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Introduction: Imperfect Information and Rural Credit Markets—Puzzles and Policy Perspectives

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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, and one explanation for this must be that they were based on an inadequate understanding of the workings of rural credit markets.

The articles in this symposium issue are devoted to empirical and theoretical investigations of rural credit markets, in the framework of the imperfect information paradigm. The authors show how this framework is useful not only in explaining puzzling features of these markets, but also in providing a policy perspective to assess the successes and failures of specific interventions.

I. Traditional Views and Puzzles

Rural credit markets do not seem to work like classical competitive markets are supposed to work. Interest rates charged by moneylenders may exceed 75 percent per year, and in some periods credit is unavailable at any price. The high observed interest rates were attributed by many to the monopoly power of the village moneylender. The policy response arising from this explanation of high interest rates was clear—it was to provide cheap institutional credit as an alternative to the moneylender.

But the past forty years of experience of government intervention in rural credit markets suggests that the creation of institutional alternatives has failed to drive the traditional moneylender out of the market and, whatever competition it has provided, interest rates charged by traditional moneylenders remain high (see table 1). In addition, high default rates have prevented the institutions

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from being self-financing: recurrent and often large injections of government funds have been required. And despite these subsidies, many of these credit programs have had little success in reaching farmers without collateral or with below-average income.

This apparent failure of policy intervention did not come as a surprise to those who did not believe in the monopoly power explanation of high interest rates, but believed instead that credit markets worked as classical competitive markets should. In this view, observed high interest rates were a reflection of perfect credit markets that took into account the risks of default (see Stigler 1967). The policy conclusion of this line of argument is not to intervene in rural credit markets, at least not on efficiency grounds.

But neither the traditional monopoly nor the perfect markets view can explain other features of rural credit markets which 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.

Table 1. *Characteristics of Rural Credit Markets Surveyed in this Symposium Issue*

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

n.a. Not available.

a. All interest rates are nominal and annual except Nigeria's which are real realized monthly rates, and Pakistan's which are real annual rates charged. See the articles in this issue for details on the calculation of these rates.

b. Annual borrowings.

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

Sources: Nigeria: Udry (this issue). Thailand: Siamwalla and others (this issue). India: Bell (this issue), plus additional data provided by Bell, drawn from the Reserve Bank of India (1954, vol. 1, part 2, chap. 21, "Regional Data" tables); Bell and Srinivasan (1989, table 2), and Bell, Srinivasan, and Udry (1990). Pakistan: Aleem (this issue).

- Credit markets are segmented. Interest rates of lenders in different areas vary by more than plausibly can be accounted for by differences in the likelihood of default; and local events—a failure of a harvest in one area—seem to have significant impacts on the availability of credit in local markets.
- There is 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.

II. 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 the exchange of consumption today for consumption in a later period, insurance against default risk, information acquisition regarding the characteristics of loan applicants and the actions of borrowers, and an enforcement element to increase the likelihood of repayment by individuals 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 four empirical studies in this symposium, and is the foundation for Stiglitz's theoretical analysis of peer monitoring that concludes this issue.

The new views of rural credit markets are based on the following three observations:

1. Borrowers differ in the likelihood that they will default, and it is costly to determine the extent of that risk for each borrower. This is conventionally known as the *screening* problem.
2. It is costly to ensure that borrowers take those actions which make repayment most likely. This is the *incentives* problem.
3. It is difficult to compel repayment. This is the *enforcement* problem.

The new view holds that it is the markets' responses to these three problems, singly or in combination, that explain many of the observed features of rural

credit markets, and that they must therefore inform the policy perspective for designing specific interventions.

One can distinguish conceptually between two types of mechanisms for resolving the three problems: direct and indirect. 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 contracts 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 behavior in credit markets. Because the interest rate serves the dual function of a price and an indirect screening and/or incentive mechanism, 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 rely on lenders expending resources to screen applicants and enforce loans. It follows from this that high interest rates may reflect the high costs of these activities. Perhaps more important, however, these direct mechanisms (through personal relationship, trade-credit linkages, usufruct loans, and so on) lead to a monopolistically competitive structure with interest rate spreads between different segments of the rural credit markets. Moreover, this suggests that the moneylenders' power is unlikely to be broken by the entry of institutional credit, unless the new institutions themselves find substitutes for the direct mechanisms used by moneylenders to overcome the problems of screening, incentives, and enforcement.

III. The Theory of Indirect Mechanisms

A key feature of credit markets is that for any loan there is a possibility that the project for which it is used will perform so badly that the borrower defaults. In these cases, the lender cannot recover his total outlay, and in fact there are legal provisions in many societies which 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 for which the loan is used is less than principal and interest due on the loan. 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 gross 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 gain from the project will rise. By straightforward extension, the borrower will prefer some projects with lower mean return over those with higher mean return if the former group entails greater risk.

One consequence of default provisions is that changes in the interest rate may change the mix of projects undertaken by borrowers. This can be seen in the case where borrowers care only for expected net return. At any given interest rate, presumably loan applications would only be submitted for projects with a positive expected net return, taking into account default provisions. For a class of projects with the same mean gross return but differing risk, the interest rate will determine a marginal project with 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 marginal project now gives a negative expected net return—the new marginal project is now riskier than before, so that the pool of projects coming from this class is on average riskier than 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: "If the legal rate . . . was fixed so high . . . the greater part of the money which was to be lent, would be lent to prodigals and profectors, who alone would be willing to give this higher interest" (*Wealth of Nations*, 1776). Thus the interest rate can act as a screen which regulates the risk composition of the loan portfolio.

A lender cannot ever 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. The lender knows, however, that the mix of projects to finance changes with the rate of interest. The interest rate takes on the dual function of a price as well as an instrument for regulating the risk composition of the lender's portfolio (Stigler 1987; Stiglitz and Weiss 1981). This can lead to unexpected outcomes. For example, when there is an excess demand for loans at a given interest rate, classical economic analysis suggests 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 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 available loanable funds by other means. Thus, contrary to the operation of markets as they are supposed to work, credit may be rationed with no tendency for the interest rate to rise.

In fact, 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 is so high that returns to the lender do not cover opportunity costs of funds, putting upward pressure on the rate of interest. But this only worsens the risk mix. The process goes on until the interest rate is so high that only the riskiest projects, those with the highest probability of default, are being 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 the surplus associated with a loan. The observation that interest rates do not seem to vary much and have not been very sensitive to competition from the formal sector is also consistent with this view of the screening and incentive problems.

Reputation Effects 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 (Stiglitz and Weiss 1983). More generally, borrowers want to avoid defaulting on loans because to do so tarnishes their reputation and curtails their access to future loans. For this incentive to be effective, of course, interest rates cannot be too high, and 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 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 (Braverman and Stiglitz 1982, 1986). For example, a trader-lender may offer a farmer who borrows from him lower prices on fertilizers and pesticides because the probability of default is reduced when such inputs are used. The use of interlinkages as a direct mechanism for solving information and enforcement problems is considered below.

IV. Direct Screening Mechanisms

In addition to using indirect screening mechanisms, most lenders will also use direct screening mechanisms and may monitor borrowers' behavior; they will withdraw credit if the terms of the loan appear to be violated. In developing countries potential lenders vary greatly in their costs of direct screening and monitoring. For some lenders, such costs are low; information is 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, which partially accounts for the high default rates they face. These differences across

lenders in the costs of screening and monitoring may lead to segmentation of markets.

Geography and Kinship

In the area of northern Nigeria surveyed in the article below by Udry, credit markets are almost completely segmented along geographic lines and kinship groups, and information asymmetries between borrower and lender within these markets appear to be negligible. In Udry's survey 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 Udry, table 3). Collateral was seldom used, and credit terms implicitly provided for direct risk pooling between creditor and debtor. That 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 in rural China was found by Feder and others, 1989.)

Even in areas in which 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 Siamwalla and others report in their article below 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 will differ in their ability to effectively assure potential lenders of their creditworthiness. Similarly, for a given applicant, lenders will 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.

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 Siamwalla and others; Bell; and Aleem; all this issue). 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" (Siamwalla and others, this issue). 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. Bell reports (this issue): "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 new agent 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 hand over the said sum to the first agent."

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 (Siamwalla and others, this issue). For this crop, a spot sale to a trader serves as a substitute for trader-financed credit.

Bell (this issue) and Siamwalla and others (this issue) 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 not know as much about his productivity and will be in a less favorable position to enforce a loan. Although the incentives problem is not entirely resolved by market interlinkages, the severity of the interest rate–risk tradeoff will be less for lenders who have greater access to inside information and to mechanisms to enforce their claims. 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.

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 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 Thai-

land, "the sphere of operation of commercial banks and cooperatives . . . has been almost exclusively in villages where land titles have been issued" (Siamwalla and others, this issue). 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. Average per capita income of Thai households borrowing from the formal sector was more than 30 percent above the mean, whereas 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 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 (Siamwalla and others, this issue). As the saying goes, "Possession is nine-tenths of the law."

A similar practice, very widespread in Nigeria, is to procure loans by transferring to the lender the right to harvest the borrower's trees. The harvest provides the interest on the lender's loan. Such transactions, which are called tree pledging, 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. They predate monetization (Bouman 1983), and they continue to be a major source of credit in African countries (where they are 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. Where individuals need to purchase a high-priced item, ROSCAs provide funds with surprisingly small spreads between the return to savings and the cost of borrowing (Edwards 1989). ROSCAs are thus an example of a credit exchange which 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:] . . . '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. The initiative for forming the group comes from a retailer of durable goods, for example, cars. Let the group be of size N and the durable have price C. The group members are required to come

together for N monthly meetings to contribute their share of the cost, C/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 transactions 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, Aleem (this issue) found that they devote an average of one day to obtaining information per applicant and reject one applicant out of every two screened. In addition to screening costs, lenders face costs of chasing delinquent borrowers, maintaining an office and warehouse, paying hired help, and, finally, covering capital costs. Aleem found that screening and enforcement costs are about 14 percent of marginal costs of lending operations.

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. For example, more than 80 percent of borrowers surveyed by Siamwalla and others reported that they borrowed from only one informal source (Siamwalla and others, this issue; see also Bell, this issue). 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. In the ten-province household survey of Thailand conducted by Siamwalla and others, 72 percent of 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! (See also Bell.)

Of course, more evidence is needed before we can infer that lenders exercise monopoly power over their borrowers. This evidence can be found in Aleem's study. His first finding is that the total average costs of lenders, as a fraction of the amount recovered, was comparable to the average interest rate charged in the survey area. His second finding is that mean marginal costs as a fraction of the amount recovered were much less than the average interest rate charged.

These findings suggest strongly that the market 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 the price down to the average cost. Thus, in the usual way of monopolistically competitive

markets, each lender operates on too small a scale; he spreads his fixed costs over too small a clientele. This view of the market can lead to dramatically different policy conclusions on the effects of cheap institutional credit on rural interest rates, as we shall see in the next section.

To conclude, we 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 in section III above. The first is active and costs 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 market. Passive screening is consistent with perfect competition and, as argued in section III, reduces interest rates below the level that would exist if information were perfect. The evidence of Siamwalla and others and Aleem 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.

V. 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 problems do not only arise in developing countries. It can be argued, however, that underdevelopment increases the severity of these problems because of more extensive asymmetries of information and a more limited scope for legal enforcement, in particular, more limited collateral. Will development, therefore, by itself remove or reduce the imperfections of rural credit markets?

Several studies have argued 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 average incomes and farmers whose incomes increase seem to face lower interest rates from moneylenders:

> A high [interest rate] r is the *effect* of the high-risk premium that the village moneylenders usually charge for lending to the peasants . . . The lack of creditworthiness is really a reflection of the peasants' poor income and meager savings. Hence, the growth of real income and repayment of the farmers should reduce the probability of default and the risk premium, which in turn will reduce r. (Ghatak 1983, pp. 21–22)

> 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 and 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 . . . In 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 productivity and incomes increase, the risk of default decreases. But the articles in this issue suggest that the link between development and credit markets is somewhat more complex.

Screening, incentive, and enforcement problems in credit markets are often mitigated through interlinkages between the credit market and other markets, (for example, land and commodity markets). 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, which in turn expands the scope of credit markets.

As technological change disrupts traditional ties in a developing economy, however, the strength of social sanctions in enforcing credit repayments may decrease. This role of social ties is documented by case studies in this issue 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 of rural credit markets may well get worse before they get better.

Because development by itself is unlikely to take care of the imperfections of rural credit markets in the short run 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

Because enforcement (or lack of it) is one of the problems in rural credit markets, 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 developed ones) suggests that the government is often politically unable to use the latter advantage.

Thus Bell notes that there is a view, widespread in rural India, that institutional loans are really grants: "politicians regularly vie with one another in promising, if elected, to have such debts forgiven." Harriss (1983) 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 Agriculture, 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" (Siamwalla and others).

In Pakistan, the political cost of foreclosing on debtors with collateral is significant. Aleem reports that while default rates in the formal sector were 30 percent, for the informal lenders the mean delinquency rate was 15 percent and the mean cumulative rate of nonrepayment was only 2.7 percent.

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 issue and elsewhere, certainly does not suggest either 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 like 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 in the presence of imperfect information and this leads to credit rationing at a fairly high interest rate, it is unlikely that the interest rate will fall. Conversely, if moneylenders engage in direct screening, those moneylenders with the highest screening costs will drop out of the market and interest rates may be expected to fall.

If borrowers cannot fully satisfy their needs from government institutions, 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 in effect become riskier, which may lead to an increase in the informal sector interest rate. To make matters worse, in monopolistically competitive settings, when there is active screening, the screening costs must be allocated among smaller loan sizes, which raises average costs and interest rates. 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 toward larger borrowers with more collateral, and the evidence suggests that they do, then the mix of applicants among which 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 how the costs of informal lenders change and on how the level of competition in the informal sector changes. If privileged access to government funds increases entry, and therefore increases average costs in moneylending because the costs of screening borrowers are now being spread over the smaller clientele, then interest rates will tend to rise for this reason. This is another example of the implications of monopolistic competition in rural credit markets.

More generally, the imperfect information framework alerts us to the difficulty of relying on financial intermediation to resolve the problems in rural credit markets. Although the case studies in this issue present evidence that moneylenders do borrow from each other in the same village and across villages, screening, incentive, and enforcement problems limit the extent of these transactions. Formal sector institutions also face these information and enforcement problems in relation to moneylenders. Aleem, Bell, and Siamwalla and others show 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 paradigm of imperfect information and costly enforcement stands in contrast to the traditional debate on monopoly versus perfect markets. On the one hand, it argues that rural credit markets do not behave like classical competitive markets are supposed to, so that there is no presumption that they are efficient. On the other hand, 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.

These problems may suggest that government intervention is called for, and that it may be successful. But both theory and evidence caution us against any simplistic view of the government's role, because government credit institutions face these same problems in relation to borrowers. In fact, they may be in a worse position in terms of informational asymmetry, monitoring, and enforcement.

Is there, then, any role for public policy? Greenwald and Stiglitz (1986) have recently shown that markets with imperfect information give rise to externality-like effects, for which government intervention may be most successful. In the context of credit markets, one externality is the reduction in information costs brought about by development in other markets. Examples are land titling and

commercialization in goods markets. More generally, government expenditure on rural infrastructure that reduces farmers' risks will likely reduce the importance of information asymmetries, improve the level of competition, and therefore reduce the distortions in rural credit markets.

Another type of externality may reside in institutions which facilitate the overcoming of informational problems in rural credit markets. One such institution is that of small-scale peer monitoring, and the article by Stiglitz in this issue analyzes a model of this activity. Individuals form a small group which 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 because a small group has a lesser ability to bear risk than a lender with a large and diversified portfolio. But Stiglitz shows that under certain circumstances the benefits more than outweigh the costs. There is, however, 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 a recent review of group lending, there are notable successes when the government has acted in this way.

VI. Conclusions

Above all, the studies in this issue 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: to investigate the extent to which the findings of these studies can be generalized to other countries, to explore more deeply the effectiveness of the variety of institutions and mechanisms that can screen and monitor loan applicants which were touched upon in this article, and to evaluate the consequences of a variety of government interventions in credit markets, taking into account the information asymmetries and enforcement problems which are endemic in developing countries.

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