DISCUSSION PAPER

CREDIT MARKETS AND CREDIT POLICY IN DEVELOPING COUNTRIES: MYTHS AND REALITY

by

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August 1983

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1. *Introduction*

Government policy towards rural and urban financial markets is an important element of economic development policy in developing countries. Among the financial policy issues that arise are the following: the setting up of new financial institutions, the control of existing institutions such as organized banks and informal markets, and credit allocation policies. I focus somewhat more heavily on the last element, and on its interaction with the others. One reason for this is the enormous growth in LDC government intervention over the last decade and a half, to control the direction and cost of credit flows. It is therefore important to understand both the professed and underlying rationale for such intervention, the effects such intervention has had, and the methodology for design of appropriate policy instruments.

All these elements of policy are intimately linked to the nature and functioning of credit markets (capital markets in general). Compared to the markets for steel or tomatoes, these are quite complex. Recent research by the author, and by others within and outside the Bank, has shown that critical elements of these markets in developing countries have been ignored in previous discussions. Though practitioners may not clearly realize it, both policy advice and intervention is based on some view of the financial market. Misperception or misunderstanding can lead to incorrect interpretation of the facts and the lessons to be derived from them. An exposition of the nature of credit markets in developing countries, is therefore a basic element of the paper.
2. The Rationale for Government Intervention

Virtually every policy intervention is justified by practitioners in terms of a mix of economic and social welfare goals. Publicly given justifications by developing country governments and policy advisors can be loosely assigned to two broad categories. These are the developmental-production goals and the socio-political goals of the governments. An early use of the former was to justify creation of new agricultural and industrial lending institutions to "foster economic development". These covered the gamut from agricultural cooperative societies to industrial development banks for term lending. Production and Investment goals have been implicit in efforts to direct the flow of credit to "Essential and Priority sectors", the repeated expressions of concern for the "credit needs" of particular producers and agricultural and industrial subsectors, and the long held belief about "inadequate long term loans".

The socio-political goals have been expressed in terms of credit for "poor/small farmers" or "raising the earning capacity of the poor". Other socio-political goals include employment generation through financing of "self-employed" and "small entrepreneurs", and of not financing "hoarding and speculative activities". These terms are politically quite evocative, but somewhat vague and imprecise to provide criteria for evaluation. We need to strip them of this overlay, to identify more specific justifications for intervention.

In examining the underlying causes for policy intervention, three types of reasons can be detected. These are inefficiency or market failure in financial markets, inefficiencies or distortions in other markets (such as for
outputs or inputs), and welfare or income transfer objectives. I ignore for the moment the practically important consideration of pure political patronage or aggrandizement of friends and supporters. Actual cases seldom fall neatly into these categories. Such a classification is useful for obtaining a clear understanding of issues and consequences.

The detailed discussion of the effects of policy intervention will be presented in section 3. In the rest of this section, the general issues and arguments will be identified and discussed.

2.1 Welfare and Income Transfer

I start by taking up the last reason first. Many welfare related arguments implicitly contain a predominantly market efficiency related justification. An example is the hypothesis that the "poor do not get enough loans". If loans depend on collateral availability, land or wealth holding can affect market efficiency. Though distributional consequences flow from market failure in this case, this issue is best addressed later. It will be taken up in section 3 along with other credit market efficiency issues. The basic welfare issue to be addressed is whether the financial or banking system is an appropriate channel for making transfer payments to the "poor".

There are few developing countries which have a system of regular welfare payments or unemployment benefits. There are two reasons for this. First, the perceived enormity of the poverty and 'hidden unemployment' problems, and consequently the cost of running such a system are likely to be too large to be sustainable. Secondly the administration problem, that is proper identification of beneficiaries, and delivery of benefits to them is likely to
be daunting. There are strong incentives for the nonpoor and 'adequately' employed to misrepresent their status so as to receive benefits.

These problems are either forgotten or ignored by many policy makers when contemplating the use of the financial system to make transfer payments. Part of the reason is a genuine belief, that capital or asset related transfers are less costly to the government than current income transfers. The former are seen as increasing the earning capacity of the poor; therefore substituting for the much slower acting education programs, and the politically "infeasible" land reforms, both of which are a recognized means for doing so.\textsuperscript{1} If the poor are aware of profitable investment opportunities, as for example in raising livestock, but are unable to exploit them, it can denote an inefficiency in the credit market. Much more likely, however, is a lack of knowledge, experience and information on production and marketing of output (or some problem in this market).\textsuperscript{2} In this case government intervention should be addressed at the education, training and information aspects. Welfare transfers will not solve the problem, but merely result in the type of cost burden we expect in any kind of transfer program.

At least initially these costs are commonly hidden inside the banking system, either in the form of reduced profits, or in the form of implicit

\textsuperscript{1} This is of course not the place to discuss the misallocation of educational resources towards graduate education and away from primary and secondary education. The result of which may be a raising of the earning capacity of some coupled with higher unemployment for others. A similar thing can happen if the wrong kind of productive assets are created because of government intervention.

\textsuperscript{2} Imperfections in other markets will be addressed under the next rationale for intervention. The evidence for this contention is found in the many programs which failed because of neglect of these aspects.
taxation (through interest controls) of another group of borrowers or depositors. Evidence from many countries indicates, that reduced profits can undermine the flexibility and stability of the banking system (see for example my study on Korea). Taxation of participants in the financial system has distortionary effects which I will analyze subsequently. It represents, however, a cost just as much as a direct welfare transfer provided by raising funds through income taxes or indirect taxes.

Another illusion is that because an existing organizational structure is being used the extra administrative costs are minimal. Identifying the genuinely poor and ensuring that they are the ones who receive the entire transfer payment or subsidy, is as much of a problem for the financial system as it would be for a welfare or unemployment insurance administration. Again the increased costs of doing so can be papered over for a time by the profits from general banking operations.

There are even more pernicious costs which are more difficult to detect. If the banking system or other elements of the financial system come to be perceived as an agency of the government for making transfer payments all other lending operations can suffer. As the welfare payment is tied to the lending operations, all borrowers are potential "welfare cheats". This is not an abstract possibility. Results of lending operations for the "poor" or for "poor farmers" show that it is the better endowed who obtain the
Another related consequence is default or nonrepayment by borrowers who have the means to repay. That is, the entire loan, rather than any interest subsidy, is itself seen as a welfare transfer.

2.2 Inefficiency In Other Markets

There are two categories of problems in other markets, which have led to attempts at intervention in credit markets. One is perceived market failure or imperfection, and the other is government created distortions. In many cases distortions in one market may be the unforeseen consequence of policies introduced to correct some perceived market failure. Intervention in agricultural credit markets has been most commonly justified by reference to market failure in other markets. Virtually every rural market has been mentioned as a culprit. Among them the markets for land and labor, for inputs such as irrigation and fertilizer, for output of crops and livestock, for disaster insurance, and for (adoption of) new technology. More generally the concern has been greatest for inefficiencies in labor (unemployment) and export markets.

As it is not the purpose of this paper to consider every possible case of market failure or distortion, one general principle needs to be stated at the outset. The work of Bhagwati and Srinivasan and others has shown that it is much more efficient and socially productive to attack the problem at its

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1/ See my paper on Bangladesh, and Von Pischke, Adams and Donald.

2/ See Ladderman, Timmer and Falcon, and my paper on Bangladesh.
source.1/ Policy intervention should be aimed directly at the point in the economic system where the market failure or distortion is present. This is the most efficient way to solve the problem. Convincing reasons for not doing so must therefore be given, before the use of the credit market as an alternative instrument is even considered.

As the first illustration of the targeting principle, consider the problem of imperfect land markets. In many countries fragmentation of land holdings is a serious problem. Thus one household's land holding may consist of as many as 10 different widely separated plots of land. This is prima facie evidence of inefficiency in land markets, because of the wastage of time and organizational effort involved, and the increased costs. If there was a "perfect" market in land, we would expect the concerned household to sell the dispersed holdings and buy a single contiguous piece of land with the proceeds. It is quite clear in this case, that no intervention in the credit market is going to solve or even ameliorate this problem. The direct method is land reform whose central purpose is the consolidation of holdings.

The next two illustrations contrast government created distortions with market inefficiency in the output market for agriculture and livestock. Government created distortions in the markets for grain and cash crops have often included one or more of the following policies: price controls to "protect" urban consumers, implicit taxation of output through monopoly procurement for internal distribution or export, and undervalued exchange rates which result in lower (equilibrium) prices. The efficient method for

1/ See, for example, Dixit (1985) for a recent restatement in the context of efficient taxation.
stimulating production and increasing the incomes of producers is in each case to reduce or remove the distortion.

An example of natural imperfection is an externality between the creation of marketable surplus in a previously isolated and undeveloped area, and the marketing channels to the urban centers of demand. The direct policy is a combination of incentive floor prices for output coupled with development of collection and marketing channels. The success of some of the production-marketing dairy cooperatives attests to the correct identification of the problem. An important measure of success in these cases is full repayment of loans at a market rate of interest. In both cases of market failure use of an indirect credit policy instrument would create its own distortion. The precise nature of the distortion depends on the type of intervention, and will be discussed fully in section 3.

Another general principle of tax-subsidy policy is relevant, even if a direct correction is ruled out. Taxes or subsidies on inputs such as capital or loans create distortions in both production and consumption, while taxes on final output create distortions in consumption alone.\textsuperscript{1} Thus even if it is impossible to attack the inefficiency or distortion at its source, the next choice is to put a tax or subsidy on some other output. In the illustration with government created price distortions this would involve a tax on nonagricultural output, or an export subsidy. This policy will correct the

\textsuperscript{1} By encouraging more capital intensive production in the case of a capital or loan subsidy. The case against input taxation was first made by Diamond and Mirrlees. Dixit (1975) has shown that it continues to apply in the presence of distortion in some output markets.
internal terms of trade distortion, and be less harmful than a subsidy on loans. It will still be inferior to correcting the original problem.

Absence of insurance markets is often cited as a justification for credit market intervention. The general principle of taking direct action to assist the development of this market still applies. In considering alternative measures, insurance markets for natural hazards and catastrophes must be distinguished from equity markets for sharing risk among investors. In cases of floods and hurricanes governments can and do provide relief to the population, thus providing some free insurance. The determination of the size of individual losses is much more difficult in the case of drought. Transferring this job to the banking system would not reduce the cost or difficulty of doing so. An argument can be made for limited and selective use of banking channels to provide crop insurance. For their own current borrowers, banks' loan repayment depends on the extent of losses sustained. Information has therefore to be collected for making decisions about the course of action to take. The additional information requirements and their cost are likely to be relatively smaller. It should be feasible to design an insurance system covering crop losses only to the extent of loan repayment due. The banking system would collect insurance premiums, and make a determination of loans to be forgiven, in turn collecting them from the insurance fund.

Possible inefficiencies arising from lumpiness of irrigation (or other) capital, and information problems in adoption of new technology are linked more closely to issues of credit market efficiency. To the extent that they are not, the previous principles of addressing the source of the problem remain valid.
2.3 Inefficiency in Credit Markets

Market failure or inefficiency in the financial market is the most fundamental rationale for government intervention in these markets. Even when the proximate reason appears to be different, it often forms part of the rationale. Issues of credit market efficiency and government intervention are intimately related to the nature of these markets in developing countries. To clarify the meaning of market efficiency, around which so much of our discussion revolves, we start, however, with the simple conventional view of these markets.

For this purpose imagine a world in which there is no uncertainty and complete information with everyone. In this world the financial market is in essence identical to the market for steel or tomatoes. It has a nominal difference, however, in that it involves transaction over time; payment of the sale price of the loan taken today, the interest rate, is only made at the end of the period of the loan (the sale and purchase of goods is essentially a transaction at a single point in time)./1 Just as in the tomato market, this financial market brings together those with more current income than they want to spend, and producers and investors whose current needs are greater than their own savings./2 The resultant outcome in a competitive (auction) market is depicted by the intersection of the savings supply (S) and investment demand (I) curves in figure 1.

1/ Any time element such as hire purchase, or delayed payment involves an implicit credit transaction.

2/ We will ignore demand for consumer loans in much of our discussion. The justification for this is the overwhelming concentration of LDC government intervention in production related credit.
Figure 1: CAPITAL MARKET IN CONDITIONS OF CERTAINTY
Efficiency in this market is defined by the condition that the marginal product of capital in every use equal the marginal cost of funds. That is the return to every borrower, from the marginal unit of loan equal the unit cost of funds. Existence of production or investment opportunities for which the marginal product of loans exceeds the marginal cost, shows that there are imperfections in this market. Potential borrowers who have identified this opportunity are unable to get a loan to take advantage of it. This implies that, potential borrowers have knowledge of and ability to exploit the opportunity. If they do not, we cannot assert that there is an inefficiency in the loan market.

The role of financial intermediaries and intermediation in this model is the same as of wholesalers or retailers of tomatoes. Just as the latter are seen as physically transferring goods from the place of production to the place of consumption, the former can be viewed as transferring funds between geographically dispersed savers and borrowers. This view of transaction cost is quite consistent with the assumption of the model that there is no uncertainty or information problems. These costs have the effect of producing a gap between the interest rate on deposits, and the interest rate on loans. The efficiency condition is also modified; the marginal return on loans must now equal the true marginal cost of raising and transferring funds.

Just as the tomato seller does not care whether the buyer is rich or poor, a business man or salary earner, land owner or landless, there is no need to distinguish between borrowers. The only thing that matters is willingness to pay the price. With perfect information all this requires is that the returns from taking the loan be more than the interest costs of the
loan. As there is no usefulness from distinguishing between different borrowers they can be viewed as being identical.

Policy analysts and practitioners who have implicitly or explicitly used this concept of the financial market, have identified a monopoly lender as the most important potential source of market inefficiency. A monopoly implies a single lender a situation which is never observed even in the smallest country. The concept of monopoly is therefore extended to one of "local monopoly" such as a single moneylender in a group of villages. Strictly speaking this is impossible given perfect information and minimal transport costs in moving funds between neighboring village clusters. Once we give up the assumptions of certainty and full information the entire view of the financial market changes.\footnote{See references to authors papers at end. This view is elaborated in the sections below.} Therefore let us ignore this contradiction for the moment and trace out the implications of monopoly within this perspective.

The monopoly equilibrium in this market is represented in figure 2. The monopolist equates his marginal costs \((S)\) to the marginal revenues. The total loans given are reduced from \(L^*\) to \(L_m^*\) while the interest at \(r_m^*\) is higher than \(r^*\). The marginal product of loans, given by \(r_m^*\), is now higher than the marginal cost of funds \(r_o^*\). For those who see this as the source of market inefficiency two solutions follow immediately. One is to encourage the formation of or to set up, alternative financial institutions which will provide competition to the "local monopolist" and thus bring down the interest rate to the socially optimum level \(r^*\). The other is to put a ceiling on
Figure 2: MONOPOLISTIC CAPITAL MARKET WITH NO UNCERTAINTY
interest rates at the level r*. Such a ceiling, presuming it was effective would re-establish efficiency in the market.

Even within this framework, certain commonly held beliefs do not follow. Even if we make the far fetched assumption that all moneylenders are monopolists, elimination of money lenders cannot improve the situation. In the short run it will definitely cause more inefficiency. Secondly an inefficiency does not imply an inability to repay the loan at the true cost of these funds. On the contrary the potential borrower would make a net profit after fully repaying the loan at this cost. This view of the market does not provide any argument for forcing either private or public financial institutions to lend below the rate of interest r*. In the presence of transactions costs, this is the cost (on the margin) of raising and transferring funds from saver/depositors to borrowers. Any situation in which there is a demand for loans which an institution would like to satisfy, but is unable to do so because of lack of funds, at rates set by the government, denotes a government created distortion in the market. All borrowers will fully repay their loans at the rate r*.

Most of the early controversies focused on whether or not developing country markets were characterized by the competitive case of figure 1 or the monopoly case of figure 2. The existence of a number of money lending sources in sample villages is cited in proof of the former, while rural interest rates ranging from 30% to 100s of percents are cited for the latter. Later controversies have shifted to the effect of interest control policies on financial markets. As shown in section 3 these are directly related. It is my
contention, however, that in the context of interest and credit control policies, this entire view of the LDC credit market is highly misleading.

2.4 The Information Perspective

We turn therefore to an exposition of the informational view of the financial market and its efficiency properties. As previously noted the interest payment (its price) on a loan is separated in time from the receipt of the loan, by the period of the loan. What happens to a borrower's income or wealth during this period can be directly relevant to the possibility of repayment. If there is any uncertainty in the former, it will generally be reflected in uncertainty in the latter.

A simple example from agriculture is useful for clarifying the implications. Consider a community of irrigated farms, in which there are a large number of money lenders. The only source of uncertainty is assumed to be the possibility of pest infestation. In general if pest infestation occurs on a particular farm, different degrees of crop loss are possible. Purely for expository simplicity assume there are only three possibilities. No pest infestation or crop loss, infestation with partial damage, and complete crop loss. From past experience, the chance (probability) of any of these cases happening on any farm, is known. The relevant information is summarized in table 1.

Four different cases are given under the heading of Repayment. Purely for expository simplicity, all cases assume that farmers rent their land, and require only working capital. The basic case (1) assumes that all farmers own no assets. In case (2) all farmers are assumed to have some of their own equity or working capital. In case (3) we go back to the assumption
<table>
<thead>
<tr>
<th></th>
<th>No loss</th>
<th>Partial loss</th>
<th>Complete loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net return gross of loan repayment</td>
<td>g(k)</td>
<td>bg(k)</td>
<td>0</td>
</tr>
<tr>
<td>Chance/Probability of occurrence</td>
<td>p1</td>
<td>p2</td>
<td>1-p1-p2</td>
</tr>
</tbody>
</table>

**Repayment Cases** *

1. No borrower equity (e = 0, \( k = \xi \))
   
   \[
   L(1+r) \quad bg(\xi) \quad 0
   \]

2. Positive equity

   \[
   L(1+r) \quad L(1+r) \quad 0
   \]

3. Small amount of collateral only

   \[
   L(1+r) \quad C+bg(\xi) \quad C
   \]

4. Full collateral

   \[
   L(1+r) \quad L(1+r) \quad L(1+r)
   \]

\[g(k) = \text{Net profits before loan repayment (subject to decreasing marginal product of loans), } k = K/A, \; K = L + e,\]

\[L = \text{loan taken} \]

\[A = \text{Land cultivated} \]

\[e = \text{equity or own funds} \]

\[r = \text{Interest rate on loan} \]

\[C = \text{Collateral} \]

\[p1 = \text{probability of no pest infestation} \]

\[P2 = \text{probability of partial pest infestation} \]

\[b = \text{fraction of profits lost under partial pest infestation} \]

* In 1) it is assumed that \( bg(k) \) is less than the full repayment due.

In 2) it is assumed that \( e \) is such that loan requirement is reduced to the point at which full repayment is possible even with partial crop loss.

In 3) it is assumed that collateral is less than the difference between loan dues minus the profits under partial loss.

These assumptions are purely for expository simplicity.
of no own funds, but now assume they have a small amount of collateral which they implicitly or explicitly pledge as a guarantee of repayment. Finally in case (4) we assume that the collateral is sufficient to cover the entire loan dues. For the moment ignore cases (2) to (4), and focus on case (1) as the illustrative example.

A lender considering the possibility of lending to these farms knows that repayment is not certain. Some of the farmers will not have the funds (at the end of the period) to repay the entire loan, while a few may default completely. Only on average (or in an expected value sense) will repayment cover the cost of raising and transferring these funds to the borrower.

A number of points emerge from an examination of table 1. One is that the loan interest rate (r) is no longer equal to the deposit rate plus the transaction cost element mentioned earlier. It is always higher than this as long as there is any uncertainty in repayment. If it were not the lender would not be able to cover his costs on average, because of the times in which he does not get part or whole of his principle (or even interest). This is apparent from case 1). Secondly, even when the underlying returns and the uncertainty is identical between different borrowers, the repayment received by the lender, and the uncertainty that he faces can change dramatically with the amount of equity or collateral that the borrower has. This can be seen from comparing the different cases. Thirdly, the mere presence of uncertainty means that repayment is affected by the mean returns of the borrower. Thus for case (1) a farmer with a higher mean return due to less crop loss in the partial loss situation (higher b), will repay more in this situation, and therefore receive better loan terms to start with.
Fourthly, it is apparent from case 4, that if collateral is sufficient to cover full repayment, there is no uncertainty in repayment. In this case the financial market is virtually identical to the conventional one without uncertainty presented earlier. It can be shown that in this limiting case, the loan interest rate is indeed equal to the cost of raising and transferring funds (assuming competitive markets). Though it is less obvious, there are also certain conditions of equity holding and basic uncertainty in which repayment is certain. For case (2) this would happen for example, when there was no chance of complete crop loss (i.e. \( p_1 + p_2 = 1 \)).

A few other implications follow, if we think of all the borrowers in this example to consist of two subgroups, corresponding to cases 1 and 4 (or 3) respectively. The loan interest rate specified in the loan transaction, will be much higher for the first subgroup than for the second. The effective price paid for the loan will, however be exactly identical. This is because on average the second subgroup will surrender to the lender a value of collateral exactly equal to the higher nominal interest payments of the first. The second point which follows is that interest differentials for otherwise identical producers (but ignoring collateral) do not necessarily indicate market failure.

To say anything more definite about market efficiency one has to go a little deeper into the technical issues.\(^1\) There is however one situation, a totally unrealistic one but of some pedagogic value, which allows us to eliminate the complexity. Recall that in the conventional model, lenders did

\(^1\) Risk neutrality on the part of intermediaries/banks and borrowers is assumed in all the specific results derived by the author and summarized in this paper.
not care about the differences between borrowers. Here we have to assume the
differences away. That is, assume that the entire credit market consists of
identical borrowers with exactly the same amount of equity, collateral and
with the same return-risk characteristics. The basic steel or tomato market
approach (or competitive auction market) used previously, then goes through,
even though we have to think of two closely connected markets./1 One is the
market for savings/deposits, and the other is the market for loans (see
appendix for a solution for the example of case 1).

The efficiency condition now requires equality between the expected
marginal product of loans in all uses with the marginal cost of raising and
transferring funds. For the example of table 1, case 1, the former is given
by, \((p_1 + bp_2) g'(k)/A\), where \(g'(k)/A\) is the marginal product of loans with no
crop loss. Market failure or inefficiency in this market means that there are
some potential borrowers with an expected marginal product of loans greater
than the true marginal cost of raising and transferring funds to borrowers.
Equivalently there are some borrowers who can put one unit of loan to more
productive use (in an expected value sense) than the expected marginal return
to any of the existing borrowers.

The most important source of inefficiency is the lack of information
on the part of borrowers (technically information asymmetry). In terms of the
previous example, this can be shown to happen when the lenders expect either
the fraction of crop loss in the partial loss state, or the probability of
partial loss (no loss) to be higher (lower) than the farmers' themselves

\[1/\] Instead of collateral having to adjust to satisfy the competitive zero
profit condition, as in my 1982 paper, the deposit interest rate adjusts
to bring both deposit and loan markets into equilibrium.
expect. I have shown in a more general situation than the example given here, that borrowers will receive smaller loans and be charged higher interest rates than if the informational problem were absent.

Within a small community of identical farmers and well established lenders, it may be hard to imagine why this should happen (though not harder to imagine than the concept of a localized monopoly). If we widen the horizon to include a large variety of land and asset ownership, firm and farm operating environments, the nature of information/knowledge about potential borrowers available to lenders becomes a critical determinant of whether the credit market will be efficient or not.

We can see what happens once borrower diversity is allowed, if we continue to use the competitive auction market approach. Collateral changes provide one mechanism for levelling out, from the lenders perspective, the diverse return-risk characteristics of borrowers. Assume that borrowers could freely vary the collateral that they implicitly or explicitly provide as a "guarantee" of loan repayment. Collateral can then be adjusted to the characteristics of each subgroup of borrowers, to make them all identical in the eyes of the lender. The way in which they are identical is that they provide the same expected net profit (assumed zero for simplicity in my derivations) to the lender. This flexibility ensures market efficiency, with the marginal conditions for efficiency holding, in the absence of information problems.
Another potential source of market failure has appeared however. If a particular borrower subgroup does not have the required amount of collaterl, rationing will result. The previously mentioned marginal conditions will no longer be satisfied. In other words any borrower who does not have the collateral appropriate to his circumstances (i.e. the equilibrium level) he will receive less than the efficient amount of loans. This approach therefore suggests, that those with less available collateral (presumably less wealthy/poor households) than their productive capacity, may indeed be constrained by availability of collateral. Even if this is true, however, it does not imply that they should receive loans at rates which are less than the marginal cost of raising and transferring funds to them. On the contrary the loan rate could be significantly higher, if their poorer knowledge and lack of relevant production information results in inferior return-risk characteristics.

To take a concrete example, suppose we discover that in a particular area very poor landless farmers are getting loans at 100% or more, when most others receive them at around 20%. In the absence of a detailed research study, and given the above analysis, a case could be made for nationalized banks in the region to lend to them at a rate of 30-50% (I am assuming their direct costs of lending are not more than 10%). If we have correctly

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1/ Recent work done by me, has developed the concept of a contractual loan market, extending work presented in the 1982b DRD working paper. This recent paper (1985b) shows that in a contractual loan market, in contrast to an auction market, efficient competitive equilibrium is independent of the amount of available collateral. In other words as long as there are no information problems, collateral cannot be a source of inefficiency. Once information problems result in inefficiency, however, the amount of available collateral does influence the degree of inefficiency.
identified the problem, their productivity should improve enormously and they should have no difficulty in repaying their loans (on average) at these rates. The rates charged should of course be brought down if experience shows that their return risk characteristics do not justify them. This would be indicated by higher profits from loans to these borrowers, than from the rest of the loan portfolio.

The information approach is useful for clarifying the issue of local monopoly raised by the conventional approach. It is hard to believe that physical barriers or transport costs between one village or cluster of villages and a neighboring one can result in localized credit monopolies. Lack of information about the detailed characteristics of potential borrowers in other villages or village clusters is quite possible, though not inevitable. I have shown that such a situation can result in a loan market which is similar in some ways to monopolistic competition.1 In this context, if there is even one lender who is not dogged by information problems, for example the moneylender in the borrower's village, the market will still be efficient. The only effect of the lack of information with the other potential lenders is that the lender with full information is able to appropriate some of the borrower's infra-marginal surplus (profits). This is done through higher collateral and interest rates. The market is efficient in that the borrower is getting the same amount of loan under this regime as in the fully competitive one. The efficiency condition is therefore still satisfied.

1/ See section IV of my 1982 paper.
This analysis assumes that the marginal cost of raising funds is the same across lenders. This is a plausible assumption when a modern banking system or a highly developed informal market (such as in certain urban areas of India and Korea) exists. In the rural areas of many developing countries, if such a system exists, it is largely because of government intervention in encouraging or developing financial institutions. In the absence of formal or informal intermediaries with highly developed connections across informationally separated markets, the overall market would be inefficient even if each of the informationally segmented markets functioned efficiently. That is borrowers in different submarkets would have different (expected) marginal returns from loans, even though within each segment these would be identical.

Such segmentation therefore provides a rationale for government encouragement of local money lenders to widen their horizons, and develop connections with other money lenders (set up a bank?). It also provides a rationale for more direct initiative by the government itself. A note of caution is necessary at this point, because of the historical tendency of so many of the government owned and supported institutions to become vast political boondoggles. One test of whether an efficiency problem of the kind hypothesized above exists or not, is that any intervention to correct inefficiency should soon become profitable. The existence of large and continuing losses and associated rents which people are trying to obtain through political intervention should alert us to a boondoggle.

The question of government intervention in the adoption of technology was mentioned in section 2.2. Unpublished work by the author (and two colleagues) has shown the critical importance of access to irrigation as a
critical determinant of HYV adoption. I therefore start by considering the case of adoption by farmers cultivating irrigated land. The same study confirms that education and extension are two important determinants of adoption.

Consider a farmer who has all the relevant information and is convinced about the profitability of the new technology. My credit market analysis and the empirical analysis in the adoption paper suggest that credit market inefficiency is unlikely to prevent adoption. If the farmer is in an area where traditional lenders and banks are ignorant about the new technology, he will receive smaller loans at a higher interest than he will under better information conditions. But both seeds and fertilizer usage are perfectly divisible, and a farmer will have little difficulty in adopting it on part of his farm. There is a theoretical possibility that he would not adopt if interest charges were greater than the entire gain from the higher yields. The adoption paper shows that farmer wealth and land holding, have little effect on the adoption decision after making proper adjustment for farmer ability and soil quality. It also suggests that "credit availability" or market efficiency had little effect on the adoption decision.

Adoption of new technology by unirrigated farmers is slightly more complicated. The adoption paper suggests that the profitability of HYV relative to traditional varieties is much less on unirrigated than on irrigated land. If a farmer realizes this, he will try to invest in irrigation prior to or simultaneously with adoption of HYV. If credit market efficiency affects fruition of the first decision it would also affect the second. Because of the lumpiness of irrigation capital it is possible for information

1/ See reference to paper by Bhalla, Roy and Virmani.
problems to affect the efficiency of credit supply in this case. If true it provides a case for government intervention in the creation of irrigation assets. It does not provide a case for intervention in provision of credit for fertilizer use.

3. Effects of Government Policy

In this section I analyze the effect of government credit allocation (and related) policies, when credit markets are efficient. This will reveal the effect of policies adopted for welfare objectives and for correction of imperfections and distortions in other markets. It will also show what happens when the government itself has incorrect information, and mistakenly believes that there is a problem in the credit market. I start with the conventional view of credit markets, before moving on to the informational perspective.

3.1 The Conventional View

To illustrate the controversies mentioned in section 2.3, I analyze two interest rate policies. An interest ceiling and an interest subsidy. Both these can be shown in the I-S diagram of figure 1, which is reproduced as figure 3. The equilibrium without intervention is represented by \((L^*, r^*)\). If an interest ceiling \(r\) is imposed on this market, savings fall to \(L_s\), while

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1/ The lumpiness of irrigation capital has implications for the savings/deposits market, which were noted by Mckinnon. A banking system which provides a market rate of interest to depositors can be an important factor in mitigating the effects of such lumpiness. As relatively less wealthy households, and those with few other opportunities for direct investment are likely to benefit the most, an appropriate deposit interest rate is also likely to have positive distributional consequences.
loan demand rises to $L_d$. There is an excess demand for loans, which can only be met by rationing. From the perspective of the lenders there is nothing distinguishing the borrowers. Rationing can therefore be done by drawing lots or any other extraneous method. The person who receives a loan also gets an implicit subsidy. It is important to understand, however, that an interest ceiling policy is very different from an interest subsidy policy.

The interest ceiling policy is actually much closer to an interest tax coupled with a lump sum or infra-marginal subsidy. This becomes clearer on examining the interest tax policy. In figure 3 an interest tax $t$ would result in an interest rate to savers of $r$ (as before), but an interest rate to borrowers of $r_L$. The same amount of saving and loans would result. The tax earns a revenue equal to $tL_s$, while the ceiling policy implicitly distributes this revenues as largess to anyone lucky enough to get a rationed allotment.

The interest ceiling story does not end there. The existence of substantial lump sum transfers invites rent seeking. Even people who have no demand for loans at the rate $r$ have an interest in getting a loan allotment. They can then lend some of their own funds at the marginal interest rate on loans $r_s$. It also becomes profitable to bribe bank officials and politicians, and to undertake other (socially wasteful) expenditures, to increase the chance of getting a loan ration.1/

These policy effects contrast sharply with those under an interest subsidy. An interest subsidy will, as shown in figure 3, increase the

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1/ See papers by Krueger, by Buchanan, Tollison and Tullock and by Virmani (1983).
Figure 3: POLICY INTERVENTION IN THE CONVENTIONAL CAPITAL MARKETS
(deposit) rate of interest received by savers to $r_d$, and reduce that paid by borrowers (the loan interest rate) to $r$. Savings and loans will increase from $L^*$ to $L_d$. Thus an interest subsidy will increase savings and investment while an interest ceiling will reduce both.

Though this approach helps to highlight the stark difference between interest ceilings and interest subsidies, it is inadequate for analyzing credit allocation policies. The essence of such policies is differences between borrower groups, while this approach assumes that there is a single homogeneous group of borrowers.

3.2 The Informational Perspective

In the context of this view of the financial market, we can analyze government policies directed at specific sectors (e.g. agriculture), uses (term loans for investment) and groups of borrowers (poor farmers, self-employed). Most of this analysis summarizes earlier work by the author (see references). Consider a group of borrowers having in common some characteristics specified by the government, such as those mentioned above. In analyzing the effect of any policy we will start by assuming that all borrowers in the group are exactly alike and perfectly identifiable. We will then see what effect the existence of differences, and identification problems might have.

An interest ceiling on loans to this group, if it is effective, will result either in smaller loans or in increased collateral requirements, or both. The reason follows from the discussion in section 2.4. The market rate of interest just compensates the lender for raising and transferring funds on average, given that in a certain proportion of the cases part or whole of the
principle is not paid. The only way in which the lender can compensate for the lower interest rate is by either making the loan safer through increased collateral, or by reducing the borrowers' loan to equity (own funds) ratio.

With a nonhomogeneous group more unpleasant results follow. Within the reduced level of total loans going to the group, relatively more will go to those who can come up with collateral. Effectively, this means that relatively less wealthy borrowers within the group will have their loans even more sharply reduced. In a rural/agricultural context those with little land of their own cannot possibly benefit from such a policy, and are most likely to suffer.

Comparing these policy effects with those in section 3.1, we note two significant differences. Here there is no rationing by random selection or arbitrary allotment of loans at the controlled rate, and consequently no rents and no rent seeking. The market adjusts by changing other terms of the loan contract. Secondly, here collateral plays an important role, when a distortion is created in the market. In the other case, strictly speaking there is no such thing as collateral.

These effects are clearly contrary to those required by governments for either the welfare (sec. 2.1) or the correction (of inefficiency in another market, sec.2.2) rationale. Interest ceilings are therefore often coupled with minimum lending requirements. That is not only must loans to the group be given at or below the ceiling rate, but the total loans going to the group must be increased by a specified amount. Before analyzing the effect of the combined policy, it is helpful to look at the minimum lending policy alone.
I define a minimum lending policy as one which forces a bank to lend to a borrower, more than it would have in the absence of such a requirement. Assume for the moment that the government is actually able to do so. Collateral requirements will rise again. The effect on loan rates is however ambiguous. Though they are being forced to give extra loans, they cannot in turn force borrowers to take more, and may in some cases have to induce (attract) them to do so. Interest rates may not therefore rise, and may even fall. If, however, borrowers do not have more collateral to offer, then interest rates would either rise, or banks would be forced to incur losses on loans to this group.

If borrowers in the group are not identical, as is likely, the proportion of loans going to those with less (more) available collateral would fall (rise). The adverse distributional consequences of this policy are therefore similar to that of interest ceilings. The greater possibility of lenders making losses on their loans, translates into stronger incentives to evade and thwart this policy. One way is to redefine their loan portfolio so as to show that they have met their lending targets. Presence of lender losses under the "minimum lending" policy is also an indication of potential rents to be gathered by those who take loans.

The minimum lending policy has its most devastating effect when it is combined with interest ceilings. The combination of lending requirements and interest ceilings can be termed a forced lending policy. The forced lending policy leads unambiguously to lender losses and rent creation. Banks and other lending institutions often have to dispense a fixed amount of loans at interest ceilings which are often binding on even the best borrowers in the target group. The marginal tax lump sum or infra-marginal subsidy which
results is very similar to that analyzed in the conventional case. The main
difference is that the minimum lending requirement is the critical element of
the problem here, while the interest ceiling is a reinforcing element. My
empirical studies of two contrasting countries, Bangladesh and Korea, support
the conclusion that it is the forced lending policy which is responsible for
many problems.

An interest subsidy to lending institutions for lending to a specific
group, is defined as a direct interest subsidy per unit of loan given to this
group. An interest subsidy provides an incentive to the lenders to increase
lending to the group. It will increase the amount of loans received by
borrowers in the group, and reduce the interest they are charged. Effectively
the lenders have to pass through part (or whole) of the subsidy to induce
borrowers to take more loans. The interest subsidy policy also tends to
decrease any collateral requirements that exist, and therefore favors those
with less collateral. In a nonhomogeneous group it will tend to increase the
proportion of loans going to poorer borrowers.

An indirect form of interest subsidy which is used more commonly, is
subsidized rediscounting of loans made to the specified group. Different
proportions, ranging up to 100% of loans, are rediscounted through the central
bank, at a rate below the interest rate on deposits. The incentive effects of
subsidized rediscounting on loan amounts and interest rates are the same as
those with a direct interest subsidy. The effect on collateral requirements
is uncertain, and consequently the distributional effects are unpredictable.

Unlike a direct subsidy, subsidized rediscounting can have negative
effects on the incentive to raise funds for lending. Disincentive effects are
most likely with 100% rediscounting, but are also possible with lower
proportions, because of other restrictions and problems. One problem which I observed in Bangladesh was an incorrect structure of rates for financial transfers between different branches of the same bank. Lending opportunities and excess savings generally differ between different geographical areas, and at different times. Branch managers must face rates which make it profitable to continue raising deposits for transfer to other branches when their own lending opportunities appear to be exhausted.

Given an appropriate structure of internal rates for fund transfer, it becomes more important to smooth the flow of funds between banks. An interbank market for short term lending plays a useful role in matching excess funds with lending opportunities. In Korea, I found the call money market playing a very useful role. In addition to the flow of funds, it provided information to the authorities on the demand-supply conditions in the loan market and was important in signalling the need for interest rate adjustments.

All these measures can be quite ineffective, if deposit rates are held permanently below those necessary for balancing supply and demand for funds. If savers do not have an incentive to make deposits, small increments in deposits may be obtained at too great a cost to banks. Irrespective of the proportion of rediscounting, it would not be worthwhile to raise more funds in this case. In the absence of such constraints, I would not expect any reasonable rediscounting proportion below 100% to have a strong disincentive effect.

Several countries including Bangladesh and Korea have loan guarantee funds, with widely differing coverage. A repayment guarantee can be thought of as provision of collateral by the guarantor instead of the borrower. If the guarantee fee is determined in a free market it must ultimately be paid
for by the borrower. Effectively the borrower is substituting interest charges for provision of collateral, and there will be little effect on his borrowing (assuming he could meet any collateral requirement).

A guarantee fund which is partially subsidized by the government, is in effect making subsidized repayment guarantees. A repayment guarantee subsidy will have exactly the same effect as a direct interest subsidy. Interest and collateral are two elements of the cost of a loan and have similar effects on the margin. A repayment guarantee which insures 100% of the repayment has very strong disincentive effects, whether in a fully funded or a government supported fund. It leaves no incentive for lenders to screen borrowers carefully, or to take appropriate actions to ensure repayment. Once borrowers realize this their repayment performance is likely to deteriorate further. A 100% guarantee is therefore very undesirable.

3.3 Policy Goals and Effects

An interest subsidy, a rediscounting subsidy or a subsidized repayment guarantee system will reduce the marginal loan costs to borrowers. A reduction in loan costs for producers belonging to the group at which the policy is directed will have two substitution effects. One is to substitute loans for the use of own funds or equity. The funds so freed will either flow into another activity which is not targeted by the government, or it will lead to increased consumption. This is often referred to as the problem of fungibility of funds. The case of agricultural lending in Brazil is often cited as the most horrendous example of this type of substitution. Large amounts of loan funds are directed towards agriculture, most of which are reported to make their way back to the thriving industrial sector. Such flows can impose
significant resource costs on the economy which are often ignored because they are not directly visible. These indirect costs must be weighed along with any policy benefits.

The other substitution effect is to induce a substitution of capital for labor in production. The extent to which capital intensity increases depends on the flexibility of the production process (elasticity). This too imposes costs on the economy. There is also an output effect which will increase the production of the target group. This will increase the demand for both labor and capital by the group, leaving the net effect on the demand for labor ambiguous. Unless other policies have the effect of eliminating the possibility, output prices will tend to fall. The production of firms or farms outside the target group who produce the same items will fall. The aggregate output effect will be lower than that for the target group. This will not, however, diminish the inefficiencies arising from the two substitution effects.

The interest subsidy, subsidized rediscounting and subsidized repayment guarantee policies have the effect of raising production and the relative income of the target group. This is accompanied by a cost in production efficiency and in the resource cost of intermediation. A direct and much more efficient way to increase production of a specified group is to give a production subsidy or above market output price (eg. for crops, dairy products). Though administrative difficulties arise, the subsidy can be minimized by making it applicable only to increases in production.
4. Conclusion

The effect of government policy were covered in the previous section assuming that there was no market failure in the credit market itself. The effect of the interest ceiling policy is exactly the same when an inefficiency is present. A minimum lending policy does, however, move lending in the right direction, but with all the other harmful effects still present. An interest subsidy, subsidized rediscounting and credit guarantee policies are shown to be the best policy measures, even though within group effect are still similar.¹/

¹/ See my 1984a paper for more details.
Appendix

Given the availability of collateral C greater than or equal to zero, the loan repayment Z depends on returns to the farmer as follows:

\[ Z = \text{Minimum} \left[ (1 + r) L, C + \text{Minimum} \left( o, b g(k) \right) \right] \]

where the other variable have been defined in Table 2 of text. Graphically, this can be shown as in Figure 4.

The expectation of repayment or average repayment X can be written as:

\[ X = (1 + r) L p_1 + b g(k) p_2 + (1 - p_1) C \quad (1) \]

as C is paid both in the partial repayment and default situations.

Let the interest rate on bank deposits be i. Assume that the cost of loan operations consists of two parts. One (t) that varies with loan amount, and another which is a fixed cost (T) per loan. The banks expected profits P per loan can then be written as

\[ P = X - IL - T \quad (2) \]

where I = 1 + i + t. The expected returns R to each borrower can be similarly written after simplification as
Figure 4: LOAN REPAYMENT AS A FUNCTION OF RETURNS TO FARMERS
$$R = p_1 \left[ g(k) - (1 + r) L \right] - (1 - p_1) C$$  \hspace{1cm} (3)

The (auction) market for loans as with tomatoes now consists of announcements of the interest rate $r$. At each rate banks determine loan supply by maximizing expected profits with respect to loans. Differentiating (2) with respect to $L$ the supply of loans is given by

$$\begin{align*}
(1 + r) p_1 + \frac{b g(k)}{A} &= P_2 \quad \text{if } P \geq 0 \\
L_s &= 0 \quad \text{if } P < 0
\end{align*}$$  \hspace{1cm} (4)

Similarly borrowers determine loan demand by maximizing expected return $R$ with respect to loans. Differentiating (3) with respect to $L$ and simplifying the demand for loans is given by

$$\frac{g(k)}{A} = 1 + r$$  \hspace{1cm} (5)

If this was the tomato market the intersection of these two curves, say at $(L_1, r_1)$ would be the point of competitive equilibrium. This is not true here because competitive equilibrium requires that the bank's pure profits $P$ be zero in equilibrium. In general, however, $P$ could be positive or negative at $(L_1, r_1)$. The missing factor is the market for deposits. the $L_s$ obtained in equation (4) represents not only the supply of loans but also the demand for deposits (i.e. supply of savings). Competitive equilibrium therefore requires that the interest rate on deposits also adjust to the point at which deposits are sufficient to meet loan demand while yielding zero profits to banks.
nL = S(i), n = number of borrowers, \hspace{1cm} (6)

(X - IL - T) = 0 \hspace{1cm} (7)

The simultaneous equilibrium in loan and deposit markets is therefore represented by equations (4) to (7) and depicted in figures (5) and (6) below.

Using equations (4) and (5) to eliminate \( r \), we can see that at equilibrium we must have,

\[(b \, p_1 + p_2) \frac{\ell(k)}{A} = I\]

That is the expected marginal product of loans (LHS) must be equal to the marginal cost of raising funds and transferring them to borrowers (RHS). Substituting this in (5) we also see that

\[r = \frac{1 + i + t}{b \, p_1 + p_2} - 1 = \frac{1 + i + t - b \, p_1 - p_2}{b \, p_1 + p_2}\]

That is the loan interest rate for given C depends on the probabilities and partial losses in a fairly complicated way even in this simple case.

This completes the analysis of the identical borrower case. For interested readers I will briefly indicate how the situation changes when borrowers are not identical. Consider two sets of borrowers. For each set of borrowers there will be equations such as (2) and (5) representing the
Figure 5: LOAN MARKET EQUILIBRIUM

Figure 6: DEPOSIT MARKET EQUILIBRIUM
implicit supply and demand curves. For each set of borrowers the bank can have negative or positive profits. The deposit market equilibrium no longer assures a competitive equilibrium in that banks will end up with positive (or negative) profits from at least one set of borrowers. In other words a competitive equilibrium is not possible if we maintain both the assumptions of auction markets and fixed amount of available collateral. One of these has to be changed.\footnote{My early work such as the 1982a and 1984b papers maintained the first assumption but assumed flexible collateral. Later work on contractual equilibrium 1982b and the 1985b paper maintain the second assumption.}
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