Subsidised credit programs have been introduced in virtually every country in the developing world. These programs have mostly proved to be failures and large financial burdens have been imposed upon governments. Failure of credit market intervention can be attributed to incorrect understanding of the workings of rural credit markets. These markets are strictly neither monopolies nor perfectly competitive. Credit markets are inherently risky because they involve a contract between two parties to be executed over time. Moreover, there is asymmetry in information between borrowers and lenders, which affects their respective responses to risk. Informal credit markets can internalise some of the risks and information deficiencies, and so cannot be completely replaced by formal markets. Some empirical evidence bearing on these issues, particularly relating to impacts of risk attitudes of market participants, is presented. It is argued that new institutional forms, including formal-informal linkages, could improve credit market performance.

1. INTRODUCTION

Beginning in the 1950s, development strategies in most developing countries emphasised increase in agricultural production. A vicious circle of low capital, low productivity, low incomes, low savings and consequently low capital was assumed to operate in rural areas. Rural credit was perceived as an instrument which could break this cycle. But it was also widely held that rural credit markets are imperfect, with money lenders usually dominating and borrowers often paying usurious interest rates. High rural interest rates were attributed to the monopoly power of lenders or to the high risks of default in rural lending. The policy response was to introduce subsidised agricultural credit programs. Yet most subsidised credit programs have been notable failures (Adams et al. 1984).

It is contended in this paper that failures of credit market intervention resulted from an incorrect perception of the nature of the rural credit markets. Classical models of monopoly or competitive markets do not adequately explain features of rural credit markets, such as the co-existence of formal and informal lending, credit rationing, interlinking and...
market segmentation. The characteristic that makes credit markets unusual is the high
degree of imperfect information, and hence a high degree of risk, that prevails. Risk is
generally not so important in markets for other goods. It is because credit markets involve a
contract between two parties to be executed over time that imperfect information and risk are
important.

Imperfect information in credit markets creates adverse selection and moral hazard
problems for lenders, as explained later in the paper. These problems increase lenders' risks
and can affect the way the market for credit operates. While the risks involved in credit
markets are discussed in the literature (e.g. Hoff and Stiglitz 1990), little attention appears to
have been given to the effects of the risk attitudes of borrowers and lenders. The importance
of risk attitudes has been mentioned by Binswanger and Rosenzweig (1986), but no
empirical work on this aspect appears to have been reported. In this paper, a study to
estimate borrowers' and lenders' risk attitudes is reported. The effect of these attitudes on
credit transactions in formal and informal credit markets is explored, particularly in regard to
use of collateral.

Informal credit markets have been better able to accommodate the information and
risk problems than have the formal markets. Hence, formal markets can seldom compete
effectively with the informal credit markets. Understanding the reasons can lead to useful
prescriptions for managers of formal lending institutions and for government rural credit
policy. This question too is explored in the paper with the aid of some survey data.

2. CREDIT POLICY AND PERFORMANCE

It has long been recognised that rural credit markets are incomplete. Some viewed
rural credit markets as monopolistic and attributed high interest rates to the monopoly
powers of rural money lenders. The proponents of this view therefore recommended cheap
credit as a relevant form of market intervention to break the powers of the monopolists. The
alternative view was that credit markets work like classical competitive markets. The
observed high interest rates, according to this view, are a reflection of the high transaction
costs and high rates of default. The policy recommendation implied is to have no
intervention in credit markets. It was that the policy makers in many developing
countries have accepted the monopoly argument, as evidenced by the proliferation of
subsidised credit programs. Many evaluations of subsidised credit programs have shown that
most of them have been failures (Adams et al. 1984). Default rates have been very high, real
interest rates negative in many cases, savings potential has been undermined, informal rural
interest rates have remained high, and substantial informal lending has continued.

McKinnon (1973) has argued that subsidised credit policies which keep real interest
rates at low or even negative levels discourage holding of wealth in financial form and
reduce the rate of capital formation. He has claimed that, through such mechanisms, low
interest rates cause financial repression, damaging the growth of financial intermediation and
so slowing the whole development process. Consequently, he recommended abolition of
institutionally-set interest rates in favour of market-determined rates. The success of a few
countries such as Korea and Taiwan in achieving economic transformation with high
nominal interest rates appears to support the validity of the financial repression school of
thought. However, there is now evidence to show that there are harmful long-term
consequences if interest rates are set too high. Interest rates above the market equilibrium
rate create excess supply of funds and stifle borrowing and real investment. Roe (1982),
who examined Sri Lanka's case, stated that the policy of high interest rates was being conducted in a manner which perpetuated many of the difficulties of the previous low-interest regimes. Rittenberg (1991) arrived at the same conclusion for Turkey.

3. THE IMPERFECT INFORMATION PERSPECTIVE

Risk in credit markets

Credit markets involve an advance of funds in exchange for a promise of repayment later. Thus, there are risks for both lenders and borrowers. The lender faces the possibility that the borrower will not repay as promised, while the main risk for the borrower is the possibility of being unable to meet the interest and repayment obligations. A lesser risk for the borrower is that the investment will return less than the loan costs, so that the borrower's net income is reduced. The relative risks faced by the two contracting parties are related to the level of information possessed by each. Moreover, there is information asymmetry between the borrowers and lenders, with the borrower possessing more information than the lender. A borrower may plan to default on a loan, but the lender may not know this. Lending is risky because borrowers differ in the likelihood that they will default, yet lenders seldom know the true circumstances and intentions of a borrower. Because collecting information to screen all borrowers is costly for lenders, information asymmetry may result in an externality imposed on honest and reliable borrowers when the lender sets interest rates to cover costs of default by other borrowers.

Adverse selection occurs when borrowers who obtain a loan are more likely to default than other potential borrowers - either those refused a loan or those who do not apply. This may occur, for example, if dishonest borrowers seek loans more often, or in larger amounts, than honest borrowers. Moral hazard occurs if the fact that a loan has been advanced gives an incentive to the borrower to give less attention to risk management than he or she otherwise would, or if a borrower is otherwise encouraged to default. Both adverse selection and moral hazard increase the risks for lenders, who need to take actions to protect themselves from these risks, or to recover the costs of defaults.

The risks for a lender arising from adverse selection and moral hazard are not independent of the interest rates charged. High interest rates increase adverse selection and moral hazard for at least two reasons. First, potential borrowers will need to have available investment opportunities yielding high return in order to justify higher loan costs. But investments with high expected returns are usually more risky than less rewarding opportunities. Second, the higher the cost of finance, the greater the incentive for borrowers to elect to default, ceteris paribus.

Because raising interest rate increases risks for lenders through greater adverse selection and moral hazard, total revenue to the lender will at first rise with increase in interest rate, but at a declining rate as default rate also rises. There will be an interest rate at which the lender's revenue is maximised, known as the bank-optimal rate. A rational lender will not wish to raise the interest rate above this level. The consequence may be that, if the demand for credit in strong, interest rate may not serve as an equilibrating price to bring credit supply and demand into alignment. In such circumstances, lenders may have to turn to other devices to ration the available funds.
Rationing of credit may be done in a number of ways. Formal government lenders may have a mandate to allocate credit according to prescribed criteria, for example, favouring small-scale borrowers. However, experience shows that such criteria can be difficult to apply and the rationing procedure is easily corrupted.

Another form of rationing is for the lender to require the borrower to provide collateral before a loan is advanced. This shifts the risks associated with default from lender to borrower to an extent, depending on the nature of the collateral and its value relative to the size of loan. The margin of safety in case of default is determined by the realisable market value of the pledged asset, net of selling costs, relative the loan amount.

From the point of view of expected return to lenders, interest rate and collateral form substitutes in that different combinations of collateral and interest rate can result in a given rate of return. Thus lenders have a choice in devising a strategy to manage the risks they face in a credit market. But their actions are constrained to a degree by the responses of borrowers, who also have options open to them in terms of type of credit they elect to use, and how diligently they strive to avoid default.

The asymmetry of information between borrower and lender, mentioned above, is not as great for informal as for formal lenders. Most informal lenders operate in geographically limited areas and information is a by-product of such living. Further, interlinking with input and product markets serves an information-augmenting function which reduces the risks of lending. Default rates in informal loans are thus low. By contrast, interlinking is seldom possible in formal banking institutions, so formal lenders have to contend with critical informational constraints.

Because of their disadvantage in terms of information, formal lenders usually place more emphasis on collateral than informal lenders. Moreover, because land is usually the most reliable form of collateral from the lender's perspective, borrowers who have land (either in freehold or in assignable usufruct rights) have greater accessibility to formal sources of finance. Yet land owners are typically better off than tenants, so that insistence on land as collateral for loans can mean that access to formal credit by the less well-off farmers is denied - sometimes the very opposite result from the declared objective of government-run rural credit systems.

Implications of risk aversion for credit markets

The choices that borrowers and lenders make in credit markets will depend on their attitudes to risk. The more risk averse a lender, the more likely he or she is to insist on collateral. On the other hand, risk-averse borrowers will generally prefer to accept higher interest rates rather than provide collateral. This is because the potential capital loss in the event of default will usually implies a greater disutility to a risk-averse individual than accepting a higher interest rate which simply reduces the expected net return from the project.

Binswanger and Rosenzweig (1986) has discussed the possible implications of risk attitudes of borrowers and lenders on credit transactions. If it is assumed that both the lender and the borrower possess the same information about the probability distribution of the outcome of the project financed by the loan, a risk-neutral lender will not impose any collateral requirement. This will be so regardless of the risk attitude of the borrower.
However, there appear to have been no empirical studies on the effects of risk attitudes of credit market participants on the operation of the market.

Empirical estimation of risk attitudes of borrowers and lenders

As indicated, the way risk affects the operation of credit markets depends on the risk attitudes of both lenders and borrowers. The operation of a rural credit market in the Badulla District of Sri Lanka was studied. Data were collected by interview survey from a stratified random sample of farmers in the district, and their recent credit transactions were investigated. The risk attitudes of borrowers and lenders involved in these transactions were estimated empirically and related to the types of credit arrangements entered into.

The estimation of risk attitudes of borrowers and lenders was done by eliciting their utility functions. The Equally Likely Certainty Equivalent Method (ELCE; Anderson, Dillon and Hardaker 1979) was used in eliciting preferences. Three certainty equivalents were derived for the money range Rs 0 to 10,000. On the basis of these certainty equivalents, individual lenders and borrowers were classified as risk averse, risk neutral or risk preferring.

Table 1 shows the numbers of loans contracted for the different combinations of risk attitudes of borrowers and lenders, and average loan sizes. It can be seen from the results that, for the majority of loans, at least one party (i.e. borrower or lender) was risk averse. For the risk-averse group (both lender and borrower risk averse), the loan size is the smallest for both for institutional and non-institutional loans. Risk aversion evidently is not conducive either for borrowing or lending large amounts.

There are other important features of these data that appear to be related to differences in risk behaviour. The proportion of loans for which at least one party is risk averse is 76 per cent in the institutional credit market, compared with 60 per cent in the non-institutional case. There are marked differences in average loan size observed between the different risk categories for the institutional sector, but these differences are less for the non-institutional sector. Also, lending when both parties are risk preferrers is reported in 10 per cent of the non-institutional loan, but no institutional loans were contracted with joint risk preference. All these differences suggest that risk behaviour is more significant in the institutional credit market than in the non-institutional market.

Differences in collateral use

The previous discussion suggested that institutional lenders will be more inclined to use collateral guarantees as compared to non-institutional lenders. This proposition is examined using data from the sample of farmers in the Badulla district. Table 2 indicates the relationship between collateral and type of lender.

The farmers were grouped into those owning land (titled) and those not owning land (untitled). The data show that 32.2 per cent of the titled farmers provided land as collateral for institutional loans. Membership of a co-operative bank or a personal identity card was used for institutional loans to titled farmers in 30.5 per cent and 23.7 per cent of the cases, respectively. Few loans were provided by institutional sources to land owners without any security.
A contrasting situation is evident in the case of the institutional lending to untitled farmers. There was naturally no land collateral for this group and the vast majority of their loans were covered by farmers identity cards (74.4 per cent), and most of the rest by virtue of co-operative membership (20.5 per cent). The interest rates did not appear to differ with the type of collateral. This is because of the ceilings imposed by government on interest rates charged by institutional lenders. In such a situation it is not surprising that the actual number of untitled farmers who borrowed from institutional sources was very small.

The study also revealed differences between institutional lenders in collateral requirements. The proportion of loans based on land as collateral from 12.1 per cent for the Bank of Ceylon to 65.2 per cent for the People's Bank. No collateral was required by the Rural Bank, even from titled borrowers. These differences may be because commercial banks are profit oriented, while other institutional lenders such as the Rural Bank may be obliged to pursue broader objectives in their lending programs to favour the poor.

As Table 2 shows, even titled farmers borrowed from non-institutional sources. Non-institutional loans were granted with no collateral both for the titled and untitled farmers. The interest rates were high (ranging between 37 and 85 per cent) and were higher for the untitled than titled farmers offering no security at all. These results accord well with findings in other countries (Feder, Onchan and Raparle 1988, Binswanger et al. 1985).

On the supply side, shop keepers and produce buyers figured prominently amongst the non-institutional lenders. Money lenders were conspicuous by their absence. Lender farmers were observed, in line with the observation that this group of lenders is emerging as increasingly important in some countries, particularly where technological development have gone on for a while (Yotopoulos and Floro 1988).

Insistence on collateral has important implications for rural equity. If pledging of land collateral is imperative for institutional loans, it means that those who own no land will not be able to obtain credit. This lack of land collateral can exacerbate existing income differentials. The provision of land as collateral has certain associated fixed costs, and also the risk of loss due to foreclosure is high. Land is of such importance to many small-scale farmers that they are very reluctant to use this asset as collateral, even if they have it. Thus, the institutional credit market may effectively be closed to both the landless and to many farmers who have title to small areas of land.

The problems of using land collateral have been noted in a number of contexts. For example, in a study of rubber smallholders in Sri Lanka it was found that, in some districts such as Ratnapura, ownership types other than sole title, such as encroachments, temple lands, jointly owned lands, comprised nearly 30 per cent (Herath 1986). These tenancy patterns constrain the lands from being used as collateral due to lack of formal property rights. Consequently, such farmers were found to be often constrained in the adoption of new technology. Similar or even worse problems are faced by rubber smallholder in Indonesia. Most Indonesian rubber smallholders have small farm areas of 2 to 3 hectares, often in several parcels. The swidden form of cultivation followed by these farmers, where young seedlings are planted along with rice, creates a circumstance where the credit market fails due to the collateral problem (Barlow and Jayasuriya 1984). Land is held by virtue of cultivation activity only, and there is no formal title. Coffee farmers in Colombia face similar problems where, due to small size of the farm, land has not been accepted as collateral for credit. Consequently, acceptance of new technology has been retarded. Loans
have been granted mostly to more stable and established farmers with limited mobility. Those farmers using swidden cultivation with no land title have not been able to offer the required collateral to obtain credit.

4. CONCLUSIONS AND IMPLICATIONS

The foregoing analysis has indicated the empirical relevance of the risk attitudes, information asymmetry, moral hazards and collateral in credit markets. The study has also shown that risk aversion results in smaller loans than for cases where one or other party is not risk averse.

It seems that there may be less risk aversion among people operating in non-institutional credit markets. The problem of information asymmetry, with the associated adverse selection and moral hazard, appear to be less serious for informal than formal lenders. The highly localised nature of these markets and greater availability of information has a risk-reducing effect. Interlinking processes in markets can provide a way for lenders to get more information and to better enforce repayment. Such measures can reduce a lender's default rate, improving the return on lending. Interlinking also permits lenders to be involved in high-return activities such as trading.

By contrast, formal lenders do not generally engage in interlinked credit. To enable these lenders to reap some of the advantages of interlinking, a policy to use traders as intermediaries to provide credit to small-scale farmers appears logical. The capital base of some of the traders is small and the provision of government credit to them would enhance their lending activity. At the same time, operating in this way would permit a formal lending institution to gain more information on the economic conditions in the areas of its operations as well as about borrowers' behaviour. Note that the farmers' need to obtain credit as well as to secure both an assured market and a regular supply of product on the one hand, and the incentive for expansion of trade by the trader on the other hand, together result in a mutually reinforcing relationship between producers and traders. Provision of additional funds would be likely to further cement the relationship, offering a secure form of lending for the formal financial institution. Similarly, local input dealers in many countries provide some credit to client farmers in the form of inputs. These traders too might be used as a conduit to channel government credit.

One way to overcome collateral problems is to reform land markets. This reform should involve reform of rental agreements, distribution, and ownership. Many varieties of rental agreements with various degrees of inequity and disincentive effects, such as share cropping and fixed rent, are practiced in developing countries. Once the land is adjudicated, consolidated, and registered with secure ownership, it could be used as collateral to get credit. However, it is necessary to sound a note of warning about the merits of improving land titles to provide collateral because there is as yet little empirical evidence of any causal link between land reform and credit availability. Land reforms may not work for two reasons. First, if interest is a substitute for collateral, collateral may not be required. Second, many small-scale farmers would still not use their land as collateral, even if tenure conditions were improved, for the reasons of risk aversion noted earlier.

The scope of this study has been rather limited, and no doubt there is a need for more data collection and more comprehensive analysis. However, the issues raised are certainly
important and in this paper we have sought to alert readers to the need to review recent thinking about the operation of rural credit markets.

5. REFERENCES


Table 1

Numbers and Average Sizes of Loans According to Risk Attitudes of Lenders and Borrowers

<table>
<thead>
<tr>
<th>Risk attitude&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Loan details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lender</td>
<td>Borrower</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>Institutional Loans:</strong></td>
<td></td>
</tr>
<tr>
<td>RA</td>
<td>RA</td>
</tr>
<tr>
<td>RA</td>
<td>RN</td>
</tr>
<tr>
<td>RA</td>
<td>RP</td>
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<tr>
<td>RN</td>
<td>RA</td>
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<td>RN</td>
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<td>RP</td>
<td>RN</td>
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<tr>
<td>RP</td>
<td>RP</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

| **Non-Institutional Loans:** | | no. | % | Rs |
|-----------------------------|-----------------------------|
| RA | RA | 16 | 16.2 | 2 149 |
| RA | RN | 8 | 8.1 | 3 300 |
| RA | RP | 15 | 15.2 | 6 204 |
| RN | RA | 18 | 18.2 | 5 133 |
| RN | RN | 9 | 9.1 | 4 144 |
| RN | RP | 9 | 9.1 | 3 178 |
| RP | RA | 3 | 3.0 | 3 500 |
| RP | RN | 11 | 11.1 | 5 345 |
| RP | RP | 10 | 10.1 | 3 190 |
| **Total** | | 99 | 100.0 |  |

<sup>a</sup> RN = risk neutral, RA = risk averse. RP = risk preferring.
<table>
<thead>
<tr>
<th>Type of security</th>
<th>Titled Percentage borrowers</th>
<th>Titled Interest rate</th>
<th>Untitled Percentage borrowers</th>
<th>Untitled Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institutional Lenders:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land as collateral</td>
<td>32.2</td>
<td>11.0</td>
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<tr>
<td>No collateral, security as:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Membership of co-op</td>
<td>30.5</td>
<td>11.5</td>
<td>20.5</td>
<td>10.2</td>
</tr>
<tr>
<td>- Identity card</td>
<td>23.7</td>
<td>10.0</td>
<td>74.4</td>
<td>11.1</td>
</tr>
<tr>
<td>No security</td>
<td>13.6</td>
<td>10.5</td>
<td>5.1</td>
<td>11.2</td>
</tr>
<tr>
<td><strong>Non-Institutional Lenders:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land as collateral</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>No collateral, security as:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- Membership of co-op</td>
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<td>0.0</td>
<td>20.5</td>
<td>37.0</td>
</tr>
<tr>
<td>- Identity card</td>
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<td>0.0</td>
<td>74.5</td>
<td>55.0</td>
</tr>
<tr>
<td>No security</td>
<td>100.0</td>
<td>70.0</td>
<td>5.0</td>
<td>85.0</td>
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