
The Economics of Rural Organization

Theory, Practice, and Policy

*Edited by
Karla Hoff, Avishay Braverman, and
Joseph E. Stiglitz*

*Published for the World Bank
Oxford University Press*

2

Imperfect Information and Rural Credit Markets: Puzzles and Policy Perspectives

Karla Hoff and Joseph E. Stiglitz

RURAL CREDIT MARKETS have been at the center of policy intervention in developing countries over the past forty years. Many governments, supported by multilateral and bilateral aid agencies, have devoted considerable resources to supplying cheap credit to farmers in a myriad of institutional settings. The results of many of these interventions have been disappointing. Despite high levels of subsidy to rural credit in the Asian countries surveyed in this part of the book, many farmers—especially small farmers—depend for credit on moneylenders whose interest rates remain extremely high. (See table 2-1.) One explanation for the failure of public credit institutions to drive out the traditional moneylender or drive down the interest rates charged must be that public policies were based on an inadequate understanding of the workings of rural credit markets.

There typically exists a dual rural credit market in developing countries. In the formal credit market, institutions provide intermediation between depositors (or the government) and lenders and charge relatively low rates of interest that usually are government-subsidized. In informal credit markets, money is lent by private individuals—professional moneylenders, traders, commission agents, landlords, friends, and relatives—generally out of their own equity. The objective of this chapter is to provide a framework for assessing the relationship between the formal and informal sectors of rural credit markets and the consequences of government interventions in formal credit markets.

Table 2-1. *Characteristics of Selected Rural Credit Markets Surveyed in This Volume*

Survey region/period	Share of formal sector in total credit (percent)	Mean interest rate ^a (percent)		Average transaction (dollars)	
		Formal sector	Informal sector	Formal sector	Informal sector
Zaria, Nigeria, 1987-88	8	-3.6	-7.5	266	51
Nakhon Rachasima Province, Thailand, 1984-85	44	12-14	90 ^b	440	254
India					
1951	7	3.5-12.5	7-35	400 ^c	200 ^c
1961	17	n.a.	n.a.	n.a.	n.a.
1971	30	n.a.	n.a.	n.a.	n.a.
1981	61 ^d	10-12	22	n.a.	80-345 ^e
Chambar, Pakistan, 1980-81	25	12	79 ^b	n.a.	284

n.a. Not applicable.

a. Interest rates for Nigeria are real realized monthly rates. Interest rates for Thailand and India are nominal and annual. Interest rates for Pakistan are real annual rates charged. See chapters in part I for details on the calculation of these rates.

b. Figures include only commercial lending; they exclude loans from friends and relatives.

c. Annual borrowings per borrowing household.

d. Based on official sources, but much higher than more plausible estimates from unofficial sources. See chapter 9.

e. Low figure for Bihar; high figure for Punjab.

Sources: Nigeria: chapter 5; Thailand: chapter 8; India: chapter 9 (table 9-1), plus additional data provided by Bell drawn from the RBI (1954, vol. 1, part 2, chapter 21, "Regional Data" tables), Bell and Srinivasan (1989, table 2) and Bell, Srinivasan, and Udry (1990); Pakistan: chapter 7.

This chapter also provides an overview, based on the case studies in part I, of the modus operandi of informal credit markets in five developing countries and Israel. Contracts and institutions that appear to be pervasive are usufruct loans, kinship- and village-based credit systems, trade-credit interlinkages, and rotating savings and credit associations. These contracts and institutions help to solve the information and enforcement problems in lending. The fact that they are available to some potential lenders and borrowers and not to others helps to explain why informal credit markets are segmented, and why financial intermediation between formal and informal sectors is very imperfect, so that low formal interest rates coexist with high informal interest rates.¹

The body of this chapter presents four competing theories of rural credit markets: (a) the view that the village moneylender is a usurious monopolist;

(b) the view that credit markets are (approximately) perfectly competitive and characterized by market clearing, with high interest rates reflecting only high risks of default and high costs of information; (c) the view that emphasizes the use of indirect screening mechanisms, such as the interest rate, with the result that there may be credit rationing; and (d) the view that emphasizes the use of direct mechanisms to solve the problems of information and enforcement, with the result that credit markets may be monopolistically competitive. Evidence from the case studies suggests that the last view is the most useful in understanding the informal sector of rural credit markets. We will therefore describe these direct mechanisms in some detail.

The end of this chapter considers policy implications. Our principal conclusion is that the most successful government interventions in the formal credit markets are those that draw on the ability of the informal sector to solve the selection, monitoring, and enforcement problems of lending.

Traditional Views and Puzzles

There are two early views of rural credit markets, each providing a different explanation for the typically high interest rates in the informal sector.

The Monopolistic Moneylender

In this view, the village moneylender is a monopolist. Without competition, he is free to charge a “usurious” interest rate. The traditional view is captured in India’s landmark study of the rural credit system in the early 1950s: agricultural credit presented a “two-fold problem of inadequacy and unsuitability” (RBI 1954, vol. 2, p. 151, cited by Bell in chapter 9). Introduction of government lending agencies and promotion of rural cooperatives were needed to “provide a positive institutional alternative to the moneylender himself, something which will compete with him, remove him from the forefront and put him in his place” (RBI, pp. 481–82).

From the perspective of recent research, that official view overstates the problems of rural capital markets because it ignores the thriving informal credit markets that often exist. It seems to assume that there is no competition among moneylenders. But in another way it understates the problems. The past forty years’ experience of government intervention in India, Pakistan, Thailand, and other developing countries shows that the creation of a positive institutional alternative—rural banks and credit cooperatives—has failed to drive the traditional moneylender out of the market (“to put him in his place”). The case study of Thailand (chapter 8) goes further—it suggests that government intervention has not even lowered interest rates charged by moneylenders.

Perfect Markets

A second view of credit markets, which is associated with George Stigler of the Chicago school, is that imperfections in credit markets are not likely to be important. In general, high interest rates reflect not monopoly power but high default rates and high information costs. Moreover, Stigler argued in his 1967 paper on credit markets (p. 291) that “there is no ‘imperfection’ in a market possessing incomplete knowledge if it would not be [privately] remunerative to acquire (produce) complete knowledge.” But this statement is true only if private and social benefits from increasing information are the same. In general they are not the same, either for information about technology (see Hirschliefer 1971, regarding inventions), or for information in labor markets (see Spence 1974 and Stiglitz 1975), or, as we will argue in this chapter, for information in credit markets. This view also fails to take into consideration the fact that imperfect information may limit the effective degree of competition within a market, a point to which we return in a later section.

In the “perfect markets” view, there is a presumption that credit markets are approximately Pareto-efficient. The only ground for government intervention in credit markets is to redistribute income to the poor (at some cost in efficiency).

The Inadequacy of the “Monopoly” and “Perfect Markets” Views of Rural Credit Markets

Neither the traditional “monopoly” nor the “perfect markets” view can explain other features of rural credit markets that are at least as important and equally puzzling as high interest rates:

- The formal and informal sectors coexist, despite the fact that formal interest rates are substantially below those charged in the informal sector.
- Interest rates may not equilibrate credit supply and demand: there may be credit rationing, and in periods of bad harvests lending may be unavailable at any price.
- Credit markets are segmented. Interest rates of lenders in different areas vary by more than can plausibly be accounted for by differences in the likelihood of default. Local events—a failure of a harvest in one area—seem to have significant impacts on the availability of credit in local markets.
- There are a limited number of commercial lenders in the informal sector, despite the high rates charged.
- In the informal sector, interlinkages between credit transactions and transactions in other markets are common.

- Formal lenders tend to specialize in areas where farmers have land titles.

Neither the monopoly view nor the perfect markets view can account for these features taken as a whole. An alternative approach is required—one that is better able to help us understand the workings of rural credit markets and, thus, help us design appropriate policy interventions.

The “Imperfect Information” Paradigm

In the past decade there have been major advances in our theoretical understanding of the workings of credit markets. These advances have evolved from a paradigm that emphasizes the problems of imperfect information and imperfect enforcement. Lenders exchange money today for a promise of money in the future and take actions to make it more likely that those promises are fulfilled. *Lending activity* thus entails (a) the exchange of consumption today for consumption in a later period, (b) insurance against default risk, (c) information acquisition regarding the characteristics of loan applicants (this is the *screening* problem); (d) measures to ensure that borrowers take those actions that make repayment most likely (this is the *incentives* problem); and (e) enforcement actions to increase the likelihood of repayment by borrowers who are able to do so.

It is this broadening of the perspective of what is entailed by lending activity that provides the background for the new theories of rural credit markets. This framework guides the case studies in part I and the theoretical analysis of peer monitoring in chapter 4.

It is useful to distinguish two types of mechanisms for resolving the problems of screening, incentives, and enforcement. *Indirect mechanisms* rely on the design of contracts by lenders such that, when a borrower responds to these contracts in his own best interests, the lender obtains information about the riskiness of the borrower, and induces him to take actions to reduce the likelihood of default and to repay the loan whenever he has the resources to do so. These mechanisms may be in the credit market itself (in loan terms such as the interest rate and loan size), or they may rely on contracts in related markets (in rental agreements, for example) that will influence a borrower’s behavior in credit markets. In the first case, the interest rate serves the *dual* function of a price and an indirect screening or incentive mechanism. As we discuss further below, this means that the equilibrium interest rate need not clear the market—there may be credit rationing. Notice, however, that these indirect mechanisms are equally applicable whether there is competition or monopoly in the market.

Direct mechanisms entail lenders’ (a) expending resources in actively

screening applicants and enforcing loans and (b) limiting the range of their lending activity to members of a particular kinship group, residents of a given region, or individuals with whom they trade. These direct mechanisms (through personal relationship, trade-credit linkages, usufruct loans, and other means) tend to lead to a monopolistically competitive structure with interest rate spreads between different segments of the rural credit markets. We will argue that the entry of institutional credit into a rural credit market is unlikely to break the power of moneylenders unless the new institutions themselves find substitutes for the direct mechanisms used by moneylenders to overcome the problems of screening, incentives, and enforcement.

The Theory of Indirect Mechanisms

Interest Rates as an Indirect Screening Mechanism

For any loan there is a possibility that the project for which it is used will perform so badly that the borrower defaults. In that contingency, the lender cannot recover his total outlay, and in fact there are legal provisions in many societies that severely limit the amount that he can recover. The probability of default on a loan thus depends on the probability that the gross return on the project financed by the debt is less than the principal and interest due. It follows that as projects become riskier, in the sense that the probability of both very high and very low gross returns increases relative to the probability of moderate returns, the likelihood of default increases. The lender is hurt by an increase in the riskiness of projects that will be undertaken with his loans. In contrast, the borrower's expected profits from the project will rise.

To see how the interest rate can be used as an indirect screen of the riskiness of projects, it is simplest (but not necessary) to suppose that borrowers are risk neutral. Risk-neutral borrowers will submit loan applications for projects with a positive expected net return, taking into account default provisions. For any class of projects with the same mean gross return but differing risk, the interest rate will determine a *marginal* project that has an expected net return to the borrower that is just barely positive. By the above argument, all projects in this class that give the borrower a higher expected net return entail a higher probability of default. An increase in the rate of interest will mean that the old marginal project now gives a negative expected net return. The new marginal project will be riskier than the marginal project under the initial, lower interest rate, so that the pool of projects coming from this class will on average be riskier than it was at the lower interest rate. The same argument applies for projects with differing

risks at any level of mean gross return. Thus as the interest rate increases, the mix of prospective projects tilts in favor of riskier projects. As Adam Smith put it some two hundred years ago: "If the legal rate of interest . . . was fixed so high . . . , the greater part of the money which was to be lent would be lent to prodigals and projectors, who alone would be willing to give this high interest" (Smith 1976 [1776], p. 379).

A lender can never fully discern the extent of risk of a particular loan, and the pool of applicants for loans at any given interest rate will consist of borrowers with projects in different risk categories. But the lender knows, by the above reasoning, that the mix of projects to finance changes with the rate of interest. The interest rate takes on the dual function of rationing credit and regulating the risk composition of the lender's portfolio. This can lead to unexpected outcomes (explored in formal models in Stiglitz and Weiss 1981 and forthcoming, and Stiglitz 1987). For example, when there is an excess demand for loans at a given interest rate, classical economic analysis would suggest that this price would rise to choke off the excess demand. Higher interest rates would raise the lender's returns if they did not greatly increase his risk by increasing the probability of defaults. But at some higher interest rate, the greater risk and thus the higher incidence of default will offset the increased interest income from the loan portfolio. In that case, the lender will choose to keep the interest rate low enough to obtain a favorable risk composition of projects, and to ration the available loanable funds through other means. Thus, contrary to the operation of markets as they are supposed to work, demand may exceed supply, with no tendency for the interest rate to rise.

The situation would be even more extreme if lenders did not recognize the effect of interest rates on the risk of their portfolios. Then we might get a process whereby, at a given rate of interest, the default rate was so high that returns to the lender did not cover opportunity costs of funds. This would put upward pressure on the interest rate, but the increase in the interest rate would only worsen the risk mix. The process would go on until the interest rate was so high that only the riskiest projects—those with the highest probability of default—would be undertaken. It has been argued by some writers that processes such as these account for the thinness of many markets (including some types of credit markets) in which the quality (default risk) of the commodity exchanged depends on the price (interest rate) and there is asymmetric information between buyers and sellers (Akerlof 1970).

This would suggest that lenders, even in situations of limited competition, cannot raise interest rates so high as to extract all of the surplus associated with a particular loan. But the limited competition resulting from imperfect and costly information may nonetheless allow lenders to charge interest rates far higher than competitive levels.

Incentive Effects of Terminations and Market Interlinkages

A lender may employ two other indirect mechanisms to enhance the likelihood that borrowers undertake the actions desired by lenders. First, the lender may use the threat of cutting off credit to induce desired borrower behavior (see Stiglitz and Weiss 1983). For this incentive to be effective, of course, borrowers must enjoy some surplus from obtaining the loans. This provides another way in which markets with imperfect information are fundamentally different from markets with perfect information: competition does not drive rents to zero. Those who are lucky enough to get loans get a consumer surplus, and that consumer surplus, being denied to the unlucky, is in effect a rent.

Second, lenders who are landlords or merchants may use the contractual terms in these other exchanges to affect the probability of default. They may interlink the terms of transactions in the credit market with those of transactions in the product or rental markets (see Braverman and Stiglitz 1982, 1986). For example, a trader-lender may offer a farmer who borrows from him lower prices on fertilizers and pesticides, since the probability of default is reduced when such inputs are used. We shall consider the use of interlinkages as a direct mechanism for solving information and enforcement problems below.

Direct Screening Mechanisms

In addition to indirect screening mechanisms, most lenders will also use direct screening mechanisms and may monitor borrowers' behavior, withdrawing credit if the terms of the loan appear to be violated. In developing countries potential lenders vary greatly in their costs of direct screening, monitoring, and enforcing loan repayment. For some lenders, such costs are low. For example, information may be a by-product of living near the borrower or being part of the same kinship group or a party to some other transaction with him. Thus, village lenders often do considerable monitoring, while banks may find it virtually impossible to do so. Differences across lenders in the costs of screening, monitoring, and enforcement may lead to the segmentation of markets.

Geography and Kinship

In the area of northern Nigeria surveyed in chapter 5, credit markets are almost completely segmented along geographic and kinship lines, and information asymmetries between borrower and lender within these markets appear to be negligible. In this case study the rural credit market was very

active, but loans between individuals in the same village or kinship group accounted for 97 percent of the value of those transactions (see chapter 5, table 5-3). Collateral was seldom used, and credit terms implicitly provided for direct risk pooling between creditor and debtor. That in three of the four villages surveyed, virtually no loans were observed to cross the boundaries of an extremely small social and geographic space, in an environment characterized by highly correlated risk and seasonal demands for finance, points to the high information costs of such transactions and the reliance on kinship and village sanctions as a mechanism for contract enforcement. Similar evidence for the informal credit market is reported in the case study of rural China (chapter 6).

Even in areas where nonresident lenders and institutions provide a large share of total credit, market segmentation by village and kinship group remains pronounced with respect to consumption loans. Thus chapter 8 reports on the temporary collapse of local Thai credit markets in the face of a severe regional shortfall of rain. In such periods, resident lenders' own equity is depleted, but nonresident lenders and institutions appear not to be able to form a sufficiently accurate judgment of households' ability to repay to permit them to operate in the consumption loans market.

Interlinkages with Other Markets

For a given lender, loan applicants with the same wealth and productive capacity may differ in their ability to assure potential lenders of their creditworthiness. Similarly, for a given applicant, lenders may differ in their cost of screening and enforcing loan performance. Besides geography and kinship group, a critical source of these differences is the scope of individuals' participation in other markets. Such participation makes possible the interlinking of loans with transactions in those markets. Interlinked credit contracts may provide means to alleviate screening, incentive, and enforcement problems. Interlinkages may also enable the reputation mechanism to work more effectively. What affects behavior is the total benefits (rent) from a relationship. When an economic relationship entails transactions in several markets, there is scope for greater surplus.

The most widespread form of interlinkage is provided by traders. Lenders who are also nonresident traders and commission agents generally require that their clients sell all their crops to, or through, them (see chapters 7, 8, and 9). This trade-credit linkage "makes information on the size of the borrower's operations . . . available to the creditor and to no one else. This . . . thus closes the borrower's access to other lenders" (chapter 8). The trader-lender can easily enforce his claim by deducting it from the value of the crops sold to, or through, him. In towns with well-organized commodity markets, there may sometimes be cooperation among traders in enforcement. In chapter 9, Bell reports that:

In Chittoor . . . a commission agent who dealt in *gur* (a sugar product) told me that agents frequently know one another's clients. If a farmer attempted to sell through an agent other than the one with whom he normally dealt, the former would deduct principal and interest on the loan, basing his calculations on the usual rule of thumb relating the size of the loan to the quantity to be delivered, and would hand over the said sum to the latter.

Under some circumstances, however, such trader-provided credit turns out to be limited. Cassava, unlike most other crops, has no fixed harvest period. This makes loan enforcement difficult. Generally, cassava growers in Thailand obtain funds only by selling outright the standing crop (chapter 8). For this crop, a spot sale to a trader serves as a substitute for trader-financed credit.

Chapters 8 and 9 argue that trade-credit interlinkages go a long way to resolving the information asymmetry between borrower and lender and the enforcement problem, while they create asymmetries of information *across* lenders. Lenders who do not serve as traders for a borrower will know less about his productivity and will be in a less favorable position to enforce a loan. In a later section we will discuss the implications of such asymmetries for market structure.

Devices That Limit the Consequences of Information Asymmetries and Enforcement Problems

Three devices commonly used in rural credit markets in developing countries—collateral requirements, usufruct loans, and rotating savings and credit associations—may be viewed as methods to limit the consequences of information asymmetries and enforcement problems. Like geography, kinship, and market participation, these devices are available to some borrowers and lenders and not to others. Hence, they also have consequences for the sorting of borrowers across lenders and for segmentation in rural credit markets.

Collateral. In developing countries, banks have found it difficult to screen and monitor borrowers directly. Banks, but not informal lenders, therefore rely heavily on collateral, generally in the form of land. For this reason, in Thailand, “the sphere of operation of commercial banks and cooperatives . . . has been almost exclusively in villages where land titles have been issued” (chapter 8). Because land wealth is correlated with income in rural areas, this finding helps to explain why borrowers with above-average income have been found to have greater access to formal sector sources than those who do not. Chapter 8 reports that average per capita income of Thai households borrowing from the formal sector was more than 30 percent

above the mean, while those borrowing only from the informal sector had average per capita income close to the survey area's mean.

Usufruct loans. In one form of a usufruct loan, a lender occupies and uses the borrower's land until the principal is repaid. Such loans are transacted in Thailand to finance migration for work abroad. They are viewed as low-risk loans. As the saying goes, "Possession is nine-tenths of the law."

A similar practice that is widespread in Nigeria is procuring loans by transferring to the lender the right to harvest the borrower's trees. The harvest provides the lender the interest on his loan. Such transactions are called tree "pledging" and occur with cocoa, oil palm, and rubber trees (Adegboye 1983).

Rotating savings and credit associations. Rotating savings and credit associations (ROSCAs) have a long history in developing countries, even predating monetization (Bouman 1983), and they continue to be a major source of credit in African countries (where they are often called tontines). In the usual case, a small group is formed from a village or family group where enforcement costs are low because of powerful social sanctions. Each member agrees to pay periodically into a common pool a small sum so that each, in rotation, can receive one large sum. If the formal credit market is characterized by a gap between the savings and borrowing rates of interest, ROSCAs may be preferred to participation in the formal market (see Edwards 1989, Besley, Coate, and Loury, 1991). ROSCAs are thus an example of a credit exchange that improves upon opportunities in the market by drawing on preestablished social ties. Highly successful tontines in Cameroon were recently described as follows:

Tontines, built on trust, are generally made up of homogeneous groups—people from the same ethnic background, the same workplace or the same neighborhood.

[One Cameroonian reported that] "if you don't make your payment to the tontine, you are rejected by the community. If you are banned from one group, you are banned from the others."

Indeed, several years ago, several Bamileke traders committed suicide because they realized that they could not make their tontine payments. (*New York Times*, November 30, 1987)

But in Latin America, ROSCAs have been adapted to a situation where individuals do not know each other (Edwards 1989). The initiative for forming the group typically comes from a retailer of durable goods—for example, a car dealer. Suppose the group is of size N and the durable has a price P . The group members are required to come together for N monthly meetings to contribute their share of the price, P/N , into a common pool. At each

meeting, the individuals draw lots. The winner takes the pool, buys the car, and becomes ineligible for future drawings, though he must complete his N monthly payments. If he misses a payment, he loses the car. The same would, of course, hold true in a conventional car loan market. But by creating a group of individuals whom the borrower comes to know, and who would be hurt if he defaulted and (at the least) imposed transaction costs on them, the borrower performs more reliably than if the cost were borne only by the lender, with whom the relationship is brief and impersonal.

Direct Screening and Enforcement Costs as the Basis for Monopolistic Competition

The most important way of limiting information asymmetries is buying information. In his remarkable survey of the operations of moneylenders in South Pakistan (chapter 7), Aleem estimates the transaction costs incurred by moneylenders. He finds, for example, that they devoted an average of one day per applicant to obtaining information and rejected one applicant out of every two screened.

The screening process creates relationship-specific capital between lender and creditor. At any one time, a borrower is likely to have built up such capital with only one lender. If a borrower tries to shift to another lender, Aleem found that he needs on average one year to build up creditworthiness with the new lender.

Chapter 8 reports findings consistent with this view of the lender-creditor relationship. More than 80 percent of borrowers in a ten-province household survey of Thailand reported that they borrowed from only one informal source. Furthermore:

Seventy-two percent of the informal sector borrowers . . . reported that they had not attempted to borrow from other informal lenders during the past three years . . . ; the average period of contact involving credit transactions reported by these 72 percent was close to seven years!

Of course, more evidence is needed before we can infer that lenders exercise monopoly power over their borrowers. This evidence can be found in chapter 7. First, the total average costs of surveyed lenders, as a fraction of the amount of funds recovered, were roughly comparable to the average interest rate charged in the survey area. Second, mean marginal costs as a fraction of the amount recovered were *much less* than the average interest rate charged.

These findings strongly suggest that the informal credit market surveyed in chapter 7 is characterized by monopolistic competition. Each lender faces a downward-sloping demand curve from borrowers tied to him, so that he can price at above marginal cost, but entry of new moneylenders keeps pure

profits close to zero by driving price down to average cost. Thus, in the usual way of monopolistically competitive markets, each lender operates at too small a scale, spreading his fixed costs over too small a clientele. This view of the market can lead to dramatic policy conclusions about the effects of cheap institutional credit on rural interest rates, as we shall see in the next section.

To conclude, we should emphasize the difference between the screening process in the informal credit market described above and the use of the interest rate as an indirect screening mechanism, as discussed earlier. The first is active and may cost resources; the second is passive and works through a process of self-selection. These two types of screening have entirely different effects on interest rates and on the structure of the credit market. Passive screening is consistent with perfect competition and can reduce interest rates below the level that would exist if information were perfect.² The evidence presented in chapters 7 and 8 suggests that active screening through investment in information raises the interest rate above the level that would exist under perfect information by increasing the costs of the lender. More important, active screening makes the credit market imperfectly competitive.

Policy Perspectives

Economic Development and the Evolution of Rural Credit Markets

We have argued that observed features of rural credit markets in developing countries can be understood as responses to the problems of screening, incentives, and enforcement. Of course, these are problems that arise not just in developing countries. However, it can be argued that these problems are more severe for countries at an early stage of development because of more extensive asymmetries of information and the more limited scope for legal enforcement (in particular, more limited collateral). We may therefore ask, Will development by itself remove or reduce the imperfections of rural credit markets?

Several studies have suggested that as development proceeds and average income levels increase, the imperfections of rural credit markets should diminish. This argument is supported by evidence from India that rural areas with higher-than-average incomes seem to face lower interest rates from moneylenders:

A high r is the effect of the high-risk premium that the village moneylenders usually charge for lending to the peasants, who are frequently without sound collateral. The lack of creditworthiness is really a reflection

of the peasants' poor income and meager savings. Hence, the growth of real income . . . should reduce the probability of default and the risk premium, which in turn will reduce r . (Ghatak 1983, pp. 21–22)³

In a relatively more prosperous district like Burdwan in West Bengal . . . , the average rural interest rate for different classes (such as casual laborers, tenants, and agricultural laborers) varied between 36 to 84 percent per annum, while in a relatively poorer district like Nadia . . . the average rural interest rates varied between 72 and 120 percent per annum. . . . [I]n West Bengal during 1975–1976, moneylenders still remained a major source of agricultural credit. (Ghatak 1983, p. 32)

Agricultural technical change does influence the supply of loans. . . . Farmers residing in areas characterized by the use and/or provision of new technology appear to benefit in that they face lower moneylender interest rates. This result provides an additional point of leverage for policy-makers: Interest rates can be lowered indirectly through the provision of technical change and investment opportunities and need not be lowered directly through costly subsidies to some borrowers in the formal credit market. (Iqbal 1988, p. 375)

The argument above relies on the observation that as incomes and productivity increase, the risk of default decreases. But the chapters in part I of this book suggest additional critical links between development and credit markets.

Screening, incentive, and enforcement problems in credit markets are often mitigated through interlinkages between the credit market and other markets—for example, for land and for commodities. The creation of a dense network of market interactions, which we would expect as development proceeds, lowers screening and enforcement costs. Legal developments such as land titling, in conjunction with the individualization of land rights as commercialization proceeds, allow land to be used as collateral, and that in turn expands the scope of credit markets.

However, as technological change disrupts traditional ties in a developing economy, the strength of social sanctions in enforcing credit repayments may decrease. This role of social ties is documented by case studies in chapters 5–10, in Adams and Fitchett (1992), and elsewhere. Thus, as social ties break down in the wake of development, but before a dense network of interactions across markets has been built up, the imperfections in rural credit markets may well get worse before they get better.

Since development by itself is unlikely to take care of the imperfections in rural credit markets in the short and medium run, policy intervention may be called for. In fact, the argument has been that the imperfections in rural

credit markets, particularly their characteristically high interest rates, may themselves be an impediment to development. We will now discuss and evaluate the policy responses to this problem.

Government Intervention and Credit Subsidies

Enforcement (or lack of it) is one of the problems in rural credit markets. Thus it might be argued that the government as a lender has advantages the private sector does not—it has the ability to extend or cut off credit subsidies (using general revenue), and it has at least a legal monopoly on the use of force. The experience of many developing countries (and some industrial ones) suggests that the government is often politically unable to use these advantages. Thus chapter 9 notes that a widespread view in rural India is that institutional loans are really grants: “Politicians regularly vie with one another in promising, if elected, to impose a moratorium on the repayment of informal and institutional debts alike.” Harriss (1983, p. 239) reports that “during the election campaign of 1972 [in North Arcot] farmers were ‘promised’ that a vote cast in the right direction would write off a loan.” In Thailand, Farmers’ Associations, groups of 50–100 farmers formed hurriedly in 1975 by the Department of Agricultural Extension, have the worst repayment record: “Because their formation was politically motivated, their members tend to be rich and influential and, precisely for that reason, their repayment rate was poor” (chapter 8).

In Pakistan the political cost of foreclosing on debtors with collateral is significant. These costs may be part of the explanation for Aleem’s finding in chapter 7 that while default rates in the formal sector were 30 percent, for the informal lenders the mean delinquency rate (the percentage of loans repaid after the due date) was 15 percent and the mean cumulative rate of nonrepayment was only 2.7 percent. The latter figure is the percentage of due loans that had not been recovered since the moneylender’s inception of lending operations (table 7-3).

In view of this accumulated evidence, the argument for direct credit supply by the government as a means of relieving enforcement problems must be questioned. What is left, then, is the fact that the government can supply *cheap* credit. What is likely to be the effect of this on the rural informal credit market? The available evidence, as documented in the case studies in this part of the book, certainly does not suggest that cheap credit will drive out informal sector moneylenders, and it may not even drive down interest rates charged by them. The theoretical framework of the “imperfect information” paradigm allows us to understand this policy failure.

If some borrowers have direct access to cheap funds from government institutions and can satisfy all their borrowing needs from this source, there will of course be less demand for credit in the informal sector. If rural credit

markets behaved as classical markets are supposed to behave, this would exert downward pressure on interest rates. But we know that rural credit markets do not behave in this fashion. If the interest rate plays a screening role and this leads to credit rationing, it is unlikely that the interest rate will fall following a small infusion of credit. Conversely, if moneylenders engage in direct screening, those moneylenders with the highest screening costs may drop out of the market, and interest rates may be expected to fall.

If borrowers cannot fully satisfy their needs from government institutions, so that they get only part of their credit needs from that sector, then it matters whether formal sector loans are treated as senior or junior debt relative to informal sector loans. If the formal sector has seniority, the informal sector loans become, in effect, riskier, which may lead to an increase in the informal sector interest rate. To make matters worse, in monopolistically competitive settings where there is active screening, the screening costs have to be allocated among smaller loan sizes, raising average costs and interest rates (as discussed in chapter 8). By contrast, if the formal sector loans are treated as junior debt, the effect on informal sector credit is ambiguous. The greater borrowing that results from access to lower rates increases (at any given level of informal sector loans and interest rates) the default risk, but a disproportionate fraction of the default risk is borne by the formal sector. Unequal access to formal sector funds may have further implications for the informal sector. If formal sector loans go to larger borrowers with more collateral, and the evidence suggests that is so, then the mix of applicants among whom the informal sector has to screen changes adversely, and this might increase the interest rates charged there.

If formal sector loans do not go directly to borrowers, but instead to moneylenders who act as financial intermediaries, the effects depend on (a) how the costs of informal lenders change, and (b) how the level of competition in the informal sector changes. If privileged access to government funds increases entry, and therefore increases average costs of moneylending because the costs of screening borrowers are now spread over each moneylender's smaller clientele, then interest rates in the informal sector need not decline at all. This is another implication of monopolistic competition in rural credit markets, and we pursue it in a formal model in Hoff and Stiglitz (1993).

More generally, the "imperfect information" framework alerts us to the difficulty of relying on financial intermediation to solve the problems in rural credit markets. Although the case studies in part I present evidence that moneylenders do borrow from each other in the same village and across villages, screening, incentive, and enforcement problems place limits on the extent of these transactions. Formal sector institutions face the same information and enforcement problems in relation to moneylenders. The case

studies in chapters 7, 8, and 9 provide evidence of the limited extent of financial intermediation between the formal and informal sectors.

Institutional Innovation and the Role of Public Policy

We have seen that the “imperfect information”/“costly enforcement” paradigm stands apart from the traditional “monopoly” versus “perfect markets” debate. It argues that rural credit markets do not behave as classical competitive markets are supposed to, so there is no presumption that they are efficient. However, both theory and evidence suggest that high interest rates are not necessarily, or even primarily, a reflection of the monopoly power of the village moneylender. Rather, rural credit markets behave the way they do because of the problems of screening, incentives, and enforcement.

Government credit institutions face these same problems relative to borrowers. In fact, they may be in a worse position in terms of informational asymmetry, monitoring, and enforcement.

Is there, then, any role at all for public policy? Greenwald and Stiglitz (1986) have shown that markets with imperfect information give rise to externality-like effects, and it is here that government intervention may be most successful. In the context of credit markets, one externality that we have identified is the reduction of enforcement and information costs brought about by development in other markets. Land titling, to the extent it increases the value of land as collateral, and the introduction of cash crops, which makes possible interlinked trade-credit contracts, will reduce lenders’ costs of enforcement. Government investment in infrastructure that makes agriculture less risky will reduce the importance of informational asymmetries between borrower and lender. See figure 1-1 on page 18.

Another type of externality may reside in institutions that directly address informational problems in rural credit markets. One such institution is that of small-scale peer monitoring. In chapter 4 Stiglitz analyzes a model of this activity. Individuals form a small group that is jointly liable for the debts of each member. The group thus has incentives to undertake the burden of selection, monitoring, and enforcement that would otherwise fall on the lender. Of course, this entails an inefficiency, since a small group has a lesser ability to bear risk than a lender with a large and diversified portfolio. Stiglitz shows that under certain circumstances the benefits more than outweigh the costs. However, there is an externality in this institutional innovation. An individual who bears the initial cost of organizing such an institution is providing a form of social capital from which *all* members of the group will benefit. As is well known, when this type of externality arises there will be an undersupply of the socially beneficial service, and there is therefore a role for the government to help organize and act as a catalyst in

the formation of such institutions. As Huppi and Feder (1990) have noted in their review of group lending, and as Braverman and Guasch report in chapter 3, there are notable successes in the provision of rural credit when the government has acted in this way.

Conclusions

The chapters in part I and the theoretical literature out of which they have grown show that we can look into the black box that was once referred to simply as “imperfect credit markets.” We can assess the nature and sources of those imperfections, and we have a framework for assessing the consequences of alternative government policies. A rich research agenda lies ahead of us: investigating the extent to which the findings of these studies generalize to other countries, exploring the effectiveness of the institutions and mechanisms for screening and monitoring loan applicants that we have touched on in this chapter, and evaluating the consequences of a variety of government interventions in credit markets, taking into account the information asymmetries and enforcement problems endemic in developing countries.

Notes

1. Floro and Yotopoulos's 1991 study of informal credit markets in the Philippines provides further evidence, consistent with much of the data reported here, of the segmentation in rural credit markets. See also the collection of case studies in Adams and Fitchett (1992).

2. This result depends sensitively on the nature of the information asymmetry. As we argued above, a *decrease* in the interest rate improves the mix of prospective projects that a lender finances if the expected return of a project is public information but its riskiness is not; only the borrower knows it. De Meza and Webb (1987) consider a different information structure—one in which the set of possible returns of a project is public information, but its expected return is not. De Meza and Webb also assume that a prospective borrower has private wealth to invest in the project. Under these assumptions, an *increase* in the interest rate improves the mix of projects that a lender finances by making borrowers more cautious about risking their own funds in low-return projects. In this case, indirect screening will not reduce interest rates below the level that would exist under symmetric information.

3. Later in his paper Ghatak qualifies the argument that the growth of income will lead to a fall in interest rates. He notes, in particular, the independent and complex role of caste and other social and legal factors.

References

The word "processed" describes informally reproduced works that may not be commonly available through libraries.

- Adams, Dale W., and Delbert A. Fitchett, eds. 1992. *Informal Finance in Low-Income Countries*. Boulder, Colo.: Westview Press.
- Adegboye, R. O. 1983. "Procuring Loans by Pledging Cocoa Trees." In J. D. Von Pischke, Dale W. Adams, and Gordon Donald, eds., *Rural Financial Markets in Developing Countries*. Baltimore, Md.: Johns Hopkins University Press.
- Akerlof, George. 1970. "The Market for Lemons: Qualitative Uncertainty and the Market Mechanism." *Quarterly Journal of Economics* 84: 488-500.
- Bell, Clive, and T. N. Srinivasan. 1989. "Interlinked Transactions in Rural Markets: An Empirical Study of Andhra Pradesh, Bihar and Punjab." *Oxford Bulletin of Economics and Statistics* 51 (1): 73-83.
- Bell, Clive, T. N. Srinivasan, and Christopher Udry. 1990. "Agricultural Credit Markets in Punjab: Segmentation, Rationing and Spillover." Yale University, Economic Growth Center, New Haven, Conn. Processed.
- Besley, Timothy, Stephen Coate, and Glenn Loury. 1991. "The Economics of Rotating Savings and Credit Associations." R.P.D.S. Discussion Paper 142. Princeton University, Woodrow Wilson School, Princeton, N.J.
- Bouman, F. J. A. 1983. "Indigenous Savings and Credit Societies in the Developing World." In J. D. Von Pischke, Dale W. Adams, and Gordon Donald, eds., *Rural Financial Markets in Developing Countries*. Baltimore, Md.: Johns Hopkins University Press.
- Braverman, Avishay, and Joseph E. Stiglitz. 1982. "Sharecropping and the Interlinking of Agrarian Markets." *American Economic Review* 72 (4): 695-715.
- . 1986. "Landlords, Tenants and Technological Innovations." *Journal of Development Economics*, 23: 383-413.
- de Meza, David, and David C. Webb. 1987. "Too Much Investment: A Problem of Asymmetric Information." *Quarterly Journal of Economics* 100: 281-92.
- Edwards, John H. Y. 1989. "Rotating Credit Associations and Lotteries as Financial Instruments for the Poor." Tulane University, Economics Department, New Orleans, La. Processed.
- Floro, Sagrario, and Pan Yotopoulos. 1991. *Informal Credit Markets and the New Institutional Economics: The Case of Philippine Agriculture*. Boulder, Colo.: Westview Press.
- Ghatak, Subrata. 1983. "On Interregional Variations in Rural Interest Rates." *Journal of Developing Areas* 18: 21-34.
- Greenwald, Bruce, and Joseph E. Stiglitz. 1986. "Externalities in Economies with Imperfect Information and Incomplete Markets." *Quarterly Journal of Economics* 101: 229-64.
- Harriss, Barbara. 1983. "Money and Commodities: Their Interaction in a Rural

- Indian Setting." In J. D. Von Pischke, Dale W. Adams, and Gordon Donald, eds., *Rural Financial Markets in Developing Countries*. Baltimore, Md.: Johns Hopkins University Press.
- Hirschliefer, Jack. 1971. "The Private and Social Value of Information and the Reward to Inventive Activity." *American Economic Review* 61: 561-574.
- Hoff, Karla, and Joseph E. Stiglitz. 1993. "A Theory of Monopolistic Competition in Rural Credit Markets." Paper presented at the meeting of the Econometric Society, Jan., Anaheim, Calif. Processed.
- Huppi, Monika, and Gershon Feder. 1990. "The Role of Groups and Credit Cooperatives in Rural Lending." *The World Bank Research Observer* 5 (2): 187-204.
- Iqbal, Farrukh. 1988. "The Determinants of Moneylender Interest Rates: Evidence from Rural India." *Journal of Development Studies* 24(3): 364-78.
- RBI (Reserve Bank of India). 1954. *All-India Rural Credit Survey*. Vol. 1, *The Survey Report*. Vol. 2, *The General Report*. Vol. 3, *The Technical Report*. Bombay.
- Smith, Adam. 1976 [1776]. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Edited by Edwin Cannan. Chicago: University of Chicago Press.
- Spence, Michael. 1974. "Job Market Signaling." *Quarterly Journal of Economics* 87: 355-74.
- Stigler, George J. 1967. "Imperfections in the Capital Market." *Journal of Political Economy* 75 (3): 287-92.
- Stiglitz, Joseph E. 1975. "The Theory of Screening, Education, and the Distribution of Income." *American Economic Review* 65: 283-300.
- . 1987. "The Causes and Consequences of the Dependence of Quality on Price." *Journal of Economic Literature* 25: 1-47.
- Stiglitz, Joseph E., and Andrew Weiss. 1981. "Credit Rationing in Markets with Imperfect Information." *American Economic Review* 71 (3): 393-410.
- . 1983. "Incentive Effects of Termination: Applications to the Credit and Labor Markets." *American Economic Review* 72: 912-27.
- . Forthcoming. "Banks as Social Accountants and Screening Devices and the General Theory of Credit Rationing." In *Essays in Monetary Economics in Honor of Sir John Hicks*. Oxford: Oxford University Press.