they are in another form). However, ease of withdrawal does not necessarily mean that savings must be extremely liquid at all times. To the contrary: the poor often seek ways to *restrict* the liquidity of their assets to protect them against other claims on cash, such as compulsive spending, other short-term spending needs, and requests from relatives and friends for monetary assistance. In savings products, they seek to match mixed liquidities to needs and savings capacity. For long-term needs, savers seek means to make their savings less liquid, to minimize the risk of their evaporation (see box 6.1).

Liquidity includes how easy saved funds may be accessed when need arises; if funds are supposed to be available, but savers must go through trials and tribulations to access them, their theoretical liquidity is of little use. Versatility thus combines mix of duration, and ease and timeliness of withdrawals.

*Positive returns:* Savings depletion stems from negative returns, among other things. A desirable property for savings is to grow over time—or at least, not to shrink through the effect of inflation or service charges. Particularly in rural areas, the poor often *pay* for savings services, reflecting the fact that they are willing to save even with negative real returns (Wright 2002). However, when credible saving schemes exist, positive interest rates on savings products increase their attractiveness, which stimulates the amount saved (CGAP 2003a). Current savings facilities are either inaccessible or unsafe, inflexible, and expensive.

### **Formal Savings**

**Formal savings are safe, offer a mix of products, and yield positive returns, but are usually inaccessible to the poor.** Formal institutions—by which is meant regulated institutions—are subject to formal banking laws because they collect deposits from clients

#### **Box 6.1**

##### **The Need for a Liquidity Mix**

The story of Prudence from Karatina in Kenya is typical of many of the poor around the world. She saves using a wide variety of informal methods: two rotating savings and credit associations (ROSCAs), one accumulating savings and credit association (ASCA), informal insurance, cash at home, and in-kind savings.<sup>a</sup>

- ROSCA 1: Four members contribute \$0.29 daily to an informal rotating savings group, from which \$26.57 is paid out each month to each member in turn. Prudence uses her share for school fees for her grandchildren.
- ROSCA 2: Four members contribute \$2.90 weekly to another informal savings group, from which \$11.57 is paid out each week to each member in turn. Prudence uses her share to restock her business, a small market stall selling basic commodities such as salt, rice, biscuits, and soap.
- ASCA: Forty members save \$1 a week and can borrow from the fund. The ASCA is liquidated annually in December. Prudence uses her savings to celebrate Christmas and can borrow from the fund for emergencies.
- Informal funeral insurance fund: One hundred members contribute \$11.40 per month. This insurance covers the immediate family and is a form of risk pooling for “repatriation” to the village.
- Emergency cash at home: Prudence keeps \$3 to \$5 at home for emergencies requiring immediate cash.
- In-kind: Prudence’s brother looks after a cow back in the village. Prudence views this as a provision for old age.

Source: Wright (2002).

<sup>a</sup> For more on ROSCAs and ASCAs, see discussion below.

who have no oversight on the management of funds. Commercial banks are safe and tend to have a well-developed menu of savings products for certain classes of clients, but have remained inaccessible to the poor. For the poor, saving in the commercial banking sector typically involves prohibitively high transactions costs arising from a number of factors: geographical distance, inconvenient opening hours, unsuitable terms and conditions of products, inappropriate minimum balance and deposit size requirements, intimidating procedures, and overly complex paperwork.<sup>2</sup>

Public institutions do not offer much of an alternative to the poor, since rural and agricultural development banks have typically suffered from political interference and lack of viability (Adams and Vogel 1986). Furthermore, their objective has often been perceived to be “one-way funnels for government funds” (Patten and Rosengard, 1991, p. 8). Consequently, these institutions have devoted little attention to savings mobilization, and their short lifespan because of mismanagement has tended to make them not a viable source of savings services for the poor.

As a result, the poor have to save through informal means, either by saving in-kind, using informal money collectors, or participating in group savings schemes.

### ***Informal Savings***

**Informal savings exist, but suffer severe limitations.** The importance of savings is demonstrated by the plethora of savings vehicles that the poor have used throughout the world and over time. However, when it comes to serving the poor, these suffer several limitations.

#### **Savings In-kind**

*Saving in-kind suffers problems of liquidity and price fluctuations.* Storing wealth through the accumulation of nonmonetary assets that can be resold easily in case of need entails other important costs. While the extra step of having to sell assets to make them liquid can protect savings from short-term sporadic claims, they have important disadvantages:

- **Nondivisibility:** Durable goods do not tend to lose their value in normal times, but gain part of their value from their size. Their indivisibility makes them poorly adapted to meet small demands for cash.
- **Loss of value in case of distress sales:** Covariate shocks give rise to a flooding of markets by assets for sale, which drives their value down. Well-known examples

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<sup>2</sup> One notable exception is the state-owned commercial bank Bank Rakyat Indonesia (BRI), which has successfully been delivering a full range of banking services to low-income clients, particularly in rural areas. See box 6.6.

include the price of livestock during droughts (Sen 1981; Rosenzweig and Wolpin 1993).<sup>3</sup>

- Diminished long-run income generation when productive assets decapitalize: Selling machinery to generate income or even delaying or canceling investments (such as maintenance or other actions to maintain the productivity of assets) to control costs can permanently decrease productive ability.
- Visibility: Livestock and durable goods are harder to hide from neighbors and family than smaller assets (FAO 2002).

The relative safety gained through non-cash accumulation, therefore, must be weighed against the loss of value of in-kind savings.

### Deposit Collectors

*Deposit collectors are flexible, but relatively unsafe and expensive.* Informal savings institutions appear in two general forms: individual systems, mainly in the form of “deposit collectors” who store individual deposits outside the immediate reach of savers; and group-based systems, where deposits by the group as a whole are redistributed to individual members. The great advantage of deposit collectors is the accessibility and security of their services. Typically, they visit their clients daily, allowing them to capture the small amounts that can be saved while they are still available. Simple procedures and personal knowledge of the local economy and of their clients limit the transactions costs. Regular visits (and potential rules) prescribe a certain discipline.<sup>4</sup> Security is enforced by reputations for honesty and safety that are painstakingly built over a long time. Nonetheless, deposit collectors may not be particularly safe. Some 40.3 percent of savers had lost money to a fraudulent deposit collector and 79.6 percent knew of people who lost money in this way in Ghana, Aryeety and Gockel (1991) report. The loss of savings in the informal sector from deposit collectors in particular averages about 22 percent, according to a MicroSave survey of over 3,000 people (Wright 2002).

Moreover, deposit collectors typically charge for their service by retaining a few deposit payments. In West Africa, it is common for deposit collectors to collect savings on a daily basis and to charge one day’s savings per month (CGAP 2002a). The dearth of saving opportunities in the slums of Bangladesh means that people are willing to pay as much as 30 percent a year to unlicensed informal collectors, Rutherford (2000b) reports. These negative interest rates lead to a depreciation of savings.<sup>5</sup>

<sup>3</sup> Lim and Townsend (1998) argue that covariant shocks actually worsen the volatility of cash holdings rather than protecting them.

<sup>4</sup> The behavioral economics literature documents various examples of how regularity instills discipline. For an example on savings, see Thaler and Benartzi (2004).

<sup>5</sup> Even deposit collectors who on-lend the funds they collect typically pay negative interest rates because of the extremely high costs of financial intermediation that they face (Aleem 1990; Banerjee 2002).

**Box 6.2****Rickshaw ROSCAs**

The rickshaw drivers in Dhaka have devised an interesting innovation to the standard ROSCA principle. Drivers can rent rickshaws for about 25 taka a day (about \$0.60) and hope to earn a net daily profit of about 80 taka (about \$2). In the 1980s, these drivers devised a ROSCA in which groups got together and agreed to contribute 25 taka a day to a fund held by a trusted outsider. Every 10 days, enough has been saved in the fund to purchase one new rickshaw, which is distributed by lottery to one of the members. As in a standard ROSCA, the process continues until every member of the ROSCA has his own rickshaw.

The innovation is that once a member has received his rickshaw in a draw, he continues to contribute *double* the amount to the pot: his normal 25 taka contribution, plus the 25 taka that he does not spend to rent a rickshaw. He is thus not any better or worse off by winning early, yet the mechanism shortens the length of the ROSCA cycle significantly, since all those who have already won are increasing the number of contributions toward the rickshaw purchases.

Source: Rutherford (2000b).

**Group-based Savings**

*Group-based informal savings systems have positive interest rates, but are inflexible.* In contrast, group-based informal systems typically do not entail negative interest rates but face other limitations, such as their relative inflexibility and short-term restrictions, which limit their versatility. Such systems include rotating savings and credit associations (ROSCAs), accumulating savings and credit associations (ASCAs), and event-specific funds (such as funds to cover the costs of weddings and funerals).

ROSCAs are safe and cheap, but not very flexible. Extremely widespread, ROSCAs date as far back as 15th century Japan (Rutherford 2000b) and 16th century Yoruba practices in Africa and extend to late 20th-century Taiwanese offices (Besley and Levenson 1996). They work according to the following principle: members of a ROSCA contribute regularly a fixed amount to a common pot, which is distributed at each group meeting to one member who has not previously received the pot. All members continue contributing until each and every one of the members has received the pot exactly once, at which point the ROSCA cycle ends (see box 6.2).

The ingenuity of ROSCAs lies in several features. They generally do not store any money; the contributions of all the members are redistributed to the “winner” of the pot at every meeting. They generate a fast growth of savings. They also pay a positive interest rate (implicitly) to all contributors (except to the last in line), since all members receive their savings faster than if they saved in autarky.<sup>6</sup> However,

<sup>6</sup> Bidding ROSCAs entail early winners paying late winners an explicit interest rate (Besley and Levenson 1996).



while well-functioning ROSCAs typically repeat once rounds are completed, they are fixed-term saving mechanisms that disburse the full amount when the saver's turn comes up, irrespective of his or her needs. While turns may be negotiated or traded, savers can “withdraw” only once, must withdraw at the dictated time, and must maintain fixed contributions for the remainder of the rotation. ROSCAs are thus poorly suited for long-term savings accumulation or as a means to finance emergencies.

ASCAs are flexible and yield positive returns, but are short-term and insecure. Accumulating savings and credit associations (ASCAs) are more versatile: they are essentially ROSCAs in which members are not compelled to withdraw their funds according to a specified schedule of redistribution. Members can borrow flexible amounts—or they may choose not to borrow at all during the lifetime of the ASCA. Borrowing members pay interest on their loans; these interest payments are incorporated into the pool, which can be used to cover the costs of running the fund, fulfill some group objective, and/or be redistributed to members according to the shares. The great advantage of ASCAs over ROSCAs is that the savings and loan options are much more flexible, and that larger amounts of savings can be accumulated over time. Members can borrow for unexpected emergencies, life-cycle expenses, or to fund large investments. There are no restrictions on the timing of deposits or loans.

However, ASCA management is far less transparent than ROSCA management. While in ROSCAs, redistribution of contributor funds takes place immediately upon convocation of the pool, ASCAs, by definition, involve storing the funds for unspecified periods of time. Furthermore, while member contributions tend to be constant during the lifespan of the ASCA, they are not necessarily equal among members, requiring more involved bookkeeping. These factors, with their concomitant lack of accountability, lead to a relatively high incidence of fraud. As Rutherford notes, fraudulent ASCAs “spring up every now and again, fail, and then after an interval—so pressing is the need to save—another one starts up, only to suffer the same sad fate” (2000b, p. 29).

This lack of accountability is answered by a fixed term in most ASCAs: accounts are usually closed periodically (typically at the end of each year) and savings are returned to their members to allow members to exit from an ASCA if there is fear of poor management. ASCAs, just like ROSCAs, are thus poor solutions for long-term savings accumulation.

*Event-specific saving funds* are safe and long-term, but not flexible. Long-term saving requires transparency. A variety of group saving funds satisfy this requirement, in much the same way as do ROSCAs (see Brown and Churchill 1999a; Rutherford 2000b). All such funds work in essentially the same way: members pay regular contributions to a group pool, and this pool serves to finance fixed individual payouts upon the occurrence of a specified (and verifiable) event. Contributions are determined such as to cover the

**Box 6.3****Funeral Funds in Ethiopia**

Throughout the world, savings groups that provide funeral services to their members are common. In Ethiopia, groups of people, tied by geographical, occupational, or family connections, come together in funeral groups called *lddr*. In some *lddr*, members make regular contributions, sometimes in kind; these are then redistributed to provide for members' funeral obligations or as financial assistance to the families of the deceased in proportion to their contribution. In others *lddr*, members do not make a regular contributions, thus preventing the risk of diversion. Members provide assistance as a group in case of a claim from one of the participants (Brown and Churchill 1999a).

Originally burial societies, *lddr* now provide a wide range of insurance services in urban Ethiopia, such as assistance for crop failure, illness (FAO 2002), or marriage expenses (Brown and Churchill 1999a). These insurance schemes allow members to access a lump sum at the time they need it in exchange for a continuous stream of savings—before and after (Rutherford 2000a).<sup>a</sup> However, only emergencies that are agreed upon in advance and publicly verifiable are covered.

<sup>a</sup> Even in the case of funds without contributions, the contributions made for claims of other group members can be thought of as savings, or premium payments, for future needs—and, if relevant, for past ones, as well.

expected number of claims in a span of time,<sup>7</sup> and disbursal of funds is immediate and public, thus enforcing accountability. However, funds are available only to address specific easily verifiable needs, such as wedding and burial costs, or fire damage (see box 6.3). In that sense, the savings accrued is extremely illiquid.

The main trade-off in informal savings systems is between security and versatility. Since some emergencies require immediate access to cash while others can be temporized, savers often choose to combine membership in multiple schemes (if available) to satisfy their liquidity needs to minimize that trade-off: emergency cash hidden at home; some saving in kind such as livestock and/or machinery; membership in a number of ROSCAs of varying amounts and lengths; and participation in long-term insurance schemes, including reciprocal risk-sharing arrangements (Platteau 1997). However, their spotty availability, risk, and high costs have stimulated the development of semi-informal institutions.

***Semi-formal Financial Institutions***

Semi-formal financial institutions are burdened by the weight of procedures and regulation. Semi-formal financial institutions are a growing sector. This chapter groups these institutions into three general categories, none of which are subject to much formal

<sup>7</sup> Designing appropriate contributions requires some actuarial sense of risk. Long-term experience and precautionary overpayments that are redistributed at the end of cycles have made these institutions quite successful, according Brown and Churchill (1999a, 1999b).

regulation: microfinance institutions (MFIs), such as microcredit programs and village banks; credit unions; and self-help groups. Their increasing popularity can be traced to the success of the Grameen Bank initiative in Bangladesh, although a variety of models (of varying quality) have developed over time. These institutions are typically created by outside interventions rather than emerging from within localized communities, which make them comparatively secure, thanks to the “benevolent force” of their management. This security, however, is generally accompanied by a significant reduction in flexibility.

### Microfinance Institutions

*MFIs* are safe, but not flexible. MFIs have been largely oriented toward the provision of credit and have not invested—literally or figuratively—in the creation of innovative savings schemes. Such reluctance can be ascribed to a confluence of (misguided) preconceptions and (real) legal and logistical restrictions.

Initiating forces behind MFIs have tended toward a bias: if the poor cannot feed themselves, how could they possibly save? MFIs have thus been built on the concept that poverty could be overcome by increases in productivity financed through credit (Hossain 1988). Their concern has been efficiency in credit delivery: “the development of highly standardized products that are simple to administer, massify, and in which fraud is easy to control” (Matin 2002, p. 4). No special focus has been made on developing broader financial instruments, apart from mandatory savings, in some cases, as a means to “train” borrowers to deposit regular amounts (Adams and von Pischke 1992).<sup>8</sup>

In addition to the perceptive bias, legal barriers explicitly prohibit MFIs from accepting deposits without complying with stringent prudential regulations and submitting themselves to supervision. The rationale for regulation and supervision comes from the shift in who bears the financial risk of the MFI’s lending activity: from external funders to the depositors. Banking regulations are designed to protect these depositors from imprudent financial management by the institution. These requirements, however, aimed at traditional formal banks, have little resonance for the typical MFIs. In particular, the institutions wanting to legally accept deposits face excessively costly restrictions, considering the nature of their activity portfolio.

Recently, some successful microfinance institutions have aimed to legally transform themselves into commercial banks to accept savings, such as BancoSol in Bolivia and Gé-

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<sup>8</sup> Some programs require that 5 percent of the loan be kept in a mandatory savings account. The account serves as a guarantee during the individual’s borrowing activity. Mandatory savings, particularly those that are deducted from the loan, generally have been perceived negatively by clients since they implicitly increase the interest rate on the loan (by reducing the available amount) and are very illiquid (since withdrawing from the savings account usually reduces the ability to borrow). See Wright (2002). In 1995, Grameen Bank clients in the Tangail District went on strike to gain access to their group funds accumulated through mandatory saving.

nesis Empresarial in Guatemala. Savings are a good source of funds for lending activities, and the transformation would allow such institutions to expand their lending operations (see box 6.4). However, the weight of regulation makes it difficult for these institutions to compete against subsidized microfinance programs in the markets they serve. Furthermore, the uncoordinated presence of subsidized and unsubsidized institutions—and regulated and unregulated ones—in the same markets can potentially have some very severe effects. Not only do subsidized institutions inflict price-competition pressures, but their potential disappearance because of failure or withdrawal of outside support could undermine confidence in the whole sector, thus destroying an entire industry of financial services for the poor (Sadoulet 1999; Rutherford and others 2004).<sup>9</sup>

In addition, even if a MFI satisfies the requirements to accept deposits, the resources to address the more sophisticated management needs of savings programs are often lacking: liquidity and risk management, as well as more complex organizational structures and information and reporting systems necessary to act as financial intermediaries. Capacity to manage savings is thus an added constraint to legal and competitive barriers.

### Credit Unions

*Credit unions*<sup>10</sup> are flexible and safe, and have positive returns, but require heavy infrastructure. Credit unions, in contrast to microfinance institutions, are based upon savings principles. They are, in essence, large and permanent ASCAs: loans are financed from members' deposits; interest revenues are returned to the common pool and redistributed annually to members in proportion to their average share of deposits over the year. Unlike ASCAs, credit unions are usually chartered under a cooperative or credit union law of the host country, and are regulated and permanent. Member deposits are also normally kept in a formal bank for safekeeping (FAO 2002).

However, the added flexibility in terms of frequency and size of deposits, as well as the number of members and size of the pool, requires more thorough management capacities, and prudential regulation and supervision to minimize the risk of financial mismanagement and favoritism. Credit unions do not have strategic investors who have incentives to oversee management for maximum efficiency and safety, or an ability to mobilize funds in case of a temporary liquidity need. Thus, they depend on a prudential supervisory body that aims at protecting the small depositors who have neither the information nor the capacity to monitor the credit union's activity (Westley and Branch

<sup>9</sup> Personal communication with Arnaud Ventura, managing director of PlaNet Finance, suggests that this competitive pressure from subsidized programs is becoming a smaller problem in maturing microfinance markets. The reputations of well-established programs as viable long-term partners are sufficient to maintain their position when confronted with subsidized smaller programs that are often perceived as unsustainable and temporary.

<sup>10</sup> Also called Savings and Credit Cooperatives.

**Box 6.4****The Grameen II “Microsaving Revolution”**

The microfinance revolution led by the Grameen Bank was in fact a *microcredit* revolution. Started in Bangladesh in 1976 by Dr. Mohammed Yunus, a former economics professor who “dropped out of formal economics,” (Morduch, 1999, p. 1575) the Grameen Bank has grown to reach a massive scale, with over 3 million current clients and dispensing \$40 million to \$50 million a month in loans. Replicating the concept of uncollateralized loans with repayment incentives built by granting bigger subsequent loans upon timely repayment, microcredit programs are estimated to reach around 15 million borrowers in Bangladesh with \$7 billion in outstanding loans.<sup>a</sup>

Although formally set up as a bank with the statutory right to mobilize savings, the Grameen model has focused quite narrowly on credit. However, faced with a repayment crisis, aggravated by the great floods in 1998 and the resulting over-indebtedness of many of its borrowers, the Grameen Bank has sought to soften the inflexibility it imposed on its borrowers (constant, year-long loans, with equal weekly payments) and that led to low participation and retention rates among the lowest socioeconomic segments of Bangladesh (Meyer 2002).

“Grameen II,” as the new initiative is called, breaks from the traditional arrangement: a joint liability, year-long group loan with staggered disbursement among group members, and a mandatory group savings account jointly owned by the members of a group. Instead, it uses individual loans with separate terms ranging from three months to three years, weekly installments determined by a repayment schedule adapted to the projected income flows of the borrower, and easy and explicit loan rescheduling in case of repayment difficulties.

In addition to the innovations in the lending program, the Grameen Bank has also made a bold move toward providing different savings products:

- A personal savings account, in which a mandatory 2.5 percent of each loan is deposited, and in which members can deposit any additional amount. The account carries an interest rate of 8.5 percent a year, and members can withdraw from their personal savings account at any time in any amount for any purpose.
- A special savings account, in which a mandatory 2.5 percent of each loan is deposited.<sup>b</sup> It also carries an interest rate of 8.5 percent a year, but no withdrawals can be made for the first three years. After that, members can withdraw half the balance once every three years, unless their current loan has been rescheduled.
- A variety of fixed-term deposit accounts (lump sum deposits), with terms ranging from 1 to 10 years.
- A recurring deposit account, the “Grameen Pension Savings,” in which a fixed sum is deposited every month for a term of five or ten years. The interest rates are 10 percent and 12 percent a year, respectively, and members may hold several of these accounts.
- A loan-and-life insurance saving scheme, in which members can open a special savings account in which they deposit 2.5 percent of the value of their current outstanding loan on the last day of the year. Interest on these savings is not paid to the member but is used to set up an insurance fund. If a borrower dies, the bank uses this fund to cover the unpaid loan balance, and the family receives the accumulated savings.

It is too early to tell what impact Grameen II will have on the livelihood of poor people in Bangladesh. However, the increased flexibility and accessibility of credit, savings, and basic insurance is a huge step forward in the provision of full financial services for the poor. The products will evolve and adapt to better fit the financial needs of the Grameen Bank’s members. As Yunus observes, “In a way, [Grameen II] is not intended to be a finished product at a given moment. Staff will be creating their own music; as they become more creative about it. All we have done is given them a piano” (Rutherford and others, 2004, p. 15).

Source: Based largely on Rutherford and others (2004).

<sup>a</sup> Virtual Library on Microcredit <http://www.gdrc.org/icm/>

<sup>b</sup> In the case of a refinanced loan, 5 percent.

2000). The weight of regulation for credit unions and institutional supervision capacity, as well as controversies as to who should design appropriate regulations for smaller and less diversified institutions, has limited their expansion, particularly in remote areas.

### Self-help Groups

*Self-Help Groups (SHGs)* are safe and flexible, and have positive returns—while they last. Self-help groups are “mini credit unions” or, equivalently, ASCAs that receive organizational support from a NGO, often with an initial financial endowment. Growth is usually financed from interest payments by borrowers. Outside benevolent management tends to reduce the security issues that ASCAs usually face, and their small structure allows SHGs to fall below the radar of regulatory agencies. SHGs therefore fulfill the long-term saving requirements of the poor.

However, like ASCAs, they face sustainability and security issues when enabling institutions reduce their support (Harper 2002).<sup>11</sup> However, unlike ASCAs, SHGs tend to have developmental goals, beyond providing savings services toward a common objectives by members. The outside promoters of SHGs charge low interest rates to borrowers, reflecting the historical campaign of NGOs against the exploitative interest rates of the “evil money-lenders,” and they measure the success of SHG performance through the impact on family income, child health and education, and women’s empowerment. As a result, most SHGs are unable to survive without the financial help of the promoting institution. As Rutherford (2000a, pp. 45–46) notes, “I don’t know of any examples of SHGs surviving in the long term after their promoting NGO has left them to their own devices.”

### Intervention to Improve Savings Facilities

There is an important scope for intervention to improve savings facilities. The poor desperately need saving mechanisms. Yet informal systems, which have the lion’s share of the savings market (Rutherford and others, 2004, p. 37), present a discouraging trade-off between versatility and security. Semi-formal systems are very rigid and tend to impose additional restrictions to promote nonfinancial objectives, and formal systems are inaccessible to the poor. The financial landscape is fairly bleak in terms of savings products for the poor. The natural question becomes: what elements are necessary to develop better savings services? The answer is as follows:

- Reduce transactions costs for clients to promote accessibility.
- Pursue transparency and control fraud to improve safety.

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<sup>11</sup> A wave of new SHG federations emerged to try to improve the sustainability of SHGs through supervision and regulation, deposit insurance schemes, and access to additional funds, but they still have a long way to go, Rutherford (2000b) concludes, based on reports.

- Supply a range of products that can be combined to achieve desired liquidity mix.
- Reduce operational costs for institutions to allow for positive returns.

## Three Levers to Improve Savings and Deposit Facilities

The general areas of intervention to improve the accessibility, versatility, security, and return on savings can be categorized into three groups: design of products; complementary infrastructure to deliver those products; and oversight to maintain their viability.

### *Product Design*

To provide effective savings mobilization for the poor, an institution must create and offer instruments and services appropriate to the specific needs of their local market segment. This requires careful market research about how the poor currently attend to their financial requirements and what they like and dislike about the available services.

Three general principles hold for savings product design: flexible deposit amounts to simplify accumulation for savers; a proper range of products to meet the financial requirements of the poor while controlling institutional costs; and standardized easy-to-understand products to reduce management costs and fraud. These are discussed in turn.

### *Flexible Deposits*

Flexible deposits are needed to match the saving capacity of the poor. Effective savings mobilization depends on institutions providing flexible deposit services, both in terms of timing and in terms of amounts, to mitigate the problem of fund availability (see box 6.5). It is better to deposit small amounts frequently than to risk their disappearance or “alternative use” for short-term purposes.

*SafeSave*, a small bank founded by Stuart Rutherford in 1996 that offers financial services in the slums of Dhaka,<sup>12</sup> allows clients to save any amount daily—as small as they want. Deposit collectors visit *SafeSave*’s clients every day to collect the funds, which are credited to their account. The result is that by 2004, *SafeSave* had about 9,200 regularly active clients with savings totaling around \$177,000,<sup>13</sup> representing average savings of about \$20 of per capita GDP per person (\$100 at PPP). Similarly, the Grameen Bank offers personal savings accounts in which anybody (even individuals not borrowing from the

<sup>12</sup> For more details, see *SafeSave*’s web site ([www.SafeSave.org](http://www.SafeSave.org)), CGAP’s Focus Note No. 18 (2000), and the very interesting book by Stuart Rutherford (2000b).

<sup>13</sup> *SafeSave* balance sheet, August 2004.



**Box 6.5****Inflexible Deposit Schemes: How to Kill a Good Savings Service**

The Association for Social Advancement (ASA) entered the microfinance arena in 1992 in Bangladesh with a stripped-down version of the (classic) Grameen model focusing on financial sustainability and cost effectiveness. There was a single standard loan and no savings services apart from the mandatory group fund (called CWS) in which borrowers deposited 10 taka a week: about 20 cents. Deposits were held by the institution until members left the program.<sup>a</sup>

However, the growing anxiety about increasing competition in the microfinance market, the search for more defined market niches, and climbing dropout rates lead ASA to introduce voluntary savings products. The expectation was that voluntary savings would increase client satisfaction and thus reduce costly dropouts and default.<sup>b</sup> Furthermore, the increased volume of savings mobilized would improve financial sustainability by giving ASA a source of relatively cheap funds.

In 1997, ASA introduced three types of savings products. First, it changed the rules of its existing Compulsory Weekly Savings (CWS) by allowing members to withdraw savings beyond a minimum balance of 10 percent of the outstanding loan (the compulsory deposits were left unchanged). Second, it introduced a completely open voluntary savings vehicle that paid 7 percent interest annually. Originally for nonborrowing members, most were opened by borrowers to save for their children. Third, it introduced two long-term savings accounts: a contractual savings account, with monthly deposits over five years, and a fixed-deposit account. Both gave compounded interest rates of 9 percent a year. The ease of withdrawal from the first two types of accounts was intended to encourage clients to save greater amounts for bad times, thus increasing the average balance per account. The higher interest rate on long-term savings was designed to give ASA access to illiquid funds.

The change to the CWS account did not generate the expected greater savings balances, although the number of transactions in and out of these accounts multiplied, substantially increasing the already heavy workload of ASA's field staff. In an effort to increase average balances, rules were changed, first restricting withdrawals from the mandatory weekly deposits, and then increasing the minimum balance to 15 percent of the outstanding loan. Withdrawals could be made only from voluntary deposits above and beyond the larger—and difficult to calculate—locked-in balance. Confusing rules and staff workload led to an actual decrease in balances in the CWS accounts.

ASA's contractual savings accounts provided an important tool to build long-term savings. However, ASA required monthly deposits in denominations of 100 taka (\$2), which represented a substantial sum for clients. For the most part, ASA staff members deducted this amount from loan disbursements, implicitly increasing the compulsory saving component of loans.

ASA's introduction of these new voluntary savings products was a failure. ASA had to deal with unknown flows in and out of the voluntary savings accounts, a low client response for long-term contractual savings accounts, and increasing capital requirements to meet the demand for credit. This left ASA with important liquidity management problems, overburdened staff, and unsatisfied clients. Little by little, the voluntary savings products were discontinued and ASA returned to its original CWS account.

*Source:* Based largely on Matin (2002); Wright, Christen, and Matin (2001).

<sup>a</sup> Forced savings has often been used as an important tool to manage borrower default, directly by using group funds to cover amounts not repaid by members of the group, and indirectly by inducing group members to pressure one another to repay to avoid depleting the group fund.

<sup>b</sup> Research by ASA staff found that many members were dropping out because they needed quick cash and thus exited the program to gain access to their funds, or had to default on their loan payments. Competition in the Bangladeshi microfinance sector was getting more intense, with MFIs competing on loan sizes and interest rates. ASA's strategy was to distinguish itself rather than compete on size and price (Matin 2002).

Grameen Bank) can deposit or withdraw any amount at any time. The success of these accounts is demonstrated by Grameen's mobilization of \$280 million (\$80 million from nonmembers) in voluntary deposits by June 2004.<sup>14</sup>

### Range of Products

A proper range of products is needed to meet the financial needs of the poor. To meet their need for liquidity, the poor need a corresponding assortment of accumulation opportunities. It is not the existence of any particular savings product that is crucial for savers, but a sufficient range of products that can be combined to meet liquidity needs (Robinson 2001). A mix of savings products offering different levels of liquidity and return should thus complement the ease of deposit mentioned above.

*SafeSave* does not provide many different products; yet, by combining those offered, it provides an extensive palette of financial services to 9,000 clients. Clients may withdraw from their accumulated savings at any time, and may even take optional "advances" (that is, credit), which they repay with interest. The only restriction is that clients may not withdraw from savings while they are holding a loan (except to repay the loan). With this combination of savings and loan products, delivered through mobile banking for easy access, *SafeSave* has managed to generate sufficient revenues to become sustainable: all five branches that have been opened for more than two years have covered their costs, both operationally and financially, within the first two years of existence.

A common concern among institutions contemplating providing savings services for the poor is that the perceived constant demand for liquidity would require them to hold very large reserves on deposits. This, in fact, is not true (see box 6.6). Liquidity is neither the sole motivation nor the sole reward for the poor. Wright (1999b, p. 2) observes that the majority of transactions involving savings schemes are deposits, not withdrawals: "The poor are remarkably unwilling to make withdrawals. However they do want to know that they *could* withdraw if a pressing need arose." Similarly, the World Council of Credit Unions reports that net savers in their credit unions outnumber net borrowers by seven to one (WOCCU 2002).<sup>15</sup> The advantages for the poor of holding nonliquid savings products are echoed in the benefits such products can provide to the financial institutions. Less liquid products can be used as reserves, or can be on-lent to generate revenues.

Furthermore, institutions can limit volatile withdrawal behavior by raising the costs of withdrawal (without restricting the availability of funds for withdrawal). Tiered interest rates both increase incentives to save and reduce withdrawals by rewarding higher minimum balances. The lower interest rates on small accounts partially offset their high-

<sup>14</sup> Grameen Bank monthly updates, July 2004.

<sup>15</sup> Robinson (2001) argues that mobilizing savings from a larger pool of clients diversifies the patterns of demand for withdrawals, creating a more stable resource base than if savings are just collected from borrowers.

**Box 6.6.****A Case of Successful Savings Mobilization: Bank Rakyat Indonesia (BRI)**

A very interesting case is provided by BRI, which has reached extraordinary levels of market penetration in Indonesia. BRI has mobilized almost 20 trillion rupias (\$2.5 billion) in voluntary savings, through 28 million savings accounts. Moreover, savers outnumber borrowers by a factor of 10, and savings provide the entirety of the capital needed for BRI's lending operations.

Savings are built through three savings products, balancing liquidity and returns: very flexible accounts, in which deposits can be made at any time and withdrawals are unlimited; semi-liquid accounts, which restrict minimum withdrawal amounts and for which interest rates are progressive based on the balance; and fixed-time deposits, which have the highest interest rates but charge fees and interest penalties for early withdrawal. The interest structure encourages BRI clients to save mostly in the less-liquid accounts, preferring interest rate penalties in case of unavoidable withdrawals, and to increase their balances to earn higher interest rates. An added incentive to save and maintain balances is created by the attribution of lottery tickets based on monthly minimum balances in savings account. The mechanism has proven to be popular, particularly among small depositors.<sup>a</sup>

*Source:* Based on information extracted from Maurer (1999) and BRI's Web site (February 2003), <http://www.bri.co.id/english/index.html>.

<sup>a</sup> For a review of Lottery-Linked Deposit Accounts (LLDAs) around the world, see Guién and Tschoegl (2002).

er relative administrative costs. Institutions may also consider imposing penalties for early withdrawal (Robinson and Wright 2001).

**Standardized Products**

Standardized products are needed that are easy to understand, and control costs and fraud. Clear and simple rules have three advantages. One is that they improve transparency in services offered: savers know exactly the conditions under which they can reclaim their funds, which reduces uncertainty and renders savings products more attractive at any given interest rate. This clarity is particularly important in socioeconomic contexts in which literacy and/or financial understanding might be limited. Two: clear rules narrow the scope for individual interpretation by staff members, reducing both institutional fraud and liquidity management costs. The reduction of uncertainty in the availability of funds for clients translates into more predictable liquidity needs for the institution. Three: straightforward rules reduce processing costs for the institution, as less time is needed to categorize how to account for the service provided. This is an important cost-saving avenue, since valuable skilled staff time can be reduced.

While appropriately designed products and flexible deposit opportunities are necessary to mobilize savings, particular attention must be paid to the accessibility and cost management of these products, and to the ability of financial institutions to provide savings services safely. The role of the complementary infrastructure is considered next.

## Complementary Infrastructure

Complementary infrastructure helps increase accessibility and safety, and control costs.

### Proximity Banking

To a population whose mobility is severely constrained in terms of both time and money, the geographic proximity of savings institutions or their representatives, and simple procedures, are of vital importance. Since the poor need to be able to save small amounts recurrently, deposit facilities should be local, frequently available, and not be burdened by paperwork or other transactions costs.

A very interesting example of accessibility is the mobile-banking approach of *SafeSave*. Neighborhood-based collectors visit their clients every day (sometimes twice daily) at their homes or workplaces, and accept payment on the spot with very little paperwork. All transactions are done during these daily visits so that the client does not have to visit a branch office at any time. Since clients have individual accounts and are not organized in groups, unlike in many other programs, there are no meetings to attend (CGAP 2000). Even though mobile banking puts the cost of interaction on the institution rather than on clients, *SafeSave*'s five branches have covered their costs, both operationally and financially, within the first two years of existence. Providing easy access to clients has costs for the institution, but the benefits accrued from more activity can outweigh these costs.

In the eyes of skeptical potential savers, mobile collection presents a significant opportunity for fraud; however, the threat is no greater than that posed by informal deposit collectors. To gain the trust of clients, deposit collectors have established simple measures that minimize fraud risks, such as "deposit slips" held by depositors on which collectors immediately record the amount of a deposit. To tackle the further issue of maintaining the honesty of their traveling fund collectors, some institutions also work with simple stamp systems whereby collectors go out in the morning with a certain number of stamps and return at the end of the day with the remaining stamps and the cash equivalent of the difference.<sup>16</sup> Such simple systems can allow institutions to be accountable to the depositors, and to control potential cash diversions that may occur during the transfer.<sup>17</sup>

An alternative to mobile banking is the creation of "light offices": that is, satellite locations that provide basic deposit services without the cost of administering a full range

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<sup>16</sup> Hirschland (2003) reports that a similar arrangement exists in Mozambique.

<sup>17</sup> The incidence of fraud among deposit collectors remains high (Rutherford 1996; Wright 2002). Nonetheless, a newspaper article in Nigeria on the drop of public confidence in formal bank reported that, when advised that some deposit collectors (*alajos*) are dishonest, locals using them answered, "So are many banks" (from Rutherford 1996, quoted in Wright 1999a).

of services. The Grameen Bank has relied on such satellite offices since its inception. These offices are open a few hours a day—but every day—and staffed by a group leader. Similarly, Bank Rakyat Indonesia (BRI) units can be found in major towns where economic activity is concentrated: many villagers come to town for various purposes and can easily visit the BRI unit office for transactions. Many people in remote villages find travel to the towns too costly, however. To meet their needs, BRI has created village service posts that bring services closer to these customers. In the same way, the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand and the Caisses Villageoises d'Épargne et de Crédit Autogérées (CVECA) in Mali use lean field offices with minimum infrastructure and staffing to provide access while keeping costs low (Elser, Hannig, and Wisniewski 1999).

Some institutions also exploit existing infrastructures to deliver their services (see box 6.7). In Azerbaijan, microfinance institutions deliver their services through postal offices, which are present in every village. Clients can conduct basic deposit services with the local postal clerk, thus creating a vast delivery network for the financial institution without it having to shoulder the cost of setting up a myriad of local offices.<sup>18</sup>

Accessibility and substantial cost controls can be achieved through creative delivery channels. Security is maintained by subjecting services to a precise set of rules, thus leaving little room for discretion. The choice of the delivery system will depend on environmental factors, such as the efficiency and cost of transportation, the density of the clientele, and the relative staff costs. However, new technologies provide a new opportunity to increase the efficiency of product delivery, while enhancing security.

## New Technologies

Financial institutions will be able to pay positive interest on savings products only by on-lending the deposited funds to generate revenues, and controlling costs effectively. Furthermore, financial intermediation requires strict accountability to ensure the security of deposits. The use of information technologies can help achieve these goals.

### *Computerized Management Information Systems (MIS)*

Part of the responsibility that comes with using savings for financial intermediation is the need for strict accountability to ensure the security of deposits. Institutions must be able

#### Box 6.7

##### **Mobile Banking Using Existing Networks**

In South Africa, a network of 8,000 armored trucks equipped with thumbprint recognition delivers pension payments of about \$60 each month to 4.5 million South Africans. Pensioners have a choice between cash or smart card withdrawals. This infrastructure could be leveraged to offer other financial services to pensioners—and others.

*Source:* CGAP (2003b).

<sup>18</sup> Personal communication with Sonja Brajovic-Bratanovic, Senior Financial Sector Specialist, Europe and Central Asia Region, World Bank.

**TABLE 6.1**  
**Comparison of Manual and Computerized Information Systems**

System	Advantages	Disadvantages
Manual Information System	<ul style="list-style-type: none"> <li>• Less expensive initially</li> <li>• No requirement for computer literacy</li> <li>• Adaptable to institutional needs</li> <li>• Little communication or power infrastructure required</li> </ul>	<ul style="list-style-type: none"> <li>• Increasingly expensive as MFI grows</li> <li>• More subject to human error</li> <li>• Much more difficult to produce adequate reports as MFI grows</li> </ul>
Computerized Information System	<ul style="list-style-type: none"> <li>• Scale economies as MFI grows</li> <li>• Less subject to human error</li> <li>• Facilitates growth and higher productivity, as it permits more sophisticated processes</li> <li>• Enhances data security</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive initial investment</li> <li>• Requires computer-literate users and support personnel</li> <li>• Software may not be adaptable</li> <li>• Infrastructure needed</li> </ul>

Source: Adapted from materials from the CGAP participant course, Information Systems for Microfinance.

to closely track operational expenses by activity, manage credit risks, manage liquidity requirements, and control fraud. They need a clear and accurate accounting system, a timely reporting system, and tractable performance criteria.

The computerization of management information systems (MIS) allows fast access to information on balances within each activity of the financial institution (see table 6.1). This allows financial institutions to analyze portfolio activity, match cash holdings to liquidity and loss reserve requirements, and detect anomalies—due either to changes in product performance or to fraud. Computerization also reduces costly manual processes, such as computing interest on flexible deposit schemes, or looking up client historical behavior upon loan renewal. However, computerized MIS also require a substantial investment in infrastructure and staff, and necessitate reliable electricity.

Many MFIs already use computerized MIS. Their size and growth rates have made it impossible for their staff to maintain an accurate enough view of portfolio management and accounting issues without a system that can process data efficiently, reliably, in a timely manner, with easily usable output. While several off-the-shelf programs exist, the specificities of each institution entails that the programs are unlikely to match the institution's policies and procedures. As Chuck Waterfield, consultant and former microenterprise director for CARE International notes, "I have been asked if I would develop an MIS that all MFIs could use. I have replied that I wouldn't attempt it if you offered me a million dollars! What is best for one user may be just barely acceptable—and perhaps even a disaster—for another. Every user has specific and unique needs, and only by carefully evaluating them, then examining the pluses and minuses of the available products, can a user begin to match requirements with product capabilities."<sup>19</sup>

<sup>19</sup> Quoted on <http://www.eclof.org/english/newhorizon/nheng31/lifesimple.htm>



Moreover, computerization is not enough. A computerized MIS allows for easier and faster data analysis, but clear objectives and matching indicators must be identified. BRI, for example, has two simple reporting mechanisms. Each of their 3,600 local offices (“Unit Desa”) follows five criteria: increase in profitability, increase in savings mobilization (number and amounts), increase in lending activity (number and amounts), reduction of arrears and long-term loss ratio, and improvement in the quality of management and administration. This simple reporting allows local offices to self-monitor and to detect changes in portfolio performance. The second mechanism consists of a regular two-page report of portfolio performance from the unit to the branch, which then is tied to a staff incentive system. Simple and timely reports, with clear performance indicators directly linked to explicit objectives, ensure effective accountability in BRI (Maurer 1999).

Computerization of MIS has another important side benefit, which is the gathering of information for credit-scoring models, which can be used to improve the processing of loan applications. In the past few years, based on the development of consumer lending models in the United States, interest has grown in credit-scoring techniques for microfinance as a way to systematize client risk assessment (see, for example, Schreiner 2004). Credit scoring can be a powerful tool to complement credit officers’ (subjective) risk assessment by using experience from similar past loans. While current credit-scoring methodologies still face challenges from lack of data, rendering them of limited effectiveness for assessments of new clients, the aggregation of information and experience suggests a promising potential both for rapid appraisals and as added information for credit officers.

### *Hand-held Computers and Personal Digital Assistants (PDAs).*

The leaps in performance and drop in prices experienced by hand-held computers and PDAs in recent years has sparked an interest in putting them to use to improve the efficiency and accuracy in microfinance processes. These simple and (extremely) portable computers not only reduce the bank officers’ paperwork burden in the field, but also allow the officers to record client data that can be quickly uploaded to a centralized database once back in the office, eliminating time-consuming data re-entry. Furthermore, they include all of clients’ data and a host of applications to improve officer productivity and client service (such as simulation software, credit-scoring information, and fast classification of client delinquency status). This allows officers to collect information and funds and provide other financial services in a single meeting rather than having to consult the centralized system beforehand (Campion and Halpern 2001).

While no large-scale evaluation yet exists, there is evidence that hand-held computers increase loan officer capacity substantially, which translates into large cost savings. ACCION is implementing such systems in Bolivia, Mexico, and Venezuela, and reports that client evaluation times have been cut by four (Beebe 2002). In India, Ajay Kumar, business development manager at SAVEN Technologies, reports that their experience with implementation with over 60,000 borrowers in 5,500 villages has led to a reduction in



field transaction time by almost 50 percent, to a reduction in field-based stationary costs by 70 percent, and to more effective quality control and monitoring, leading to an overall cost decrease of approximately 30 percent.<sup>20</sup> The expansion of wireless networks will allow remote officers to communicate with centralized operations, thus even increasing efficiency and flexibility. ADOPEM in the Dominican Republic substantially improved the speed of processing loan applications, shrinking to two days the period from application to disbursement, and dramatically improving client retention rates. Loan officer caseloads and other productivity measures increased by about 35 percent (Waterfield 2003).

However, successful implementation of hand-held computers requires interconnectivity with the MFI's managerial information system. Synchronizing the information on the central and remote system has proven to be one of the major bottlenecks in adopting PDAs, as many institutions run managerial information systems that are difficult to modify to communicate with an outside data source. The process of transforming MIS or switching to a new one is expensive and time-consuming. Compartemos, in Mexico, recently suspended its use of PDAs until better technological solution become available (Waterfield 2003).

### *Smart Cards*

Even greater gains can be achieved by combining hand-held computers with smart card technology. Smart cards are plastic cards that contain an electronic chip that contains all of the customers' personal details, account numbers, transaction records, and—potentially—fingerprints, making them a substantial gain in security, particularly in countries without systematic national identification cards. Transactions are recorded on a card by inserting it into a terminal. These are proprietary in some cases. For example, BGS, an Austrian company that has provided smart card systems to financial institutions in South Africa and the Newly Independent States, developed an inexpensive wallet-sized device into which smart cards are inserted to conduct transactions between cards. Terminals are widely available in other cases (such as the use of Palm Pilots at SKS in India, and ATMs for Sunlink Cards in East Africa).

Because the electronic chip can hold up to 256K of data,<sup>21</sup> smart cards can be used to store substantial amount of information and transactions on several accounts. They can also be programmed to hold and transfer currency in the same way as banks track balances in accounts without physically transferring any money. Therefore, transactions can be conducted between cardholders or between accounts of a single card holder without having to be connected to a central database: all the relevant balance, historical, and security information is stored on the card. Reconciliation with the financial institution's records does not need to be immediate or even regular. Smart cards represent potential better service for the client, and substantially reduced cash-handling cost for financial institutions.

<sup>20</sup> Posting on Microfinance Gateway Information Systems Services discussion group, 28 August, 2002.

<sup>21</sup> See Samsung Web site, <http://www.samsung.com/>

### *Automatic Teller Machines (ATMs)*

Automatic Teller Machines, commonly available in most countries now, offer a possibility to serve financial needs at very low marginal costs. With a magnetic (or smart) card and a personal identification number (PIN) code or thumbprint as an identifier, users can perform a variety of transactions without having to go to their local branch, thus reducing employee costs while increasing hours of operation (see box 6.8). Furthermore, ATMs extend the financial institution's network without having to increase the number

#### **Box 6.8**

##### **Tailoring Technology to Local Conditions: Prodem's Multilingual Smart Card ATMs**

Prodem FFP is a regulated, privately held fund that provides microfinance loans and savings services to primarily rural communities in Bolivia: markets that its sister institution, BancoSol, deemed were too expensive to serve on a profitable commercial basis. It offers savings accounts, loans, national and international money transfers, and other related services. The lack of telecommunications and road infrastructure has been problematic for microfinance institutions whose aim is to serve the rural population. Prodem focused on developing solutions that meet rural customers' needs despite the lack of infrastructure.

Prodem found the available solutions based on new technology were too expensive, or unworkable for the Bolivian rural market. Many of the towns lacked communications infrastructure, which made the permanently connected traditional ATM networks impossible to implement without an enormous investment in infrastructure. The high levels of illiteracy and the presence of several indigenous languages meant that ATMs with on-screen text would be able to serve only a very limited fraction of the market. Furthermore, identification with a personal identification number (PIN) was an unfamiliar concept in the Bolivian rural market.

Instead of purchasing an existing ATM system that would be poorly adapted to its needs, Prodem designed its own to fit its needs. Prodem's ATMs are voice-activated in local languages, with color-coded touch screens, and use fingerprints stored on smart cards issued to the users as identification. Users receive audio instructions in Spanish, Quechua, and Aymara, and are given the option to select one of the three languages. They are then instructed to insert their smart card and place their finger on the fingerprint recognition device. If the print matches the image stored on the card (the equivalent of a 300-digit PIN), they are instructed to select a particular color for the transaction they want to conduct. The system does not need real time connection; it simply reads the account information stored in the smart card. Once a day, a log of transactions is transferred to Prodem's headquarters and the local branch office for account conciliations. This log can be alternatively transferred on a floppy disk if the phone system is unavailable. Developing and assembling the ATMs in Bolivia, using commercially available components lowered the cost of each machine to around \$18,000, compared to \$30,000 to \$40,000 for traditional ATM machines with more limited functionality. Prodem charges a \$7 annual fee for smart cards, and no transaction fee.

The smart cards and ATM access have met with even more success than anticipated. The number of accounts has more than tripled reaching more than 48,000 in August 2003.

*Source:* Kennedy (2002); Hernandez and Mugica (2003).

of branches. Settlements can be made through telecommunications links and regular visits to collect the deposits and restock the ATM.

### *Effective Use of New Technologies*

There is a widely held perception that the poor cannot use or might not want to use new technologies, either because of poor literacy rates or because of lack of trust. However, the evidence suggests that the opposite is true. BGS has implemented 550 smart cards system in countries ranging from southeast Asia and Kenya to the Newly Independent States.<sup>22</sup> The Nedcor Group, with similar technology, has had 10 years of success in South Africa serving the large base of customers who do not currently hold credit cards (approximately 90 percent of the population is low-income).<sup>23</sup>

Moving from a credit to a savings model is not a matter of adding a few products; it requires a fundamental change in organizational culture and operational procedures (Robinson 2002). “Voluntary savings contrast sharply with compulsory savings required as a condition for credit; these reflect two different underlying philosophies. The latter assumes that the clients must be taught financial discipline and ‘the savings habit’. The former ... assumes that most of the working poor already save, and that what is required for effective savings mobilization is for the institution to learn how to provide instruments and services that are appropriate for local demand” (Robinson, 1995, p. 3).

Furthermore, managing a financial intermediary is considerably more complex than managing an institution focused on delivering and recovering credit. Liquidity must be managed, risk and costs must be balanced, and the MIS necessary to do so maintained.

Before mobilizing savings, institution must ensure they have an accountable ownership that can be held responsible if something goes wrong, a strong and committed management, a track record of self-sufficiency so savings are not used to finance other operations, appropriate MIS with easily read output to track performance, and a well-trained and motivated staff to achieve the scale to lower average costs. Changing all these aspects of an organization is not easy to implement.

### *Clear and Appropriate Regulation*

Prudential regulation aims at protecting the safety of small deposits in individual institutions. When a deposit-taking institution becomes insolvent, it cannot repay its depositors. This is not only a major cost for its depositors; it can undermine the confidence in the entire banking sector, leading to a run on deposits and bringing down the financial sector as a whole. However, since institutions providing savings to the poor are different and tend to be much smaller than conventional banks, regulations in most countries will

<sup>22</sup> See BCS home page, <http://www.bgssmartcard.com/>

<sup>23</sup> <http://www.smartcard.co.uk/resources/articles/finance.html>

need to be revised to reflect the specificities of these institutions (see box 6.9).

Prudential regulation is needed only when there are depositors to protect. It is not appropriate for credit-only MFIs that fund themselves from donors or commercial loans. Such MFIs may require relatively light non-prudential regulation. Similarly, a CGAP report (2002b) argues that some deposit-taking organizations should be exempted from prudential regulation when they only mobilize mandatory deposits that are kept to secure loan repayments (as is the case in many microcredit programs) since those funds are not lent out—or if they are, the exemption should extend to member-based organizations that only accept deposits from members and in which these members have the capacity to supervise operations. Institutions that are pilot-testing new products where the deposits are covered by a guarantee should also be excluded.

### Box 6.9

#### ***Fondos Financieros Privados Legislation in Bolivia.***

The success of BancoSol in becoming licensed as a commercial bank allowed it to provide a savings products, which gave it a significant commercial advantage in the very competitive Bolivian market. This development generated substantial interest from other microfinance institutions with commercial ambitions of becoming full-fledged banks.

Recognizing the growing importance of the microfinance sector and the fact that their NGO status constrained their potential growth (MacLean and Virreira 2000), Bolivian regulatory authorities created an intermediate category of institutions, called *Fondos Financieros Privados* (FFPs). They were authorized to take savings deposits—but not to offer current accounts or engage in foreign currency operations. There are now seven FFPs operating in Bolivia, serving close to 20 percent of Bolivia's financial system's customers (Hernandez and Mugica 2003).

## **Challenges to Providing Valuable Savings Services to the Poor**

The foregoing analysis demonstrates how the main concerns of poor savers—safety, accessibility, and positive returns—can be addressed through the three levers of product design, complementary infrastructure, and regulation. However, important issues arise when attempting to put these criteria into practice; the gains in some criteria may be offset by deterioration in others. These challenges, summarized in table 6.3, create great opportunities for donors to intervene.

### ***Product Design and Complementary Infrastructure***

#### ***Covering Costs of Accessibility***

Providing frequent deposit opportunities requires staff presence; accepting tiny deposit amounts drives the average cost of savings collected. These costs rise as the clientele is more sparsely distributed. Providing savings services to remote depositors may require building on synergies. The one most frequently mentioned is the provision of services to nonpoor households; this can increase revenues and help pay for the fixed costs of the infrastructure, some argue (see Sebstad and Cohen 2001; Robinson and Wright 2001).

However, attracting nonpoor clients or providing saving services to remote depositors is often removed from institutions' vision. They are therefore unlikely to develop deposit services for the poor unless it is an explicit part of their mission (CGAP 2002a).

### Standardized Products and Complex Needs

Simple and clear rules reduce the opportunities for abuse and processing costs. However, "the poor" are not a homogeneous group and their differing circumstances call for different products. Beyond demand, the products offered by an institution must satisfy financial and operational viability criteria; can the institution recover its cost of providing the product? The course of identifying needs and opportunities, of designing and testing the products, and of full-scale implementation and monitoring is complex. "It remains a process with which few MFIs have experience and with which still fewer have expertise," the United Nations Capital Development Fund (UNCDF) concluded.<sup>24</sup>

All the same, while substantial market research is necessary to gather information about local demand, having products with clear rules that are well understood is necessary to reveal reliable client preferences. If rules are confused or complicated, uptake and subsequent use of products will depend on the combined interpretation of those rules by individual clients and staff members.

### Pricing Savings Services

To mobilize savings on a large scale, savings institutions must offer interest rates that are competitive with those offered in the local market. However, since administrative costs are comparatively higher for small accounts than for large ones, interest rates should be higher. Similarly, pricing should vary across products depending on the time spent managing accounts. Each of these costs is aggregated to set loan interest rates to cover the financial costs of savings products, in addition to the loan administration costs and provisions for defaults. Such pricing models are not straightforward and are difficult to transfer to other institutions since it depends on how each operation contributes to the cost of providing the service. Furthermore, institutions have no comparable historical data to base any of their actuarial estimates (on the number of transactions demanded, for example). A full cost-pricing analysis would therefore be based on limited information as to client demand and behavior: a heavy undertaking with uncertain results that must be weighed against the costs of alternative sources of funding.<sup>25</sup>

<sup>24</sup> [http://www.uncdf.org/english/microfinance/documents\\_and\\_reports/policy\\_related\\_papers/savings\\_policy.php](http://www.uncdf.org/english/microfinance/documents_and_reports/policy_related_papers/savings_policy.php)

<sup>25</sup> Adams (2002) comments that the availability of subsidized outside funding distorts the incentives for institutions to invest in savings mobilization. Take away inexpensive sources of funding and deposit mobilization might appear relatively cheap.

## Product Development

Product development requires an important investment up front in a systematic process to deal with client needs, institutional strengths, and product positioning. This process requires resources and time to conduct the market research, to cost-price the product, describe it in simple and clear language that clients (and staff) understand, and adapt the management information system to monitor the product. The process is complex and requires an important investment in resources. Institutions that have introduced products without the proper process have had to contend with limited demand, inadequate managerial information systems to track product performance (and ensuing losses generated by the new product), and inadequately trained staff for the marketing and delivery of the new product. Not all institutions have the motivation, commitment, and capacity to introduce new products (Wright and others 2001).

## Regulatory Challenges

There is an important debate on what the appropriate regulatory requirements should be regarding minimum capital, capital adequacy ratios, collateral registration and loan documentation, and branching regulations. Institutions would like to lower capital requirements, as equity is harder to raise than for commercial banks; yet a proliferation of small institutions would overwhelm the regulator's supervisory capacity. Similarly, microfinance institutions claim that microfinance loans do not need the same provisioning as unsecured loans in commercial banks because they are not as risky (as demonstrated by their high repayment rate) and high provisioning cuts into their available funds for their revenue-generating lending activities. Yet MFI portfolios tend to be more volatile than those in commercial banks, and delinquency can be extremely contagious since repayment incentives decline when it becomes less likely that the financial institution will survive.

However, Christen and Rosenberg (2000a, 2000b) warn that any attempt to implement a new regulatory framework in the microfinance sector and to improve the performance of existing MFIs should beware of potential unintended consequences. For example, Corporsol, the largest MFI in Colombia, acquired a licensed finance company simply to be able to capture commercial funding; all the loan operations were run by the NGO to avoid the interest rate cap placed on licensed finance companies. The lack of transparency to avoid regulation made it difficult to evaluate Corporsol's performance, and it collapsed in 1996 because of escalating repayment problems. Similarly, over-specific regulations on physical requirements for branches can limit innovation and competition by restricting the use of light offices, mobile banking, and ATMs in villages without local branches.

## The Crucial Role of Donors

In the quest for developing savings and deposit systems for the poor, donors can play a crucial role by absorbing some of the challenges that face the tasks of developing new financial services, improving information, and providing sound policy and legal frameworks. There are three main levels of intervention: the institutional level, the industry level, and the policy level.

At the institutional level, donors can alleviate the costs of outreach by providing financing for the research and development of new products and delivery mechanisms (including testing), and for staff training. The Consultative Group to Assist the Poor (CGAP 2003a) warns donors to avoid subsidizing loans to make up for large costs; investing in long-term development of products and delivery innovations maintains institutional incentives for performance.

At the industry level, donors can help set up information-sharing systems (including credit bureaus), and provide auditing and technical assistance. At the policy level, donors can advise regulatory agencies on the design of simple and transparent licensing and regulatory frameworks, and help agencies build supervisory capacity.

However, sequencing is crucial (Robinson 2002). MFIs rolling out savings products must be prepared for a substantial and rapid increase in membership, since more low-income people typically want to save at any one time than to borrow.<sup>26</sup> Accordingly, before deployment takes place, the following must be firmly in place: regulatory and supervisory capacity; a financially sound institution; rigorous product development (research, pilot, evaluation); institutional capacity building for expansion; and a systematic approach and proper staff incentives for growth.

The development of savings and deposit services for the poor requires a comprehensive view of the sector. This will require cooperation among donors and with the local institutions. Local managers have a much better sense of local needs and constraints. Specialized institutions have built technical expertise in particular areas. Large donors have the credibility to gather and disseminate information, help develop training programs for use at the local and policy level, lobby and advise governments on financial sector strategy, and fund supervisory capacity development. As demonstrated by the experience with microcredit institutions, cookie-cutter approaches do not work and substantial investment in money and time will be necessary to develop sustainable localized approaches. Donors should concentrate on those in sectors in which they have particular expertise or tolerance of risk.

Most of all, donors and governments should avoid a “rush to regulate” in fear of putting small depositor funds at risk. After all, the poor to date have had access only to unregulated financial institutions. The crucial issue is developing the capacity to provide them with better opportunities—and that takes time and care.

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<sup>26</sup> Mature MFIs tend to have more savings accounts than loans.



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## COMMENT

**Banking the Unbanked:  
The Experience of Mexico's National Savings and  
Financial Services Bank (BANSEFI)**

*Javier Gavito Mohar*

Formal financial systems in developing countries often lack depth, leaving the majority of the population without access to financial services. Consequently, low-income households must turn to informal financial markets, which are characterized by high interest rates and lack of regulations—which make transactions insecure. This situation has limited the growth of productive activities, as well as economic development at the regional level. Additionally, it is an obstacle to alleviating poverty.

To address this problem, developing countries had opted for two formal solutions. *The market solution* has focused on the traditional financial sector. This solution has been based on the penetration and deepening of the financial sector by traditional financial intermediaries, such as commercial banks. It has failed because of lack of interest from commercial banks. No expansion of outreach has been possible.

*The State intervention solution* has focused on credit and the traditional development bank. As an alternative to market failures, governments have implemented policies that have relied on direct credit at subsidized interest rates, and subsidized credit guarantees through first and second tier development banks and trusts. This strategy has led to recurrent debt forgiveness and restructuring because of inappropriate incentives. The use of commercial banks as first tier intermediaries has yielded no results in terms of higher levels of outreach.

The market and the State intervention models have not been able to cope with the challenge of deepening the financial system. This situation has stimulated the creation of multiple entities with different legal status aimed at serving the demand for financial services of the poor. Many have been in the market for more than 50 years and most of them have not been regulated and supervised by the authorities. Thus, the *semi-informal solution* has had a life of its own and has been able to meet demand only at the margin. The sector includes more than 439 privately or collectively owned financial intermediaries in Mexico, strongly linked to their communities.

***The Creation of a Social Bank in Mexico***

The administration of President Vicente Fox, with the help of Congress, designed a public policy to transform the activities of the semi-formal financial sector into an opportunity to deepen the financial system. This policy includes legislative action by Congress to approve an adequate legal and regulatory framework according to international standards

### Characteristics and Expected Results of the Social Bank

Characteristics	Expected results
Targeting low- and medium-income groups	The development and consolidation of the sector, aiming at self-sustainable and adequately regulated financial intermediaries, either privately or collectively owned, and strongly linked with their communities
High potential to provide financial services for unmet demand. Offers different financial products that respond to client needs. Savings is key to generate funding for the loan portfolio.	Protection of depositors
Reduce problems of asymmetric information	Increase in outreach to the unbanked
Reduce the transaction costs inherent in the size of transaction and kind of population clientele	Promotion of economic and social development at the community level, by consolidating sustainable financial intermediation
Presence in both rural and urban areas	

(Popular Savings and Credit Act); creation by law of a development bank (National Savings and Financial Services Bank, BANSEFI) as the State vehicle to promote and coordinate the transformation of the semi-formal sector; and governmental investment through fiscal transfers to strengthen the institutional capacity of the sector, through technical assistance, training, technological platforms, and network creation (L@ Red de la Gente).

### *The Role of BANSEFI: Banking the Unbanked*

To support and coordinate the development of the microfinance sector in Mexico, the National Savings Association (PAHNAL) was transformed into BANSEFI in November 2001. This Bank seeks to achieve three main objectives: to promote savings, to become the *Caisse Centrale* of the microfinance sector, and to coordinate government aid to the sector.

### Promoting Savings

Between January 2001 and May 2006, the number of savings accounts grew approximately 400 percent, from 850,000 to 3.3 million. The BANSEFI distribution network has spread to 523 branches. Half are located in places where the presence of a commercial bank is minimal or nonexistent. To encourage savings behavior, customers can open an account with only \$5. No fees are charged, and market interest rates are paid. To promote the banking of the population, BANSEFI distributes payments from federal government programs (Oportunidades and Procampo) through its branches and L@ Red de la Gente.<sup>1</sup>

<sup>1</sup> L@Red de la Gente is a voluntary commercial alliance between BANSEFI and the regulated microfinance intermediaries. It integrates the branches of BANSEFI with these intermediaries to distribute remittances and government programs. Branches are located in urban and rural areas, where commercial banks usually have no presence.



Recipients of payments from those programs must open a savings account in BANSEFI. Oportunidades<sup>2</sup> is a successful program implemented by the Subsecretaría de Desarrollo Social y Humano (SEDESOL) that provides health, nutrition, and educational support to Mexico's poorest families. As of May 2006, 1.2 million savings accounts had been opened.

Through the Jóvenes con Oportunidades program, students who have completed high school with the support of Oportunidades receive additional government support of \$120 to \$300 by opening an account to promote savings and continue their studies. As of May 2006, 188,601 accounts had been opened.

Through these arrangements, beneficiaries of Mexican social policy programs are introduced to the use of formal financial products, most of them for the first time. Moreover, these programs have demonstrated their capacity to promote a savings culture. After their second payment, virtually all (94 percent) of the beneficiaries of social programs have a positive balance in their account. After the fifth cash payment, 5 percent of beneficiaries make deposits from another source of income.

### Improving Access to Housing Savings

BANSEFI and the federal government mortgage agencies are offering different savings products to access housing credit.

*Cuentahorro INFONAVIT:* This program allows the user to obtain a mortgage loan through the Instituto del Fondo Nacional para la Vivienda de los Trabajadores (INFONAVIT) after reaching a previously established savings goal (up to 15 percent of the total credit to which he/she is entitled).

*Vivienda Ahorro:* This program makes it possible to obtain a subsidy for housing granted through the Fondo de Habitaciones Populares (FONHAPO) when the user reaches a pre-established savings goal. This program is oriented toward families that earn up to four times the minimum daily wage (35.12 pesos = \$3.65). The federal government provides a subsidy of 90 percent of the cost of a housing unit priced up to 150,000 pesos.

*Ahorra SIF.* This program was launched through an alliance of BANSEFI and the Sociedad Hipotecaria Federal (SHF) to help families obtain housing credit. This program is oriented to families that cannot document the source of their income but have demonstrated the capacity to save.

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<sup>2</sup> *Oportunidades* was one of the first conditional cash transfer programs to be implemented in Latin America and the Caribbean and provides benefits to more than 5 million poor households in rural areas of Mexico.



### Becoming the *Caisse Centrale* of the Microfinance Sector

BANSEFI is moving toward acting as a central agency for Mexico's microfinance institutions. In this regard it is carrying out its efforts to offer financial services to help them expand the range of products they can bring their customers and members; reducing their costs of regulation and operation; and improving management efficiency and the quality of their services.

The cost of the products and services offered by BANSEFI must be competitive because the institutions are free to choose who will provide these products and services. As the microfinance sector is capitalized, the participation of the federations (bodies that comprise a number of popular savings and credit institutions) in the equity of BANSEFI will be promoted.

Today BANSEFI provides asset management services to 227 microfinance institutions with a total asset amount around \$100 million. Additional services will soon be offered to microfinance institutions and/or their customers that are transformed according to the law:

- Acting as the clearinghouse for both national and international money transfers
- Acting as the clearinghouse and issuer of credit and debit cards
- Offering
  - checking accounts and cash management services;
  - risk management consultancy;
  - asset and liability management consultancy;
  - management of ATMs and POSs,
  - foreign exchange and derivatives operations; and
  - trusts.

### Coordinating Government Aid

Congressional approval of a legal framework aimed at transforming the sector and the fact that the government is actively supporting this transformation have attracted backing from the international community. Support includes a MIF/IDB grant of \$3.5 million, which triggered the project when it was in the design stage; a World Bank credit of \$140 million to support the transformation of the sector and help the institutionalization process; and a grant from the Government of Germany of 1 million euros for technical assistance for the federations.

These funds have been allocated to the following projects:

*Technical assistance.* BANSEFI is providing technical assistance to 416 intermediaries in the social banking sector, most of them affiliated with 15 federations, to help the transformation of the federations and their members. The evaluation standards and diagnosis methodologies being used resulted from the work of a group of international and nation-

al experts financed by the World Bank, coordinated by the Comisión Nacional Bancaria y de Valores and BANSEFI. They include the main financial indicators and fundamental aspects of the new legal framework and regulation. The standards classify financial intermediaries into one of four groups: those that are ready to be authorized; those that require an improvement program to be authorized; those that will have to split, merge, or reorganize their structures and internal control; or those that must be liquidated in an orderly manner.

International consultants and federations' supervision committees established customized work plans for the recipients of technical assistance, aimed at incorporating each participant into the new legal framework.

*Training.* To build human capital, several types of courses and training are being offered. Expert consultants have provided more than 416 financial intermediaries courses in such areas as accounting, credit, risk management, and financial analysis. These workshops represent an important tool in the creation of a new culture of duties and responsibilities, free from the misconceptions of failed policies of the past.

*L@Red de la Gente.* L@Red de la Gente will be supported by a platform that will use state-of-the-art technology and will allow BANSEFI branches and regulated microfinance intermediaries to connect to the network through the Internet in real time. Members will be able to expand the variety of financial products and services they can offer, such as remittance payments, delivery of payments from federal government programs (Oportunidades and Jóvenes con Oportunidades), loans from federal mortgage agencies, and health insurance to low-income customers and their families (in process).

The members of this network will also obtain economies of scale and economies of scope through the network. The microfinance sector is promoted through a single brand, and the individuality of the participating intermediaries is respected. A single technological process is used to distribute products, governmental programs, and financial services, increasing efficiency and productivity. Today, L@ Red de la Gente has 89 partners (including BANSEFI), which represent 1,225 branches in Mexico.

*Technological platform.* Integra T, the technological platform that is being built, will allow users to provide financial products and services in a competitive and efficient manner. The platform offers a menu of options that includes Back Office, which reduces the need to invest and operate information and accounting systems.

The technological platform will allow microfinance institutions to operate in network, as well as to centralize information to improve decisionmaking and minimize costs of operation and supervision. The technological design is based in the autonomy of the institutions and is scalable according to their needs. The technology services will be provided monthly, mostly through outsourcers.

***Final Remarks***

Savings banks are destined to play an important role in the Mexican financial system. The new legal framework is the first step toward providing certainty to depositors and investors who participate in the sector.

The sector's distribution network is well positioned to cover areas where commercial banks have no presence in or knowledge of local markets. This will be a powerful tool to banking the unbanked.

The incorporation of technology, technical assistance, regulatory compliance, and best governance practices will be key drivers in the sector.

The transformation and formalization of the sector will contribute to deepening the Mexican financial system, allowing more people—particularly those with low levels of income—to have access to financial products and services and hence to gain new opportunities to promote their development.

# 7

## Deposit Insurance and Poverty Reduction

Edgardo Demaestri, Facundo Martín, and David K. Walker

Many countries are adopting explicit limited deposit insurance systems.<sup>1</sup> A number of these countries, including Honduras, Mongolia, and Vietnam, have included such systems as a component of the poverty reduction strategies they are adopting with World Bank and IMF support.<sup>2</sup>

This chapter investigates the relationship between deposit insurance and poverty reduction: an area of only limited study to date. It reviews earlier research in this area and develops a conceptual framework to analyze how differing deposit insurance objectives and design features may influence poverty reduction outcomes. Relevant country information is used, where appropriate. The study first focuses on the links between financial development, growth, and poverty; then it introduces deposit insurance in order to understand its effects on growth and poverty.

Before proceeding further with the analysis, it is important to understand that while deposit insurance systems are usually aimed at protecting the savings of small depositors, they have limited impact on the very poor. In cases of extreme poverty, individuals have little or no formal savings to access the financial system. However, deposit insurance systems can provide benefits to the very poor *indirectly* by contributing to the stability of the financial system and by ensuring that the banking sector funds the cost of financial rescues, rather than taxpayers.

This chapter is organized as follows. The next section analyses the connection between development in the financial sector, growth, and poverty reduction, from both

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<sup>1</sup> An explicit limited deposit insurance system is usually distinguished by statutes or other legal instruments that stipulate the rules governing the terms and conditions of protection.

<sup>2</sup> These strategies are presented in so-called Poverty Reduction Strategy Papers (PRSPs). In September 1999, the World Bank and International Monetary Fund requested that countries taking part in their concessional lending and debt relief assistance prepare PRSPs. The World Bank and IMF endorse a three-pronged approach to poverty reduction strategies involving promoting opportunities for the poor, enhancing empowerment, and increasing security for poor people.

macro and micro models. The third section introduces deposit insurance and reviews the ways in which theoretical, empirical, and case study literature have analyzed the issue, usually relating deposit insurance to its effects on banking sector stability or growth. An illustration of these concepts is presented with a comparative static exercise using an extension of the model by King and Levine (1993b) and a potential extension of Townsend and Ueda (2001). The fourth section studies the impact of different deposit insurance objectives on financial development and poverty reduction. The fifth section concentrates on the characteristics of a deposit insurance system, trying to identify some desirable elements to help reduce poverty—or at least avoid negative effects on poverty. The sixth section concludes and presents some ideas for the future research.

### **Financial Sector Development, Economic Growth, and Poverty Reduction**

Although poverty can be defined in many ways, it is often looked at in terms of whether households or individuals have the capability to meet their basic needs. This usually involves an analysis of income and its distribution, consumption, education, or other factors, along with some defined threshold below which a household or individual is considered to be poor (see Coudouel, Hentschel, and Wodon 2002). Because of data limitations, however, this study will approximate poverty by changes in economic growth and per capita income.

Much of the economic literature on poverty reduction emphasizes the need to create opportunities for the poor to raise their incomes and improve their economic security. These goals are being addressed in a variety of ways, including policies to stimulate economic growth and by focusing on building a positive climate to promote savings and investment, small and medium-size businesses, and job creation.

Although the very poor usually have little or no access to the formal financial system, either because of high transaction costs or lack of savings, developments in the formal financial system will have significant macroeconomic effects. Those who do not participate in the financial system will be affected in some way by the strong links between the financial sector and the real economy.

The development of macroeconomic models that directly incorporate the relationship between financial sector development and economic growth is a relatively recent phenomenon in economic literature. Most macro models in use treat the financial sector through a general flow of funds approach. That is, in equilibrium savings equals investment, and primary lending in the economy equals primary borrowing. The development of the financial sector leads to growth in savings and credit, which translates into growth in investment, capital formation, and ultimately growth in the economy as a whole and in per capita income.

One of the first comprehensive attempts at examining the specific relationship between the financial system and economic growth was by Raymond Goldsmith

(1969).<sup>3</sup> He based his work on a source and uses of funds in a closed economy model and illustrated how savings, borrowings, lending, and the use of securities influence economic growth. Using data on 35 countries from 1860 to 1963, Goldsmith found a strong linkage between financial sector development and per capita income.<sup>4</sup>

Theoretical and empirical work by King and Levine (1993a,b) and Levine (1996) built on Goldsmith's earlier paper and found that there is a positive relationship between the development of financial instruments, financial institutions, and markets and the speed and pattern of economic growth. Levine saw financial systems as facilitating the allocation of resources across space and time, in an uncertain environment. Financial systems can contribute to better risk shifting, allocation of capital, more efficient trading of goods and services, better financial contracts, and the mobilization of savings—all of which can lead to higher economic growth and rising incomes. Doing so, however, requires overcoming two main barriers: the transaction costs associated with collecting savings from different individuals, and informational asymmetries associated with making savers feel comfortable in relinquishing control of their savings.<sup>5</sup> Thus, financial intermediaries (including banks and savings institutions) must have good networks to collect deposits and must have a good reputation so savers feel comfortable entrusting them with their savings.

However, the delegation of savings to an intermediary raises the question of who will monitor the intermediary. If the intermediary is exposed to effective market discipline and has a well-diversified portfolio, it should be able to meet its obligations with little risk. But this is not always the case, and depositors may be faced with the potential of default risk and institutional failure. If enough depositors view default risk as significant (and these depositors do not have enough information available or the ability to interpret information on bank risk), this could diminish the attractiveness of using banks and savings institutions.

Developing these considerations in model form, King and Levine (1993a) looked at four indicators of financial system development: the overall size of the formal financial intermediary sector; the degree to which the central bank allocates credit, compared to commercial banks; the ratio of private credit to total domestic credit allocation; and the ratio of total credit extended to the private sector over GDP. The four indicators were assessed against three measures of growth from 1960 to 1989:

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<sup>3</sup> Growth models developed in the 1980s using capital externalities or linear production functions ("Ak models") to generate steady-state per capita growth—such as Romer (1986) and Lucas (1988)—also illustrate how financial systems affect growth by stimulating the rate of savings or by reallocating savings among different capital producing technologies.

<sup>4</sup> However, his early research did not fully control for other factors influencing economic growth and did not identify the direction of causality between economic growth and financial system development.

<sup>5</sup> Informational asymmetries arise whenever the information available to one party is not the same as that available to the other party.

average GDP growth per capita, average rate of growth in the capital stock per capita, and total productivity growth. The regressions were run on a pooled cross-section of 77 countries. The authors found that financial sector development is strongly linked to economic growth.<sup>6</sup>

In contrast to their macro counterparts, micro models looking at financial development and economic growth tend to focus on how individual households, firms, and governments earn income and make decisions under risk and uncertainty to deploy their resources productively. Greenwood and Jovanovic (1990) construct a model showing how financial intermediation and economic growth are linked. The authors detail a Pareto optimal competitive equilibrium with a set of value functions, savings rules, and pricing functions. Their work assumes that the costs of entry in poorly designed financial systems can limit access to savings and credit, reinforcing low levels of income, consumption, and savings. The model assumes that the very poor have a low savings rate and are hindered in joining the formal financial sector by the high cost of developing linkages. Wealthier agents have a higher savings rate and tend to enjoy higher returns from the financial sector. Thus income inequality in this model increases over time, widening inequality. Over time, with development, the proportion of agents outside the formal financial sector declines while those within it rise, helping to stimulate income growth for the poor and helping to reduce income inequality over the long term.<sup>7</sup>

Models developed by Townsend (1995, 2001) address the issues of risk and insurance for the poor and incorporate many of these concepts. For instance, Townsend observes that the poor often face high levels of risk in terms of income fluctuations, and much of this risk appears to emanate from shocks. If the shocks are idiosyncratic, then opportunities may exist to insure against these risks: that is, through local pooling of savings and insurance. The poor find it costly to participate in the financial system because of the fixed cost of entry in the form of learning costs or physical infrastructure, and marginal transaction costs. Thus, they remain uninsured from income fluctuations. This, in turn, leads to increasing inequality relative to those inside the formal financial system. Using

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<sup>6</sup> In addition to spurring economic growth, financial development may also help dampen income inequality, work by Li, Squire, and Zou (1998) suggests. Also, recent work by Beck, Demirgüç-Kunt, and Levine (2004) shows a positive relationship between financial system development, economic growth, and the ability of the financial sector to raise the incomes of the poor.

<sup>7</sup> Savings is increasingly being viewed as a powerful tool for poverty reduction. Until recently, microfinance initiatives focused mainly on providing credit. While important, credit does not always reach the very poor. In many developing countries, more capital is banked informally and in very small amounts. Often such savings are in forms that are illiquid (such as jewelry) or difficult to secure. Bringing these small savings into the formal financial sector by providing savings services can be very helpful (see Vogel 1984, and chapters 5 and 6). In particular, having a deposit account can help a poor person secure a loan. Enhancing the savings and investment climate for the poor is of particular importance in that it can give them access to useful financial products and services to help them reduce their vulnerability to shocks and crises.



survey data and a variety of different models, Townsend found that many of these shocks are indeed idiosyncratic and that existing financial markets and institutions can help individuals deal with these risks with varying degrees of effectiveness.

Townsend (1995) looked at village food banks, credit unions, local money lenders, banks, rural credit programs, and insurance companies, among other methods. His data samples and analysis also suggest that the poor often have low levels of insurance against risk because of problems with moral hazard, adverse selection, and other counterproductive incentives. He and others also found that many efforts to address these problems, such as rural credit programs, have not been particularly successful (for example, see Adams 1984).

In summary, the economic literature usually emphasizes the important role of financial development in promoting or facilitating growth. Given that economic growth is a fundamental component of poverty reduction, this study now focuses on how deposit insurance systems can improve financial development and generate the conditions for more growth and less poverty.

## **Linking Deposit Insurance, Financial Sector Development, and Poverty Reduction**

### ***Developing a Conceptual Framework***

The importance of banks in the economy, the potential for depositors to suffer losses when banks fail, and the need to mitigate “runs” and “contagion” risks lead most countries to establish financial safety nets. A financial safety net usually includes prudential regulation and supervision, a lender of last resort and, increasingly, some form of deposit protection system. Without deposit protection arrangements, the possibility exists that depositors might cause a run on all or some banks by removing their deposits in response to difficulties at a single bank. Bank runs, even if they are isolated, have the risk of ending in systemic banking crises, converting a short-term liquidity problem into a more serious problem of solvency.

The difference between a bank run and a stock market run is that once a bank run is on its way, there is no fall in prices that will deter or stop it. In stock markets, a fall in the price of equity during a run on equities will help convince some potential sellers not to dump their stocks. Bank deposits, on the contrary, remain redeemable at par until the bank locks its doors, so that the best strategy for bank depositors in the case of a confidence crisis is to run before the bank closes. In this way, the confidence problem can become self-fulfilling.

The economic and social costs of systemic crises may be huge, with obvious negative consequences on poverty. Demirgüç-Kunt and Kane (2001) estimate that the fiscal cost alone of the southeast Asian crisis of 1997 exceeded 30 percent of GDP in Thailand and Korea, and was close to 50 percent in Indonesia. Following a survey on global finance by

**TABLE 7.1**  
**The Fiscal Cost of Banking Crises in Various Countries**

Crisis period	Country	Cost as a percent of GDP
1980–1982	Argentina	55.1
1997–2002	Indonesia	55.0
1981–1983	Chile	42.0
1997–2002	Thailand	34.8
1997–2002	Republic of Korea	28.0
1990–present [2003]	Japan	24.0
1994–1995	Venezuela	22.0
1995	Mexico	19.3
1997–2001	Malaysia	16.4
1994–1996	Brazil	13.2
1989–1991	Czech Republic	12.0
1991–1994	Finland	11.2
1991–1995	Hungary	10.0
1990–1993	Norway	8.0
1998–1999	Russia	7.0
1991–1994	Sweden	4.0
1988–1991	United States	3.2

*Source:* Claessens, Klingebiel, and Laevan (2003).

*The Economist*,<sup>8</sup> Dobson and Hufbauer (2002) have gathered estimates of the cost in lost GDP of 24 banking crises and 36 currency crises during the 1980s and 1990s. Research suggests that the calamities of the 1980s cost Latin America an average of 2.2 percent of GDP a year over the decade. In the 1990s East Asia's financial traumas cost the region 1.4 percent of GDP a year. Table 7.1, taken from Claessens, Klingebiel, and Laevan (2003) presents estimations of the cost of rescuing banks in several countries as a proportion of GDP.

Some countries chose implicit deposit protection arrangements that arise when the public, including depositors and other creditors, expect full protection in the event of a

<sup>8</sup> Survey on Global Finance, "Catching the Tide," *The Economist*, 3 May, 2003, p. 5. Available at [http://www.economist.com/printedition/displayStory.cfm?story\\_id=1730335](http://www.economist.com/printedition/displayStory.cfm?story_id=1730335)

bank failure. Others choose an explicit deposit insurance system, which is usually distinguished by statutes or other legal instruments that stipulate the rules governing the terms and conditions of protection. Many countries prefer explicit limited deposit insurance to implicit protection because it reduces uncertainty and risk for depositors and can be helpful in reducing expectations on the part of the public of government support in the event of a bank failure.

Does the existence of an explicit deposit insurance system have an impact on poverty reduction? One would expect that the introduction of an effective deposit insurance system (which minimizes potential moral hazard problems) would contribute to greater confidence in financial institutions generally and thus lead to a higher level of savings, investment, and incomes than would otherwise be the case, all other things being equal.

The mechanisms by which a deposit insurance system may contribute to greater confidence and stability are likely to be both indirect and direct. That is, deposit insurance can play a role, along with other elements of the financial safety net, in creating an environment of confidence in the entire financial system. In terms of a direct impact, the existence of deposit insurance may be associated with the increased use of savings deposits to provide insurance against shocks, accumulate wealth, and facilitate greater access to lending services for the general population and the poor in particular. More specifically, by protecting small depositors, even if they may not be the poorest in society, it can safeguard their limited saving and prevent them from becoming poorer. Moreover, by inducing a fairer sharing of the costs of resolving crises, deposit insurance systems can ensure that poor taxpayers are not forced to subsidize the protection of higher income depositors.

The indirect effects on poverty are extremely important, as well. An economy where banks have a potential default risk will generate lower growth rates vis-à-vis another one where there is more confidence in the banking sector because fewer savings will be intermediated. A successful deposit insurance system, as part of a more complex safety net, may generate confidence in the banking sector, increasing the level of intermediation and making more resources available to finance investment, leading to more growth in the medium and long run.

Some would argue that the benefits of explicit deposit insurance could be achieved with 100 percent implicit insurance. In countries where implicit protection for deposits is prevalent, this can help safeguard the financial system. However, even in such cases, there may be some uncertainty regarding the existence of this implicit guarantee and the timing and extent of coverage for depositors. Moreover, such systems often protect the largest and most politically connected institutions and creditors. In addition, the cost of the implicit protection usually falls on the government, whereas an explicit deposit insurance system usually requires banks to cover these costs directly. An explicit limited system can help redress these imbalances and level the playing field for smaller banks.

The existence of State banks, with their implicit or explicit full government guarantees, could also diminish the need for a formal deposit insurance system. However, few countries have an economically viable State banking system that effectively provides

such services—particularly to the very poor. Moreover, many countries have been seeking to steadily reduce the role of State banks in the financial system in favor of private banking or some form of limited deposit insurance.

Most of the theoretical and empirical work on deposit insurance has focused on such issues as its impact on financial stability and pricing, rather than poverty reduction per se. For example, Diamond and Dybvig (1983), in their seminal paper on deposit insurance, showed that in the absence of moral hazard, deposit insurance can reduce the likelihood of contagious bank runs, maintaining confidence in a country's financial system. Others argue that deposit insurance introduces moral hazard into a financial system by reducing the monitoring of financial institutions by depositors. In the absence of mitigants such as sound regulation or incentive compatible design features, deposit insurance can allow banks to take on more risks than would otherwise be the case.<sup>9</sup> Thus while deposit insurance can contribute to stability by helping to avoid runs, it may introduce instability through this moral hazard mechanisms.<sup>10</sup>

However, the majority of these models assume that in the absence of explicit deposit insurance, there is full and effective monitoring by depositors and therefore a high level of market discipline. Most of these models do not take into account the role that other elements of the financial safety net, such as prudential regulation and supervision and use of lender of last resort facilities, can play in introducing moral hazard into a financial system. For instance, studies by Gropp and Vessala (2001) and Nier and Baumann (2003) illustrate that moral hazard associated with implicit protection may exceed that generated by explicit deposit insurance. And, the Financial Stability Forum Working Group on Deposit Insurance (2001), which incorporated the practical experience of a wide range of countries with deposit protection arrangements, emphasized that moral hazard is a feature of *all* safety nets—not just deposit insurance. The Working Group went on to emphasize that moral hazard associated with a safety net can be mitigated by ensuring good corporate governance and sound risk management of individual banks, effective market discipline, and frameworks for strong prudential regulation, supervision, and laws.

Some recent works, while recognizing the potential moral hazard problems originated in deposit insurance systems, analyze how the introduction of specific prudential regulation or variations in the characteristics of deposit insurance systems may help overcome these problems. Cordella and Levy Yeyati (2002) focus on some characteristics of deposit insurance and make the case for risk-based insurance premiums to eliminate the moral hazard incentives and increase welfare.

In terms of prudential regulation, Cooper and Ross (2002) extend the Diamond and Dybvig (1983) model to evaluate the costs and benefits of deposit insurance in the

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<sup>9</sup> Moral hazard in this context refers to the incentive for risk-taking by banks or those receiving the benefit of protection.

<sup>10</sup> See studies by Kane (1989) and Demirgüç-Kunt and Detragiache (2002).

presence of moral hazard by banks and monitoring by depositors. They find that full deposit insurance (that is, 100 percent blanket deposit coverage) is not a first-best solution because depositors will not have incentives to monitor the banks and banks may incur excessive risk taking. This analysis shows that deposit insurance avoids bank runs but implies less monitoring by depositors, and in the absence of suitable controls such as sound regulation or incentive compatible design features, allows banks to take on more risk than would otherwise be the case. However, with complete deposit insurance and sufficiently large capital requirements, the moral hazard problem can be solved, bank runs can be eliminated, and depositors do not need to monitor since they are completely insured. The paper shows how the costs of a deposit insurance system can be overcome with adequate capital requirements.

Empirical analysis has also yielded mixed results on the question of the contribution of deposit insurance to financial system stability. Based on data collected from 1980 to 1997, Demirgüç-Kunt and Detragiache (1998, 2002) of the World Bank claim that the probability of a banking crisis, on average, increases under an explicit deposit insurance system because of moral hazard. According to their research, the negative effects of deposit insurance on bank stability are greater in countries with weak institutions that cannot contain the risk of moral hazard through effective prudential regulation and supervision of the banking system. The authors stress that the results depend heavily on individual country characteristics and the specific design features of the systems in question. A series of World Bank studies by Barth, Caprio, and Levine (2001) using similar methodologies supported these findings.

In contrast, work by Eichengreen and Arteta (2000) using different data sets and definitions of financial system crisis found no convincing evidence to support the claim that deposit insurance leads to greater financial instability on average. Their work suggests that the causes of financial crises are numerous (such as inappropriate macroeconomic policies and poorly designed and implemented financial system liberalization) and vary from country to country. In addition, work by Gropp and Vesala (2001) found that European banks did not respond to the establishment of deposit insurance in the European Union by increasing risk. Research by the Working Group (Financial Stability Forum 2001) indicates that a well designed and implemented deposit insurance system can contribute to financial stability without introducing significant moral hazard.

More in line with the purpose of this study, a connection between deposit insurance and economic growth is made by Amable, Chatelain, and De Bandt (2002). They construct an overlapping generation model with endogenous growth and show how deposit insurance may reduce instability in the banking sector, and increase the number of deposits, welfare, and growth. The lack of depositors' confidence because of the threat of a failure of the banking system may be detrimental to long-run economic growth. The lack of confidence inhibits the collection of saving and may contribute to the persistence of poverty traps.

According to their model, the systemic risk is eliminated (a simultaneous default of all banks is eliminated) with the introduction of a deposit insurance fund that pays

depositors with certainty if the bank fails. The young generation is taxed only after the macroeconomic shock is known and if banks cannot make the difference between the realized value of their investments and the promised value to depositors. This works as a social security pay-as-you-go system designed to ensure that the old generation receives their deposits with certainty. The main problem is that there will be limits to the availability of funds: the tax proceeds are bounded by the aggregate income of the young generation.

Based on this model and its assumptions, the introduction of deposit insurance appears to have two opposite effects. On one hand, there is an increase in the number of deposits collected by banks, since the probability of depositor losses in bank failures has decreased. On the other hand, there is a reduction in overall saving as a consequence of taxation. In this way, by reducing saving, investment will be reduced and it may not be welfare improving because deposit insurance is too costly.<sup>11</sup>

This model also argues that deposit insurance with free entry of banks leads to higher growth both because there is no longer distrust in the banking system and because the number of banks increases. They also show that only an incomplete deposit insurance system can be implemented. Those states of nature for large negative macroeconomic shocks cannot be insured because it is too costly, thus making the case against blanket guarantees.

In a similar vein to these arguments, deposit insurance can be thought of as a risk-shifting mechanism for the poor.<sup>12</sup> That is, deposit insurance can shift risks from the small depositor to the deposit insurer, the banking industry, and the government (which can be viewed as having a contingent liability if the resources of the deposit insurer are insufficient to deal with failures).

Carrying this argument further, it has been suggested that to the extent that a deposit insurance system pre-funds itself by charging levies or premiums, this could raise the transaction costs associated with collecting deposits. The extent to which transaction costs could rise would depend on the level of premiums, competitive conditions in the industry, and the ability of banks to transfer these costs to depositors. Nevertheless, while deposit insurance may raise transaction costs to some degree, it should be kept in mind that these costs are relatively small and need to be weighed against the cost savings to banks and depositors associated with financial stability and the benefits of a more confident depositing public.

Cull, Senbet, and Sorge (2001) examined the relationship between deposit insurance and various measures of financial sector development and stability. Using a 29-country

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<sup>11</sup> The assumption that the deposit insurance system is funded directly from taxpayer funds is an important factor in this model, contributing to a reduction in savings arising from the introduction of deposit insurance. The majority of deposit insurance systems in operation in the world are funded privately by their member institutions, according to Garcia (1999).

<sup>12</sup> This follows from the work of Townsend (1995, 2001), which looks at the concept of risk shifting and insurance for individuals dealing with uncertainty.

sample and simple univariate correlation model, the authors found no strong relationships between the presence of deposit insurance and various measures of financial development (such as ratios of bank credit and liabilities to GDP). However, by developing a model based on agency theory, they generated results showing that deposit insurance systems can positively contribute to financial sector development in the presence of a sound legal environment and provided that coverage levels are not excessively high.

In summary, while there are many different views on the impact of deposit insurance on financial stability, development, and poverty reduction, there appears to be a consensus that deposit insurance can play a net positive role provided that it, and all the other elements of a country's financial safety net, are used to effectively promote stability while mitigating moral hazard.

### ***A Comparative Statics Exercise Based on King and Levine (1993b)***

As mentioned, work by King and Levine (1993b) has been very influential regarding the effects of financial development on economic growth. This section takes their model and reinterprets some of the comparative static results in terms of the introduction of a deposit insurance system.

King and Levine present an endogenous growth model showing the connections between finance, entrepreneurship, and economic growth. Two Schumpeterian ideas are behind the structure of the model. First, innovations are induced by a search of temporary monopoly profits. Second, financial institutions evaluate and fund entrepreneurs with innovative initiatives. The nexus between finance and innovation is central for economic growth.

Productivity growth is endogenous and is the result of rational investment decisions. Financial systems influence the decisions to invest in productivity-enhancing activities through two mechanisms: evaluating prospective entrepreneurs, and funding the most promising ones.

Financial institutions have a comparative advantage relative to individual investors in providing research, evaluation, and monitoring, as well as in mobilizing funds to finance entrepreneurs.

The main idea behind the King and Levine model is that better financial systems improve the probability of successful innovation and then accelerate economic growth. Financial sector distortions, by reducing services provided by the financial system to savers, entrepreneurs, and producers, reduce the rate of innovation and thus reduce the rate of economic growth.

More specifically, in emphasizing the links between finance and innovative activity, the model highlights the demand for four services provided by the financial system.

- Because of the existence of large fixed costs, specialized organizations have a comparative advantage in evaluating investment projects and identifying the most promising ones.



- Given the scale of the projects, funds must be pooled from many small savers and mobilized by financial institutions.
- Given that innovation outcomes are uncertain, there is a need for the financial system to provide the means to individuals and entrepreneurs to diversify these risks.
- If productivity enhancement requires that individuals choose to engage in riskier innovative activities rather than in producing existing goods using existing methods, it becomes important that financial systems reveal the expected profits from innovative activities.

The links between innovation and economic growth are modeled in line with the endogenous technical change literature developed by Romer (1990), Aghion and Howitt (1992), and Grossman and Helpman (1991). In this model, innovations permit a specific entrepreneur to produce one of many intermediate products at a cost temporarily lower than that of his/her rivals. The extent of innovative activity undertaken by societies dictates the rate of economic growth.

In the model, there are many individuals with a time endowment and equal financial wealth. Some of them are potentially capable entrepreneurs: that is, there is some positive probability that they can manage the project well. This capability is not observed but can be ascertained at a cost by the evaluator. Entrepreneurs can be rated in this way, determining the value of a rated entrepreneur. Rated entrepreneurs need a number of units of labor to undertake a successful innovation with some probability. The productive activity takes time and has an uncertain return. A successful innovation gives monopoly profits to the entrepreneur. General equilibrium analysis is approached from both the supply and the demand sides by studying the linkages between returns and growth. The production side linkages between returns and growth are determined by the equilibrium condition in three markets: financial intermediation, the stock market, and the labor market.

The production side relation between interest rates and growth can be written as:

$$(7.1) \quad r = \left\{ 1 - \frac{1}{\lambda} - \frac{m}{\lambda}(1 - \tau) \right\} \gamma + \left\{ \frac{m}{\lambda}(1 - \tau) \right\} \bar{\gamma},$$

where  $r$  is the instantaneous real interest rate prevailing between times  $t$  and  $\Delta t$ ;  $\lambda$  is the continuously compounded rate of productivity growth that occurs when innovation is certain in each industry (when it is certain that some entrepreneur will successfully innovate, generating a capital loss for an incumbent firm);  $m$  is the net mark-up over the firm's unit costs in each industry or sector of intermediate goods;  $\tau$  is the tax rate on the gross income from financial intermediation;  $\gamma$  is the rate of productivity growth (that is, the economy's growth rate or the common growth rate of consumption and the productivity aggregate), and  $\bar{\gamma}$  is the maximum feasible growth rate (or how productive the economy is), obtained if all labor is allocated to innovative activities.

This equation describes an ambiguous relation between interest rates and growth. At the same time, there is a clear negative relation between interest rates and the tax rate for any given growth rate.

The preference side linkages between returns and growth is given by:

$$(7.2) \quad \gamma = \frac{[r - v]}{\sigma},$$

where  $v$  is the pure rate of time preference of the family (how patient they are), and  $1/\sigma$  is the intertemporal elasticity of substitution in consumption for an immortal family with a time-separable utility function (or how willing they are to substitute consumption through time). This equation shows a positive relation between growth and the interest rate.

Combining equations 7.1 and 7.2, the market equilibrium growth rate is given by the following expression:

$$(7.3) \quad \gamma = \frac{\left[ \frac{m}{\lambda} \bar{\gamma} (1 - \tau) - v \right]}{\left[ \sigma - 1 + \frac{1}{\lambda} + \frac{m}{\lambda} \bar{\gamma} (1 - \tau) \right]}.$$

The growth rate is higher if individuals discount the future less or become more patient (lower  $v$ ), or if they are more willing to substitute consumption through time (lower  $\sigma$ ). The same is true if the economy is more productive in the sense of a higher maximum feasible growth rate  $\bar{\gamma}$ , or if there are higher mark-ups ( $m$ ), indicating imperfect competition, or if there is a fall on the capital losses that innovation inflicts on incumbent firms ( $1/\lambda$ ).

How can the results of a model like this be used to analyze the implications of a deposit insurance system on economic growth? First of all, an effective deposit insurance system should increase confidence in the financial system. This may lead to an increase in the patience of individuals, who are now more confident about their deposits in the banking system. In this way, a fall in the rate of impatience or rate of time preference will lead to higher growth. At the same time, and for similar reasons, they may be more willing to substitute consumption through time, lowering and increasing growth. The maximum feasible growth rate ( $\bar{\gamma}$ ) can be thought to be higher with an effective deposit insurance system. If the existence of deposit insurance makes people more confident in the banking system, more funds will be intermediated and will be available to finance innovation. If the probability of success of innovation  $\pi$  is a function of the funds allocated to the project, then this success probability will be higher, leading to a higher maximum feasible growth rate. In this way, the economy becomes more productive and growth is higher.

Apart from confidence-related issues, a successful deposit insurance system can be thought of as a way to improve the enforcement of property rights. As in King and Levine (1993b), a better enforcement of property rights can be seen as an increase in the net mark-up over unit costs  $m$ , leading to an increase in the growth rate through an increase in the size of the financial sector. With a higher return to innovation, entrepreneurs will demand more financial services, and more evaluation and monitoring of their

projects will be needed. A deposit insurance system can be seen as another way to protect the property rights of depositors, giving them more confidence in the financial system and inducing them to deposit more savings—which will finance innovation, leading to higher growth.

However, the equation must also incorporate the way in which a deposit insurance system is financed. The parameter  $\tau$  represents explicit taxes on financial intermediaries (taxes on gross receipts of banks, VAT taxes, or taxes on loan balances, financial transactions, or intermediation profits), as well as implicit or quasi taxes (noninterest-bearing reserve requirements, forced lending to the governments and to State enterprises, and the introduction of interest ceilings on loans and deposits). The premium that banks must pay for a deposit insurance system can be seen as another tax on financial intermediaries (although it produces benefits for the banks). It is clear from equation 7.3 that an increase in taxes leads to a reduction of growth, so that the way to finance a deposit insurance system takes resources out of the system and reduces growth through lower returns on investment. This result is consistent with the findings by Amable, Chatelain, and De Bandt (2002).

Nevertheless, the benefits of a successful and efficient explicit deposit insurance system more than offset the cost of financing it in terms of banking sector stability and protection of smaller depositors. Additionally, the costs of an implicit deposit insurance system would conceivably be even higher.

### ***A Potential Extension Based on Townsend and Ueda (2001)***

The micro model by Townsend and Ueda mentioned above consists of households with an initial wealth endowment,  $k_0$ , which choose consumption,  $c_t$ , and savings or investment,  $s_t$ , in order to maximize their expected discounted utility subject to a simple budget constraint:

$$(7.4) \quad \begin{aligned} \text{Max } E_t \left\{ \sum_{t=0}^{\infty} \beta^t u(c_t) \right\} \\ \text{s.t.:} \quad c_t = k_t - s_t \end{aligned}$$

Two investment technologies are available in the economy: a safe one, producing output at a  $\delta$  rate next period; and a risky one, that returns output per unit invested at a variable rate  $\theta_t + \varepsilon_t$ .  $\theta_t$  is a common aggregate macro shock, while  $\varepsilon_t$  is a project-specific idiosyncratic shock.

Households must decide whether to capitalize their savings into the financial system (becoming participants, and thereby facing a transaction cost), or not (remaining nonparticipants). There is a one-time fixed cost entry fee,  $q > 0$ , and a variable cost,  $(1-\gamma)$ , proportional to the rate of return, where  $\gamma \in [0, 1]$ .

Nonparticipants invest a portion of total savings in the risky technology, so that the next period capital stock is equal to:

$$(7.5) \quad k_{t+1} = s_t [\varphi_t (\theta_t + \varepsilon_t) + (1 + \varphi_t) \delta].$$

Participants deposit  $s_t$  in a bank and then borrow to finance a project under advice from the bank, with a per unit return  $r(\theta_t) = \gamma \max(\delta_t, \theta_t)$ . Next period capital stock is:

$$(7.6) \quad k_{t+1} = s_t [r(\theta_t)].$$

In this way, the idiosyncratic shock is diversified away for those who join the financial sector. The transaction costs generate a constraint in terms of wealth to participate in the financial sector. Only those with wealth above a certain critical level  $K^*$  will do it.

The model is estimated/calibrated with data for Thailand, and also with data for Peru by Alem (see chapter 4), finding that financial deepening has probably contributed to growth and to inequality, and that financial deepening may have been constrained.

Is it possible to modify the model to incorporate elements of a deposit insurance system, or to see how the decision to participate in the financial sector changes in the presence of a deposit insurance system? Even if this goes beyond the reach of this study, one possible reinterpretation is possible. A successful deposit insurance system should increase banking sector stability, reducing the probability of banking crises. In this way, the macro shock may be lessened if there is more confidence in the sector. The risky return of the bank deposit becomes less risky if there is a successful deposit insurance system in operation.

This will affect the return of the participants as well as the nonparticipants because of spillover effects to the rest of the economy. One may hypothesize, without knowing the results of a potential simulation, that more people may be willing to participate in the financial sector, leading to fewer people being subject to idiosyncratic shocks. Will the critical capital stock also be affected by a successful deposit insurance system by reducing the transaction costs? The answers to these questions need to be addressed in the framework of the Townsend and Ueda model, something that goes beyond the purpose of this study.

## **Impact of Different Deposit Insurance Objectives on Financial Development and Poverty Reduction**

The ability of a deposit insurance system to contribute to poverty reduction (either directly or indirectly) may be influenced by factors such as the objectives of the deposit insurance system, its specific design characteristics, and the institutional development of a country.

A number of surveys indicate that the most commonly stated objectives are to: contribute to financial system stability; protect less financially sophisticated deposi-

tors; increase competition in a financial system; and reduce the need for public funds to deal with financial sector problems.<sup>13</sup> The authors are not aware of any country that has adopted a deposit insurance system that explicitly states poverty reduction as an objective.

### ***Contributing to Financial System Stability***

A common objective for most deposit insurance schemes is to contribute to the stability of a country's financial system by reducing the incentives for insured depositors (primarily small depositors) to remove their deposits from a bank unexpectedly. This helps maintain stability, particularly in periods of economic turbulence, and helps reduce the potential for systemic crisis. This is usually done in conjunction with the roles of other safety net players. Obviously by maintaining confidence in the financial system, crises are either avoided or reduced in severity, which benefits all participants, including the poor.

However, as stated in the third section, the ability of a deposit insurance system to do this will depend on its effectiveness in contributing to overall stability, in conjunction with other safety net players. If a deposit insurance system (and other elements of a safety net) are poorly designed and implemented, this can create instability.

The Financial Stability Forum Working Group (2001) guidance for effective deposit insurance systems provides a number of options in this area for minimizing the likelihood of such problems. This includes promoting good corporate governance and sound risk management of individual banks, effective market discipline, and frameworks for strong prudential regulation, supervision, and laws.<sup>14</sup> Moreover, a main point stressed by the Working Group and Garcia (2000) is that country-specific factors—such as the design of legal institutions, accounting and disclosure practices, and regulation—must be taken account of when developing an incentive compatible deposit insurance system.

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<sup>13</sup> See CDIC International Deposit Insurance Survey (2003) and Garcia (1999).

<sup>14</sup> According to the Working Group (Financial Stability Forum 2001, p. 8): "Good corporate governance and sound risk management includes standards, processes, and systems for ensuring appropriate direction and oversight by directors and senior managers; adequate internal controls and audits; management of risks and the evaluation of bank performance; the alignment of remuneration with appropriate business objectives; and management of capital and liquidity positions. Effective market discipline requires sound accounting and disclosure regimes and the ongoing attention to a bank's soundness by rating agencies, market analysts, financial commentators and other professionals. Regulatory discipline can be exercised through effective regulation covering the establishment of new banks, the imposition of minimum capital requirements, the qualifications of directors and managers, sound business activities, a fit-and-proper test for controlling shareholders, standards for risk management, strong internal controls and external audits. Supervisory discipline can be exercised by ensuring that banks are monitored for safety and soundness as well as compliance issues and that corrective actions are taken promptly, including the closure of banks when necessary."

### ***Protecting Less Financially Sophisticated Depositors***

This objective appears to offer the most direct mechanism for reducing poverty, as it primarily acts to improve the security of the poor's savings and enhance their overall economic security. Furthermore, some arguments have been made that a deposit insurance system can help the position of small depositors vis-à-vis larger depositors by encouraging better treatment of small depositors and encourage the entry of more institutions and improve access and competitive benefits for poorer individuals. Garcia (1996) argues that in some cases, limited coverage deposit insurance may help small depositors receive preferential treatment compared to large depositors. This argument is based on the notion that small depositors are likely to have a higher proportion of their deposits protected at a failed bank. Although all depositors may be treated equally up to any coverage limit (in cases where one exists), the difference lies in the depositors' total exposure to potential loss. In addition, in theory, some banks may benefit more than others from limited coverage. Since insurance lowers the risk of deposit repayment, the direct cost of insured deposits (that is, interest costs) should be lower. Banks with a high percentage of insured deposits may have an average cost of funds that is lower than banks with a lower ratio of insured deposits to total deposits.

It seems important to bear in mind that small depositors are not necessarily the poorest. The very poor have limited access to the banking system in most countries, or they lack the savings needed to participate in it, or they have little confidence in the formal financial sector. However, a stable financial system where deposits are explicitly protected may persuade the very poor to participate in the formal financial sector to a greater degree than without explicit protection. Townsend and Ueda (2001) suggest that efforts to attract small depositors into the formal financial system can provide benefits for the poor and stimulate financial system and economic growth. However, care must be taken to ensure that policies designed to attract the poor to the formal financial sector for credit and savings are targeted and efficient (see Kaboski and Townsend 2002).

### ***Improving Competition in the Financial System***

A deposit insurance system may level the competitive playing field for smaller banks (or at least contribute to the contestability of the market), leading to a higher number of smaller institutions, improving deposit rates, and lowering lending costs in the competitive market for all banks, according to Garcia (1996). All these can help smaller depositors and aid in financial sector development and improved accessibility and opportunities for the poor. In the absence of deposit protection, depositors may prefer using large institutions that may be perceived to be less risky because they are protected by an implicit government guarantee and are considered "too big to fail"; or they could have a long history with a high level of brand and franchise awareness among the public. Deposit insurance is seen as a mechanism that reduces depositor's concerns about an institution's

ability to repay deposits, which, in turn, allows new or less well-known banks to attract deposits and potentially avoid paying higher costs for funds.

On the other hand, some theoretical papers have emphasized the fact that more competition in the banking system may lead to less stability by reducing profit margins. For instance, Amable, Chatelain, and De Bandt (2002) analyze two alternative measures to deal with the instability resulting from excess capacity in the banking system: restrictions to competition and entry in the banking sector to increase profits, and the introduction of a deposit insurance system to reduce the risk of depositors losing their savings in a bank failure. They find that the introduction of deposit insurance can contribute to stability by eliminating runs and reducing the incidence of banking crisis. As mentioned above, a deposit insurance system should increase stability by increasing the confidence on the sustainability of banks.

### ***Reducing the Use of Public Funds in Financial Rescues***

Helping to ensure that the banking industry pays for its own problems can help reduce the need for public money to be used for financial rescues. In countries where there is no formal deposit insurance scheme or where the guarantee is implicit, the cost of any attempt to protect deposits often falls directly on the government and all taxpayers, with a probably excessive relative burden on the poor. Deposit insurance schemes can reduce the government's financial obligation by limiting coverage, and by providing a mechanism through which surviving banks may cover all or a portion of the costs associated with resolving failures.<sup>15</sup>

As discussed, the funding of the system plays a crucial role in determining the impact on the poor. If deposit insurance is financed by surviving banks rather than by the government, the risk of the poor subsidizing the lower-to-middle income class small depositors is minimized.

The situation of Argentina during and after the 2001–02 crisis is one good example of this concept. The explicit deposit insurance system in place at the time was not activated because of the systemic nature of the crisis. Instead, the government issued bonds to partially compensate depositors and an implicit deposit insurance system started to operate. The “re-dollarization” of deposits ordered by the Supreme Court of Justice of Argentina constituted another element of such an implicit system. In the absence of an implicit deposit insurance system, weaker banks would likely have failed but the stronger banks would probably have survived.

In retrospect, Argentina's explicit deposit insurance system could have been activated to protect depositors in those banks, leading to a more solid and concentrated banking

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<sup>15</sup> A number of countries in Asia that experienced banking problems during the 1997 Asian financial crisis have cited this as a reason for introducing explicit deposit insurance. In some countries, such as Thailand and Indonesia, a system of 100 percent implicit protection and the emergency use of blanket deposit guarantees led to the widespread use of public funds to bailout the financial system.



system later (although a less competitive one) and a more sound and stable financial system, without hurting small depositors or the poor outside the formal financial sector. However, the use of this implicit protection has shifted the costs of resolving the financial sectors problems to the government and public, including a disproportional large impact on the poor.

## **Impact of Different Design Characteristics of Deposit Insurance Schemes on Financial Sector Development and Poverty Reduction**

Closely linked with the objectives of a deposit insurance system are its design characteristics. Administration and governance arrangements, membership in a scheme, the level and scope of coverage, public awareness of insurance, the speed and accuracy at which protected deposits are repaid, the credibility of the funding mechanisms, and institutional development can all affect the extent to which deposit insurance is capable of contributing to stability, development, and poverty reduction. However, using a deposit insurance system with the sole aim of reducing poverty could be problematic and result in negative trade-offs. Thus balancing objectives with appropriate design features is a key challenge to ensuring that deposit insurance contributes to poverty reduction, on net.

### ***Administration and Governance***

One important question to be asked in designing a deposit insurance system is whether the form of administration has an impact on economic development and poverty reduction. There are many types of systems in place. They tend to range from fully publicly administered to a primarily private; many have an element of both systems.<sup>16</sup>

Completely private systems are usually not established by legislation, have little or no legal obligation to pay depositors, and have no government involvement in their operations. As a result, these systems, by themselves, do not expose the government and taxpayers to loss. Furthermore, a number of predominantly private deposit insurance systems, such as that in place in Germany for commercial banks, rely on self-monitoring of member risks through industry supervision.

While this form of administration may introduce less moral hazard into the financial system, as maintained by Demirgüç-Kunt and Detragiache (2002), practical experience has shown that most private protection systems can function effectively only if failures are infrequent or relatively small, or if entry into the financial system is very limited.

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<sup>16</sup> A survey of 70 explicit deposit insurance systems by Garcia (1999) found government administered schemes were the most common, with 34 in operation. Some 23 schemes were administered jointly by the private and public sectors, and 13 were administered privately.

In an economic downturn, when the protection system is under stress (in dealing with a wave of failures or a single very large failure), the capacity of such systems to absorb losses and pay depositors can become problematic.<sup>17</sup> In these circumstances, the government may have to provide a backstop to the protection system, thus exposing the safety net and public funds, without certain safeguards that would otherwise be in place with a government-backed system.<sup>18</sup>

By contrast, there are predominately privately administered deposit insurance systems that have legislative underpinnings, such as the depositor protection arrangements in Italy. These systems are required to pay depositor claims and usually have access to government assistance, often in the form of interest-bearing loans. Well-structured private deposit insurance systems with these elements can contribute to depositor confidence as well as mitigate moral hazard.

By far the most common deposit insurance systems are those administered by governments. The main advantage of these is that most of them provide the full faith and credit of the government and are part of the financial safety net. As a result, they are able to maintain depositor confidence even in times of great financial stress. Furthermore, government-backed systems usually have the advantage of offering a clear legal obligation (promise) to pay depositors. Many private systems do not provide this degree of legal certainty.<sup>19</sup>

### **Membership**

Membership characteristics may also influence stability, financial development, and poverty reduction. The choice confronting most deposit insurers is whether membership should be compulsory or voluntary. One problem in any given insurance system, and especially so in deposit insurance, is that of adverse selection: the tendency for higher-risk banks to opt for deposit insurance and lower-risk banks to opt out, when membership in a deposit insurance system is voluntary. Given the need to maintain the financial integrity of the deposit insurance system in times of financial stress and reduce confusion on the part of depositors over who is insured and who is not, it would appear that compulsory membership has many benefits. However, the Financial Stability Forum Working Group (2001) and Garcia (2000) suggest that membership should be granted only to institutions

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<sup>17</sup> The private deposit insurance systems used in Argentina in the early 1980s and in Venezuela until the late 1990s did not have the resources to pay insured depositors promptly. This was a factor that deepened and prolonged the financial crises in these countries.

<sup>18</sup> A good example was the experience of the Scandinavian countries in the late 1980s and early 1990s, with their private protection arrangements.

<sup>19</sup> In addition, government administered schemes tend to be more effective in reducing potential bank conflict of interest concerns that can arise in privately administered schemes (that is, where directors from one private bank may have access to confidential information about other banks).

that accept deposits from the public, are financially sound, and are subject to sound supervision and regulation to safeguard the solvency of the insurer.<sup>20</sup>

### *Coverage*

The level and scope of coverage may also affect the extent to which deposit insurance is capable of contributing to the protection of depositors and stability. There are many trade-offs relating to coverage. Obviously, full (100 percent) coverage for all deposits and depositors would effect the greatest protection for depositors but at the same time present the greatest challenge for controlling moral hazard.<sup>21</sup> At the other end of the spectrum, very low coverage levels that do not protect the majority of depositors in the system would not be effective at curtailing runs and protecting the savings of depositors. Work by Demirgüç-Kunt and Detragiache (2002) and Demirgüç-Kunt and Kane (2001) argue that high coverage levels are highly correlated with instability and thus would be detrimental to financial stability—and thus poverty reduction. However, this is not always the case. Some countries (such as Germany and Canada) can sustain very high coverage levels when their deposit insurance systems are supported by a sound supervisory, legal, and accounting systems and there is an emphasis on prompt corrective supervisory action to reduce the cost of failures. Thus each deposit insurance system must find a proper tradeoff when deciding on a suitable coverage level.

In addition to the level of coverage, it is important to be aware that the scope of deposits covered is also important. It is possible to exclude deposits held by depositors who are deemed capable of ascertaining the financial condition of a bank and exerting market discipline, such as deposits held by banks, bank directors, government bodies, and mutual funds and other professional investors. In this way, protection is provided to those who need it most and those individuals that can exercise market discipline are exposed to it.

Another coverage approach often advocated to foster market discipline and to reduce the costs of deposit insurance is the use of coinsurance, whereby a pre-specified proportion of deposits is insured. However, even under a coinsurance system, individuals who have small account balances may not exercise market discipline because of a lack of

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<sup>20</sup> This study defines “banks” as financial institutions that accept deposits from the public. While this would normally include most banks, depending on country circumstances, a deposit insurance system could also include finance companies, credit unions, and possibly even microfinance institutions.

<sup>21</sup> A common practice to try to stop banking crises has been to issue explicit blanket guarantees. Extensive blanket guarantees in case of crisis delay healthy adjustments and prolong such crisis, generating an additional output loss, according to Honohan and Klingebiel (2000). On the other hand, the provision of such guarantees may be unavoidable in a systemic crisis so as to maintain domestic and international confidence in the banking system, Garcia (2000) and Walker and Hoontrakul (2001) argue. However, since such arrangements can have a number of adverse effects if retained too long, notably an increase in moral hazard, they should be removed as quickly as country circumstances permit.

financial incentives or sophistication, or because the costs of doing so exceed the benefits. In this case, individuals bear a cost for bank failure without increasing market discipline. Moreover, for coinsurance to be effective, extensive information must be provided to the public regarding the financial condition of banks. A negative consequence of coinsurance is that depositors may opt out of the banking system altogether.<sup>22</sup>

### ***Funding***

Sound funding arrangements are critical to the effectiveness of a deposit insurance system in maintaining public confidence. A number of alternative systems of funding are available for a deposit insurance system, including government appropriations, levies, or premiums assessed against member banks, market borrowings, or some combination.

The way a deposit insurance system is financed may also have a significant impact on the poor. As discussed, a deposit insurance system entirely financed by the government can lead to taxpayers bearing the entire cost of failures. In fact, one of the many reasons countries have adopted deposit insurance is that in the absence of industry funded insurance, the costs of resolving bank failures fall almost entirely on taxpayers.

Premiums or levies on member institutions can be assessed on an *ex ante* or *ex post* basis. *Ex ante* funding refers to the accumulation of a reserve or a fund. It provides an opportunity to smooth the premiums paid by banks over the course of a business cycle. Because all banks contribute to building and maintaining a reserve or fund, banks that subsequently fail will have contributed to paying for the cost of their failure. *Ex ante* funding sources may be supplemented by measures such as *ex post* levies or premium assessments on member banks, draws on government lines of credit, and/or government guarantees. *Ex ante* funding has the potential to remove capital from the banking system because premiums paid to the deposit insurer cannot be used for other purposes. If policymakers decide to use *ex ante* funding, the deposit insurer should ensure that funds are well managed and readily available to cover losses as they arise (see Financial Stability Forum 2001).

*Ex post* funding requires member banks to pay premiums or levies after failures occur. Demirgüç-Kunt and Detragiache (2002) argue that *ex post* funding may improve inter-bank monitoring because each bank has an incentive to avoid the costs associated with the failure of a member. Such incentives may be particularly strong in banking systems characterized by a small number of large banks. However, because assessments and collections occur after a failure, prompt reimbursement of insured depositors may be more problematic if other funding mechanisms are unavailable at the time. Moreover, banks that fail will not have contributed to funding the costs associated with their failure.

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<sup>22</sup> One way to protect against these potentially adverse effects is to apply coinsurance above a certain amount so that individuals holding small account balances are protected fully against the risk of loss, while maintaining the incentive for depositors holding larger account balances to monitor banks.

In practice, deposit insurance systems often are funded on a combined ex ante and ex post basis. The advantages and disadvantages associated with ex ante and ex post funding are generally applicable to hybrid funding arrangements.

Policymakers also have a choice between adopting a flat-rate premium system or a premium system that is differentiated on the basis of risk profiles for individual banks. The primary advantage of a flat-rate premium system is the relative ease with which assessments can be calculated and administered. However, in a flat-rate system, low-risk banks effectively pay for part of the deposit insurance benefit received by high-risk banks. However, because flat-rate premiums do not reflect the level of risk that a bank poses to the deposit insurance system, banks can increase the risk profile of their portfolios without incurring additional deposit insurance costs. As a result, flat-rate premiums may be perceived as encouraging excessive risk taking by some banks, unless there is a mechanism to impose financial sanctions or other penalties for risky behavior.

Thus risk-adjusted differential premium systems can mitigate such criticisms and may encourage more prudent risk management practices at member banks when the information required to implement a risk-adjusted differential premium system is available.<sup>23</sup>

The effects of some of the funding characteristics of deposit insurance systems are analyzed by Cordella and Levy Yeyati (2002). They investigate how the increase in bank riskiness due to the opening to competition of the banking system can be mitigated with risk-based deposit insurance or the public disclosure of financial information. When deposit insurance premiums are flat, banks have an incentive for moral hazard: an issue that can be addressed by charging risk-based premiums. In their model, the banks decide the intensity of monitoring, which will determine the riskiness of their portfolio. However, this model assumes that the risk-based premiums applied to a bank appropriately reflects the true risk profile of the bank and prices it accurately. In practice, this would depend on the specific design characteristics of the risk-based premium system and other country specific institutional characteristics.

### ***Public Awareness***

For a deposit insurance system to be effective at contributing to public confidence and stability, it is essential that the public be informed about its benefits and limitations. Experience has shown that the characteristics of a deposit insurance system need to be publicized regularly so that its credibility can be maintained and strengthened. This is of particular importance for the poor, whose financial sophistication and resources may be very limited.

According to the Financial Stability Forum Working Group (2001), a public awareness plan that addresses issues related to failures should be carefully developed before an

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<sup>23</sup> Laeven (2002) argues that countries applying premiums tend not to charge actuarially fair prices and that underpricing deposit insurance can lead to governments and taxpayers bearing a greater portion of the costs of resolving problem banks.

actual failure occurs. A well-designed public awareness program helps to counteract the potentially disruptive effects of bank failures and helps maintain confidence in the stability of the financial system.

## **Other Design Characteristics**

Instituting effective failure resolution processes and ensuring the prompt reimbursement of depositors funds can also play a role in improving the effectiveness of deposit insurance and contributing to confidence and stability objectives. The objectives of an effective failure resolution process are to meet the deposit insurer's obligations; ensure that depositors are reimbursed promptly and accurately; minimize resolution costs and disruption of markets; maximize recoveries on assets; settle bona fide claims on a timely and equitable basis; and reinforce discipline through legal actions in cases of negligence or other wrongdoings.

## **Conclusion**

This chapter has sought to explore conceptually and theoretically the relationship between deposit insurance systems, financial sector development, and poverty reduction. It also investigated differences in the objectives and design features of deposit insurance systems to explore how they might affect poverty reduction outcomes.

To address these issues, the chapter began by looking at a variety of macroeconomic and microeconomic models of how financial system development can contribute to income growth and help households deal with uncertainty and risk. Then it incorporated the role of explicit deposit insurance into this framework to examine how deposit insurance can affect various outcomes. A theoretical model based on work by King and Levine (1993b) was modified to illustrate some of these concepts. The growth rate was found to increase after a successful deposit insurance was introduced. This increase was traced to the increase in confidence in the financial system (individuals become more patient, innovations are more likely to succeed, and the economy becomes more productive), as well as better enforcement of property rights.

The study reported in this chapter found that the mechanisms by which a deposit insurance system can contribute to financial development, growth, and poverty reduction are likely to be both direct and indirect. That is, deposit insurance can play a role, along with other elements of the financial safety net, in creating an environment of confidence and thus contribute to the overall stability of a financial system. In addition, the existence of deposit insurance can help promote competition and may be associated with the increased use of savings deposits and facilitate greater access to lending services.

However, for a deposit insurance system to be successful at contributing to poverty reduction through these mechanisms, commonly adopted system objectives—such the



protection of depositors, avoidance of runs, and the promotion of competition—must be balanced with the need to ensure that the system does not lead to excessive risk-taking by member banks.

In addition, the main design features of deposit insurance may also play a role in contributing to financial system stability, development, and poverty reduction. Administration and governance arrangements that provide credible guarantees and are accountable to depositors, the industry, and other stakeholders are particularly beneficial. Widespread and compulsory membership can reduce adverse selection problems, while helping to diversify system risk. The scope and level of coverage needs to be balanced between the necessity to protect depositors and avoid runs and the ability of a country to control for moral hazard. With respect to funding, a wide variety of options exist. Those that ensure that adequate funding is available when needed, that relate premiums to the risks posed by individual members, and that spread the cost of dealing with failures directly to the industry appear to be the most effective. Effective public awareness initiatives, reimbursement, and failure resolution procedures are also helpful.

In closing, the role of deposit insurance in financial sector development and poverty reduction is a relatively new area of research, which could benefit from further study. In particular, empirical research and testing could be applied to a number of the models discussed in this study. This would be helpful in developing a better understanding of this important subject.

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## COMMENT

**Deposit Insurance and Poverty Reduction***Carlos Isoard y Viesca*

Although poor people have little or no monetary savings or access to formal financial services, a well-designed and sound deposit insurance scheme can contribute to the alleviation of poverty indirectly: by fostering financial stability and the sound functioning of the payments system. This, in turn, will promote economic growth and poverty reduction.

The main objective of a deposit insurance scheme is its contribution to financial sector stability and thus to the preservation of a well-functioning payments system through the prevention of bank runs and potential contagion effects on sound banks—particularly by protecting small depositors. As Friedman and Schwartz (1963, p. 440) note: “The knowledge on the part of small depositors that they will be able to realize on their deposits even if the bank should experience financial difficulties prevents the failure of one bank from producing ‘runs’ on other banks that in turn may force ‘sound’ banks to suspend.”

With the growing recognition of the benefits of deposit insurance, deposit insurance agencies have proliferated. While in the 1930s there was only one such agency, the Federal Deposit Insurance Corporation in the United States, by the 1960s five other OECD countries had established such schemes, and by the year 2000 there were nearly sixty. Today, 115 countries have or are planning to put in place a deposit insurance system: 94 are in operation, 12 are pending, and 9 are planned or under serious study.

The mandates and powers assigned to deposit insurance schemes vary widely. Mandates range from the operation of a pay-box system to ensure prompt reimbursement of deposit claims to more complex risk minimizer schemes, also charged in the case of bank failure. To fulfill its mandates, a well-designed deposit insurance scheme must be equipped with adequate powers. Powers range from authority to charge premiums in one extreme, to the ability to monitor member banks, provide financial assistance, and resolve cases of bank failure, on the other.

Deposit insurance does not generate financial stability on its own. Stability comes from the interaction of the diverse components of what is known as the financial safety net. Four interrelated variables ensure the viability of the role of deposit insurance in financial safety nets: financial planning and regulation (regulation); risk monitoring, detection, and enforcement of applicable banking regulations on institutions (supervision); liquidity provision (lender of last resort); and the maintenance of public confidence through the timely reimbursement of valid deposit reimbursement claims (deposit insurance). The purpose of a safety net is to protect bank costumers, limit excessive risk taking, prevent and control damage from bank failures, detect and resolve insolvent banks, and

allocate losses incurred from bank failures across society. Having all these features in place will lead to financial stability.

Financial stability, in turn, is only one of the components of a sound macroeconomic framework that favors poverty reduction. Other elements of such a framework are prudent fiscal management, exchange rate stability, price stability, and strong legal and constitutional frameworks. The combined effect of all these attributes provides an adequate framework conducive to reducing poverty.

One of the reasons why deposit insurance may not have a strong effect on poverty reduction is because the poor tend not to use banks for their savings. Rather, they save in two different ways: in kind (animals, land, staples) or in cash (informal sector, rotary credit schemes, semi-formal sector, credit associations, and other financial or nonfinancial associations).

Why do the poor lack access to formal banks? Barriers may include banks' intimidating access structure, with complicated forms and terminology; the high balances required to open new accounts; and the need for personal references. Banks should work to overcome these obstacles and review the suitability of their geographic locations to be able to serve the poor.

Along with the non-poor, the poor share other concerns regarding the use and maintenance of savings accounts. These include:

- Security: confidence and certainty in the depository institution (through market discipline or government protection)
- Convenience: which translates into liquidity of instruments and the diminishing of transaction costs
- Availability of real returns, and
- Reciprocity: potential access to a loan.

To address these concerns, public policy must encourage the existence of simple and accessible financial intermediation services to promote formal savings among the poor.

There is a need to generate confidence among the poor in financial institutions. Formal means of saving will facilitate their access to credit at relatively more affordable interest rates—below those they can find in the informal market (through such means as loan sharks) and encourage formal investment. This should promote the creation of wealth and a sound culture of debt payment.

Should deposit insurance be extended to other institutions? To help reduce poverty, deposit insurance should include other financial intermediaries such as savings and loan associations, credit unions, mutual funds, and informal microfinancial institutions. However, experience shows that different types of deposit insurance schemes should be established for different types of intermediaries. In particular, they do not share the same fund resources to cover reimbursement of deposit claims. Separate funds should be built for each different type of financial intermediary.

Finally, deposit insurance contributes to public confidence. Thus deposit insurance can foster savings by the poor. To ascertain the nature and magnitude of the impact of deposit insurance to the access to formal financial services by the poor, additional research is needed.

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# 8

## Enhancing Access to Credit for Low-income Borrowers

Jorge Rodríguez-Meza

Expanding access to credit for low-income sectors of the population requires tackling several dimensions of the development of financial markets. This study focuses on the development of policies to increase the supply of credit, with special emphasis on the legal and institutional developments necessary to create the right conditions for financial development. The crucial role of the legal and institutional infrastructure for financial development was recognized only recently. Economic theory has traditionally assumed away this dimension under the assumption of a perfect legal environment that allows the writing and enforcement of contracts with zero or close-to-zero transaction costs. Thus the problem of access to credit has been considered a problem of channeling funds to target sectors of the population.

This chapter develops a framework to study the consequences of relaxing the assumption of a perfect legal and institutional environment. The framework is then used to evaluate policies aimed at enhancing access to credit for low-income sectors of the population. The framework takes as a starting point the standard debt contract. The set of incentives and interests implicit in this type of contract is carefully examined. Policies aimed at enhancing access to credit are then considered from the perspective of their treatment of the incentives and interests implicit in the debt contract and the impact these policies may have on promoting greater access to credit.

The optimal contract design between lenders and borrowers takes into account many variables in addition to the legal dimension. Some of the variables most studied in the literature are the information set available to each participant, their risk-taking preferences, and the uncertainty about the future state of nature. This study considers these dimensions as they relate to the debt contract, since this is the most common type of contract between financial intermediaries and borrowers in developing economies.

The analysis departs from the principle that any mechanism used with the goal of enhancing access to credit must be evaluated from a cost-benefit perspective. The ultimate goal of enhancing access to credit for low-income sectors of the population is the

increase of social welfare through better use of limited available resources. The emphasis in this chapter is on continued access to credit by creditworthy clients who are currently being rationed out of the market for various reasons.

Finally, the approach taken ignores the political implications of the problem under study. Current legal institutions favor sectors of the population that, because of the benefits received, most likely enjoy some political power and have a vested interest in preserving the status quo. In all likelihood, some of the policies discussed here may provoke negative reactions from these sectors. This is a logistical problem that in reality will determine the success or failure of any policy. This problem can be solved only by dealing with the political reality of each country.

## Finance and Growth

A vast set of literature has established a positive relationship between financial and economic development through cross-country, time-series, and case studies. The qualitative and quantitative development of financial instruments and institutions in several countries has been used to associate financial structure and financial development. From this association, different theories have explained the relationship between financial development and growth.

As early as 1969, for example, Raymond Goldsmith, using a basic metric of financial development for a series of countries—total outstanding financial assets as a proportion of total wealth—found that this proportion tends to grow with economic development until it levels off at a given point. Also, the size of the financial structure of an economy is associated with the separation of the process of saving and investment, as it is reflected in a greater proportion of financial assets, shares, and bonds issued by nonfinancial sectors.

Since Goldsmith's seminal study, the association between financial development and economic growth has been explained through several transmission mechanisms between the allocation of resources in time and space and economic development. In all models, the functions of financial markets influence economic development via the rate of accumulation of capital through increments or adjustments of the savings rate, or through changes in the rate of technological innovation. Different functions of financial markets affect either transmission mechanism, thereby having a direct effect on the rate of growth of output per capita. The functions of the financial market can be summarized as follows.<sup>1</sup>

First, financial systems facilitate risk diversification, trade, and insurance. The financial system reduces liquidity risk, as liquidity markets make possible production projects that otherwise would not be profitable. Secondary markets of liquidity are justified not only because they efficiently manage costly information (Diamond 1984; Williamson

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<sup>1</sup> Levine (1997) presents a detailed discussion of the functions of financial markets.

1987) but also because they allow the separation between savers and investors and serve as intermediaries and facilitate trade between them (Bencivenga and Smith 1991). Secondary liquidity markets also reduce the transaction cost of any investment. Moreover, financial markets facilitate diversification and exchange of idiosyncratic risks, thereby generating a reallocation of resources toward higher profitability investments. Better diversified investment portfolios free resources that may be used in research and development of innovations, which directly affect the rate of growth.

Second, financial systems overcome information problems, leading to a more efficient allocation of limited resources. Additionally, they facilitate the acquisition and dissemination of information. Debt contracts, for example, face lower monitoring costs than direct financing, by allowing the delegation of monitoring. By delegating monitoring to financial intermediaries, savers do not waste resources in this activity. This argument is based on Diamond (1984) and others (Gale and Hellwig 1985; Boyd and Prescott 1986; Williamson 1987), who explain the emergence of financial intermediaries as coalitions of economic agents specialized in intermediation and monitoring of agents with financing needs. In a world without risk aversion, the debt contract between investors and financial intermediaries is optimum. The intermediary monitors producers and receives their repayment in the name of the depositor (ultimate suppliers of funds). The debt contract with intermediation is superior to direct financing.

Third, financial systems facilitate monitoring and controlling of investment projects and firm managers, which improves the allocation of investment funds and raises the economy's flow of funds channeled toward investment. With financial development, control of the firm is directly linked to financing through share prices and firm value. Liquidation and absorption of failing firms and manager's remuneration based on results are facilitated by the financial system.

Fourth, financial systems facilitate the mobilization of savings, improve the efficiency of the allocation of savings, and promote the generation of additional savings. Economic agents differ in their abilities to combine factors of production, and agents with surpluses do not necessarily face the best investment projects. By separating savings and investment, therefore, greater efficiency is achieved in the allocation of savings. Additionally, projects that otherwise would not be financed because their scale of investment is greater than the level of savings of any individual saver can be financed. New marginal savings are generated by individual savers attracted by greater returns and by lower transaction costs that result from the formalization of financial markets.

Fifth, financial systems, by reducing transaction costs, promote specialization and technological innovation. Financial deepening (growth of the real money balances in the economy) is associated with the unification of capital markets, which leads to better allocation of investment resources, specialization and, reductions in uncertainty (Shaw 1973). Investment indivisibilities are overcome and technology diffusion and market integration are facilitated. Financial intermediaries in developing economies are particularly affected by the lack of reliable information (McKinnon 1973). Risk preferences are difficult to evaluate because of the fragmentation of production and technological

opportunities. Insolvency risk is mostly tackled with the use of collateral. As a consequence, there is a close relationship between resource endowments and access to credit—much closer than in developed economies. The development of financial markets facilitates its separation.

The merits of financial development emerge from greater intermediation. Credit, the main topic of this study, is only one side of intermediation. To the extent that savings mobilization is a credit operation between savers and financial intermediaries, many of the underlying principles of credit transactions are also valid for the mobilization of deposits. However, in practical terms, deposit mobilization imposes unique challenges that require careful analysis. For this reason, this other side of intermediation is not explicitly considered here.

## **Legal and Institutional Environment and Financial Development**

The role played by the financial system and its impact on economic growth are closely linked to the legal and institutional environment of the economy. Several authors pose the legal and institutional environment of the economy as one of the main obstacles to financial intermediation in developing economies (Shaw 1973; McKinnon 1973). De Soto (2000) proposes that a sound development process begins with the formal definition of property rights that concedes rights to property rights; this requires a legal system adapted to the customs and needs of the majority. Such conditions would induce agents to transact within the realm of legality, thereby allowing the generation of more wealth from existing levels of wealth. Society saves the costs of operating outside the boundaries of the law.

Recent empirical studies with time series for a varied collection of countries have found evidence that greater firm growth rates and access to funds is associated with the development of the financial system and the legal environment (Beck et al. 2000). Additionally, there does not seem to be evidence that the structure of the financial system—whether it is oriented toward bank financing or direct financing—has a significant effect on variables that measure economic growth or the creation of new firms (Levine, Loayza, and Beck 2000).

These results indicate that, in general, countries with more developed financial systems and more solid legal systems enjoy faster growing economies, with greater external financing, faster firm growth, and a greater number of new firms. The metrics used to account for the development of the financial system are direct or indirect measurements of the volume of private credit in the economy. The degree of development of the financial system is measured by the degree of creditors and minority shareholders protection vis-à-vis management, employees, and main body of shareholders and the degree of protection offered by the legal statutes and the relevant courts.

The efficiency and impartiality of the courts are important determinants of the efficiency of contract enforcement. The source of differences in legal development can be

traced to the historical origin of the legal system in each country, according to La Porta and others (1997, 2000). Civil law countries, as opposed to common law countries, tend to offer less protection to creditors and minority shareholders, both in the written law and in its implementation in the courts.

Regardless of the origin of these differences, the value of financial transactions and their collateral depend on the efficiency of the legal institutions of a country: that is, written law and procedures. Not surprisingly, countries with lower levels of protection of private interests tend to have less developed capital markets, as firms prefer to self-finance or recur to direct financing instead of intermediated financing.

In developing economies in particular, one of the main impediments to financial development is the existence of legal systems that do not efficiently protect the private interests of creditors in financial transactions. In many cases this protection is almost nonexistent, as borrowers' rights are given priority and the existing creditor protection entails very high transactions costs. To understand why creditor protection is important in a debt contract and how this protection determines the characteristics of financial transactions, it is necessary to understand the microeconomic foundations of these transactions. These foundations are examined in the following section.

## **Legal Environment and the Debt Contract**

The debt contract is a promise of exchange of current resources over future resources between two economic agents. One of the agents foregoes rights over a given set of resources. The other agent acquires the right to use those resources for a given period of time in exchange for future resources (Bell 1988).

In this contract, both agents agree that the lender (or creditor) relinquishes or transfers resources to the borrower (or debtor) in the present. The borrower uses the resources to pursue his/her own objectives but promises to return the resources in the future. Repayment by the borrower typically includes, in addition to the principal, an interest or premium that represents the lender's opportunity cost of relinquishing the use of the resources for the duration of the contract.

Each agent has different objectives when undertaking the contract. The agent that surrenders rights over current resources aims at receiving a future return over these resources. This return must be at least as high as the return that can be obtained in any alternative use of the resources for the agent to be interested in entering into the contract. In a competitive market, this means that the premium the borrower must pay equals the market opportunity cost of the funds lent. If the creditor has any market power, the premium will include any rent the creditor is able to extract beyond the opportunity cost of the funds.

The agent that foregoes the rights over future resources—the borrower—has the objective of supplementing his/her current scarcity of resources. The command over additional resources obtained with the contract, among other things, eases liquidity re-

strictions and consequently raises levels of current investment and/or facilitates dealing with unexpected or expected fluctuations of income.

The temporal nature of the debt contract introduces a unique characteristic of this type of contract: uncertainty. The state of nature in the future, when the borrower will have to repay, is unknown at the time of signing the contract. Given this uncertainty, and in the absence of complete market of contingent securities, the lender cannot be sure that the borrower will be able to repay the loan.

There are several reasons why borrowers may be unable to repay. First, borrowers may not be able to repay because of low returns in the production project due to the stochastic nature of these returns. Second, borrowers may not be able to repay due to bad allocation or bad use of the funds received. Third, borrowers may be able to repay their obligations but may choose not to repay.

The final form of the debt contract will be determined by the actions undertaken by the lender to protect his/her interests. Lenders typically protect their interests by requiring the use of collateral or some form of collateral substitute (Nagarajan and Meyer 1995). In practice, in addition to collateral, lenders include covenants in the contract to provide and preclude actions in case of eventualities. These covenants usually specify the degree of responsibility of the borrower in using the funds and in repaying the obligation and the different actions the lender is allowed to undertake in case of lack of repayment. These clauses derive their value from the legal system. Ultimately, the legal system substantiates the validity of the contract and establishes the actions the lender may undertake in case of lack of repayment.

The protection of the interest of the lender is further complicated in the presence of asymmetric information. Information asymmetries are typical of financial markets. They are usually grouped according to two types of incomplete information that the lender faces. First, in most lending transactions, lenders have incomplete information about the type of borrower. Second, lenders also have incomplete information about the actions or level of effort of the borrower when using the funds lent. Under incomplete information, the final contract will reflect not only the actions undertaken by the lender to protect his/her interests because of uncertainty but also those undertaken to manage and improve his/her limited information.

Economic theory provides many principles for the design of the optimal debt contract in the presence of asymmetric information. These principles have the purpose of aligning borrowers' objectives with those of lenders through adjustments in the terms and conditions of the contract. Consequently, lenders may offer contracts that deal with their imperfect information about the actions of the borrower by inducing them to undertake the actions most preferred by lenders. In the case of imperfect information about the type of borrower, lenders will offer different types of contracts that attract different types of borrowers, allowing lenders to differentiate among borrowers by their choices.

As mentioned, debt contracts owe their validity and final form to the legal environment that sustain them. For example, lenders are constrained by legal regulations on the extent of interest rate discrimination and types of collateral that may be acceptable.

Choices over the type of collateral depend not only on the characteristics of the collateral but also on the legal status and the regulations that provide the norms for the use of collateral.

The legal environment underlying a debt contract is also important in a second moment during the life of the contract: at the moment of enforcing the promise of timely repayment of principal and interest. Even in the cases when the value of the collateral equals more than 100 percent of the outstanding debt, there is a residual of uncertainty that emerges from the possibility of compelling the borrower to repay the debt. The efficiency of the legal system and the cost of the different procedures that may be necessary to undertake to enforce repayment also play a role in the design of the original contract.

Borrower's repayment decisions are the result not only of their repayment capacity but also of their willingness to repay. Opportunistic behavior by the borrower—that is, default even when the borrower has the resources to repay—is an additional consideration in the design of the contract. Again, the efficiency of the legal system and its procedures determine the degree of risk lenders are willing to take when dealing with the possibility of opportunistic behavior by borrowers.

In sum, the final form of the debt contract is determined by the degree of uncertainty, which is present in every contract due to its temporal dimension, the degree of information available to the lender at signing and at the due date of the contract, and by the legal environment that substantiates the contract. The combination of these factors determines the degree of risk lenders are willing to take and, consequently, the final terms and conditions observed in actual debt contracts.

## **Collateral**

### ***Definition and Characteristics***

In every credit transaction, the degree of risk assumed by the lender depends on the lender's capacity to secure his interests by using some type of collateral. From a legal perspective, a debt contract is secured to the extent that the commitment of repayment implicit in the contract is guaranteed by a form of collateral that is clearly identified by the legislation governing financial transactions. Credit transactions guaranteed by some sort of collateral substitute, not contemplated under the prevailing laws, are considered unsecured transactions.

This distinction between collateral and collateral substitutes according to the legal standing of the interests of lenders is a tenant of this study. Some authors prefer a broader definition of collateral and use this term without making any distinction between collateral and collateral substitutes. The distinction is important, however, because it highlights the role played by the legal system in which contracts are signed. As will become clear, however, both collateral and collateral substitutes may be successful, to varying degrees, in securing the interests of lenders in a credit contract.



To evaluate the role played by collateral and collateral substitutes, it is important to first establish the characteristics of assets, tangible or intangible, that are important in securing interests in a debt contract:

- Collateral and collateral substitutes have value for the borrower. Their loss, in case of default, brings disutility to the borrower. Consequently, default is costly for the borrower.
- They also have value for the lender. Lenders can capture their value by selling the assets.
- Either the assets or their returns can be appropriated.
- They remain in existence throughout the duration of the contract.
- The transaction costs of pledging them and seizing them are commensurable to the value of the transaction for both borrowers and lenders.

Assets that fulfill all these characteristics are better suited to securing interests in a debt contract. However, not all characteristics must be met for assets to be used as collateral or collateral substitutes. Most assets used as collateral meet most of the characteristics, to varying degrees, whereas assets used as collateral substitutes typically meet only some of them.

In many cases, the fact that some assets do not meet all these characteristics is the reason they are excluded from the legislation that regulates collateral use. Moveable household assets in some countries, for example, are excluded from the legislation on collateral, but they are used as collateral substitutes by some financial organizations. These organizations are willing to accept a pledge of collateral in the form of household assets in spite of little use-value for the lender and the lack of secondary markets for these types of assets. This is the case even when the lack of legislation makes it difficult to seize or to resell these assets in case of borrower's default.

Most formal financial organizations in the developing world rely on the use of collateral, as opposed to collateral substitutes, for the realization of the debt contract and for the definition of the proper incentives to enforce the contract successfully. Even though collateral substitutes are also used, they are most commonly found in informal and semi-formal financial organizations.

### Subjective Valuation

Having value for the borrower is one of the most important characteristics an asset must have to be used as collateral. This characteristic induces the right repayment incentives in the borrower, regardless of whether the asset can be seized and sold to compensate the lender for the lack of repayment. From this perspective, even nontradable assets can be used as collateral, as long as the borrower attaches some value to their possession. The loss of this value, or the utility obtained from enjoyment of the asset is what makes default costly.

Contracts offered on the basis of the borrower's subjective valuation of the collateral require that lenders have some knowledge of borrower's preferences. More specifically, lenders must have some knowledge of the borrower's valuation of the collateral when the contract is due. If, when the contract is due, borrowers assign a lower valuation to the collateral than the value of the repayment, they will default and lenders will have to assume the loss. The likelihood of this event imposes a restriction over the range of loan sizes a lender is willing to offer on the basis of the subjective valuation of the collateral (Barro 1976; Benjamin 1978).

The future valuation of the collateral is uncertain for both borrower and lender at the time of signing the contract. A lender who at least knows the distribution of the future valuation will offer a supply of funds, as in figure 8.1.

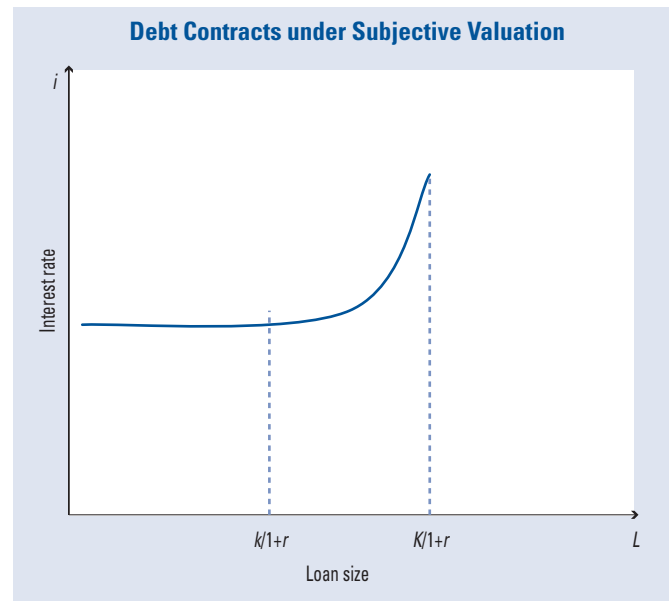
If the future valuation is defined within the range  $[k, K]$ , loan sizes smaller than  $k/(1+r)$  have zero risk of default. Therefore, lenders will offer any quantity between zero and  $k/(1+r)$  at an interest rate  $i$ , equal to the opportunity cost of the funds,  $r$ .

For quantities larger than  $k/(1+r)$ , the lender will face some probability that the borrower will give lower valuation to the collateral than to the financial obligation. Consequently, loan sizes larger than  $k/(1+r)$  will face some positive probability of default. As a consequence, lenders will add a premium to the opportunity cost of funds to compensate for the additional risk. Increasingly larger loan sizes will face greater probability of default, up to a maximum loan size of  $K/(1+r)$ . Loan sizes larger than this maximum loan size imply absolute certainty that the future valuation of the collateral will be lower than the outstanding obligation and, therefore, default is certain. Loan sizes a lender will be willing to offer, secured by the subjective valuation of a collateral asset, are bounded by this amount.

### Objective Valuation

To be used as collateral, an asset must also have some value for the lender. The lender must be able to capture this value by selling the asset in the market to recuperate his/her investment in case of borrower's default. This assumes that there is an active market for the assets and that the legal system gives lenders rights over the collateral when borrowers default. Lenders' rights over the collateral, consequently, attenuate borrower's rights during the duration of the contract.

FIGURE 8.1



The attenuation of borrower's rights is explicitly expressed in some debt contracts with the inclusion of covenants in the credit contract that limit the rights of use by the borrower and establish provision for safekeeping of the collateral for the duration of the contract. In the extreme the borrower completely renounces the services enjoyed from having the collateral, as it is the case when the asset is held physically held by the lender.

In most cases, however, borrowers keep possession of the collateral for the duration of the contract. Keeping possession of the collateral has major consequences over the value of the collateral when the contract is due. Lenders have rights only over the residual value of the collateral. Many of the covenants of the contract that attenuate borrowers' rights try to deal with the asymmetry of information about the utilization of the collateral when borrowers keep possession of the collateral. Since the information of the borrower's level of effort in safekeeping the collateral is private, borrowers may have incentives to use the collateral in manners that might be optimal for their own objectives, but detrimental to the lender's interests. Over-use of the collateral, for example, can considerably reduce the residual value of collateral, which is an entitlement of the lender.

From the point of view of the potential market value of the collateral, two determinants of the set of assets that lenders are willing to accept as collateral are the existence of a secondary market and the possibility of constraining borrower's opportunistic behavior in the use of the collateral. Assets with active secondary markets and limited depreciation—that is, high residual value—are preferred over assets with fragmented or thin secondary markets and over assets with short lifetimes. For this reason, real estate is the type of asset preferred as collateral, and durable household assets of small value rank among the least preferred. Household assets depreciate quickly and lack active secondary markets where lenders could get back their funds.

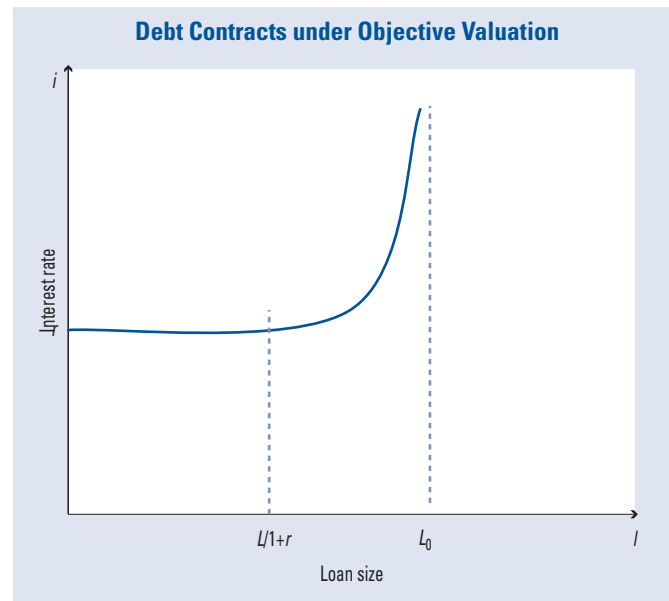
Assets with active secondary markets that are physically transferred to the lender for the duration of the contract are usually assets with indivisibilities or high selling costs; otherwise, borrowers would have preferred to sell the asset to obtain the funds borrowed. Assets with active secondary markets that remain in the hands of the borrower for the duration of the contract are pledged as collateral to the extent that selling costs are greater than the benefits obtained from using the collateral, minus the attenuation of borrower's rights for the duration of the contract; otherwise, borrowers will be better off selling the collateral themselves.

The net selling price of the asset pledged as collateral in the market determines the maximum loan size a lender is willing to grant. If the opportunity cost of funds is represented by  $r$  and the asset's net price is equal to the gross price minus selling costs,  $L = P_a - C_s$ , any loan size between zero and  $L/(1+r)$  will generate perfect repayment, as borrowers are better-off repaying the loan, principal plus interest, and keeping possession of the collateral with market value,  $L$ . Since there is perfect repayment, lenders will offer any quantity between 0 and  $L/(1+r)$  at the opportunity cost of funds,  $r$ .

With loan sizes greater than  $L/(1+r)$ , borrowers will repay their debt only if the amount due is lower than the future market valuation of the collateral. Since the future market valuation of the collateral is uncertain at the signing of the contract, lenders will

charge a premium over the opportunity cost of funds to compensate for the probability of default that emerges from that uncertainty. For a given asset pledged as collateral, the maximum loan size a lender offers is  $L < L_0$ , since as loan size increases the probability of default also increases. Total certainty about lack of repayment will be gained at loan sizes larger than  $L_0$ . Consequently, no loan size larger than  $L_0$  will ever be granted. Figure 8.2 shows the resulting curve representing different loan sizes at different interest rates when loans are secured with a pledge of collateral with market value  $L$  (Barro 1976; Benjamin 1978).

FIGURE 8.2



### Appropriability

The third characteristic of assets that can be used as collateral—to be susceptible to appropriation—is substantiated through both the characteristics of the asset and the legal framework where the contract is signed. Assets that can be appropriated are assets with well-defined property rights that allow transferring those rights at costs commensurate to the value of the transaction. Meeting this characteristic is a necessary condition for lenders to be able to capture the market value of the collateral.

Since borrowers can pledge the same asset as collateral in several simultaneous financial transactions, credit contracts must clearly specify a hierarchy over property rights. This process is known as “perfection” of the collateral. The process of perfection clearly defines which lender has priority over the appropriation rights vis-à-vis the rights of other lenders that also have a claim over the same asset.

A clear definition of property rights that facilitates the transference of property and that provides the framework for the process of perfection is both anchored in the degree of development of the judicial system, and the efficiency of the registry and the courts of law. Appropriability, therefore, is also a characteristic that depends on the legal environment where the transaction takes place.

### Existence

A potential asset, tangible or intangible, must remain in existence for the duration of the contract to be able to be pledged as collateral. Assets that depreciate rapidly or that pose great uncertainty over their future value are less attractive than assets with little depreciation and low risk of losing value in the future. Covenants added to the contract usually attempt to reduce the idiosyncratic risk of loss of value faced by each asset by trying to

control for moral hazard in the utilization of the asset or by requiring insurance and/or discounts in the valuation of the asset.

### **Transaction Costs**

Lastly, the use of collateral in a credit contract should not impose high transaction costs. Both lender and borrower face different types of costs in the formalization of a credit contract. Transaction costs can easily become the main component of the total cost of the transaction and can preclude the transaction from taking place.

Borrowers face transaction costs when pledging the collateral. They include transportation, registration, maintenance, and other costs emerging from actions borrowers must undertake, usually by requirement of the lender, to preserve the value of the collateral and for the collateral to be accepted by the lender. Lenders face transaction costs in the process of registering, seizing, and selling the collateral. These costs may be considerable depending on the type of collateral, especially if the seizing and selling process require legal proceedings, as is often the case.

The efficiency of the legislation, the courts of law, and sale procedures determine the lender's choice among potential types of assets that may be used as collateral by defining the types of transaction costs faced by each asset, directly and indirectly. Many collateral substitutes are characterized by low transaction costs, or at least transaction costs that are commensurate to the size of the loan, and thus become a viable alternative to traditional collateral.

### ***Economic Role of Collateral***

In almost every credit transaction, the interests of the lender are secured by requiring some form of collateral or collateral substitute. However, in most economies, only those credit transactions that secure interests using collateral are considered legally secured. Credit transactions that use some form of collateral substitute are considered legally unsecured. The most commonly forms of collateral that legal systems recognize are real estate; fixed durable assets of considerable value that usually require registration, such as machinery and equipment; and some moveable assets that are easy to register and sell in secondary markets, such as vehicles.

The distinction between collateral and collateral substitutes is not universal. It depends on the legal environment where the financial transaction takes place. In developing countries, many assets are not capable of fully securing lender's interests in a credit transaction because the legal system fails to recognize them; consequently, they can only be used as collateral substitutes. Any loan that uses this type of asset as collateral is considered unsecured. The set of assets that fall into the realm of traditional collateral varies across countries.

Depending on the historical use of each type of collateral, different countries classify different types of collateral in different groups. Also, in many cases, a distinction is made

between collateral and personal guarantees. Personal guarantees are instances where interests are secured by the solvency of the borrower (such as with the special guaranty endorsement) or a third party (such as with the guaranty bond). There are different types of personal guarantees in which the guarantor assumes the responsibility over the loan with all or part of his/her wealth in case of borrower's default.

Collateral is usually associated with physical assets that guarantee the loan. Real estate and some moveable property are the most commonly used types of assets. The asset may physically remain with the borrower or it may be placed under the supervision of the lender or a third party. In either case, lenders keep the right to expropriate the asset if the borrower does not meet his/her financial obligation. Collateral may also be pledged in the form of rights over the returns on the exploitation of an asset for the total amount due.

### Microeconomic Foundations of Collateral

The economic literature about the use of collateral can be grouped into two major fields. Each considers a different role for collateral, associated with two different characteristics of the debt contract: the lender's uncertainty about the borrower's capacity and commitment to meet the contract; and the asymmetry of information between borrowers and lenders. A third, very important dimension of every credit contract, the legal environment underlying the contract, is usually assumed to work perfectly, to isolate the analysis of these two characteristics. Relaxing the assumption of a perfect legal system complicates the role played by collateral in dealing with the first two characteristics of the debt contract. The specific legal problems in the definition and use of collateral are topics that relate to policy implementation. They will be addressed in later sections.

Under the assumption of a perfect legal environment, collateral can play two different roles. First, it can be used to reduce or eliminate the risk that lenders face because of the possibility of default by the borrower—regardless of the reasons that caused lack of repayment. Second, collateral can be used to overcome incentive incompatibilities between the participants in a credit contract that arise at the signing of the contract from the asymmetry in the information available to each party.

### *Collateral as a Mechanism to Minimize the Risk of Default for the Lender*

In the credit contract, the lender surrenders his current rights over resources in exchange for a promise of future repayment, and assumes the risk of default. The most direct function of collateral is to reduce or eliminate the risk of default for the lender. Because of the presence of collateral, regardless of borrower's intentions, lenders increase their probability of being able to recuperate their funds when the contract is due. From this perspective, the collateral must have a value greater than or equal to the value of the borrower's obligation. In the extreme, when the value of the collateral is much greater

than the amount owed by the borrower, lenders could induce borrowers to undertake loan sizes beyond their repayment capacity, with the objective of seizing the collateral.<sup>2</sup> In most cases, however, the costs of seizing the collateral and the limited number of assets that can be used as collateral mean that most lenders face some degree of risk of losing the funds disbursed.

Barro (1976) and Benjamin (1978) formalized this function of the collateral on the basis of the future market value of an asset or on the basis of the borrower's marginal valuation of the services rendered by the asset. As discussed in a previous section, given a set of assets that can be used as collateral, lenders define the interest rate and loan size as a function of the probability of default adding a premium to the opportunity cost of funds to compensate for the risk of default.

According to this approach, collateral loan sizes and interest rates are jointly defined by the lender, with the purpose of recovering the funds lent. Consequently, it would be expected that in riskier environments, there would be greater variety of interest rates than in less risky environments. Riskier environments generate lower expected reservation values of collateral: that is greater expected losses.

Given loan size and the value of the collateral, default is an increasing function of collateral depreciation because depreciation reduces the reservation value of the collateral. Given two assets with the same market value and different depreciation rates, the asset with lower depreciation will be able to guarantee larger loan sizes. Consequently, assets with low depreciation will be preferred as collateral.

The function of collateral in reducing the risk of lenders of losing their funds in a credit transaction is valid even if the market value of the collateral differs between borrower and lender due to transaction costs. Transaction costs may differ between lenders and borrowers depending on the type of asset, the legal framework, and the type of lender accepting the pledge of collateral. The relationship between interest rate and loan size still holds, even though the value lost by the borrower might not equal the value gained by the lender.

The use of collateral by lenders as a mechanism to ensure the collection of loans partly solves the problem of strategic default by borrowers: the case when a borrower chooses to default even though he/she has sufficient funds to repay. The use of collateral does not necessarily solve the incentives problem underlying strategic default, even though it does reduce its impact on the lender. The incentives problem is solved only if strategic default is eliminated by making it in the borrower's own interest always to repay the loan. The lender then would not be forced to seize the collateral. If the lender is forced to seize the collateral to recover the funds because of lack of repayment, the use of collateral has been successful in reducing the risk to the lender—but it has not been successful in addressing the incentives problem implicit in strategic default.

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<sup>2</sup> Bell (1988) presents examples of these extreme cases.



### *Collateral as a Mechanism to Solve Information Asymmetries*

Several models have been used to study the use of collateral to deal with the problems created by asymmetry of information between the participants in a credit contract. The use of collateral to solve the problem of adverse selection created by information asymmetries about the type of borrower is more controversial. The use of collateral to solve the moral hazard problem resulting from the information asymmetries about the actions of the borrowers is more generally accepted.

Stiglitz and Weiss (1983) were the first to consider the role collateral plays in credit contracts under private information about the type of borrowers. In their model, under risk neutrality, collateral plays no role. Under risk aversion, the use of collateral requirements to reduce the risk of default can induce an adverse selection problem. When borrowers simultaneously choose the form of financing—loans or self-finance—and the projects to finance, an increase in collateral has a double effect. Lower-risk borrowers drop out of the financing market and choose to self-finance. Borrowers who remain in the financing market undertake riskier projects. If the former effect is sufficiently strong, lender's profits will fall. Consequently, lenders will prefer to randomly ration the quantity of loans offered without requiring collateral. Even though an increase in collateral requirements may reduce the level of risk of an existing portfolio, it can also cause low-risk clients to drop out of the market. Consequently, collateral is a bad instrument to discriminate among types of clients.

Benjamin (1978) finds a similar role for collateral. If the supply of loans is based on the collateral's average reservation value for all the clients of a lender, borrowers whose marginal valuation exceeds the average valuation will repay with certainty. The opposite will be the case for borrowers with marginal valuation below the average. The former type of borrowers is then defined as low-risk and the latter type is high-risk. Under a contract with a unique interest rate, low-risk borrowers will consider the interest rate offered to all borrowers to be too high, since their high valuation of the collateral makes them unlikely to default; borrowers with marginal valuation below the average will find the interest rate of the unique contract to be conveniently low, since their low collateral valuation makes them likely to default. The final result is that a unique contract with a unique interest rate will attract only high-risk borrowers: the adverse selection problem.

Stiglitz and Weiss, and Benjamin conclude that collateral is not a good mechanism to discriminate among borrowers with private information about their type. Wette (1983) poses that adverse selection can happen even when borrowers are risk-neutral. When collateral requirements are raised, some projects will become unprofitable and these borrowers will drop out of the market. The drop-outs are low-risk borrowers because, under his assumptions, expected returns are an increasing function of the level of risk: high-risk projects are defined by higher return dispersion.

Besanko and Thakor (1987) show that with a different assumption about the distribution of returns, under complete information, competitive lenders are able to extract all

surplus from each borrower by offering different contracts with different interest rates according to risk types without requiring collateral. Under asymmetric information, lenders offer different contracts with different collateral requirements. High-risk borrowers are charged higher interest rates and are not required to pledge collateral. Low-risk borrowers are charged lower interest rates but must pledge collateral. Thus collateral requirements are inversely related to interest rates. Collateral can be used to differentiate between types of borrowers. Requiring collateral with a lower interest rate precludes high-risk borrowers from trying to take the low-risk contracts to get a lower interest rate. Since collateral has more effect on high-risk borrowers because they face lower returns at each level of risk, only low-risk borrowers will take the contract that requires a pledge of collateral. This result for competitive lenders under private information about borrowers' types rejects the result of Stiglitz and Weiss regarding the futility of collateral in dealing with adverse selection.

In the case of a monopolist lender, collateral is not a good discriminator since the lender must prevent low-risk borrowers from pretending to be high-risk borrowers so they may obtain a lower interest rate. Any attempt to reduce the interest rate and raise collateral will be faced with the reality that borrowers still prefer the high-risk contract because of its lower interest rate. A lender with market power may raise the interest rate to induce high-risk borrowers to drop out of the market without requiring collateral from any borrower. Low-risk borrowers get higher interest rates because they have higher willingness to pay.

Chan and Kanatas (1985) give collateral a function of intermediary between the different project valuations of the lender and the borrower. Lower project valuation by the lender relative to borrower's valuation will imply higher collateral requirements. Collateral is pledged not to get a lower interest rate or to reduce lender's risk of default but to compensate for the difference in the valuation of the project. The difference can become so large that the transaction does not take place. If the source of the differences is information asymmetries, collateral requirements can be understood as signals of the borrower's expectations about the project. In a rational expectations equilibrium, the borrower's optimal choice of collateral reveals the true nature of the project. Consequently, the best borrowers signal their status by pledging collateral.

All theoretical models presented above assume that agents have no problem pledging any level of collateral. To the extent that they may face restrictions in their endowment of assets, random credit rationing may still be optimal. If this is the case, the use of co-signers, who bring additional wealth into the contract, may be welfare improving (Besanko and Thakor 1987). Moreover, in these models, the use of collateral as a mechanism to reveal private information works only to the extent that it is jointly used with the interest rate. Limitations on interest rate levels would obviously limit the effectiveness of collateral.

The empirical prediction derived from these results is that higher collateral requirements are associated with low-risk borrowers. This result crucially depends on the assumption that preferences reflect the type of agent: low-risk agents are more willing to

accept higher increases in collateral requirements for each reduction in interest rate than high-risk agents.

In contrast to the empirical prediction, Berger and Udell (1990) find empirical evidence of a positive relationship between collateral and levels of risk, at both the borrower and at the lending organization level. Not only do borrowers who pledge collateral tend to be riskier, but loans with a pledge of collateral also tend to be riskier than loans without collateral. Moreover, banks that grant loans on the basis of collateral tend to have riskier loan portfolios. Morsman (1986) observes that within commercial banks, riskier projects—defined as projects with higher levels of leverage—are associated with higher collateral requirements.

These empirical observations, which apparently contradict theoretical predictions, are evidence that financial organizations invest resources in collecting information about potential borrowers, which is then used to design the contracts offered in the market. Thus it is not surprising that observed credit contracts exhibit higher levels of risk, associated with greater collateral requirements. The levels of collateral requirements are the result of observed risk obtained from evaluations of clients before disbursement.

Higher levels of collateral associated with higher risk can also be explained by lenders who offer multi-period contracts with renegotiation (Bester 1994). Pledging collateral increases the probability of renegotiation at the end of the first period, leading to forgiveness of part of the debt. Renegotiation avoids inefficiencies from changes in the property of the project, which is the alternative to renegotiation in the absence of collateral. However, with renegotiation, borrowers have incentives to falsely claim insolvency. These incentives are attenuated by the presence of collateral. The greater the level of collateral, the more lenders will be willing to believe the presence of low project returns when borrowers claim insolvency: that is, collateral reduces expected insolvency cost. Consequently, collateral will more likely be pledged by high-risk borrowers.

Collateral can also play an important role in solving moral hazard problems, which are typical of credit contracts. These problems emerge from the private nature of the information about the borrower's choice of effort in the use of the loaned funds (Bardhan and Udry 1999). Given limited liability, borrowers have incentives to apply low effort in the project funded (not being diligent in the use of funds) and by doing so, make lenders risk-sharing partners in the project.

When both agents—lender and borrower—are risk-neutral, collateral requirements force borrowers to internalize all the risk, thus eliminating the incentives to exert low effort. Under risk aversion, however, the optimal contract entails some risk sharing, depending on the relative risk preferences.

### ***Collateral Substitutes***

As explained, the distinction between collateral and collateral substitutes depends on the legal environment where the contract takes place, among other things. Because of legisla-

tion vacuums, incorrect interpretations of the law, and inefficient courts and procedures for contract enforcement, the set of assets that can be used as collateral in many developing countries is quite restricted. Consequently, collateral substitutes are often used, and they play an important role in credit contract design.

Some of the most commonly used collateral substitutes are: borrower's reputation, borrower's credit history, the value of a long-term relationship with the lending organization, interlinking of financing and production, and peer pressure in solidarity groups. In between traditional collateral and collateral substitutes there is vast set of "nontraditional" assets that fall outside the legislation regulating the use of collateral to secure lenders' interests. This set is composed of mostly moveable and intangible assets. Reforms of the laws governing secured transactions could easily facilitate their incorporation into the set of traditional collateral.

Most collateral substitutes share the characteristic that they are unable to compensate lenders for the loss of funds in case of default. From this point of view, collateral is clearly superior to collateral substitutes. Collateral substitutes put emphasis on creating the right incentives for timely repayment of the debt obligation. In this respect, collateral substitutes can be as efficient as traditional collateral. Nevertheless, lenders use collateral substitutes mostly to supplement the lack of traditional collateral, thus allowing borrowers to increase their leverage over their wealth. For this reason, increasing the set of assets that can be accepted as collateral to fully secure a credit transaction could potentially have a great impact in access to credit by previously rationed market participants.

Loans granted on the basis of the borrower's reputation are very common in informal markets in credit transactions of small amounts, although they also occur in well-developed financial markets when borrowers have a well-established reputation with a lender. The borrower's valuation of his/her reputation and a credible threat by the lender that he/she will share information with other lenders in case of default are necessary conditions for this type of guarantee to work.

This type of collateral substitute underlies many informal credit transactions. It is commonly used in conjunction with other collateral substitutes and traditional forms of collateral. Many loans informally granted by friends and relatives on the basis of the borrower's reputation also include an element of reciprocity in case that the lender may, in turn, need financing in the future. Borrowers' credit history, in combination with reputation, is a form of collateral substitute widely used in developed financial markets in the form of credit card credit. In this instance, the threat of losing a good credit history has proven to be an excellent deterrent of default.

A borrower's credit history becomes more important as the relationship with an organization lengthens. The credit history becomes an intangible asset for the borrower (Diamond 1989). This creates incentives for the borrower to maintain a long-term relationship with the same lender to the extent that there is no exchange of information among lenders. When there is no exchange of information among lenders, acquired information can become the source of some market power for the lender, which eventually may allow the lending organization to extract rents from borrowers. At the firm level, reputation and

credit history are the collateral used when issuing commercial paper, which is an important form of short-term financing in developed financial markets for firms with good public ratings (Pu 2003). This is one of the cheapest forms of financing for well-established firms.

Reputation and credit history are closely linked to the value of the relationship with the financial organization. In long-term credit relationships between borrowers and lenders, the discounted value of all the benefits borrowers may gain from maintaining the relationship provides a strong repayment incentive (Rodríguez-Meza 2000). This type of collateral substitute is especially important in environments where the threat to personal reputation and credit history are weak because of the cost of implementing the threat. The implicit promise that the lender will provide financing in the future is usually enhanced with a promise of improving the terms and conditions of the contract if the relationship lengthens with good repayment records. This type of collateral substitute, in combination with other collateral substitutes, has been highlighted as one of the main engines of growth of several successful microfinance organizations in the developing world (González-Vega and others 1996). These microfinance organizations have been able to develop healthy loan portfolios with borrowers that lack traditional forms of collateral.

Another form of collateral substitute, frequently used in agricultural credit, is the interlinking of financing with output production and commercialization (Bell 1988). The intermediary that purchases the agricultural output takes advantage of the private information acquired throughout the commercial relationship to grant loans on the basis of the resulting better set of information. The already established commercial ties create strong repayment incentives in the credit contract. This type of credit transaction is also usually accompanied by other types of collateral. The interlinking of the transactions, however, provides the strongest repayment incentives. In case of default, borrowers not only face the consequences of breaking the credit contract but also the possibility of losing an outlet for their production.

Another form of collateral substitute that has received considerable attention in the last decade is the use of peer pressure in solidarity groups. Groups of borrowers share the repayment responsibility of a group loan, even though the group loan is divided into different shares among members of the group. Each member is responsible not only for his or her share of the loan but also for his or her partner's share, since typically the lending organization does not accept partial repayment from individual members. The loan is guaranteed by the cohesion of the group and the peer pressure among members.

There is a vast literature about the merits and disadvantages of this collateral substitute, both theoretical and empirical.<sup>3</sup> (While it seems to be an efficient mechanism to bring credit to sectors of the population that lack other forms of collateral and collateral substitutes, the empirical evidence suggests that this type of collateral substitute faces serious limitations when dealing with borrowers that are experiencing growth and increasing financial needs.

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<sup>3</sup> For a literature review, see Ghatak (1999) and Huppi and Feder (1990).

Finally, in between collateral and collateral substitutes there is the set of assets that for historical, institutional, and legal reasons do not fall within the legal framework for securing credit transactions. Thus any credit contract that uses any of these assets as collateral is considered legally unsecured. While the specific list of assets included in this category varies across countries. It usually includes household items, future harvest or output, livestock, warehouse receipts, inventories, and other forms of moveable property.

These assets are considered collateral substitutes because of exogenous circumstances not related to the inherent qualities of the asset. Moreover, they are widely held by many sectors of the population that are rationed out of the formal credit market. Rationing is the result of legal narrow definitions of collateral. Risk-averse lenders prefer not to take a chance by accepting collateral pledges of assets with dubious legal standing. The consequence is a limited supply of funds. By modifying the legislation to include a broader set of assets that can be used as collateral, access to credit could be considerably expanded.

### ***Collateral and Collateral Substitutes***

In spite of the thin line that divides collateral from collateral substitutes, lenders face major consequences from accepting collateral substitutes. That explains the strong bias toward the use of traditional forms of collateral in most developing economies.

In most cases, collateral substitutes can generate the same repayment incentives as traditional collateral. However, most collateral substitutes do not compensate lenders for lost funds if borrowers default. Consequently, the use of collateral substitutes implies some degree of risk sharing between lenders and borrowers, in addition to the risk already existing in any credit transaction due to uncertainty and transaction costs. How much risk a lender is willing to take depends on his or her degree of risk aversion.

Additionally, the regulation and prudential supervision of financial organizations in most countries considers loan portfolios granted on the basis of collateral substitutes as unsecured portfolios. Therefore, regulated financial organizations are required to keep higher levels of provisions on these portfolios. This has a direct effect on the profitability of the financial organization and it constitutes a major deterrent to the use of collateral substitutes by regulated organizations.

There is a secondary effect when financial organizations with portfolios granted with collateral substitutes attempt to finance their own activities by using their financial assets as collateral. A portfolio of unsecured loans is also considered unsecured; thus there is a double penalty in the use of collateral substitutes. Financing a portfolio of unsecured loans is more costly than financing a portfolio of secured loans.

In sum, the acceptance of collateral substitutes brings about additional costs for lending organizations in terms of risk, portfolio management, and financing. In spite of the additional costs, collateral substitutes are widely used in informal and semiformal financial markets. In these market niches, borrowers lack traditional forms of collateral or the transactions costs of using them are prohibitive. Typically, loan sizes are small and terms to maturity are typically short-term, which reduces the risk exposure of the lend-



ing organization in a single transaction. Additionally, most of these organizations are not regulated. Thus they are not forced to keep differential levels of provisions for legally secured and unsecured loans.

The virtual absence of medium- to long-term credit transactions in semiformal and informal markets is evidence of the failure to design a credit contract with the right repayment incentives that successfully controls for uncertainty in the absence of traditional collateral.

In the market for short-term financing with collateral substitutes, the additional costs imposed by the acceptance of this type of collateral are reflected in higher effective interest rates and in loan size rationing. In many countries, the prevailing practice of providing grants and subsidies to semiformal financial organizations, such as NGOs and self-help groups, has hidden the real cost of using collateral substitutes. The real costs, however, are quite obvious in the informal markets where informal lenders face the additional costs of accepting collateral substitutes. In informal markets, borrowers pay much higher interest rates than in formal markets and loan sizes tend to be more severely rationed (Rodríguez-Meza and González-Vega 2002).

## **Secured Interests: Problems for Expanding the Use of Collateral**

### ***Moveable Assets***

In most developing countries, the only moveable assets that can be used as collateral are vehicles, some types of equipment and machinery that are easily identifiable, and some types of inventories stored in warehouses. Broadening the number of assets included in this category would not only increase the number of borrowers with access to credit but would also improve the terms and conditions of existing loans for those who already have access to credit: that is, lower interest rates, larger loan sizes, and longer terms to maturity.

Access to credit is especially constrained by the limited set of assets that can be used as collateral in the case of small projects, as the funding option would require an amount of collateral inconsistent with the funds demanded. That is the case, for example, when a borrower has to take on a mortgage to finance short-term working capital because the borrower's only available asset that can be used as collateral is real estate. As a consequence, many small producers are forced to use their own savings or to borrow in the informal financial markets to finance their small-scale investments. The result is an inefficient allocation of resources. Small producers are constrained by the availability of their own funds and by investment indivisibilities. With more flexibility to define credit contracts, society would achieve greater levels of investment by better allocating its scarce resources.

Even with larger loan sizes, an enlargement of the set of assets that can be used as collateral and reforms that expedite seizing procedures and contract enforcement can



lead to a better allocation of resources. The current system gives incentives to marginally overinvest in assets that may eventually be used as collateral. This may not be the best allocation of investment resources. For example, firms have incentives to overinvest in buildings and real estate because they can easily be used as collateral later.

At the overall level of the economy, the investment bias toward a narrow set of assets that can be used as collateral distorts the relative returns to investment and may misallocate resources to uses that may not be optimal. This can also distort the allocation of savings and retained profits. These surplus balances may not be allocated to their best uses through financial intermediaries and instead may be reinvested within the same economic units generating them. The consequence is less financial intermediation and lower investment levels. De la Peña and Fleisig (2001) have examined the small size of the set of assets that are used as collateral in the agribusiness sector in Latin America. In this sector, access to credit is constrained by the use of real estate, vehicles, and warehouse receipts as collateral, despite the fact that producers own other types of assets, such as tools and equipment.

In Latin America in general, the use of collateral is constrained by a few acceptable types of assets in every sector of the economy. Even personal guarantees are ultimately reduced to real estate guarantees, as a personal guarantor is usually required to own real estate. In many cases, some moveable assets are accepted only in conjunction with personal guarantees—and the guarantor is required to own real estate.

There are a few exceptions to the bias against the use of moveable property, including cases where the moveable property is physically placed with the lender (such as pawn shops), when the lender keeps legal ownership of the asset (such as leasing), or when the assets are placed with a third party. However, some of these alternative arrangements have also faced problems because of narrow interpretations of the law. For example, in Bolivia a limited interpretation of the law that challenged the possibility of auctioning small value assets by the lot, as it is needed in the case with gold and jewelry to make it economically viable, almost eliminated pawn shop loans in an innovative microfinance organization.

Fleisig and de la Peña (1996a,b,c,d; 1997a,b; 2003) have carried out many case studies of the legal impediments to the use of moveable property as collateral in several Latin American countries. From these studies, they have identified several problems related to the use of moveable property as collateral.

*Seizure of specific assets is explicitly prohibited.* For example, some tools and working instruments and household assets are declared by legislation to be immune to seizure. Therefore, no lender is willing to accept them as collateral. This immunity is justified on arguments of social and basic human entitlements. To the extent that the number of assets included in the immunity is small, the impact of this type of prohibition is small. However, in some countries the immunity is stretched to cover some real estate, in the form of a minimum extension of land that cannot be foreclosed. The social benefits of these restrictions must be compared to the social and private cost of being excluded from

financial markets. The computation must account for the resources spent on circumventing the restriction, an inevitable side effect of every restrictive regulation.

*Legal definitions are too narrow or too wide.* As a consequence, their application is limited to one interpretation of the type of asset or their legal standing is too diffused to be practical. Fleisig and de la Peña present examples such as legal codes that typify bonds as collateral without considering trusts, and legal codes that explicitly establish legislation on pledges only for new assets and thus preclude the use of used assets. Also, a physical description of the asset is sometimes required when pledging it as collateral. Thus when assets undergo a transformation due to their nature or because they are an input in a process of production, the original legislation cannot be applied.

*There are vacuums in the legislation that leave a whole set of assets outside the legal codes.* The missing assets are then included within inappropriate legislation, thwarting their use as collateral. A typical example is the lack of legislation for the use of floating pledges, which do not require direct physical identification of the assets and allow pledges in terms of the total value of the transaction. This type of legislation is flexible and allows the use of stocks of animals, rotating inventories, and future harvests. In most developing economies, the absence of adequate laws for this type of collateral has led to the use of only a small number of physical and easily identifiable assets in credit transactions. The law should take into account the evolving nature of a business and the potential transformations of an asset in the normal process of production, such as a future harvest being stored in a warehouse in the form of inventory.

*Laws are not flexible in the use of the asset once it is pledged as collateral.* For example, some pledges prohibit any transaction with the asset pledged, thus seriously limiting the economic value of the asset.

*The law is not neutral.* The State sometimes has priority over private parties, as is the case with warehouse receipts in some countries.

*There is no legislation for the use of accounts receivables as collateral in some countries.* This precludes input suppliers and semiformal financial intermediaries from financing their own activities by leveraging their portfolios. The supply of funds in the economy and the possibility of establishing linkages between the formal, semiformal, and informal sectors are seriously constrained. Even if formal financial intermediaries are not willing to expand their services directly to smaller clients, these linkages could indirectly generate a large volume of funds for these sectors and could indirectly increase access to credit by marginal sectors of the economy.

*The lack of ownership registries for some assets does not allow property rights to be clearly established.* Such property rights are indispensable to secure a transaction formally. No in-

termediary would accept an asset as collateral unless the property rights of the borrower over the asset are clearly defined.

*The law does not establish norms for the publication and perfection of pledges adjusted to the characteristics of the assets.* In some countries when a portfolio of loans is offered as collateral, for example, the lender is obliged to notify each original borrower.

*The law does not establish norms for the enforcement of pledges adjusted to the characteristics of the assets.* For example, it does not establish clear provisions for the use of private action, which may be an efficient manner to settle cases for some assets. The laws and procedures for enforcement of contracts must be clearly defined: not only for the cases when the two parties are willing to settle but, more importantly, for the cases when there is disagreement.

*There is a lack of a unique registry of liens, which could enable lenders to easily establish the priority and existence of previous claims over an asset.* Lenders that face difficulties establishing the priority of their claim vis-à-vis those of other lenders will be reluctant to accept such assets as collateral.

*Procedures to enforce contracts are slow, which limits the possibility of using assets subject to quick depreciation.* The principle should be to facilitate the recuperation of funds. Therefore, loopholes must be avoided and appeals must be limited and handled expeditiously. The continuation of the claim on the proceeds if the borrower sells the collateral reduces the risk of moral hazard in the use of the collateral by the borrower.

*The costs of some enforcement procedures are not on par with the value of the financial obligation.* This cost is a function of the clarity of the law and the efficiency of the procedures and relevant courts. Lawyers' rates must be established in accordance with the value of the transaction. These costs may easily hinder the use of some assets as collateral, even when there is clear legislation to support them.

*There are problems with the publication of the collateral.* When the borrower retains possession of the asset pledged as collateral, lenders must follow a process to make public their claim over the asset. In some cases, this requires a costly process with full description of the asset and publication in several national newspapers.

*Public registries compromise the use of some moveable property.* Problems include the following:

- Many types of registries create confusion and increase search costs. In some countries, there are different registries by region within the country, by type of lender, and by type of transaction. When several registries exist, it should be possible to consolidate the information at low cost.

- There is legal confusion about where claims should be filed.
- The administrative processes of registration are corrupt and slow. Paper documents are frequently lost.
- Paper registries limit access (unlike online systems, which facilitate access and allow easy consolidation of the information).
- Filing systems make access difficult.
- Registration fees are high. The use of fixed fees has a regressive effect in relation to loan sizes.
- If the registration process of liens takes several days, there is a danger that new claims on the same asset can be filed. This increases the risk for the lender.

*Contract enforcement is complicated, raises the cost of financial transactions, and constrains the use of assets that depreciate quickly.* The most common limitations to efficiency in contract enforcement include the following:

- Private action is not permitted for the repossession of assets. In some countries a warrant issued by a judge is required to seize an asset. This not only slows down the process but also opens the possibility for disputes, which further delays the termination of the contract. In some cases, it may take several years.
- The process to obtain a warrant is slow and requires considerable red tape, regardless of the value of the transaction.
- Court procedures raise costs, sometimes exponentially. They include costs for lawyers, appraisers, publication, and court fees. In many cases, there is double publication, first to announce a borrower's default and again to announce the sale of the asset pledged as collateral. This unnecessarily increases the cost of enforcement.
- In many countries, assets pledged as collateral can be sold only in public auctions and do not become the property of the creditor. This lengthens the duration of contract enforcement.
- Auctions by lot for assets of small value may not be allowed, which increases the selling cost of a single asset pledged as collateral.

*Bankruptcy laws may give priority to employees, the State, lawyers, and other parties involved with the borrower, which render the collateral useless for the creditor.*

All these factors explain why Fleisig and de la Peña estimate that borrowers in Latin America pay a considerable premium in the interest rate, as compared to borrowers in developed financial markets. Lenders add the additional risk brought about by the lack of legal recognition of most moveable assets as a premium to the interest rate.

Another effect of restrictions on the use of moveable assets is that the only alternative for borrowers' external financing are loans with personal guarantees. Most financial intermediaries have very limited funds to grant as personal loans. These funds are usually allocated on the basis of close relationships with borrowers with well-established credit

histories. This has a regressive effect, since borrowers with financial histories are usually wealthier. Borrowers of limited wealth and little financial experience have little opportunity to obtain personal loans.

One of the main sectors affected by the limitations in the use of moveable assets as collateral is the microenterprise sector, which is characterized by ownership of nonregistered moveable assets of low resale value. Additionally, the assets of most microenterprises are composed mostly of inventories and accounts receivables, which are usually excluded from the traditional set of moveable assets that can be used as collateral. Accordingly, it is not surprising that the financial organizations that have been able to successfully penetrate these markets have designed original mechanisms to facilitate the use of moveable assets as collateral, in spite of the limitations of the legal system.

### ***Non-moveable Assets***

#### **Real Estate**

Loan portfolios in Latin American financial markets are secured mostly by real estate. Even moveable assets and personal guarantees are usually backed by some form of real estate. The emphasis on the use of real estate has two clear direct consequences. First, borrowers that lack this type of asset are excluded. Second, borrowers that obtain funding using additional forms of collateral typically must pay a premium in the interest rate, to cover the additional risk lenders face by accepting other types of assets.

The most commonly used type of real estate is land. Land meets most of the criteria of an ideal asset to be used as collateral (with the exception of low transaction costs, in most cases). Property rights for land are relatively better defined than for any other assets. Despite some problems with titling and the definition of property rights and foreclosure that persist in most countries, land has a better defined legal framework and established procedures to regulate its use as collateral than any other type of asset. Almost every country has developed considerable amounts of written legislation and jurisprudence in the use of land as collateral. In some cases, however, this excessive jurisprudence may become an obstacle to its use. Additionally, land property rights are usually well defined for at least some sectors of the population.

With a few exceptions, land does not depreciate. It is not surprising, then, that mortgages are the preferred type of collateral for long-term financing. Moreover, land is not prone to moral hazard problems in the use and preservation of the asset. In addition, land markets are typically very active. This translates into high expected value of recovering the funds lent in credit transactions secured with land.

In spite of the advantages in the use of land as collateral, it has some problems. Most emerge from exogenous factors not inherent to its characteristics, but rather from problems with the definition of property rights, mortgage registrations, and enforcement of contracts. The main limitations for the use of land can be summarized as follows:

- There are problems with titling. Vast portions of land in the developing world have been possessed without proper title because of tradition, invasion, or redistribution.
- Use rights are not recognized. This limitation excludes users who possess an intangible asset over the land that emerges from years of using land plots while lacking individual property.
- In many cases, individual borrowers cannot use their land as collateral when it is exploited in community or trust, even when this form of land tenure is socially and legally recognized. There are problems with the definition of individual property rights when land has been distributed through some form of association of individuals such as farmers' associations or cooperatives.
- No clear distinction is made between the land itself and fixtures, buildings, and improvements on the land, such as canals. Fixtures should have value as assets independently of the land where they are located.
- There are cadastral problems. This makes it difficult to ascertain the exact dimensions of the land upon which a mortgage would be established. The absence of a clear definition of the limits of each plot complicates contractual agreements. This problem is aggravated in isolated rural areas.
- Explicit limitations are placed on property rights over land, such as a prohibition to resell or to pledge land as collateral to secure a transaction.
- In some countries, minimum thresholds of land extension have been established, below which land cannot be repossessed. The goal of these regulations is to reduce inequality, but such regulations may be counterproductive since they exclude small landowners from financial markets, thereby limiting their chances to increase their well-being.
- Land registries are incomplete or very difficult to use. Issuance of property titles and verification of ownership require too much time, cost, and effort.
- The costs of mortgage registration are high because of notary requirements and taxes and fees for inscription. In Costa Rica, for example, lawyers' honoraria may add up to 12.5 percent of the value of the transaction (Monge, Cascante, and Hall 2000).
- Mortgage registration is too lengthy. For example, in Bolivia and Mexico, it may take a month, while in El Salvador and Costa Rica it may take more than a month and a half. Consequently some financial organizations have designed alternative mechanisms to expedite loan disbursement, such as disbursements on the basis of the receipt of inscription. These alternative mechanisms raise the level of risk of the transaction, which is transferred to the borrower through the terms and conditions of the loan: usually as smaller loan sizes and higher interest rates.
- Limits have been placed on the number of mortgages that can be pledged per unit of land. Some countries allow only one mortgage, independently of the value of the transaction. When second and third mortgages are allowed, a clear definition of priority rights is needed. Such a definition can limit opportunistic behavior dur-



ing the mortgage registration process by borrowers who may attempt to use the same asset for several credit transactions *simultaneously*.

- Foreclosing costs may increase the cost considerably, in terms of both money and time. The judicial process of foreclosing a mortgage is usually lengthy; in many cases it may take years. Legislation regulating the publication and transfer of claims usually delays the process further.
- The transaction costs of mortgages are usually fixed; they are independent of the size of the transaction. To the extent that financial organizations rely on the use of real estate to secure their interests, small borrowers with demand for small loan sizes are excluded.

### ***Problems Common to Moveable and Non-moveable Assets***

Collateral legally secures a financial transaction, as opposed to collateral substitutes. Because of this distinction, lenders prefer conventional collateral to collateral substitutes. However, the securitization of a financial transaction generates additional costs for both borrowers and lenders, whether it is backed by moveable or non-moveable assets. The level of these costs depends directly on the efficiency of the laws, institutions, and procedures of the legal system.

Both moveable and non-moveable property used as collateral face costs emerging from inefficient registries and lengthy and costly processes of foreclosure and repossession. These costs can be so high that some assets might not be used as collateral—despite adequate legislation. In some cases, assets are used under innovative arrangements to avoid the high costs of registration and enforcement—but these arrangements render the legal validity of the claim useless. For example, in many rural areas of developing countries, semiformal financial organizations retain titles of land under their possession to enforce repayment, yet there is no registration or legal validation of the claim.

For both moveable and non-moveable assets, the processes of publication and perfection must be well defined and the enforcement of the contracts must be designed to facilitate the process and minimize costs for both lenders and borrowers. Private action in contract enforcement, whenever it is appropriate, considerably reduces transaction costs and expedites the process of terminating a contract.

### **Unsecured Loans: Constraints to the Use of Collateral Substitutes**

Different forms of collateral substitutes succeed to varying degrees in securing the interests of the lender in a credit transaction. The varying degrees of success explain the varying degrees of their use, as lenders are reluctant to accept collateral substitutes that fail to enforce a debt contract successfully. The development of many collateral substitutes has been the result of innovations introduced by financial organizations in an



attempt to adjust to their economic and legal environment and to their clients' wealth and asset endowments.

### ***Reputation and Repayment History***

Many loans lacking conventional forms of collateral are disbursed on the basis of the borrower's valuation of his or her personal and financial reputation. For this type of collateral to be effective, lenders must be able to collect and store the necessary information about potential borrowers, reputation, and repayment history, and must be able to pose a credible threat to that reputation in case of lack of repayment.

In many nonregulated microfinance organizations, such as village banks and NGOs, these two functions are easily achieved, thanks to the small size of the markets. The collection of information is cost-effective and the threats to reputation and repayment records naturally follow from an almost monopolistic positioning in the market. As markets become more competitive, the need for more efficient mechanisms of information collection, storage, and dissemination becomes apparent. In developed financial markets, these functions are effected thorough credit bureaus and credit public registries.

### **Credit Bureaus and Public Credit Registries**

Credit bureaus and public credit registries are means for lenders participating in the market to exchange information about clients and potential clients. The exchange of information can be voluntary or compulsory.

Voluntary exchange implies the creation of an information center that may be established by the participants in the market or by a third party. Participants provide their own information voluntarily in exchange for information from other lenders in the market. The center is organized to guarantee the veracity of the information. The center must establish penalties for inadequate information because of negligence or bad intent. To the extent that the legal framework allows it, the exchange of information does not violate individual privacy because the exchange is voluntary. In many instances, to overcome any legal obstacles, the borrower's authorization of the exchange of information is included in the credit contract.

Compulsory exchange implies the creation of public credit registries. These registries are typically managed by the public regulator of financial organizations or the central bank. Given the compulsory and public nature of the information, there may be problems with the privacy of the information. Thus this type of exchange of information is usually limited to global information about the individual borrower and not by operation. The information exchanged is also limited to credit transactions. Public credit registries are common in Latin America. The type of information required from market participants includes arrears, credit exposure, interest rates, collateral, and other terms and conditions of the loans. There is usually a minimum loan size below which it is not compulsory to provide any information. This usually excludes small loans of borrowers

who are starting to participate in financial markets and a large part of the operations of microfinance organizations.

Compared to public credit registries, credit bureaus allow a more comprehensive exchange of information, not limited to the credit transaction itself, such as characteristics of the borrower and the projects financed. As they are usually organized as private organizations or nonprofit associations of lenders, they do not face the political pressures and problems of organizational structure that some of their public counterparts encounter. In public registries, the linkages to the central bank or the financial regulator may introduce distortions into their basic functions. However, the compulsory nature of participation reduces the need to generate incentives to provide accurate information, as failure to comply may bring about serious penalties or the loss of the charter of operation.

Credit bureaus can collect financial and nonfinancial information. Typically, credit bureaus collect information from individuals and household units. To the extent that they collect information on firms, their functions converge with the functions of rating agencies. Rating agencies, however, require more elaborate information.

The information collected from individuals may be either black (negative) or white (positive). Black or negative information includes repayment history of defaults and arrears. This type of information is useful to establish willingness to repay of the potential borrower. Lenders that lack access to this type of information are forced to use personal references collected in the community about the borrower's behavior and his or her patterns of repaying charges for public utilities and other obligations.

White or positive information includes information about assets and liabilities of potential clients, such as potential assets to be used as collateral, the structure of liabilities, schedules of repayment of outstanding loans, and employment and family history. This information is useful to establish the repayment capacity of potential borrowers. In the absence of credit bureaus, lenders obtain some of this information by screening clients through a thorough evaluation of potential clients and their production projects. Some countries forbid the exchange of white information, to protect individual privacy.

In most Latin American countries, credit bureaus collect black information and white information only to limited degrees (Jappelli and Pagano 2002). The accumulation of white information along with black information may allow credit scoring algorithms to be implemented to evaluate potential clients.

Lenders can easily develop credit scoring technologies by combining their private information about their clients and the information obtained from credit bureaus. Thus the existence of credit bureaus can facilitate credit scoring technologies, in the hands either of credit bureaus or individual organizations. This innovation has been successfully used by individual microfinance organizations that have only partial shared information to complement their own private information (Shreiner 2000). These initiatives would benefit greatly from greater exchanges of information. They could be used to reinforce the use of reputation and repayment history as collateral substitutes.

The information obtained from credit bureaus can also be used in the process of screening and evaluating potential clients and can be a complement or a substitute to traditional process of selecting clients, depending on the relative costs of the individual analysis, the cost of participating in the exchange of information, and the quality of the information. For clients in the informal sector who engage in nontraditional activities that lack audited financial statements, individual analyses may be very costly. In this context, the information obtained from credit bureaus may even be more valuable.

In terms of the financial market as a whole, on one hand, credit bureaus facilitate the design of debt contracts tailored to the specific characteristics of the borrowers. Thus they have great potential to reduce problems of adverse selection. On the other hand, the exchange of information also increases competition and reduces rents that incumbent lenders may be extracting from private information accumulated about their clients. The latter effect explains why some financial organizations refuse to exchange information; they perceive the value of their rents to exceed the benefit that could be obtained from additional information about potential borrowers. This also explains why credit bureaus have not spontaneously emerged in Latin American countries where financial markets are concentrated in a few formal banks (Pagano and Jappelli 1993; Padilla and Pagano 1997).

The threat of reporting negative information to credit bureaus about clients with arrears works as a deterrent to default by borrowers and reinforces the value of repayment history as a collateral substitute. However, there is no evidence that greater exchanges of information are associated with lower repayment problems, even though there is evidence that greater exchange of information leads to greater volumes of credit (Jappelli and Pagano 2002).

### ***Interlinked Transactions***

Historically, one form of collateral substitutes has emerged as a mechanism to provide financial services to rural producers and borrowers that lack financial histories and traditional forms of collateral: interlinking of financing, production, and commercialization of agricultural products. Under this arrangement, the buyer of the output grants credit to producers, who in turn pledge their future output as a collateral substitute.

Contracts in typical interlinking transactions successfully address problems of asymmetric information between lenders and borrowers (Braverman and Stiglitz 1982). This type of contract may also give some degree of monopolistic power to the lender/intermediary, however. The monopolistic power gained by the sole viable buyer of the production can then be used to extract rents from the borrower/producer. These rents would not have emerged in a competitive setting (Bardhan and Udry 1999).

Moreover, the objective of the lender/intermediary is not necessarily to provide financial services but to commercialize the output. Thus the right set of incentives is needed to induce intermediaries to enter into this type of arrangement, if such interlinking is to be used as a policy to enhance access to credit. This poses a serious challenge for

policymakers because these firms are typically privately owned and any attempt to inject funds with the aim of increasing the supply of funds to producers must deal with the problem of fungibility of money. Additional, problems of implementation are aggravated by the unique characteristics of each output market; this impedes policy generalizations, even in the case of agricultural products.

The legal problems with the use of future harvests as collateral are closely related to the interlinking of transactions as a form of collateral substitute. In practice, liens of future harvests are commonly used to secure transactions between lender/intermediaries and borrower/producers. Appropriate legislation for the use of future harvest as collateral will likely increase access to credit not only on its own merits but also by facilitating the interlinking of transactions.

### ***Joint Solidarity***

The use of joint solidarity groups as a collateral substitute has been a main engine for the development of some microfinance organizations that have been widely recognized for expanding the financial frontier in several developing countries, such as the Grameen Bank in Bangladesh and BancoSol in Bolivia. The success of these organizations seems to indicate that this type of collateral substitute can play an important role in enhancing access to credit for low-income populations.

Most of the successful cases of using joint solidarity have had some degree of implicit or explicit subsidization. This complicates the analysis of this mechanism's potential to expand access to credit. It is difficult to disentangle the effects of the subsidy from the effects of the innovation in the use of a collateral substitute. As a public policy matter, the subsidy could be justified to the extent that social benefits outweigh social costs. Yet a rigorous cost-benefit analysis of the use of this type of collateral substitute has seldom been attempted (Pitt and Khandker 1995).

The use of joint solidarity as a collateral substitute imposes additional challenges from a legal standpoint. Currently, most lenders willing to accept this type of collateral substitute face the problem of holding an unsecured portfolio. This is not only costly to develop but also difficult to finance, since the portfolio itself cannot be used as a secured asset to raise funds.

Additionally, joint liability contracts may also be weakened when offered to wealthier sectors of the population or even to marginal clients who experience rapid growth. As the differences in levels of debt and wealth increase, the incentives to remain in a solidarity group are reduced and the stability of the group is threatened.

### **Regulation and Supervision**

The appropriate system of regulation and supervision of financial organizations is crucial to the expansion of access to credit by low-income sectors of the population, in

particular, and the total volume of credit in economy, in general. However, the form, extent, and role of the regulation and supervision are subject to considerable debate, especially when dealing with developing financial markets. In particular, several points are debated:

- Which organizations should be regulated and more specifically, which organizations should be subject to prudential supervision?
- Who should be the regulator?
- What are the optimal instruments and rules of regulation and supervision?
- What are the sanctions that should be imposed on violators?
- Who should pay the cost of regulation and supervision?

Regulation and supervision will become more important as existing financial markets expand toward marginal sectors of the population by introducing innovations in lending technologies to overcome the legal and informational problems of these markets. This has been the case, especially when the expansion of financial services has sprung from informal and semiformal microfinance organizations that started at a small scale but have been growing in a process of convergence toward market niches traditionally served by formal financial markets. Bolivia, El Salvador, and Peru are examples of countries where regulation and supervision has become a crucial factor in the expansion of the supply of financial services.

This does not mean, however, that more regulation and supervision necessarily generate an expansion of the supply of financial services. The evidence seems to suggest that for individual nonregulated financial organizations, there is a threshold level of development beyond which appropriate regulation and supervision becomes necessary: recently formalized microfinance organizations in the countries mentioned above are good examples. The need emerges from the desire to gain access to low-cost funds and to more abundant sources of funding, such as collecting deposits from the public.

The question about the type of organizations that should be regulated is a question about the justification for intervention in a market. Economic theory provides explanations based on market failure. Regulations of financial markets such as regulations on entry, capital adequacy, mobilization of deposits, and the levels of risk undertaken by financial organizations are justified on the basis of arguments about market failures.

These regulations have different goals. First, they preserve a competitive and stable market, since the social cost of a breakdown of the system more than offsets private costs. Second, they protect the consumer or depositor who lacks the adequate information or the incentives to directly control the actions of the organization that is receiving their deposits. Third, they maximize the quantity and quality of control of the performance of financial organizations. This is an activity with considerable economies of scale, which are difficult for individual economic agents to achieve. Fourth, financial organizations require continued monitoring in several periods during which individual economic agents

may be committed to long-run contracts, without the possibility of renegotiation or exit, but during which financial organizations can easily exit; thus individuals need to be protected from abuse.

Laws and regulations restrict entry to the credit market, to guarantee an optimum provision of financial services and preserve the stability of the system by avoiding frequent bankruptcies of organizations incapable of competing in the market. To these ends, participants must meet a set of minimum requirements as established by regulation, such as minimum levels of capitalization, norms of operation and procedures, norms on asset composition and levels of provision for accounts nonreceivable, and norms on financial and operative profitability.

In the traditional view of regulation and supervision, two different levels of financial organizations are clearly defined. Organizations with a seal of approval enter into the framework of regulation and supervision. Organizations without a seal of approval remain as informal organizations with limited outreach. The threshold of separation is defined by access to some forms of financing; only organizations that mobilize deposits are regulated. The levels of capitalization and risk undertaken by each organization are regulated to provide a minimum guarantee on deposits of the public. Since credit-only organizations do not mobilize funds belonging to third parties, they are not regulated. It is assumed that the owners or investors of these organizations have the right incentives and capabilities to exert the appropriate monitoring and control to guarantee a safe return on their investment.

In this twofold approach, both participants and regulators encounter costs and benefits from supervision. In addition to limits on the levels of leverage and capitalization, regulated organizations must deal with some loss of freedom to experiment and develop new products and methodologies because of the rigid structure established by the supervision. Other costs include the generation of regular reports and the cost of adapting to accounting practices required to transmit financial information to the regulator. The main benefit for regulated organizations is access to cheaper forms of financing such as public deposits and lines of credit from other financial intermediaries, which become available thanks to the seal of guarantee provided by formalization.

The supervisor also faces additional costs and benefits with the expansion of the scope of supervision toward marginal sectors. Additional costs emerge from the greater number of organizations under supervision, as well as from the increase in the diversity of assets and liabilities to take into account. The portfolios of new organizations to be supervised typically consist of numerous small loans with considerable geographical variability and decentralization. These require great numbers of personnel to appropriately supervise them.

The case for credit-only financial organizations is usually made on the basis of problems of governance and ownership structure or in spillover effects of potential bankruptcy. These arguments provide the foundation for the provision of charters of operation. However, deeper levels of regulation should be evaluated taking into account the cost and



benefits of additional regulation, which is a costly activity for both the regulator and society.

Between the credit-only microfinance organizations and the formal financial intermediaries that mobilize deposits from the public there exists a whole range of intermediate organizational forms. These organizational forms include organizations that capture deposits from the public as a means of providing a service or financial discipline but do not use the funds as a means of financing, such as village banks and other programs that require compulsory savings for participation; organizations that mobilize deposits exclusively from their members/owners to finance their activities, such as closed cooperatives or credit unions; and organizations that mobilize deposits from their members/owners and the general public but only through savings accounts and term deposits, such as open cooperatives. In the case of these intermediate organizational forms, the degree of supervision required is greater than the credit-only organization because their use of funds collected from depositors with limited capacity for monitoring the actions of the intermediary.

The inclusion of these intermediate organizations within a unique framework of supervision along with full financial intermediaries violates the principle of neutrality that every regulatory framework should respect. Ignoring the different composition of the assets and liabilities and the ownership structure of this type of organizations places them in a disadvantageous position. These organizations do not conform to the archetype of organization used to design the regulatory principles: the most common formal financial intermediaries, banks. Thus there may be serious consequences from inappropriate regulation and supervision for the provision of credit services to low-income sectors of the population. These intermediate organizations are the organizations best suited to generate a sizeable volume of credit in these sectors because of their freedom to experiment and to develop new products tailored to the needs and characteristic of these clients. The incentives to innovate and to experiment are seriously hampered when organizations are forced to meet narrow rules of regulation.

An alternative approach to supervision, more in tune with the principle of neutrality, is proposed by van Greuning, Gallardo and Randhawa (1998). Supervision is adjusted to the typical balance sheet of each type of organization. A different composition of assets and equity of nonbanking alternative organizations exposes them to different risks; therefore, they require different prudential regulation. Even though the underlying principles are the same, the relative importance and the origin of the risks differ. Consequently, the supervisor should place different emphasis on different risks, as well as varying levels of thresholds and acceptable ranges of risk indicators, according to the reality of each type of organization. Sanctions and penalties should also be a function of this reality. For example, most microfinance organizations offering financial services to marginal clients are funded through donor's funds. Thus greater levels of capitalization by donors will not increase the level of responsibility of their managers in the running of the organization.



These authors propose a scaled system of supervision, adjusted to the levels of risk of each organization. For instance, organizations that mobilize resources from members but not from the public, such as credit unions, require supervision over the quality of their assets. Such supervision will aim at preventing portfolio mismanagement and at correcting the wrong incentives generated by an ownership structure and management style that empower management over the rest of the members of the organization. Instruments, indicators, and sanctions will also differ from those used in the regulation of organizations with an equity structure based on shareholding and public financing.

The responsibility of supervision can also be differentiated according to the types of organizations. In many cases, market mechanisms can be used to monitor and control organizations, as it is the case with rating agencies. In such circumstances, this also solves the problem of who should pay the cost of regulation. Scaled regulation and supervision according to the levels of risks faced by different types of organizations reduces the cost of supervision and allows the evaluation of each type of organization to be adjusted to its technological characteristics.

## Conclusion

The level of access to credit by low-income sectors in Latin American countries is severely constrained by the legal and institutional framework for financial transactions: laws, procedures, and institutions. These constraints lead to the partial or total exclusion of some sectors of the population from formal credit markets, with serious consequences for the efficiency of their investments and their welfare. A better allocation of credit resources to these sectors will improve their management of risk and information, the levels of specialization and development of technological innovations, and the levels of investment in projects requiring sizeable amounts of capital because of indivisibilities that cannot be financed by informal financial markets. Thus greater access to credit will lead these sectors to be better integrated into the markets and will increase their liquidity. The final result will most likely be higher and more stable levels of investment and income and households better equipped to smooth consumption when dealing with income fluctuations.

Greater access to credit by low-income sectors of the population requires overcoming the current legal and institutional impediments that are constraining its growth. The objective is to remove the constraints that preclude the realization of private contracts between lenders and borrowers. A permanent solution requires the removal of constraints and the creation of an appropriate environment to promote financial transactions between private economic agents. Any alternative solution will be only a short-term solution.

In an appropriately designed credit contract, borrowers are able to take advantage of the additional funds obtained with the loan. When the contract is due, the funds are repaid accounting for their opportunity cost for the duration of the contract. A competitive private lender will be able to continue financing creditworthy borrowers only under

these conditions. The breakdown of the credit contract because of lack of repayment is a threat to the benefits provided by continued access to credit.

To guarantee their continued presence in the market, lenders must be able to secure a competitive return to their investment. In the credit contract, lenders surrender their rights over current resources in exchange for a promise of future repayment. The uncertainty and information problems typical of these contracts mostly affect the interests of the lender, not the borrower. Thus the legal infrastructure should not impede the protection of the private interest of the lender in credit transactions.

Lenders protect their interests in the credit contract by requiring some sort of security. This can be provided by conventional collateral recognized by the legal and institutional infrastructure, and, to some extent, by some form of collateral substitute. Collateral substitutes have been widely used by some financial organizations and, in some respects, have been shown to be as effective as traditional collateral. In most cases, the only dimension collateral substitutes cannot fulfill is the recovery of funds by lenders in case of borrowers' default. In terms of managing information and creating incentives to avoid default, both collateral substitutes and traditional collateral can be equally effective.

Some forms of collateral substitutes, however, owe their existence to particular circumstances of the projects financed or to the participation of third parties in the financial transaction, which in turn are justified by the inability of financial intermediaries to provide credit to some sectors of the population. This is the case with the interlinking of credit and commercialization transactions. The involvement of a third party in a credit transaction requires additional resources. These mechanisms of securing credit transactions must be evaluated, therefore, accounting for the overall social costs and benefits.

Most forms of collateral substitutes impose additional costs to the credit transaction that are unique to them. Most of these additional costs accrue to the lender. At least three types of additional costs to the lender can be identified: the risk of not recovering the funds lent, the higher cost of refinancing, and the cost of higher levels of provisions if the lender is regulated.

In spite of the additional costs, collateral substitutes can play a very important role in expanding access to credit by low-income sectors of the population. Most forms of collateral substitutes that have spontaneously emerged from the day-to-day practice of informal or semiformal financial organizations are low-cost, effective mechanisms of bringing credit to marginal clients. Collateral substitutes can play a role even in formal financial markets, as has been shown by several examples of developed financial markets. The legal infrastructure of most developing countries must be adapted to include this type of collateral substitute, instead of becoming an obstacle to their use.

Reputation, financial history, the long-term value of the relationship between borrowers and lenders, and joint solidarity are types of collateral substitutes that promote a more active market of information in which a financial transaction is secured by an intangible asset. More active markets of information may bring considerable impact in expanding credit for low-income sectors.

When considering the promotion of more active markets of information, the relative merits of credit bureaus over credit public registries seem to suggest that direct intervention in the market may not be the best solution. However, the potential rents accruing to lenders from the accumulation of information on individual borrowers suggest that credit bureaus may not spontaneously arise in the market. A direct intervention in the market may be necessary to start the system. Nevertheless, the possibility of running credit bureaus as profitable businesses also suggests that they should eventually be private. In case of private ownership, it is first necessary to overcome the obstacles to exchanges of private information that plague many developing economies. This is an area that deserves more empirical and theoretical research.

The empirical evidence of developed economies, where large volumes of credit are granted on the basis of the exchange of information among lenders about individual borrowers, suggests that there is great potential for expanding access to credit by enhancing the exchange of information in developing financial markets. Additionally, this type of collateral substitute is an intangible asset available to any borrower with some record of participation in the market, regardless of wealth, activity, or geographic location.

The main problem with this type of collateral substitute is the creation of reputation or credit history for borrowers who have been excluded from financial markets in the past or who are about to start participating in the market. Joint liability may be an important mechanism in the creation of the basic original intangible asset, to the extent that individual information is recorded and that there is enough flexibility to link joint liability with other types of collateral through individual loans once group members have developed or acquired potential alternative forms of collateral.

However, joint solidarity is not the only answer to the problem of expanding access to credit by borrowers just entering the market. An alternative is the practice of sequencing the terms and conditions of the loans, according to which a long-term relationship is initiated with small loans sizes that grow as the lender accumulates information about the borrower. This practice has been successfully used in many microfinance markets.

By far the greatest potential for the expansion of access to credit by low-income sectors of the population is in the broadening of the set of assets that can be used to legally secured credit transaction in most developing countries. The types of assets most commonly held by low-income families are typically moveable household assets, livestock, tools, inventories, and expected production. The laws and procedures governing financial transactions should include these assets as conventional collateral, thereby minimizing the risk of using them to secure financial transactions. The legal support will reduce lenders' uncertainty about future collection of outstanding debts. Without legal backing, this type of asset is accepted as collateral only as a means to generate repayment incentives, which seriously restricts its potential to expand access to credit.

This study identifies several policy reforms to broaden the set of assets that can be used as collateral to fully secure a financial transaction, drawing from case studies of the use of collateral in several developing countries. The aim of these policy reforms is to increase the level of leverage on each economic agent's endowment of assets. These reforms

would also have a multiplicative effect in expanding credit through linkages in financing that would emerge from the possibility that lenders could fund their activities by using their portfolios of outstanding loans, secured with collateral and collateral substitutes.

The proposed reforms entail not only written laws but also reforms that aim at reducing the transactions costs of registering, seizing, and selling assets used as collateral and at increasing the efficiency of the judicial processes and contract enforcement. Even traditional forms of collateral currently used in credit contracts will benefit from these reforms.

The greatest potential for raising access to credit to low-income sectors of the population lie in policy reforms aimed at secure lending. This is because an efficient and comprehensive framework for secure lending provides the basis for existing financial organizations to expand their range of financial products toward low-income sectors. Such reforms would expand borrowing capabilities of existing borrowers, and would help incorporate borrowers that had previously been rationed out of formal financial markets. For new entrants, this would be the first step to building financial histories and relationships with financial intermediaries that could open the possibility of enhancing their borrowing capacity in the future. For incumbents, it could open the possibility of increasing access to credit with better terms and conditions. The effect for society would undoubtedly be positive.

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## COMMENT

**Enhancing Access to Credit for Low-Income Borrowers***Arturo Galindo*

In his chapter, Jorge Rodríguez-Meza discusses key policy areas where intervention may be needed to increase access to credit. The first area is the framework in which transactions can be secured, which should be backed by both moveable and non-moveable assets. Secondly, the author considers substitutes of collateral: not only credit registries and alternative types of contracts, but also credit guarantee schemes.

Well-functioning frameworks to secure transactions involve efficient property registries that allow creditors to track the ownership and pledging of assets; clear rules and regulations that define property rights regarding the types of assets that can be pledged as collateral in credit agreements; and enforceable rules and efficient institutions that allow creditors to seize collateral in an efficient and timely manner if the debtor defaults.

Latin America and the Caribbean lag far behind other regions in the protection of creditor rights. According to an index of effective creditor rights developed by the Inter-American Development Bank (IDB 2005), Latin America's index is only 0.15 compared to emerging country average of 0.40 percentage points. Bankruptcy proceedings average four years in Latin America—twice as long as in the OECD countries. As these measures suggest, Latin America and the Caribbean will gain from strengthening protections of creditor rights by increasing the size of credit markets, increasing access to credit for particular sectors, and decreasing credit market volatility.

Institutions lay out the rules of the game in terms of creditor protection and the breadth of credit markets. Internal laws and their enforcement determine the incentives of the participants in a debt contract and determine the extent to which insiders (managers) can expropriate the assets of outsiders (creditors, investors) that take the risk to finance projects. Better creditor protection increases financial breadth and depth by making it more difficult for insiders to expropriate outsiders: that is, by granting stronger rights to outsiders over collateral.

Creditor protection enhances the use of collateral. If collateral cannot be used, credit rationing resurfaces and leads to underinvestment. Collateral reduces several problems derived from informational asymmetries when the value of collateral is less uncertain than the value of the project. Furthermore, collateral is used a signal about the quality of the project and reduces moral hazard. Additionally, better creditor protection can increase access to credit by small firms.

Galindo and Micco (2004) have developed a model based on the standard idea that it is difficult for a lender to enforce both a particular use for the credit granted (asset substitution) and the level of entrepreneurial effort. The model introduces these two types of

moral hazard, mixing the formulation in Holmstrom and Tirole (1996, 1997) and Bester and Hellwig (1987).

To illustrate, assume that there are two kinds of risk-neutral agents. The first are borrowers that face profitable investment opportunities, but do not have enough cash to finance their own projects. The second are banks that have plenty of cash, but no investment opportunities. Banks have a monitoring technology that forces entrepreneurs to adopt a safe technology that reduces the “assets substitution moral hazard” and increases leverage. The monitoring action has a fixed cost per entrepreneur, and therefore is worthwhile to use only when the entrepreneur has a high level of wealth that implies a high level of investment. The solution of the model shows that in equilibrium, banks will not monitor small borrowers: entrepreneurs with low initial wealth (SMEs). This increases the moral hazard problem for small firms and they adopt the risky technology, with a higher probability of bankruptcy.

According to Galindo and Micco (2004) based on data from the World Bank’s World Business Environment Survey, in the developing country sample, the average share of bank credit in small firms is 10.7 percent, with a standard deviation of 9.3. In the developed country sample, this figure is considerably higher: 19.6, with a standard deviation of 11.8. The share of bank credit in medium-sized firms averages 17.0 percent, with a standard deviation of 11.9, for developing countries, and 18.3 percent, with a standard deviation of 11.4, for developed countries. Finally, the share of bank credit in large firms is 26.3 percent, with a standard deviation of 14.5, for the developing country sample, and 19.9 percent, with a standard deviation of 16.1, in the developed country sample. An improvement in effective creditor rights from the 25th percentile to the 75th percentile reduces the access gap between large and small firms by almost 15 percentage points.

Credit protection can also reduce the impact of adverse shocks over the credit cycle. The impact of an adverse shock that increases credit risk can be exacerbated if creditor protections are low. Low creditor protection can lead to stronger contractions when collateral cannot be recovered.

Developing a system to use collateral adequately is crucial to increase access to financial services. Among the main instruments to strengthen the different components of a secured transaction framework are: the development of frameworks to incorporate movable assets as collateral; the strengthening of registries; the protection of creditors from a legal perspective; and the improvement of enforcement mechanisms through the creation of special courts.

Various guidelines for reform and experiences with reform (such as the cases of Estonia and Romania) demonstrate that strong political will is needed to adapt existing laws. Incumbents may not want to change the status quo as Rajan and Zingales (2003) point out. Reform might be unpopular because personal assets that have traditionally been protected, such as homes, can be exposed.

However, it is very important to note that there is a one-to-one correspondence between the protection of creditor rights and the protection of deposits. Banks base most of

their lending on their deposits. Thus the ability to exercise a security interest on nonperforming loans amounts to *protection for depositors*.

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## COMMENT

### Law, Credit, Poverty, Efficiency, and Growth

*Heywood Fleisig\**

This comment raises several issues: first, it explains why Jorge Rodríguez-Meza's excellent study in chapter 8 deserves careful attention; and then, it comments on what I believe is an important error—the treatment of the guarantee as a collateral substitute. This error is not so important in itself, but its social cost is potentially enormous. I would then like to suggest extending the findings of this study to other themes. I will try to relate the experience of the Center for Economic Analysis of Law (CEAL) in reforming the laws governing debtors and creditors to the guidance that Robert Townsend sets out in chapter 1. I will close with some thoughts about next steps.

### Features of the Rodríguez-Meza Study

The Rodríguez-Meza study undertakes two important tasks. First, it sets out different microeconomic models of lending: one secured (with collateral), and one unsecured (without collateral). It asks how those models treat the microeconomic incentives facing lenders and borrowers. Then the study asks parallel questions about the law: what microeconomic incentives does the law give lenders and borrowers under the legal regimes for secured and unsecured lending? The study concludes that the laws and the economic models do not match well. Rather, these laws do not permit lenders and borrowers to act in accordance with economic incentives that, without the law's constraints, would permit private lending markets to produce more desirable social outcomes. The study recommends that the laws be reformed. I agree.

In addition, the study sets out a clear review of the underlying economic literature, a mathematically difficult literature. The study also describes an underlying legal literature that is always dense and often counterintuitive. Do not let the clarity of the author's exposition deceive you. These are complex issues. It is also important to congratulate the author on what he has not done: he has not simply correlated indexes of the “quality” of the legal system with indexes of the “quality” of the financial system. Rather, he has given us a microeconomic tour of models and laws that tell us why we might want to pay attention to the studies that present such correlations. In this, he follows Robert Townsend's advice: “The starting point...is an explicit structural model...” Only after the model is presented come data and testing, and only at the end, come policy recommendations. Bravo.

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\* This comment was published as a CEAL Issue Brief (October 2004).

## Guarantees are Not Collateral Substitutes

The study, however, discusses guarantees as a “collateral substitute.” I believe this is an error with potentially serious consequences if left uncorrected. Let me elaborate. In contrasting secured and unsecured lending, the author refers to unsecured lending systems as “collateral substitutes.” Now CEAL has encountered some hybrid models of debtor/creditor relations that do not fit easily within the normal “secured” and “unsecured” categories. For example, Uruguay’s dairy cooperative, CONAPROLE, can sell equipment on credit to dairy farmers at a low risk because, as a monopsony, it can deduct payments from the accounts receivables of Uruguayan dairy farmers. Bolivia imprisons nonpaying debtors for using the illegal post-dated check as a security instrument. About 25 percent of the inmates of La Paz jails are incarcerated for debt default through this device. More than half the inmates are women, often jailed with their children. Some Latin American indigenous communities punish debt default with death. These systems may, in some sense, be “collateral substitutes.”

However, a guarantee is not a collateral substitute. A collateral substitute would presumably reduce the risk and expected cost of non-payment, as does collateral. A guarantee, however, simply transfers the existing risk from the lender to the guarantor. After issuing the guarantee, the guarantor must worry, like the lender, “How do I get my money back?” The answer to that question lies in the same analysis of borrower incentives that the Rodríguez-Meza study has set out in its secured and unsecured lending models. This confusion is amplified for Latin America by an unfortunate feature of the normally rich and descriptive Spanish language. It offers us *garantías* as the word for guarantee; *garantías reales* as the phrase for secured transactions, or secured lending; and *fondo de garantías* as the phrase for a guarantee fund. Confusion is easy: reform of *garantias reales* is part of the solution; *fondos de garantías* are part of the problem.

## Extensions of the Study’s Themes

The points set out in the Rodríguez-Meza study about the legal framework for debt payment could be extended to several larger themes. These would relate the legal framework for debt payment to growth-driven inequality of income, the efficiency of the allocation of capital, and economic growth.

### *Debtor/Creditor Laws and Growth-driven Inequality*

The studies by Luis Tejerina (chapter 2) and Mauro Alem (chapter 4) present striking evidence of how income inequality increases as growth proceeds. Unreformed laws contribute to this result. They treat different property differently as collateral, and these legal treatments correlate with the property holdings of the rich and the poor. To see this more

clearly, think of a stylized system that has three classes of people: the rich, the poor, and the “in-betweens.” The rich own buildings, large plots of real estate, and movable property. The poor own nothing. The in-betweens own small plots of real estate and movable property. The legal treatment of this property in unreformed legal systems gives more access to credit to the rich as growth occurs. This applies to both secured and unsecured lending frameworks.

### Secured Loans

The laws governing secured lending treat the property of the rich and the poor very differently as collateral.

*For the rich:* Large plots of urban real estate usually are titled. Most unreformed mortgage laws provide a clear, though expensive route to using such titled property as collateral. Since real estate usually does not fall in value with time, even a slow and expensive debt collection system may permit lenders to recover part of their loans in the event of default. Therefore, the real estate of the rich can serve as collateral by using the legal device of the mortgage, common in unreformed Latin American systems. Moreover, because of the law’s curious treatment of “fixtures”—movable equipment that is ultimately physically attached to buildings—the rich can also finance much equipment. Unreformed law treats fixtures as part of the building to which they are attached, and therefore as part of the property subject to the mortgage on the building. Thus the rich can get financing for both the real estate and for much of the equipment in their commercial and industrial ventures.

*For the in-betweens:* The in-betweens fare worse. Unreformed legal frameworks do not permit small holdings of real estate to serve well as collateral. First, such holdings are often untitled, even though their ownership rights, especially in civil code countries, may be secure and uncontested. However, because these parcels are untitled, they are not in the real estate registry. The mortgage law will specify that the mortgage must be filed in the real estate registry. However, the untitled property will not be in the registry, so the lender will have no place to file the mortgage. Without a place to file, the mortgage holder cannot establish priority. A mortgage without priority is no better than an unsecured loan. Moreover, even when these holdings are titled, unreformed laws make the cost of mortgaging small holdings of property prohibitive because of the large number of expensive and unnecessary requirements set out by typical unreformed mortgage laws. In addition, badly drafted legal provisions protecting the “homestead” do not clearly define the part of a small real estate holding that a lender can legally repossess. So the in-betweens cannot get much credit secured by their real estate. Nor can they use their movable property. By themselves, for the reasons set out in Rodríguez-Meza’s study, their holdings of movable property are largely without economic value as collateral. Even worse, if they plan to run a business in rented real estate, as do most small and microenterprises, any



equipment they fastened to the property could potentially be seized by the holder of the landlord's mortgage in the event of the landlord's default, as the law would consider that property part of the landlord's real estate. Consequently, no rational commercial seller of such equipment would sell to these businesses on credit using the equipment as collateral. Finally, for many small businesses, well-intentioned laws prevent seizing the tools of the worker's trade for any reason. For this reason too, no rational seller of equipment would sell productive equipment on credit to small enterprises. These features of laws will keep the in-betweens from getting loans secured by their equipment and inventory or buying such property on credit.

*For the poor:* In this stylized case, it is assumed that the poor have no property. However, that does not mean the poor do not face limits on credit arising from these unreformed legal frameworks. Rather, under such laws, they will also not have much opportunity to buy property on credit, since the property they are buying cannot itself serve as collateral for the loan. Under such laws, a lender will find a loan to purchase tools no less risky than a loan to finance consumption. A poor person in the United States can save 5 percent of the purchase price of a used truck for a down payment and, if employed, can buy the truck on credit. By contrast, a poor Latin American must pay cash. If a reformed legal system permits the poor to buy a truck with a 5 percent down payment, that means that for any given income, it takes poor Latin Americans 20 times longer to buy a car on credit than their North American counterparts.

### Unsecured Loans

The problems with the legal framework for secured loans have parallels in the legal framework for unsecured loans.

*For the rich:* The legal system will give the rich more access to unsecured financing than can be explained by income differences. The unsecured lending system rests on two foundations. First, it rests on the lender's confidence that the borrower will repay. Second, however, it rests on the legal system that governs the collection of unsecured debts. Unpaid unsecured creditors do not just make a black mark in the credit bureau and go home. They go to court to get judgment liens that permit them to seize the debtor's property and garnish the debtor's wages. In unreformed countries, this process is long and costly, and therefore only useful insofar as claims that can be made against relatively large holdings of real estate. Since mainly the rich have such holdings, they also have more access to unsecured credit than the differences in their incomes from other citizens might explain. Formal sector lenders in these countries sometimes dress up these loans to pretend they are secured by movable property, but they are, in economic terms, unsecured and the lender is ultimately looking to the real estate for comfort. We know this because interviews with such lenders indicate they will not extend the same credit to those who only own movable property and can offer only movable property as collateral.

*For the in-betweens:* These problems also limit the access of the in-betweens to unsecured credit. Lenders know that if in-betweens default, ordinary debt collection proceedings will not permit seizing their property and, where they do seize it, the process will take so long and yield so little that the economic outcome from further debt collection will be nil. Consequently, the in-betweens will get access to unsecured credit on the same general terms as the poor, based largely on their expected capacity and willingness to pay—in turn largely based on their expected income and past repayment records.

*For the poor:* The unreformed legal system will also limit access to unsecured credit by the poor. Obviously, since the poor have no property (by assumption), defects in the law permitting recovery from unsecured debtors will not constrain lending. However, other problems do affect lending. Unreformed laws do not effectively permit potential lenders and credit sellers to use portfolios of unsecured loans as collateral for refinancing loans and credit sales. Therefore, trade creditors making unsecured loans to the poor cannot refinance their operations with the formal sector and with nonbank investors. Rather such trade creditors must depend on their own retained earnings when extending credit. Similarly, microlenders must fund their loans from their slim deposit base or the generosity of donors.

### ***Debtor/Creditor Laws and the Worsening of the Income Distribution***

How does this relate to the findings of the Tejerina and Shulhofer-Wohl studies? Suppose an unreformed country receives an exogenous positive shock. For example, suppose a multilateral financial institution gives the country a loan with good conditions and the country actually implements the advice. The positive shock will improve the economic opportunities of all classes. However, for the rich, the increase in access to credit will exceed that of other classes in both absolute and percentage terms. They will be able to exploit their opportunities, while the poor and in-betweens will not. This is what these studies show. This is also how unreformed laws contribute to the observed rising inequality during periods of growth.

### ***Debtor/Creditor Laws and Efficient Allocation of Capital***

Sam Schulhofer-Wohl presents evidence in chapter 3 that capital constraints are present in Nicaragua, and operate more strongly for the less wealthy than for the wealthy. He shows that the marginal return on investment for wealthy individuals is 35 to 70 percent less than the median return. But why does the wealthy entrepreneur invest at a low rate of return when he could lend to the median entrepreneur and earn a high rate of return? To understand how defects in laws contribute to this constraint, consider how the law limits the lending options open to the wealthy entrepreneur.

Suppose the wealthy entrepreneur is a rich coffee grower. Smaller coffee growers operate nearby. They have many high-return, on-farm investment opportunities. The

rich grower might make some small unsecured loans to the small farmers he knows and trusts, but for a large loan, the rich grower would want collateral. What can these borrowers offer? For the reasons already discussed, the rich grower could not secure the loan with either the real estate or the equipment that the small grower has or wants to buy. Nor could the rich grower take the pledge of the future crop—the backbone of the North American crop loan system—because Nicaraguan law does not permit the pledge of the future crop. That means the rich grower would have no way to enforce such a pledge in a Nicaraguan court. In some other Latin American countries, where the pledge on the future crop is permitted, the laws call for filing the pledge in the real estate registry. However, that legal form offers no help to the small grower who has no title or is working on rented land. The grower does not have land in the title registry and, therefore, has no place to file such a pledge. Suppose the wealthy entrepreneur is a big wholesaler, selling through many distributors. These distributors could increase profit by carrying more equipment or inventory or by selling on credit to their unsecured customers. However, the big wholesaler would have no way to take as collateral the existing or new equipment of these distributors. Nor could such a wholesaler take as collateral their inventory or their accounts receivable: the assets typically taken as collateral assets for secured financing in the United States. Not surprisingly, these wealthy entrepreneurs lend only small amounts of money to those they know well and send the rest of their funds to Miami.

### ***Debtor/Creditor Laws and Growth***

Why is income per person lower in developing countries? At the most simplified level, two broad explanations exist (see figure A). Under one explanation, developing countries operate on a production function ( $f-1$ ) that is inferior to that of industrial countries ( $f-2$ ). They use worse technologies and their labor forces have more limited skills. Accordingly, they produce less output per worker ( $Y/L = y$ ) from the same amount of capital per worker ( $K/L = k$ ). Whereas the industrial countries get the high output per worker of  $y-ic$  with capital per worker ( $K/L$ ) of  $k-3$ , the developing country gets less output per worker for the same  $K/L$ . Moreover, since both industrial and developing countries borrow in the same world capital market, the external interest rates facing both countries are the same (aside from small differences ascribable to different country risk). Investors will not increase the capital stock beyond the point where the marginal product of capital (MPK or  $y'(k)$ ) equals the interest rate; it would not be profitable. Since, in this view, developing countries have inferior production functions and lower capital productivity, they stop accumulating capital at  $k-2$ : less than the industrial country ( $k-3$ ). At that point the MPK in developing countries equals that of industrial countries and the MPKs in both regions equal the world interest rate; the slopes of the two production functions— $f-1'(k)$ ,  $f-2'(k)$ —equal the marginal product of capital, and those values are the same along any ray from the origin.

With such production conditions, supporting economic development requires a broad-ranging effort to shift the production function upward, raise the rate of return on

capital, and create incentives to raise  $K/L$  and thence  $Y/L$ . That solution requires efforts to improve human capital, provide physical infrastructure, and reform a wide range of civil and political institutions. Just adding more physical capital cannot increase output per person. This notion of the broad roots of low per capita incomes is the view of much of the development literature. It also appears to be the view of the multilateral financial institutions, judging by the breadth of their Web pages, their publications, and their lending programs.

There is another view, though. It denies the inferiority of the developing country production and sees all economies on the same production function: the same potential access to knowledge and technologies exist for all countries ( $f-2$ ). Low-income countries have lower incomes per capita ( $y-dc$ ) because they have lower capital-labor ratios than industrial countries ( $k-1$ ). At these lower  $K/L$  ratios, the rate of return on capital in developing countries is higher than in industrial economies:  $f'(k-1) > f'(k-3)$ .

How can the returns on capital differ in the two regions when the world interest rate is the same for both? In this view, despite the higher marginal return on capital in developing countries, they have lower capital-labor ratios because they are constrained. Something keeps them from taking advantage of globally available superior techniques that would raise total factor productivity and permit them to increase their ratios of capital to labor ( $K/L$ ) and, thereby, output per person ( $Y/L$ ). This is broadly the finding of R. E. Lucas (1988), Robert Barro (1991), E. C. Prescott and S. L. Parente (2000), and Lutz Hendricks (2002).

One possible explanation of this failure to increase  $K/L$  may arise from a direct local constraint on capital. In this “constrained capital” view, some feature of the world or local economy prevents them from increasing their capital-labor ratios to industrial country levels. The capital constraint is a central element of the accounts presented by Robert Townsend and by Mauro Alem, Luis Tejerina, and Sam Schulhofer-Wohl.

What explains this capital constraint? An obvious candidate lies in defective laws governing the collection of secured and unsecured debt. Whatever countries’ overall access to external credit, these legal problems impose high transactions costs that limit

FIGURE A. Output Per Worker for Different Levels of Capital

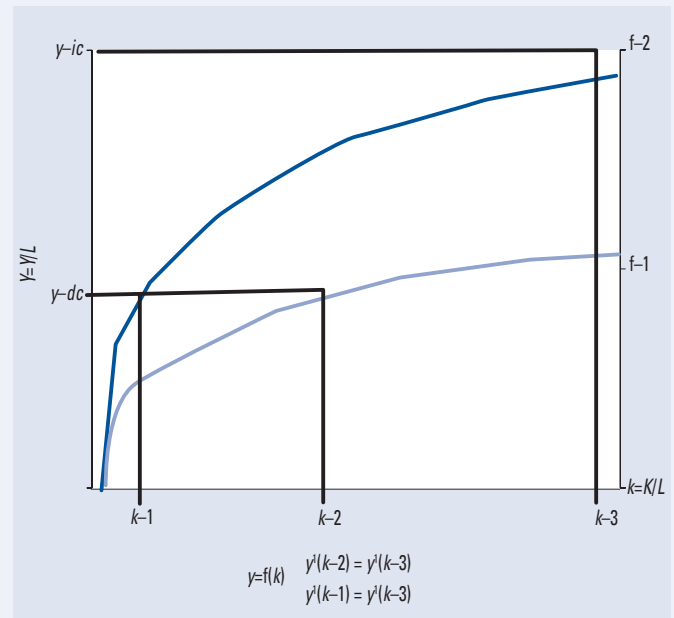


Figure A shows a homothetic production function that determines output per worker ( $Y/L=y$ ) from the level of capital per worker ( $K/L=k$ ). This production function shifts up with improved technology and labor force skills. Low output per worker in developing countries could arise because developing countries have inferior production functions ( $f-1$ ); they get less from any given amount of capital and labor. Or low output per worker could arise from a constraint on capital, even if the production function were the same as the industrial country production function ( $f-2$ ). Thus  $k-1$  and  $k-2$  both could produce  $y-dc$ , although they are on different production functions. Along any ray from the origin, the slope at the point of intersection with the production function is the same. Thus the slope of the production function [ $y'(k)$ ], the marginal product of capital, is the same at  $k-2$  and  $k-3$ . However, this is not the finding of studies presented at this conference. The studies found that the marginal product of capital,  $MPK = [y'(k)]$ , was greater at  $k-1$  than at  $k-3$ , supporting the existence of a capital constraint within the countries examined.

domestic private financial sector intermediation between domestic investors/borrowers and savers/lenders, both foreign and domestic. A legal system that cannot use collateral or collect unsecured loans can support only limited unsecured lending. Firms in such countries face credit rationing—offers of small loans, relative to their cash flow—and higher interest rates. Accordingly, enterprises economize on capital and cannot take advantage of the new technologies embodied in such capital. Their incomes per capita lag behind those of countries that have overcome the legal problems causing this capital constraint.

A casual inspection of the lending terms of any lending institution in a country with good collateral laws displays the power of collateral. For example, in the lobby of the Inter-American Development Bank, you can observe the loan terms of the IDB credit union. Compared to a borrower who offers no collateral, the IDB credit union will give a borrower with good collateral up to eleven times longer to repay, nine times more credit relative to cash flow or income, and charge half the interest rate. The same range of terms applies to IDB dishwashers and to IDB department directors. These terms are commonly offered at all local U.S. private financial institutions. Moreover, even the unsecured loans benefit from the legal framework for secured transactions because the unsecured loans themselves can serve as collateral for refinancing loans and capital market issues, in asset-backed securitizations.

Unreformed countries lack such a legal framework. Whatever the external credit conditions they face, their domestic borrowers are constrained to the limits of an unsecured lending system—and a poorly functioning unsecured lending system, at that. The faulty legal framework could explain the puzzling failure of general models to explain low per capita income as well as the manifestations of credit constraint documented in this volume. By contributing to this constraint, unreformed laws restrict financial intermediation and limit economic growth.

## **Government Policy and IDB Policy**

Robert Townsend (chapter 1) presents a solid and thoughtful paradigm of research informing policy and of policy informing research. The history of the reform of the legal framework for debt collection provides some important stylized facts that could enrich that paradigm and, unfortunately, constrain it.

## ***Private Support, Public Opposition***

In over 35 projects in reforming the laws governing debtors and creditors, CEAL has almost always had the support of the private sector: both borrowers and lenders. In a simple political economy model, that is not surprising: lenders want to lend, borrowers want to borrow, and they have a mutual interest in reducing risk and transactions costs.

You would think, for the same reasons, that such a reform would win immediate government support. However, this reform has rarely had the full support of the government. The reasons for this include lack of government awareness, desire to keep inefficient laws because they generate revenue, desire to keep control of State-run registration systems, indifference to improving the operation of the private sector, satisfaction with existing State-run lenders, and political support for lending systems that make loans that do not get paid. The collateral system in Bolivia, for example, was the subject of a World Bank report delivered formally to the Bolivian government in 1992 and to all donors in 1994, including the Inter-American Development Bank (IDB) and the International Monetary Fund (IMF). Yet neither the Government of Bolivia nor any other government in Latin America has since devised an effective secured transactions or debt collection law and passed it.

### ***No Systematic MFI Support***

In the past there has not been systematic support from multilateral financial institutions (MFIs) for reforming the laws governing debtors and creditors. There is much opportunity for the IDB, the World Bank, and the IMF to provide support for the passage of such laws. Experiences from countries in other regions (such as Romania) have proven that with the combined presence of MFI support and government predisposition, important reforms can be made to improve the environment for secure transactions and improve access to credit. CEAL's brief presentation to the board of the Inter-American Investment Corporation (the IIC, the private lending wing of the IDB) in 2003 examined conditionality and strategy for IDB operations in Latin American countries with deep financial problems: Argentina, Brazil, Jamaica, and Uruguay. We noted that the IDB has not been involved in providing support to reforming the laws governing debt collection in these countries. While the best channel to do this may depend on the specific country and the existing government willingness to embark in the reforms, much could be done by the IDB by exploring the best way to provide support for these types of reforms and through specific actions along these guidelines (such as technical support, mentioning of the problems in strategic documents, and conditionality). In CEAL's brief 2003 presentation to the World Bank, we noted that this support was also lacking in its own and the IMF's operations in the major financial trouble spots across the world. Rather, support for this reform comes from scattered task managers and rarely rises to the division level in attention. A recent IDB operation in Ecuador will be the first time passage of such a law has been the condition of an IDB lending operation. The same scattered pattern of support for reform—entirely a function of the interest of individual task managers—appears at the World Bank and the IMF. The research paradigm suggested by Robert Townsend will receive a substantial push forward by more systematic support from government and multilateral finance institutions along these areas.



## Next Steps

Where MFIs act with firmness and resolve, these laws are passed and consequences are impressive. The World Bank's reform of the Romanian secured transactions system cost less than \$1 million and in less than four years produced more than 400,000 new loans, added 100,000 new borrowers, and generated total additional private credit of at least \$60 million. Romania, like many Latin American countries, has a civil code based on that of France, as well as a commercial code based on that of Italy. The time for more active IDB support of this type of reform of laws governing secured lending and debt collection is long overdue.

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**Inter-American Development Bank**

1300 New York Avenue, N.W.  
Washington, D.C. 20577

**[www.iadb.org/sds](http://www.iadb.org/sds)**