Financing Small-scale Industry and Agriculture in Developing Countries

The Merits and Limitations of "Commercial" Policies

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ABSTRACT

The paper discusses how two factors lead to an unwillingness of financial institutions to finance small-scale industry and agriculture in developing countries: (a) controls on interest rates, and (b) the initially high risks and administrative costs involved. Most economists appeal for a relaxation of the controls. But by reference to the observed reactions of the institutions to (b), it is shown that this policy alone would not achieve an efficient flow of finance to small-scale activities. The paper discusses the role of risk-guarantee schemes in encouraging institutions to acquire the information base and the experience to reduce the risks and administrative costs over time. It concludes that these schemes would work better, however, if the administrative controls were relaxed. The paper draws on the observations made during the course of project work in several countries.

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The views expressed are the sole responsibility of the authors.
INTRODUCTION

In the literature on financial intermediation in developing countries, there have been widespread appeals for more "commercial" interest rate policies: that is, for policies that would allow the level and structure of interest rates to reflect the costs and risks of lending to various classes of borrower, both large- and small-scale. These appeals have been made by people otherwise representing a broad range of views on development policy. 1/ The reasons have been set forth in their various texts and papers, and can be stated briefly:

(1) The controls on interest rates and on the borrowings and lendings of financial intermediaries in most developing countries, apart from limiting the capacities of the intermediaries to raise resources, have necessarily led them to concentrate their lending on low-risk, large, corporate borrowers. Leff (1976) has also argued that it has led to the joint ownership and control of banking and industry in some countries in order to extend large industry's scope for raising finance, both domestic and foreign - what he calls the "group" alternative to independent financial intermediation. In consequence large numbers of efficient small-scale activities (outside the "group"), employing the majority of the labor force in most developing countries, do not have access to institutional finance.

(2) The response of most governments to (1) has been to set up special financing schemes for small-scale industry and agriculture, generally on a concessionary basis. As discussed below, the performance of these schemes varies greatly over time, among countries and also among the institutions implementing them within countries. But two commonly discussed problems are, first, that the concessionary rates have naturally attracted influential borrowers of good-standing, already having access to

1/ Such as Myrdal (1968), Lipton (1976), Myint (1971, Chapter 13), Shaw (1973) and McKinnon (1973, 1976). See also Adams (1971) and the conference volumes of Howell (1980) and Donald (1976).
institutional finance on "commercial" terms.
and second (though again the picture varies)
the default rates are often high.

In consequence it is argued that a relaxation of administrative controls would provide the incentive for the private intermediaries to lend more widely, to small as well as to large-scale activities. Further, if this were to be the case, the question is raised, would the public sector, through the development banks and the various rediscounting and other facilities at its disposal, still need to be involved with the finance of small-scale industry and agriculture?

In this paper, the aim is to show that a relaxation of the administrative controls is a necessary condition for achieving an efficient flow of finance to small-scale industry and agriculture, but in itself, it is not a sufficient condition. The right combination of policies, it is argued, is a relaxation of the controls combined with interventions to address shortcomings, essentially of an institutional nature, in the capital markets. The suggested interventions take the familiar forms of lending by the development banks (at non-concessionary rates) and publicly backed risk-sharing schemes available to the private sector.

The reasoning behind this policy suggestion is that the uncertainties faced by financial intermediaries, both public and private, would still lead them not to lend to small-scale activities if the administrative controls were relaxed — even to large numbers of would-be borrowers with efficient and financially sound projects and with every intention of repaying the loans. Given the historical concentration of their lending activities on the corporate sector, financial intermediaries in developing countries have acquired neither the capacity nor the information base to increase lending significantly to large numbers of small borrowers. Hence borrowers with "good" projects and intending to repay the loans are indistinguishable from others. In addition, the legal framework that is necessary for the efficient functioning of a financial system, and for maintaining loan repayment discipline, is exceedingly weak — as evidenced by the high default rates even among borrowers of good standing. Consequently, when programs are first begun, the losses due to default are extra-ordinarily high, and persist over periods that are not short, until the staff involved have accumulated the necessary information and experience in dealing with local firms. The same is true of the costs of ascertaining whether firms are high or low risks; they do not decline until the firms are familiar with and to the institutions. Hence risk and cost-reflecting interest rates would reach high levels until the risks have been reduced. Since all borrowers must be charged the same rate, those with "good" projects are either driven out of
the market or must substantially reduce their investments. In both cases there is a loss of economic efficiency. 1/  

One way out of the difficulty would be for the institutions to keep interest rates low and accept losses in the short and medium term, in the expectation of satisfactory returns over the long haul once screening procedures have been developed. As will be seen below, this option is precluded, in the first place, by the even greater uncertainties of the long-run; and in the second, by evidence of risk-avoidance by those employed in the financial institutions, beyond the point determined by economic efficiency.

Such arguments are familiar from the literature on uncertainty in capital markets. Examples can be found in the paper on the market for "lemons" by Akerlof (1970) and in the readings edited by Diamond and Rothschild (1978). The present paper adds the following points:

(i) There is a common tendency in much of the literature on financial intermediation and credit programs to appeal for "market" or "commercial" policies, neglecting the point that when risks rise to high levels, for however short a period, markets may fail; on the other hand, much of the literature dealing with risks, while providing many insights, remains largely theoretical. In this paper we have attempted to combine our interpretations of the theory with the observations made in the course of project work in six countries.

(ii) During this work, a large number of interviews were held with people in banking and business, and we have used the material so obtained to provide a fuller description of the sources and nature of the risks, and of how institutions respond to them.

(iii) It argues that risks are changing and sometimes unstable quantities, a function of the information and experience that is accumulated within an institution, of an institution's own policies, and of the scale of lending and other factors; we have attempted to show what this implies for interest rate policies and for publicly-backed lending programs. Lastly:

(iv) Any such program inevitably involves losses in its early phases, and these can only be justified from an economic point of view when the prospective volume of (derived) demand for institutional credit from small-scale activities is sufficiently large. That is, there are questions of timing and of weighing up the costs and returns of introducing or expanding any particular program. The questions have not received much attention in the literature, and for this reason we have chosen to address them formally below. In doing so, we allow for the external benefits to potentially low-

1/ Or as Rothschild and Stiglitz (1976) note: "high-risk individuals cause an externality: the low-risk individuals are worse off than they would be in the absence of high risk individuals" (p. 629).
risk borrowers of an institution's being able to distinguish between them and potentially high-risk borrowers as information and experience are accumulated within the institution.

The paper is organized as follows: Part I discusses the nature of uncertainties in the capital markets from a financial institution's perspective. Part II discusses what the externalities mentioned above imply from an economist's perspective. Throughout, the argument is developed in relation to small industries in developing countries, since it is on this aspect of a financial institution's work that we have acquired most of our evidence. In Part III we then note some striking parallels between our findings and of those who have examined credit policies for small-holder agriculture. Part IV presents our conclusions.
I. UNCERTAINTIES IN THE CAPITAL MARKETS

Consider a program of lending to small industries, and let \( p \) denote the expected value of financial losses, per unit of principal, due to the non-repayment of principal and interest. For brevity, these losses are broadly referred to as the financial risks, and include "write-offs" - that is, all principal and interest not repaid - less net recoveries through foreclosures and penalty charges. Also, let \( a \) denote the expected costs of administering and supervising the loans, again expressed per unit of principal. It will be argued below that both quantities decline for two reasons. First, for loans of a given size, there are economies from "learning by doing". These arise from the accumulation of information and experience within the institution as lending takes place; the effect is to improve screening procedures and reduce both the risks and the administrative costs of subsequent loans. Second, there are several sources of economies of scale. The most important of these stem from:

(i) the fixed costs of processing a loan, which are incurred regardless of the size of the loan, and

(ii) gradual increases in the average size of loans demanded.

To begin, however, it is useful to examine the magnitudes, of \( p \) and \( a \) in the early years of a program of lending to small industries, ignoring changes over time with the growth of lending. The reason is that it is their initial magnitudes - and of expected losses due to default in particular - that inhibit lending as much as any other factor. This is partly because ceilings on interest rates (which are prevalent in most developing countries) contribute towards financial institutions planning for the short-run. But given the even greater uncertainties about the demand for loans in the long run, it is possible that short-run considerations would predominate even if the ceilings did not exist, and it is instructive to consider this case first.

Initial Magnitude of the Risks.

Let \((1 + r)\) be the principal plus interest due per unit of principal, the actual size of a loan \( j \) be \( X_j \), and \( p_j \) be the expected losses due to non-repayment of principal and interest, again expressed per unit of principal. Loans are rarely wholly in default; usually some repayments are made before defaults occur. Let \( y \) denote the fraction of principal plus interest repaid, and \( \pi_j(y)dy \) be the probability of the repayments being in the interval \( y \) to \((y + dy)\), with \( y \leq 1 \). Then \( p_j \) is given by one minus the mean value of \( y \):

\[
p_j = 1 - \int_0^1 y \pi_j(y)dy
\]  

(1')
Similarly, let \((1 + i)\) be the costs of principal and interest to the financial institution of raising resources, and \(a_j\) the administrative cost of handling the loan, each again being expressed per unit of principal loaned. Then for a program to have positive expected profits it is necessary for the total principal and interest recovered to exceed the total costs of raising resources and administering the loans:

\[(1 + r)\sum (1 - p_j)X_j > \sum (1 + i a_j)X_j \quad (1')\]

The quantities \(p\) and "a" defined above are then the following averages for the whole program:

\[(1 - p) = \sum (1 - p_j)X_j / \sum X_j\]

and \(a = \sum a_j X_j / \sum X_j\)

Substituting back into the above expression we then have

\[(1 - p)(1 + r) > (1 + i) + \gamma\]

or \(r > (i + a + p)/(1 - p)\) \hspace{1cm} (1)

The term on the RHS gives the total cost of lending, including expected losses due to default, expressed as an interest rate. Note that \(p\) appears in both the numerator and the denominator since the interest payments on the good accounts must cover the lost principal in addition to the lost interest on those in default. Further comments on the various quantities in (1) and on the simplifying assumptions used might be helpful.

As regards the losses expected due to default, few institutions would begin a full-blown lending program without first making "pilot" loans to a significant number of clients. Alternatively, they would begin a program gradually, expanding it in stages, with a careful monitoring of the loans and the experience gained at each stage. In practice, this is the only way of obtaining an estimate of \(p\), since the distribution function in (1') cannot be measured directly. If, then, the actual losses due to default on a loan \(X_j\) are \(f_j\), per unit of principal, an estimate of \(p\) can be obtained from:

\[\hat{p} = \sum f_j X_j / \sum X_j\]
All institutions keep records on (though rarely publish) $E_j$ for various categories of borrower, and are given headings such as the "quality" or "riskiness" of portfolio. A related quantity is "ageing of arrears", in which arrears on current loans are classified according to how long the loans are overdue. It is common to classify these figures further to identify sources of risk (e.g. are new businesses riskier to finance? how do losses vary according to the types and precise scale of the business activities financed? and so on) and to examine trends to assess changes in risks over time.

As regards the administrative costs it is sometimes thought that, over a broad range, they do not vary with loan size, and are more properly expressed as a fixed cost per loan; $a_j$ would then be written as $a_j = \text{constant}/X_j$. But an examination of the practices of banks in appraising and supervising loans shows that this is not quite accurate, though it is true that there is a significant constant term which accounts for small loans being more expensive per unit of principal. $l/$ The main costs are staff time and overheads; there is a minimum amount of time that must be spent on any loan. Responsibility for very small loans is generally entrusted to local branch staff, only marginally involving branch managers—so long as "problem accounts" do not occur too frequently. The larger the loan, however, the more the time that is spent on appraising it, and the greater the likelihood that more than one staff member and branch or even area managers will become involved. Thus, $a_jX_j$ rises with the size of the loan, though $a_j$ decreases as commonly thought.

The expressions (1") and (1) apply to term-loans only if the interest rates are quoted for the "term"; that is, if it is an n-year loan then an n-year interest rate is needed. Alternatively, they could be expressed on an annualized basis such as:

$$A(r) > A(1 + a)/(1 - p) \quad (1''')$$

where $A(X)$ denotes the annuity rate at an interest rate of $X$, and can be estimated from standard financial tables. Here, of course, the administrative costs have to be recalculated in terms of an effective annual interest rate.

Finally, it will be noted that the expressions (1), (1") and (1'''') have each been left as inequalities. This is because we use them in various places below when discussing the behavior of financial institutions—in particular, when explaining why they are often unwilling to develop lending programs to small industries. For this purpose, some allowance has to be made for risk aversion and the various constraints, which we are about to discuss,

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1/ For a further discussion of administrative costs see Saito and Villanueva (1981) and Anderson and Khambata (1981).
that act on their policies. Most financial institutions do not act on the criterion that expected revenues should equal or exceed expected costs; in practice, they expect the former to exceed the latter by a significant margin.

To see this, it is instructive to put some numbers into the expression. For term loans, "i" might be about 5% in real terms for developing countries at the present time, once an allowance is made for the costs of raising financial resources, and for reserves and other provisions; if the rate of inflation is 10%, this would make i about 15%; "a" is typically 5%, but could be more or less depending on the size and maturity of the loan and the familiarity of the bank with the borrower. 1/ Hence the annuitized cost would be in excess of A(20%) = 33% for borrowings of 5 year maturity. If one takes the percentage of principal and interest that is in arrears by more than six months 2/ to be a rough measure of p, then its initial value is not untypically in the range 0.3 to 0.5 or higher. 3/ Hence, using (1' ' '), for term-loans to be profitable in the early years of a program, risk-reflecting annuity rates would have to be in the range 33% divided by (1 - 0.3) or (1 - 0.5) = 50 to 70%, implying interest rates of 40 to 60%. 4/ These are roughly two to three times the levels required for term loans to large borrowers.

In practice, interest rates in developing countries are frequently prevented from rising to such levels by administrative ceilings. 5/ Even without the ceilings, however, it is unlikely that the banks and non-bank financial intermediaries would be prepared to charge very high rates for small borrowers alone. Apart from fears of political attack, there are grounds for

1/ Ibid.

2/ Several branch managers have commented to us that once a loan had been in arrears for more than two quarters, it is extremely difficult to retrieve. It is important to spot arrears problems early.

3/ One private commercial bank in Philippines reported bad debts on two thirds of its portfolio in a private small loans program introduced in the mid 1970's, and had consequently closed it down. This was, moreover, for short-term loans.

4/ Taking loans of 5 year maturity. Note that these rates are comparable to those often reported for loans in the informal sector.

5/ Galbis (1980) remarks that information on interest rates in developing countries is not well documented. He provides data for 19 Latin American countries, finding ceilings on liabilities in 17 countries. Data on interest rates for agricultural credit for 34 countries can be found in Table 7 of Donald's (1976) book. We have provided documentation for the Philippines, in the study cited above. Indonesia and Thailand are two other countries in which we have worked where interest rate ceilings on the loans to industry and agriculture were binding. Ghandhi (1977) provides data for Sri Lanka.
believing that supply would not rise to meet demand at such rates. First, the margins for contingency on the borrowers' projects as planned would be greatly reduced. This would obviously act both to lower demand and to make the borrowers' projects a riskier proposition (that is p is an increasing function of r). But beyond this demand effect, such rates would involve the financial institutions in a type of lending remote from anything in their previous experience; at the same time, given that contingency margins are reduced, their understanding of the risks would need to be greater than before, whereas in fact it would be less. Such factors would reduce rather than increase their willingness to lend as interest rates rose above a certain level; that is, the supply curve may be backward sloping. 1/ A related argument is presented by Stiglitz and Weiss (1981) who suggest that higher interest rates may attract the riskier and deter the more conservative borrowers, and induce others to undertake yet riskier projects in the expectation of higher returns. That is, while revenues per loan repaid rise with interest rates, the probability of repayment decreases, and Stiglitz and Weiss argue that there is an optimum interest rate which under plausible conditions can be below the market clearing rate. Hence, we are still left with credit rationing and a system in which potentially "good" borrowers are driven out of the market by the "lemons". Finally, the bank and non-bank financial intermediaries have to maintain a reputation for financial soundness, and would not wish to report high risk elements in their portfolios even if, on account of high interest rates, those elements were not leading to financial loss.

Fears of criticism affect both the composition of the portfolios – or more specifically, the proportion of risky assets a manager is prepared to hold – and the effective level of interest rates that an institution is prepared to charge. These fears are common to both public and private institutions. It is worth quoting Jamshed Ghandhi's (1976) observations on the conservative policies of banks in Sri Lanka 2/, which he associates with "an undue adherence to the outmoded principles of the [British] Banking School." As regards the composition of loan portfolios, he comments "With the possible . . . exception of their larger and more established customers, banks seek their security for loans not in indicators of the capacity for repayment, but rather in the quantity and quality of collateral. And the prudent banker

1/ See also Jaffee and Russell (1976), who, however, argue that the existence of credit rationing does not depend on the particular shape of the supply curve.

2/ Ghandhi, op. cit. pp. 7-16. It is interesting to read his criticism of the conservatism of the "British Banking School" in the light of precisely the same criticisms recently raised by industrialists and the proprietors of small firms in Britain. See The Times (1981). The Wilson Committee (1980) proposed guarantee schemes (on the lines we have encountered in several developing countries) to encourage the clearing banks to face the risks of financing small business. See also Binks (1979) and Bannock (1980). In the March 1981 budget, Britain's Chancellor of the Exchequer finally responded to such criticisms by introducing a risk-guarantee scheme for financing small businesses.
is one who attempts to ensure that the value of the asset so pledged is always greater than the amount of loan due. Nationalized enterprises are particularly sensitive to comment and criticism and experience elsewhere suggests that managers of such enterprises are usually reluctant to expose themselves to 'undue' risks. Given a situation where the benefits of risk taking do not accrue directly to manager, but the potential costs of criticism under failure are very real, it is no wonder that safety is so often sought in orthodoxy. As regards the question of interest rates, he observed: "It is recognized that interest rates, if set at too low a value, may be avoided by various devices—by requiring large compensating balances, by charging fees and commissions, and even by requiring the purchase of insurance or other services which can be provided at a high charge, so that officially quoted interest rates may have a tenuous relationship to the true charge. However, our investigations suggest that very little recourse is had by the banks to such practices."

In most developing countries the public banks do attempt to provide a measure of finance to small industry and small-holder agriculture—often at a loss. For this reason it would be wrong to imply that they are altogether unresponsive to the demands to these activities. We can, however, draw two conclusions, and which form the point of departure for the following analysis. First, that a policy of simply letting interest rates float in and of itself is unlikely to induce private banks to lend to small businessmen out of their own resources—except to a small minority of good standing. Second, any policy that is advocated in the interests of economic efficiency must allow for differences between the objective functions of the participating institutions and the objective function of the economist based on the expected present value of economic returns. Such differences may not be serious when risks are low, and the efficient policy would be to let interest rates rise to clear the market. But when, as in the cases analyzed in the present paper, the risks rise to significant levels, additional measures are required. With respect to private financial institutions, some form of publically backed risk-guarantee program is needed to absorb the initially high risks. An understanding that the public sector banks will be involved in the program with the aim of sharing the risks among institutions may be important too. With respect to both public and private institutions, it will also be necessary to show, assuming that this is the case, that lending is likely to be profitable over the long-run, once the risks have been reduced. Otherwise the justification of the program is in question and the institutions will not respond to it as intended. This leads us, then, to examine the factors that determine the level of risks and administrative costs, and how they change over time.
Changes in Risks and Administrative Costs Over Time.

It is apparent that risk-guarantee and risk-sharing programs are merited only if:

(i) the risks and administrative costs are in fact reducible over time; and

(ii) the net present value of the expected returns, once the reductions have been achieved, exceed the net PV of losses expected during the adjustment period.

The latter presupposes a continuing volume of business from small enterprises after the adjustment period. Let us consider these points further, confining ourselves for the moment to a financial point of view.

It was noted earlier that under certain assumptions, which we are now about to discuss, both the risks and the administrative costs could each be expected to decline due to learning by doing and economies of scale. First consider learning by doing.

Recall that the expected rate of losses due to default, which was denoted by p, was an average for a large group of individuals. It is now necessary to introduce some distinctions, and we begin by dividing p into two parts:

\[ p' = \text{The expected losses due to default by known creditworthy borrowers; it would include for instance losses due to uninsured personal misfortunes (e.g. illness or injury, economic slumps) plus an allowance for "human errors" on the part of branch staff and/or the borrowers when appraising the projects;} \]

\[ p'' = \text{The extra losses expected due to default by borrowers whose creditworthiness is unknown or is more difficult to ascertain.} \]

In other words p" reflects the likelihood of financing "lemons" on account of their not being distinguishable, when the programs begin, from "good" borrowers whose real risks to the institutions, were they not otherwise
confused with the former, would be closer to \( p' \). As before, both quantities are expressed in relation to total principal. 1/

No institution of course expects to be free from the risks represented by \( p' \). But by diversifying portfolios and through other devices they are kept at low levels. To gauge from the percentages of bad debts and loans in arrears on their portfolios, private sector institutions typically operate with a \( p' \) of around 2% (often less) for short-term loans, and 3-4% for long term loans. The second source of risk is normally avoided simply by not lending. In instances where lending has been attempted, the losses have proved to be alarmingly high; the common reaction, at least among private sector institutions, is to abandon the programs. The questions to be discussed below are thus:

(i) is \( p'' \) in fact reducible, and if so how is this accomplished and over what length of time? and

1/ Previously we had \( p = \sum_{j=1}^{J} p_j \frac{X_j}{\sum_{j=1}^{J} X_j} \) with \( j=1...J \) individuals. Now divide \( J \) into \( j=1...C \) known creditworthy borrowers, and \( j = C+1 ... C+L \) borrowers whose creditworthiness is more difficult to ascertain and may include a number of "lemons" (\( J = C+L \)). Further, denote the expected losses due to "natural" risks, from which neither group is immune, by \( p_j' \), and those due to "lemons" by \( p_j'' \), which by definition only appear in the second group. Then:

\[
p = \left[ \sum_{j=1}^{C} p_{j}'X_j + \sum_{j=C+1}^{C+L} (p_{j}' + p_{j}'')X_j \right] \div \sum_{j=1}^{J} X_j
\]

We have defined

\[
p' = \sum_{j=1}^{C} p_{j}'X_j \div \sum_{j=1}^{C} X_j = \sum_{j=1}^{C} p_{j}'X_j \div \sum_{j=1}^{J} X_j
\]

and

\[
p'' = \sum_{j=C+1}^{C+L} p_{j}'X_j \div \sum_{j=C+1}^{J} X_j
\]

Note that we have defined \( p_j' \) and \( p_j'' \) so that they are additive rather than multiplicative. This entails an approximation, which does not affect the following analysis seriously, but does simplify algebra. We owe it to Karen Kilby for making us more precise on this matter.
(ii) under what conditions is it worth incurring the loses when $p''$ is high in the expectation of longer run returns once it is low?

The administrative costs per unit of principal, which were previously expressed as a group average, also vary greatly between individual borrowers. Like risks, they are also higher for the first loan. We can similarly divide the group average, $a$, into two parts: $a'$ to represent the administrative costs (per unit of principal) of dealing with borrowers with established credit ratings, and who are both familiar with and to the institution concerned; and $a''$ the extra costs (per unit of principal) of dealing with new an unfamiliar borrowers.

With these changes in notation, the criterion (1) above is now:

$$ r > \frac{1+a'+a''+p'+p''}{1-p'-p''} \quad (2) $$

if lending is to be profitable at any point in time.

Those who do not repay loans, except under the circumstances discussed under $p'$, vary greatly in competence and motivation. There has been a tendency in the literature to classify them simply as "dishonest" or "bad" borrowers, though when one interviews the borrowers themselves, or the branch staff of the banks who have made loans to them, it is apparent that this is too coarse a classification. Furthermore, dishonesty is not the most common cause of failure to repay. It is necessary to discuss this point further since it helps to explain how institutions respond to the risks faced, and are able to reduce $p''$ over time, given the will and the incentive to do so. In particular, it is possible to classify those who default on loans, for reasons other than those given under $p'$, into three groups. 1/

First, there are some borrowers, though a minority, who have no intention from the outset of repaying the loans, and are correctly described as dishonest. They obtain the loans anticipating that foreclosure or making them repay will be too troublesome or costly for the institution, or that repayments will not be expected for reasons of collusion. Losses from this source may reach very high levels when the programs begin, and may persist over long periods unless detected early through monitoring procedures. 2/

Apart from preventing collusion, however, managers involved in the development of lending programs are unanimous that the key element for reducing losses from dishonesty is the accumulation of knowledge among the branch staff of the more trustworthy businesses in their local communities, itself a time

1/ The following draws on interviews held with people in business and banking in several developing countries. The interviews in the Philippines are reported in Anderson and Khambata (1981). The others were undertaken in the course of project appraisal and supervision and have not been published.

2/ These require surveys of businesses in each locality, and not a little detective work, to determine if the default is due to dishonesty or to a genuine problem faced by the business.
consuming process. Until formal creditworthiness records are established, this is the only thing to go on.

Second, there is a large group who are prepared to repay provided the incentives to do so are sufficiently strong. They present the institutions with a form of "moral hazard", in the sense often discussed in the literature on insurance. 1/ With respect to lending to small businesses, the source of the hazard lies in the perception of borrowers as to the likely reaction of the institution and of the legal authorities to default. If insufficient legal or social pressures are brought to bear on those in default, and who are in a position to be repaying their loans, others actually repaying them may risk not repaying too. The problem becomes compounded by the difficulties of deciding whether the defaults are due to genuine misfortune or to dishonesty, since the institutions involved cannot be expected to be neutral with respect to the two cases. With respect to misfortunes, imperfections in the insurance markets have to be recognized in any publically-backed lending program, and indeed may be one reason why it was initiated in the first place.

The moral hazard is increased further by the administrative impossibility of handling a large and increasing number of troublesome accounts. Write-offs become widespread, and borrowers not in default, perceiving the institution's difficulties and knowing that many others are not repaying, may now find that the likelihood of any penalty or legal action for not repaying is low. The situation then, it is apparent, is highly unstable, and defaults may escalate rapidly to high levels. In commenting on this section of our paper Jamshed Ghandhi noted that one bank in Sri Lanka suffered credit losses of around 90% in some years 2/; elsewhere, we have reported on the experiences of both public and private institutions that have had losses escalating to extremely high levels. 3/ If the programs are closed down, any new initiative in subsequent years is plagued by the past reputation of the institutions for laxness—something that is common unfortunately in small industry and small farmer credit programs in developing countries.

If, therefore, it is decided to develop industry on a broad basis, and to address the risk problem we have described, the only option of the financing institutions, as one manager put it, is to "flex muscles", by threatening foreclosures, publicising cases under litigation, mounting loan collection drives, and simply by visiting the borrowers more frequently as part of supervision to instill an awareness among them that they are being watched. This may seem a harsh option, but there is no alternative if the programs are not to be discontinued and if, therefore, those who can use the resources honestly and profitably are not to be denied access to them. Where

1/ See e.g. Arrow (1963), Pauly (1974), and Spence and Zeckhauser (1971). All these papers are reprinted in Diamond and Rothschild op. cit. (1978). Jamshed Ghandhi's comments were particularly helpful to us in interpreting this issue.

2/ Personal correspondence.

3/ Anderson and Khambata, op. cit., Chapters 2 and 3.
the practice has been followed, we have noted a significant decline in the risks. ¹/ (The experience shows, incidentally, that $p''$ is not independent of $a''$, nor $p'$ of $a'$.)

A commonly discussed incentive to be honest is the prospect of subsequent loans, and is often thought to be an advantage of loans for working capital over those for fixed capital. Stiglitz and Weiss (1980) consider this non-price incentive, noting that "banks can exploit the desire of firms to obtain loans by conditioning future loans on the repayment of past debts" and adding that subsequent loans are generally less risky than the first. Elsewhere, Bottomley (1975) has argued that subsidized interest rates provide an incentive to repay if subsequent loans are permitted, since the borrowers have an obvious reason for remaining on good terms with the institution that offer them; this does not, of course, argue for subsidized interest rate policies, but it does help to explain the low arrears and default rates in administered credit schemes in some countries.

The third group is more appropriately thought of as comprising those with whom "honest mistakes" were made. The turnover rates of small industries are high and, until the branch staff have become more informed about businesses in their local communities, financing a higher proportion of poor projects is unavoidable in the early years. In addition, there is a common tendency for proprietors to overestimate sales and underestimate the costs and difficulties of running a business following an investment. If the capacity is dimensioned accordingly and financed by a bank, the business becomes highly vulnerable to shortfalls in sales or supplies.

It is platitudinous, but nevertheless true to say that the avoidance of mistakes of this kind is a matter of experience. Given the institutional problems referred to above, lending decisions are based as much on the "character" of a client as on any other factor. In this respect, a branch manager who has been involved with a program in a particular region over a 5-10 year period will have been associated with the finance of several hundred small firms, acting as a counsellor to many of them; have seen many businesses succeed in the area, and many others fail; know the savings accounts records of local firms, and may have encouraged them to hold their payrolls in the branch;

¹/ Ibid. Peter Kilby (1981) makes the following observations in a lending and industrial estates program for small industries in Kenya. "Of the 288 loans outstanding, 269 are in arrears by 3 months or more. It has been estimated that as many as 133 loans could prove uncollectable... Despite several attempted reforms... no systematic supervision of loan repayments has yet been achieved: while a majority of the projects in Nakuru and Eldoret are not generating any earnings out of which loans might be serviced, this is not true for Nairobi. The problem could be a lack of determination at the top. Delinquent borrowers are seldom visited, letters of notice are rarely sent, and legal action is hardly ever taken. The previous Managing Director was himself delinquent on two... loans.

"A similarly lax enforcement had obtained with respect to factory unit rentals... In this case a serious campaign was undertaken, including the use of a padlock on the door, with the result that by 1980 arrears had been more than halved."
have had his or her fingers burnt by both untrustworthy borrowers and trustworthy ones who for various reasons did not succeed; and will have acquired access to several informal sources of information on firms in the region. This experience is central to any efficient screening procedure; it takes years to acquire; and it is not available when programs are being started up.

Some other sources of risk that come under this heading arise from the reportedly poor management practices in small businesses 1/, which some countries have attempted to improve through extension and training programs. Such programs should also help to reduce the risks. Finally, the design of the lending program is often faulty, and may place an undue stress on the business - e.g. by overemphasizing the finance of fixed assets and neglecting working capital. This tendency of governments to understate the importance of working capital has been recognized for some time. 2/

Similar observations about the changing nature of risks, and how they may be reduced by various measures, or sometimes simply through knowledge and experience, are also noted by Akerlof, 3/ who similarly stresses the importance of knowledge of the local communities. He quotes several cases that are still worth reading, including one regarding credits offered by cotton ginning companies in Iran, in which "in the first years of operation large losses [were to be] expected from unpaid debts - due to poor knowledge of the local scene."

It is nevertheless clear that the period required to reduce \( p^* \) (and also \( a^* \)) to comparatively low levels can be quite long, particularly if the emphasis (which is excessive in our opinion) is placed on term loans. In the first five years of a program in the Philippines for instance, the probability of loans not being repaid was reduced to less than one fourth of the levels originally experienced, but was still significantly higher than most private banks would consider to be acceptable. 4/

1/ See e.g. Kilby (1971), Chapter 1, in which he reviews material on the sources and quality of entrepreneurship in developing countries.

2/ Sen (1964) and Kennett (1979).


To conclude this section on changes in risks and administrative costs over time, it is necessary to note various sources of economies of scale. First there are economies with respect to risk bearing. 1/ Let \( p \) be the probability of default, \( n \) the number of loans, and, to simplify matters, assume a binary distribution so that \( (1 - p) \) is the probability of (full) repayment. Then the standard deviation for the population is
\[
\sigma = \left[ p(1 - p) \frac{n}{n} \right]^{1/2}
\]
and per loan is
\[
\sigma/n = \left[ p(1 - p) / n \right]^{1/2},
\]
which declines as \( n \) rises.

With respect to administrative costs, we have already noted that these decline (per unit of principal) as the average size of loan demanded increases, so it is sufficient to note why the latter occurs. There are two reasons. One is the increase in the average output of small firms with economic growth, which raises their derived demands for both fixed and working capital finance. The other is the growth of some small firms through the size distribution, which again raises their demand for fixed and working capital finance. It is not uncommon, for example, for firms to borrow in small amounts when they are still fairly new, and to plan to increase output and capacity in larger increments once their markets and supplies have been established. 2/

Finally, we note a connection between economies of scale in administrative costs and reductions in risks. The larger the average size of (small) loan, the greater the time and effort an institution can put into identifying the more dependable and efficient businesses in a community, and into appraising and supervising loans. Moreover, this can be done while average costs per amount loaned are falling, for reasons noted above. This gives the financial institutions an advantage in financing the larger of the small industry projects, and helps to explain why the risks they face decline as average loan size increases; Bottomley (1975) has made the same point for small-farmer credit programs. 3/

A Forward Looking Financial Criterion

The decision to initiate a lending program is profitable if the present worth of the annual returns exceeds the present worth of losses represented by \( p'' \) and \( a'' \) during the adjustment period. Let the volume of lending in any year \( t \) be \( Q_t \), and recall that \( i \) is the cost of raising resources (the borrowing rate, plus the costs of administering borrowings, plus allowances for reserves). The relevant criterion is then:

\[
\sum_{t} \frac{(1 + r)(1 - p' - p'')}{(1 + i)^t} Q_t > \sum_{t} \frac{(1 + i) + a' + a''}{(1 + i)^t} Q_t
\]

1/ Jamshed Ghandhi pointed these out to us.

2/ See e.g. Berna (1961).

3/ See Part III, below.
To simplify algebra, we shall assume that economies of scale occur mostly in the initially much larger terms involving $a''$ and $p''$, so that $p'$ and $a'$ are, to a rough approximation, constants, representing minimum levels of expected financial losses and administrative costs respectively.

Rearranging (3), lending to small enterprises is likely to be profitable over the long-haul if the interest rates on loans are allowed to rise such that

$$r > \frac{(1 + a' + p') + [\sum (a'' + p'') \frac{Q_t}{(1 + i)^t} + Q_t/(1 + i)^t]}{(1 - p') - [\sum p'' \frac{Q_t}{(1 + i)^t} + \sum Q_t/(1 + i)^t]}$$

(4)

The second terms in the numerator and denominator (shown in square brackets) represent the losses during the adjustment period. Both are present worthed and weighted by the volume of business; both are also divided by the present worth of the volume of business. The terms involving $p''$ and $a''$ are summed over the period over which these quantities are significant. As discussed above, this is not necessarily a short period; it is, however, shorter than the period over which the denominators should be summed. Hence the likelihood of establishing a profitable lending program turns in an obvious manner on one's assessment of the role of small enterprises in the economy and on the growth of their demand for institutional credit.

The limiting case of (4) occurs when there is a high expected volume of demand and/or when $a''$ and $p''$ decline to low levels over a comparatively short period. It then approaches:

$$r > \frac{i + a' + p'}{1 - p'}$$

(5)

(Note that the static case, given by (2) above, yields the same result if $a''$ and $p''$ are written as declining functions of $Q$. It also approaches this level the more the losses due to $a''$ and $p''$ are cushioned by the risk-guarantees and the spreads on government backed financing schemes.

At the beginning of this paper we noted that there is little long run interest on the part of private sector institutions in developing countries to develop lending programs for small enterprises. This is so even though many governments have introduced risk-guarantee and rediscounting facilities to cushion losses from $a''$ and $p''$. One reason for this is the prevalence of administered interest rate structures, so that even the less stringent criterion, (5) above, is not being met.
Interest Rates and Government-Backed Financing Schemes.

Government schemes may take several forms 1/: direct financing by the public banks and development finance companies; rediscounting facilities provided by the central bank or by the public development banks, with spreads and guarantees to cover a significant fraction of the risks and administrative costs; guarantee funds or simply guarantees by the public sector to meet a certain percentage of losses; or some combination of the foregoing. Direct financing by the public sector is sometimes seen, in theory, as being complementary to, rather than a substitute for private sector lending: (a) it is thought to have a demonstration effect, (b) it makes most of the first loans to small industries, which are inherently costlier and riskier than second and subsequent loans, and (c) it provides information and experience that can be shared, e.g. regarding which clients were "lemons" and which were not. Whenever the intention is to involve the private sector, however, the immediate and common aim of all such schemes is to absorb the losses due to a" and p" and to encourage a long-run interest in lending to small industries.

Suppose, however, that interest rates were allowed to rise such that (5) is satisfied. It could then be argued that the private financial institutions would find lending to SSE's profitable over the long-run. Most would also have the resources to finance the short-run losses, and interest rates would not need to rise to the levels previously estimated (from (1)), sufficient to depress the demand and extinguish any interest on their part in meeting it. In this case, the arguments for the schemes are not strictly economic or financial in nature:

(i) Even small differentials in interest rates between small and large borrowers may be resisted politically, except perhaps those that can be accommodated under reductions, within an otherwise uniform structure, for prime borrowers. As noted earlier, the private financial institutions may face this constraint in the absence of any ceilings set by the government. In this case the schemes become a device for narrowing differentials, and are a "second best" measure from an economic point of view.

(ii) Perceptions may differ between the public and private sectors as to the extent and growth of small enterprises and the growth of demand

1/ See e.g. World Bank (1978), pp. 30-35, Davenport (1967), Staley and Morse (1965), and Society for Economic and Social Studies Bombay (1958).
for credit over the long run. 1/ In this case the schemes are a
device for promoting investments in regions and activities in which
the public sector expects a satisfactory return to the economy, but
in which the private financial sector has doubts.

(iii) While the private sector bases its projects on expected returns
adjusted for risks, these adjustments may be larger than is
economically efficient in the absence of institutions or mechanisms
to insure against risks. 2/, 3/ There is then a function for the
public sector to step in with guarantees or other forms of subsidy of
its own. 4/

Other and perhaps more familiar reasons put forward are:

(iv) The schemes are necessary to offset institutional biases in favor of
lending to large scale arising from the structure of ownership and
control of industry and finance; and

(v) Small enterprises are more labor-intensive than large-scale 5/, and a
greater share of investment in them would serve a redistributive aim
by raising the demand for labor in low-income regions.

1/ Given the limited information on the size distribution of industry, these
differences of perception can be huge. E.g. in our study of the Philippines
(op, cit., Chapter 6) infrastructure improvements and agricultural growth were
shown to have led to a rapid growth of business activity in certain
provinces. But an entirely opposite view was still quite prevalent; this was
that such developments might lead to an increasing demand for externally
manufactured goods and a rapid decline of local small-scale industries all
round.

2/ Arrow and Lind (1970), who further argue that the public sector's
decisions should be neutral to risk, given its size. For a less conclusive
view, however, see the comments of Foldes and Rees (1977) on Arrow and Lind’s

3/ One mechanism often conspicuous by its absence is a means for sharing
records between institutions on borrowers, so as to provide additional checks
on creditworthiness. In several instances in the Philippines we encountered
borrowers who were in default with one institution, but who were still able to
obtain credit from another. See also our quote from Ghandhi’s study in Sri
Lanka, above.


II EXTERNALITIES, ECONOMIES OF SCALE AND INTEREST RATES

The discussion in Part I was concerned with the financial returns to lending to small industries. It is now appropriate to consider if these are likely to differ from the economic returns and, if so, what this implies for interest rate policies.

The probability of financing low-risk borrowers, we have argued, rises with the volume of lending. The experience and information gained in one year's lending improves the capacity of the institutions to lend to small industry and distinguish between these borrowers and the "lemons" in following years; that is, it improves screening procedures. The administrative costs (per unit of principal) decline for similar reasons. Note further that the gains are not wholly confined to the institution making the loans, depending on how far information and experience are shared. E.g. if a person has borrowed from one institution and invested the funds successfully in a business, both the risks and the administrative costs of lending to him subsequently by the same or other institutions (if the fact is shared among them) are significantly less.

In other words, there are external benefits to improvements in screening and administrative procedures. Those borrowers with the capacity to invest the funds efficiently and repay the loan become more distinguishable from those without it, and in consequence are less likely to be excluded from access to the lower cost resources of the organized financial sector. This, together with the various sources of sale economies noted above, suggests that an investment criterion based on economic benefits would be different to the financial criterion so far considered, so long as the external benefits remain significant. Consider the economic benefit criterion further, first from a static and then from a dynamic point of view.

Simple Static Case

Let $B=B(q)$ denote the expected economic benefits from investments financed by all those loans, or fractions of loans, that it is expected will be repaid; $q = (1 - p)Q$ in our previous notation. $B$ is the willingness of these borrowers to repay principal plus interest, and is related to the marginal efficiency of capital schedule, $R = R(q)$, as follows. $R(q)$ is the rate of return to projects in the interval $q$ to $(q + \delta q)$, so that the willingness to repay principal plus interest in this interval is $(1 + R)\delta q = \delta B$. Hence $\delta B/\delta q = (1 + R)$. For any "good" borrower, $R \geq r$, where $r$ is the optimum interest rate, which we are to determine.

It is taken that economic benefits are generated only by those loans, or fractions of loans, that are repaid. There are two reasons for this: - (a) Those who default because the business failed evidently gain no economic benefit from that portion of the loan on which they have defaulted. In fact they may incur additional losses, which are not taken account of above. (b) Those who default because of dishonesty may well invest the borrowings in activities that make a measurable addition to economic output;
but given the damage done to the lending programs and the external costs to
other borrowers when dishonesty rises to significant levels, there seems no

good reason for including such additions in the benefit stream. The net
expected benefits for any volume of lending Q are then:

\[ B(p, Q) - (1 + i + a) Q \]

Differentiating with respect to Q gives:

\[ (1 + R) \left[ (1 - p) - Q \cdot \frac{\partial p}{\partial Q} \right] - (1 + i + a) - Q \cdot \frac{\partial a}{\partial Q} \]

Setting this expression = 0 gives the marginal conditions, at which the rate
of return to capital (on the marginal projects) should just equal the rate of
interest. Hence putting R = r, and solving for r gives:

\[ r = \frac{i + a + p + Q \left( \frac{\partial a}{\partial Q} + \frac{\partial p}{\partial Q} \right)}{1 - p - Q \cdot \frac{\partial p}{\partial Q}} \] (6)

The term \( Q \cdot \frac{\partial p}{\partial Q} \) (which is negative) reflects the marginal benefits from an
increased expectation of financing "good"borrowers the greater the volume of
lending undertaken. The term \( Q \cdot \frac{\partial a}{\partial Q} \) (also negative) reflects corresponding
reductions in administrative costs. The former appears to correspond to the
external benefits identified by Arrow (1965) in a growth model that examined
the economic implications of "learning by doing". In this model, learning was
associated with the cumulative production of capital goods, from which he
concluded: 1/ "the presence of learning means that an act of investment
benefits future investors, but this benefit is not paid for by the market.
Hence, it is to be expected that the aggregate amount of investment under the
competitive model ... will fall short of the socially optimum level."

The various terms are interpreted in figure 1. The marginal
efficiency of capital schedule is drawn twice, corresponding to two levels of
expected losses, \( p_1 \) and (a lower level) \( p_2 \). The marginal cost schedule is
shown declining on account of the economies from learning and scale. If the
interest rate were set at \( r_1 \), say, the level of demand would be \( Q_1 \), of which
the expected portion going to "good" investments is \( (1 - p_1) Q_1 \). If the
interest rate were reduced to \( r_2 \), the demand would rise to \( Q_2^* \), and the
portion going to "good" investments to \( (1 - p_1) Q_2^* \), on the assumption that
the rise in demand met makes no improvement to the screening procedures of the
institutions. If, however, there was an improvement, reflected in a larger
share of "good" investments being financed, then the marginal efficiency

FIGURE 1

Changes in Economic Benefits and Costs with a Price-induced Change in the Demand for Loans from "Good" Borrowers

Marginal Benefits (for a given p) and Marginal Costs

Schedules for two values of p

Demands of "good" borrowers, q = (1 - p)Q, for given values of p
schedule moves outward, as indicated, and the extra economic benefits from the investment (shown vertically shaded) may more than offset the losses (shown diagonally shaded) due to the rates of return on some projects being below the marginal cost schedule.

Expression (6) differs from (2) only by the terms involving $\frac{Qa}{aQ}$ and $\frac{Qp}{aQ}$, each of which (being negative) lowers $r$ below the value suggested by (2). Hence the economic criterion suggests interest rates lower than the financial criterion so long as there are significant benefits to be obtained from learning and economies of scale. The limiting cases of both (2) and (6) are the same, however: $p$ tends to $p'$, as to $a'$, $Q\frac{a}{aQ}$ to zero as $Q$ rises, so that $r$ tends to $(i + a' + p') / (1 - p')$ in both cases. $\frac{1}{1}$

The Dynamic Case.

The variables $Q_t$ and thus $B$, $a$, $p$ and $q = (1-p)Q$, change over time and are given the subscripts $t$. The present worth of benefits is given by:

$$\sum_{t=1}^{\infty} \frac{[B_t(q_t) - (1 + i + a_t) Q_t]}{(1 + i)^t}$$

Both $p_t$ and $a_t$ are functions of the cumulative volume of lending up to time $t$; that is:

$$p_t = \phi(\Sigma q_{t'}), \quad \frac{1}{t}$$
$$a_t = \phi(\Sigma q_{t'}), \quad \frac{1}{t}$$

From these last two expressions, it follows that a change in $Q$ in any year will lead to changes in $p$ and $a$ in the same and subsequent years.

The marginal conditions are derived by differentiating through with respect to $Q_t$ and setting the resulting expression to zero. Putting $(1 + r_t) = a B_t / a q_t$ as before, where $q_t = (1 - p_t)Q_t$, and $r_t$ is the

$\frac{1}{1}$ E.g. following Arrow (1965) put $a = a' + a'' Q^{-\lambda}$ and $p = p' + p''^{-\mu}$ into (6) and (2) where $\lambda$ and $\mu$ are constants both $> 0$, to represent the effects of economies of learning and scale on the values of $a$ and $p$. 

optimal interest rate for year t, as determined by the marginal conditions, it can be shown that

\[ r_t = \frac{i + a_t + p_t + \sum_{s=t}^{\infty} [Q_s \cdot \partial a_s / \partial Q_t + W_s \cdot Q_s \cdot \partial p_s / \partial Q_t] / (1 + i)^{s-t}}{1 - p_t - \sum_{s=t}^{\infty} [W_s \cdot Q_s \cdot \partial p_s / \partial Q_t] / [1 + i]^{s-t}} \] 

(7)

Where \( W_s = (1 + r_s) / (1 + r_t) \). If we took a constant rate of interest over time, \( W_s \) would equal unity; otherwise, if rate is declining, it would be less than unity.

The terms involving \( \partial a_s / \partial Q_t \) represent the present worth of the marginal reductions in administrative costs due to the economies of learning and of scale derived from the marginal change in demand in year t. The terms involving \( \partial p_s / \partial Q_t \) represent the present worth of the marginal benefits expected from finding extra "good" investments in t and future years, again derived from the marginal change in demand in year t. As with the financial criterion, future returns are weighted by the expected volume of lending. The terms involving \( \partial p_s / \partial Q_t \) are weighted by \( W_s \); this reflects the elementary point that, as \( r_t \) falls, a greater number of projects with lower rates of return, though with rates equal to or greater than \( r_t \), are included in the benefit stream.

The limiting case is again the same as that for the financial criterion (4). Both \( a_t \) and \( p_t \) tend to \( a' \) and \( p' \) as the cumulative volume of lending rises, with \( \partial p_s / \partial Q_t \) and \( \partial a_s / \partial Q_t \) tending to zero, so that

\[ r = \frac{i + a' + p'}{(1-p')} \] 

(8)

The contrast between (4) and (7) is illustrated in Figure 2. The economic criterion implies lower interest rates than the forward-looking financial criterion during the adjustment period.

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1/ Using the following relationships. Put \( q_s = (1 - p_s)Q_s \), with \( s > t \). The marginal efficiency of capital schedule in year s is

\[ \frac{\partial B}{\partial q_s} = (1 + R_s) \] with \( R_s \) being the rate of return to capital (c.f. the static case), which we set \( = r_s \in \) in the marginal conditions. The various derivatives in the objective function are as follows:

\[ \frac{\partial B_s}{\partial Q_t} = \frac{\partial B_s}{\partial q_s} \frac{\partial q_s}{\partial Q_t} = \frac{(1 + r_s)}{\partial Q_t} [\partial q_s (1 - p_s) - Q_s \partial p_s] \]

Also \( \frac{\partial (a Q_s)}{\partial Q_t} = a \frac{\partial Q_s}{\partial Q_t} + Q_s \frac{\partial a}{\partial Q_t} \)
FIGURE 2

Variation of Interest Rate with Cumulative Volume of Lending, According to Financial and Economic Criteria

Interest Rate

Financial criterion

Economic criterion

asymptote, \( \frac{i + a' + p'}{1 - p'} \)

Cumulative Volume of Lending