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THE COSTS OF CREDIT DELIVERY, THE INSTITUTIONAL STRUCTURE
OF RURAL FINANCIAL MARKETS AND POLICIES TO REACH
MORE SMALL FARMERS WITH CREDIT PROGRAMS

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This paper uses a theoretical framework to show the important role of transactions costs embodied in credit delivery systems and their influence on lender and borrower behavior, and how these behaviors converge to have an important impact on the structure of rural financial markets. The analysis shows how transactions costs permit moneylenders with high interest rates to coexist with agricultural banks with low interest rates, and how the banks use transactions costs to ration credit towards farmers who want large loans. If banks want to compete with the moneylenders and capture a larger share of the market they must lower transactions costs, especially if they simultaneously raise interest rates.

To improve incomes of their rural poor many less-developed countries have established small-farmer credit programs in agricultural banks. Often these programs are financed by foreign aid; most are designed to rescue the farmer from reliance on the informal credit market; and almost all feature concessionary interest rates. It is widely recognized that most of these programs have not obtained the level of success in reaching the large numbers of small farmers envisioned by governments and donors of aid, with the consequence that most small farmers continue to work with other lenders, often those of the informal market.

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Recently, convincing arguments have been made by Adams (1971), Gonzalez-Vega (1976, 1977), Laiman and Tinnermeier (1981) and others that a major factor contributing to this lack of success is the concessionary interest rate, because it leads to credit diversion, low lender revenues and the political use of credit. Further, that these results are exacerbated when inflation is present. The recommended policy action is to raise the real interest rate. Such an approach concentrates on the roles of interest rates in resource allocation, income distribution, and interest charges as revenues to the bank and costs to the borrower.

Many authors have recognized the role of transactions costs as influencing lending and borrowing decisions and consequently influencing the success of small-farmer credit programs. For example, Gonzalez-Vega (1976) demonstrates how transactions costs encourage banks to make larger rather than smaller loans, and Donald (1976, pp. 120-136) discusses problems with the credit delivery procedures of agricultural banks. In a pathbreaking article, Adams and Nehman (1979) examine borrowing behavior in the context of total borrowing costs, including transactions costs, rather than just interest costs, as is traditionally the case. They present empirical evidence from several countries showing how the large transactions costs of agricultural bank credit lead to high borrowing costs from those institutions. They conclude that the large transactions cost component discourages the rural poor from borrowing from these banks.

The present study presents a theoretical analysis of lender and borrower behavior that supports this conclusion. Furthermore, the analysis is extended to show the specific role of transactions costs in influencing the structure of financial markets in rural areas and, therefore, why the small-farmer credit programs of agricultural banks have not displaced informal market lenders but, indeed, may have reinforced their business.

The analysis is undertaken in the context of the credit delivery system (CDS). The paper is organized in three parts. First, is an analytical frame-

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work consisting of a conceptualization of a CDS, and models explaining lender and borrower behavior and their influence on market structure. Second, is evidence from Bolivia about CDSs and the structure of rural financial markets in that country. Third, are conclusions and policy recommendations.

Credit Delivery System

A CDS is defined as the set of procedures and conditions of credit that are followed by a lender in the process of making, servicing and collecting a loan with its borrowers. In the broadest sense, a CDS includes all of the processes that the lender must undergo not only in its direct relations with borrowers, but also in the indirect functions of acquiring loanable funds and maintaining records, accounts and offices because the indirect items are associated with the credit process. More narrowly, a CDS refers to those operations, basically between lender and borrower, that are directly involved in extending credit. In this paper the latter definition will be used because of the emphasis on transactions costs; reference will be made, however, to the importance of the indirect processes as they influence the lending and borrowing decisions. For purposes of analysis, the CDS is separated into three phases: (a) loan application, (b) loan disbursement and servicing, and (c) loan repayment.

A lending institution takes the active role in establishing a CDS in accordance with certain criteria that are imposed upon it by law, mandate and/or institutional operating procedures. The prospective borrower, who takes a passive role, must be willing to accept both the prescribed procedures and loan conditions if he is to become a client. From his perspective, these conditions and procedures as well as any other acts that he must undertake to satisfy the lender's requirements are the elements of his CDS. Although the lender and borrower are interacting in the process of credit delivery, the elements and procedures of their respective CDSs are not mirror images, but may be quite different. For example, a borrower may have to present documents that might

require considerable outlay of time and money on his part to acquire, but, for the lender, only require the time to examine and file them.

Costs in Credit Delivery Systems

A CDS embodies a set of costs for both the lender and borrower. For the lender these consist of the transactions costs associated with the use of manpower, supplies and equipment that are employed in the process of credit delivery. For the borrower the costs of credit delivery are: (a) interest charges; (b) out-of-pocket outlays required to obtain documents, pay commissions and bribes, travel to and from the lender's office, and miscellaneous expenses; (c) opportunity costs of time involved to complete all procedures and requirements; and (d) the costs of lost revenues associated with late disbursements due to delays in credit delivery. The direct costs included under (b) and (c) are transactions costs.

Comparison of Credit Delivery Systems

Each lender or credit institution has its particular CDS. Within any country a continuum of lenders, ranked in terms of complexity of CDS, could be established. An inter-country comparison of continuums would likely show considerable similarity of rankings among the different types of lenders. At the end of the scale denoting the least complex CDS, but with highest interest rates, would be the informal market lenders typified by moneylenders. At the other extreme would be the agricultural development bank with a highly complex CDS and concessionary interest rates. In between would be cooperatives, credit unions, commercial banks and other lenders. For purposes of simplicity this paper concentrates on the two extremes, the agricultural development bank and the moneylender.

Agricultural Bank. The complex CDS of the typical agricultural bank requires that many forms be completed and documents, such as land titles, be presented in the loan application phase. Loans are often disbursed in

segments in accordance with the farmer's plans to purchase inputs. Sometimes they are disbursed in kind. There are often farm visits by the lender. Repayment is usually made at the bank in one or more parts. The set of procedures involves considerable transaction costs for both the lender and the borrower. In the case of the lender there is the time cost in interviewing farmers; reviewing, recording and filing documents; and making farm visits. In many instances loan applications must be reviewed by several authorities at different levels in the hierarchy of the bank. There are also the costs of maintaining an office and vehicles.

The borrower must commit considerable time not only in his direct dealings with the bank in interviews, filling out forms, waiting in line, farm visits, disbursements, etc., but also in travelling to and from the bank as well as to other offices to obtain required documents. A number of visits to the bank and other public offices are often necessary. He also must be prepared to meet the required out-of-pocket expenses for the transportation expenses, charges for documents, taxes on documents, bribes, lawyers and notaries fees, etc. Clearly such a CDS involves considerable transactions costs for both the lender and borrower.

Given these high costs, why have the banks developed such high CDSs? There are four fundamental reasons.

First, and foremost, is to protect the bank's funds by determining the prospective borrower's creditworthiness. This involves taking measures to select clients and to ensure that the loan will be repaid, with interest, on schedule. In the loan application phase this typically includes the preparation of a farm plan, and past and projected income and financial statements. Documentation attesting to land tenure and collateral is often required. In the loan servicing phase it consists of properly documented disbursements and farm visits by the bank agent to ensure the funds have been invested in accordance with the loan purpose. In the loan repayment phase it consists of

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efforts and paperwork to collect funds when they fall due and to make a loan extension if warranted.

Second, is internal control. This is to ensure that credit is extended for the designated purposes, as specified in the credit program's mandate or national agricultural plan. Also that the bank and its personnel are exercising financial responsibility in handling the public funds placed at their disposal.

Third, is education of the farmer in farm planning, use of improved technologies and financial savvy. This is an important element of supervised credit programs.

Fourth, in context of government bureaucracy and patronage, it may be that some procedures are simply designed to make work for the large numbers of persons that are incorporated into the public payroll in the bank.

The present analysis supports a fifth reason, suggested by Adams and Nehman(1979, p.174), e.g., credit rationing. The argument is that the banks employ these complex procedures in an effort to exclude clients who want smaller and unprofitable loans and to force lending to clients who borrow for larger and more profitable loans. By spreading their available loanable funds over fewer farmers they are able to keep their total transactions costs lower, an important factor given the low bank revenues that emanate from the concessionary interest rate policy.

Moneylender. In contrast to the bank's CDS, that of the moneylender is quite simple. The moneylender requires little paperwork and, most likely, no documents. He obtains his information about prospective borrowers through personal observation over time since he typically lives nearby his clients. He operates out of his home and has no overhead. He seldom visits the farm site. The borrower incurs few transactions costs for time and out-of-pocket expenses in working with a moneylender. He visits the moneylender infrequently, usually only to obtain and repay the loan. Out-of-pocket expenses are low since

few, if any, documents are required and the moneylender lives nearby.

Clearly there are important differences between the two CDSs. That of the moneylender has high interest rates and low lender and borrower transactions costs and that of the agricultural development bank low interest rates and high transactions costs. The following two sections present models of lender and borrower behavior that show the impact of interest revenues and transactions costs on lender behavior and interest costs and transactions costs on borrower behavior. Then, in the following section, lender and borrower behavior are brought together to show why, given interest rates and transactions costs, a rural credit market is structured to include moneylenders operating alongside an agricultural development bank. The analysis could be amplified to incorporate other lenders, but for purposes of simplicity the discussion is confined to the two above-described lenders.

Lender Model

The following model is applicable to any lender. A number of simplifying assumptions have been made to facilitate the exposition. The lender is assumed to have one source of revenue (R), which is derived from a fixed interest nominal rate (r) times the loan volume. There are four categories of costs. First, are the financial costs (MC) associated with acquiring funds. These are assumed to be a function of the cost of obtaining the loanable funds at a constant interest rate. All loanable funds are assumed to be loaned out.

Second, are the fixed costs (FC) associated with a given size of plant including overhead and costs of central administration, etc.

Third, are the risk costs (RC) representing the probability that a loan will not be repaid. An average RC is assumed per unit of money loaned.

Fourth, are the lender transactions costs (LTC) that are directly due to the credit delivery system. It is very realistic to assume that transactions

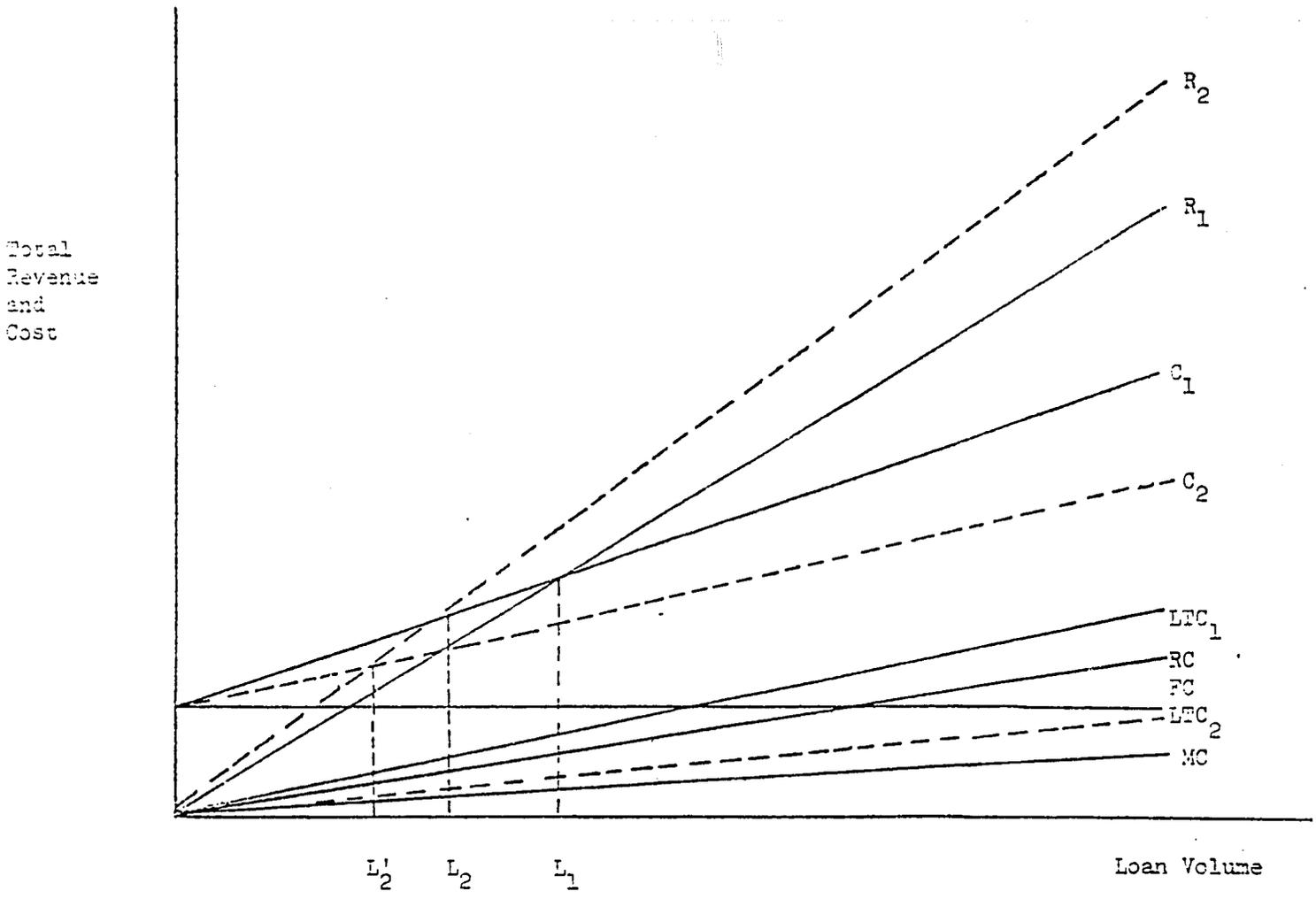


Figure 1. Lender Cost and Revenue Functions

costs per loan are constant (\overline{LTC}) for all sizes of loans, since the procedures in the credit delivery system are constant, irrespective of loan size. For simplicity it is assumed that all loans are the same size.

The revenue and cost functions are diagrammed in Figure 1. The total lending cost function (C) is the vertical sum of the four costs. If C_1 and R_1 are the relevant total cost and revenue functions the lender would break even at loan volume L_1 . At lesser loan volumes the lender suffers a loss and at greater loan volumes a profit ($\overline{\pi}$) is earned. Assuming the lender wants to maximize profit ($\overline{\pi} = R - C$), or minimize loss, it will prefer to operate as far to the right as possible, given the availability of loanable funds and the capacity of fixed plant.

Profitability can be increased in three ways. First, r can be raised, say to give a revenue function R_2 ; the breakeven loan volume would be lowered to L_2 and profitability increased. Second, C can be reduced, say to C_2 , which would achieve the same result. Third, a combination of the first two could occur. If R_2 and C_2 were the relevant functions then the breakeven level would be L'_2 .

C may be lowered by reducing one or any combination of the four costs. The purpose at hand is to examine the effects of lowering LTC , say from LTC_1 to LTC_2 .¹ As shown above, such action would raise the lenders profitability and the breakeven loan volume lowered.

Lowering Transactions Costs

Figure 2 illustrates how LTC could be lowered. LTC_1 shows the transaction costs function is derived as the average slope of a discontinuous, step-wise cost function where the vertical discontinuity corresponds to the transactions cost associated with each loan, and the horizontal length of each step is the loan size. Since all loans are assumed to be of a fixed size the TC function is a straight line. To reduce the level of LTC the lender has four options.

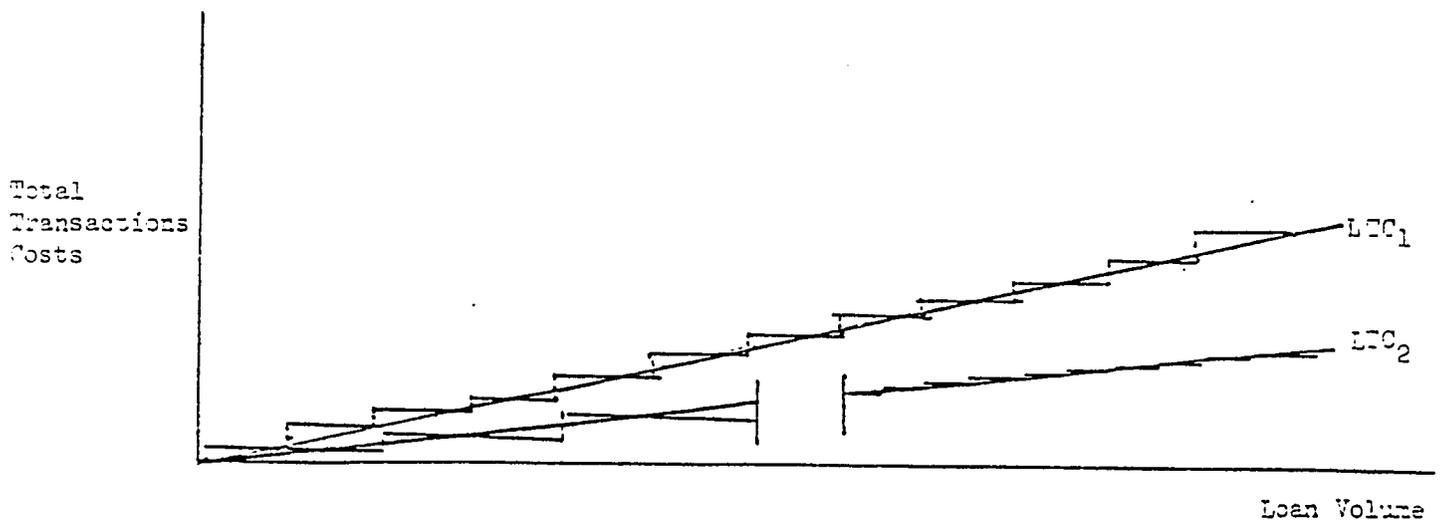


Figure 2. Lender Transaction Cost Function

First, to expand the size of the loan as shown in the left portion of LTC_2 . It is likely that if the lender expanded loan size that it might also want to change the type of enterprise it would want to finance. Larger loans are typically associated with longer-term type investments, as in cattle, machinery and irrigation systems, whereas smaller and short-term loans are typically used for operating expenses like seed, fertilizer and labor. If the lender were to choose this option fewer short-term credit needs of the farmers would be met.

The second option is to reduce the size of the \overline{LTC} as shown in the right portion of LTC_2 . If the lender were to streamline the CDS in order to reduce \overline{LTC} then more farmers could be reached, albeit with smaller loans, with the same size plant. In this case loans would tend to be for operating expenditures and shorter terms.

The third option is to reduce \overline{LTC} by dealing with repeat borrowers rather than first-time clients. Those seeking credit for the first time require much more effort on the part of the bank. In contrast, much of the information and documents collected for a previous loan can be used by the lender for a repeat borrower.

The fourth option is some combination of the above three. This would also lead to longer-term loans, but even lower LTC compared to the other two options.

The Agricultural Development Bank and Moneylender Cases

The model readily explains the often-observed conditions of agricultural development banks and moneylenders. In the case of the banks the combination of concessionary interest rate and high costs contributes to the high loan volume that is required to break even. Indeed, many banks do not reach that point, run a loss and need subsidization. In particular the high \overline{LTC} associated with the CDS and the high FC associated with the centralized and bureaucratic operations contribute to this result. Where loan repayment is poor

FC is another important factor. In an effort to reduce C, banks might try to lower LTC by increasing the average size of loan. In some cases they may try to lower LTC by reducing the \overline{LTC} ; for example, lending to groups and cooperatives.

Moneylenders have very low FC and LTC and high r. Each of these factors contributes to a low breakeven point which explains why most rural financial markets have numerous moneylenders, many of whom make few loans and for small amounts.

Borrower Model

Assume that a farmer has a given set of farm enterprises and associated technology from which he can select in order to produce a combination of farm products. Further, assume that he must rely upon credit to undertake any of these investments.² His demand for credit will thus be derived from the expected productivity of the resources employed as a result of using credit (Ladman, 1970). A demand for credit schedule, DD', is shown in Figure 3. It consists of the locus of present values of the marginal revenue products of credit (MVP) resulting from the resources employed using successive units of credit. The demand is net of risk associated with enterprise selection and with credit use.

Assume the farmer is working with a given lender. If the farmer uses credit he must incur borrowing costs (BC) that are imposed by the lender's CDS. These consist of interest costs (IC) and borrower transactions costs (\overline{BTC}). The former are equivalent to the product of a constant nominal interest rate (r) and the loan size (L). The latter arise from out-of-pocket costs and opportunity costs of the borrower's time spent in undertaking loan procedures, and, since they do not vary with loan size from a given lender, are considered fixed. Revenue (R) resulting from borrowing is net of costs of the resources employed with credit, but is not net of BC.

For simplicity of exposition assume that there are no delays in credit delivery that cause the farmer costs in the form of lost revenues. It should be noted, however, that such delays often occur especially when farmers are

dealing with lenders that have complex and time consuming CDSs such as those that require multiple loan reviews of loan applications before disbursements can be made.

Assume the borrower is a profit (Π) maximizer. Thus, he would enter into a loan only if he expected $\Pi > 0$, i.e., $R > (IC + BTC)$. Furthermore, he would maximize Π by borrowing up to the point where $r = MVP$, i.e., where the marginal cost of borrowing is equivalent to the marginal revenue from credit.

The profit statement can be expressed in terms of average revenue (AR) and average borrowing cost (ABC) by dividing all terms by the size of loan, L. In this form:

$$\Pi = \frac{L(R)}{L} = \frac{L[R - (IC + BTC)]}{L} = L[AR - (r + ABC)] = L[AR - ABC]$$

Figure 3 shows the profit maximizing condition. The farmer would want to borrow L_1 , where $r = MVP$. Π would be $L(AR - ABC)$.

The role of BTC on profitability is clear. First, ceteris paribus, the larger or smaller BTC the lesser or greater Π . Second, there is a minimum level of L which the borrower must exceed before he would be willing to borrow from the lender. This level (TH_1) is the borrowing threshold and is the level where $ABC = AR$ and $BC = R$. Clearly, for any given r, the larger BTC the higher is TH_1 .

Third, is the out-of-pocket cost threshold (TH_2). TH_2 represents the amount of outlay the farmer must make in the loan application phase to obtain credit. Examples are payments for documents and travel expenses. If the farmer does not have the required TH_2 funds he will not be able to obtain credit, no matter what its profitability for his desired loan size.

In summary, the farmer would be willing to borrow L from the lender if $TH_1 < L < L_1$, and if he had funds available in the loan application phase that were at least equivalent to TH_2 . If he did not have TH_2 he would be forced to go without credit.

Borrower
Revenue
and Costs

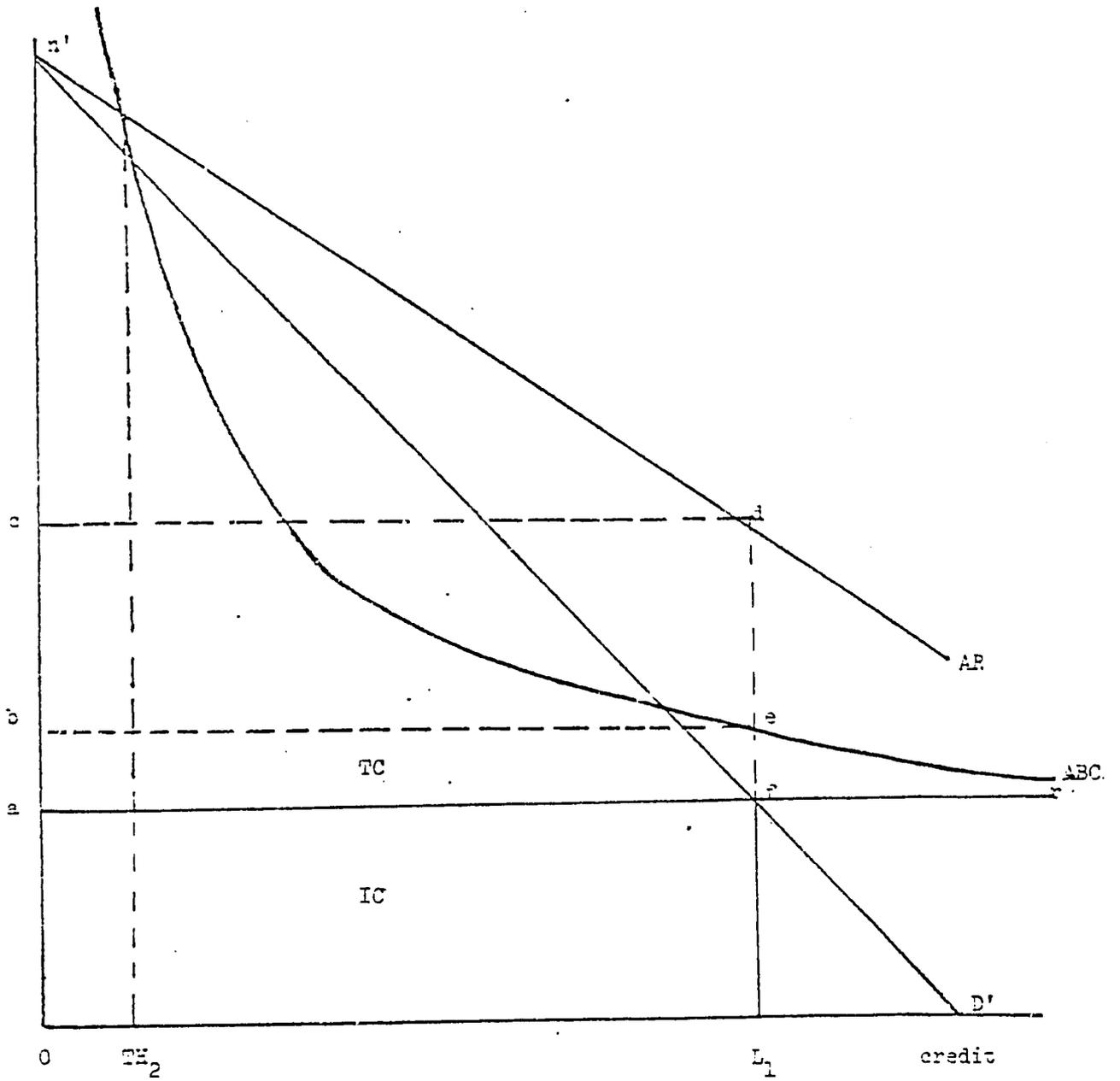


Figure 3. Borrower Credit Demand and Costs

It is important to note that first-time borrowers may have larger \overline{BTC} , TH_1 and TH_2 than repeat borrowers because they must present information and documents that need not be furnished again by repeat borrowers.

Choice of Lender

Now assume there are two lenders (I and II) in the market and that any farmer will choose to operate with one lender at a time. The decision criterion for the farmer will be to select the lender that offers him the largest expected $\hat{\Pi}$ given r_I , r_{II} , \overline{BTC}_I , \overline{BTC}_{II} and DD' , subject to the constraints TH_{2I} and TH_{2II} . Thus at any L , the farmer would choose I, be indifferent between I and II, or choose II depending upon $\hat{\Pi}_I \stackrel{?}{\lessgtr} \hat{\Pi}_{II}$, subject to covering TH_2 for the preferred lender. If he could not cover TH_2 for that lender he would be forced to a second best (lower $\hat{\Pi}$) situation by borrowing from the other lender if he could cover TH_2 for that lender. If he could not cover TH_2 for that lender he would be forced to go without credit.

For any L the above inequality showing preference for borrowing from the two lenders can be rewritten as a function of borrowing costs, i.e., $(r_I + ABTC_I) \stackrel{?}{\lessgtr} (r_{II} + ABTC_{II})$.³ The level of L where the farmer is indifferent between I and II is the point of indifference and where he would prefer to use one lender or the other should L rise or fall.

It is quite possible that the shape of DD' would be such that a farmer would not choose to operate with a lender because $TH_1 > L_1$. Therefore, the particular lender is not within the farmers feasible set of lenders. In this situation the farmer would still likely want to work with a lender that had a CDS embodying a low TH_2 even though it might mean paying a high r . Work by Ladman (1971) shows this in Mexico.

Moneylender and Agricultural Bank

Assume I and II are a moneylender and an agricultural bank respectively. Further, as is commonly the case, that r_I greatly exceeds r_{II} and that \overline{BTC}_I is

Borrower
Revenue
and Costs

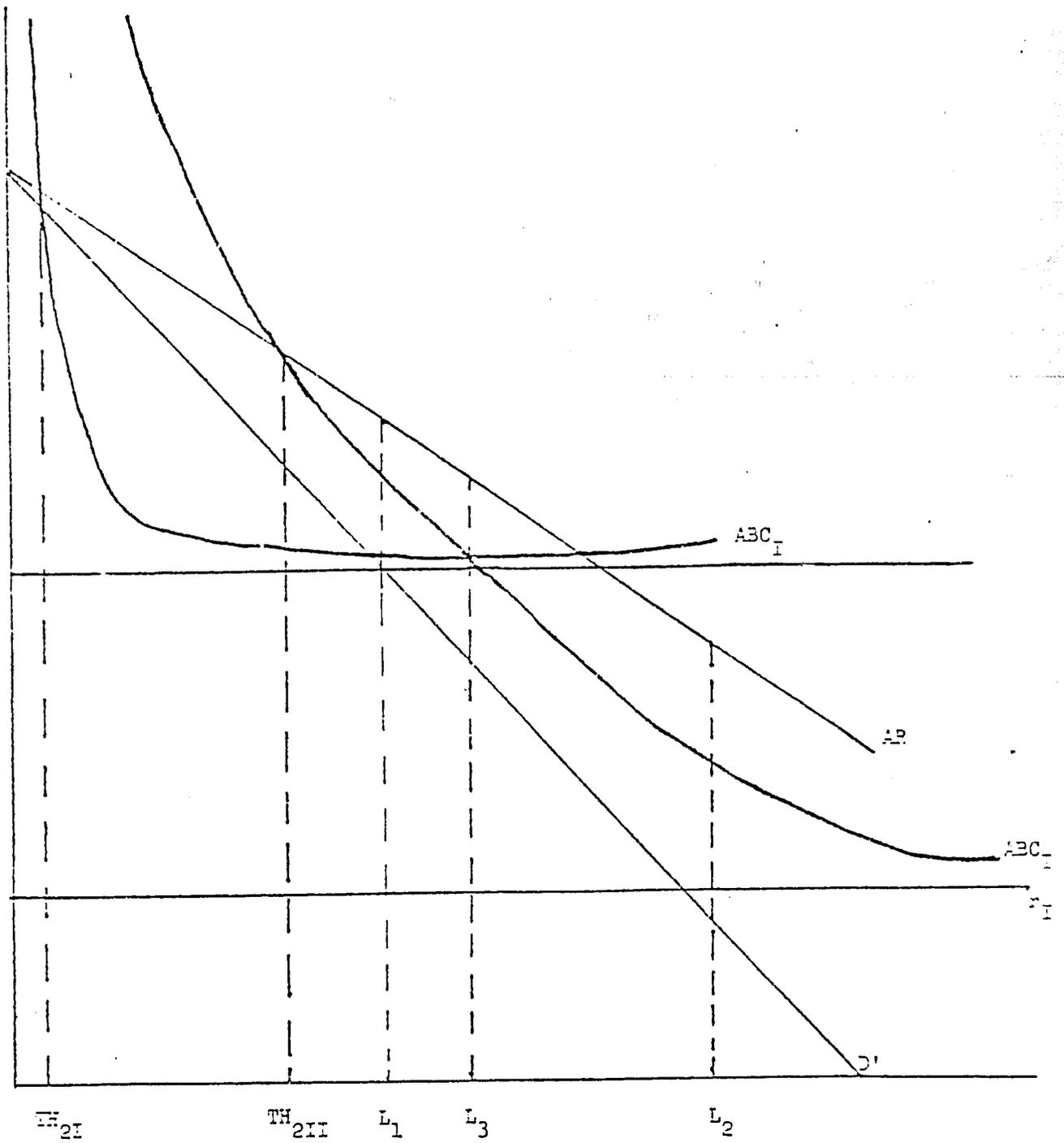


Figure 4. Borrowing Costs and Revenues
for Two Lenders

very small compared to \overline{BTC}_{II} . As a consequence $TH_{1I} < TH_{1II}$ and $TH_{2I} < TH_{2II}$.

As shown in Figure 4 the farmer would be indifferent between the two lenders at L_3 , where $\hat{r}_I = \hat{r}_{II}$; prefer the bank at loan sizes greater than L_3 , where $\hat{r}_I < \hat{r}_{II}$, if he has funds to cover TH_{2II} ; and prefer to work with the moneylender at loan sizes less than L_3 , where $\hat{r}_I > \hat{r}_{II}$, if he has funds to cover TH_{2I} . Farmers preferring the bank would want to borrow L_2 credit because at that level of credit they would maximize their profits. Likewise, those preferring the moneylender would want to borrow L_1 .

If the farmer prefers the bank, but can not cover TH_{2II} , then he would be forced to borrow from the moneylender, but would not use more than L_1 credit. If a farmer were to borrow from the moneylender, but could not cover TH_{2I} , he would be forced to go without credit.

It is possible that due to the shape of DD' the farmer would be excluded from operating with the bank because $TH_{1II} > L_{1II}$. In other words, the high \overline{BTC}_{II} exclude the farmer from including the bank within his feasible set of lenders.

Market Structure

The previous two sections show how the CDSs associated with different lenders in rural areas, as represented by the loan conditions as well as procedures and processes, heavily influence both lender and borrower behavior. Thus, the CDS, as manifested in borrower and lender interaction, has an important impact on the operations and structure of financial markets in rural areas. Indeed, the CDS, can provide a rational explanation of why several different credit institutions can operate side by side in a rural area even though they each charge considerably different rates of interest.

The borrower model showed why a farmer would prefer to borrow from a moneylender or an agricultural bank depending upon DD' , the two CDSs and TH_2 's and L . It was shown that, given the typical CDS for both lenders, farmers would prefer to work with the bank for larger and longer-term loans and with the

moneylender for smaller and shorter-term loans. The lender model shows that the bank prefers to lend for larger loans and that the moneylender is very suited to lending for the smaller loans. Thus, lender and borrower behavior converge to create this structuring or partitioning of the financial market in rural areas.

As a result of this convergent behavior the aggregate demand for credit (the sum of individual farmer demands) in these markets is partitioned into two segments; the first, associated with higher rates of interest and smaller loans, corresponds to moneylenders, and the second, associated with lower rates of interest and larger loans, corresponds to the bank. Farmers will make a decision about the lender with which they wish to operate and seek loans accordingly and thus contribute to the segment of demand of credit for that lender.

It is possible that an excess demand for loans from the bank may exist due to the concessionary interest rate. Should this be the case the bank will resort to some form of credit rationing, perhaps by raising \overline{LTC} even more. Farmers who are thus excluded from borrowing from the bank would need to resort to borrowing from moneylenders which would increase the demand for loans from moneylenders.

The aggregate demand will tend to be partitioned at an aggregate loan volume where the average costs of borrowing from both lenders are equal, i.e., where, in the aggregate, farmers are indifferent about borrowing between the two lenders. This condition will be determined by the CDS of both lenders. Mandates, rules and operating procedures governing the lenders' CDSs will determine \overline{BTC}_I , \overline{BTC}_{II} and r_{II} . Conditions of competition will determine r_I . If there is perfect competition among moneylenders r_I will be kept at a level that is commensurate with the opportunity costs of lending for non-agricultural purposes and/or other investment opportunities. If conditions of non-perfect

competition prevail, r_I will be kept at some level allowing the moneylender to abstract monopoly profits. In such a manner the partitioning of the market is determined. Now consider what would happen if transactions costs and interest rates were to be changed for either lender.

The Role of Transactions Costs

It is to the moneylenders advantage to keep \overline{BTC}_I as low as possible. If \overline{BTC}_I were higher more farmers would prefer to borrow from the bank. Low \overline{BTC}_I enable the moneylenders to capture more of the total aggregate demand leading to a larger loan volume and greater profits.

By the same line of reasoning lower \overline{BTC}_{II} would enable the bank to capture a larger share of the aggregate demand by more effectively competing with the moneylender for loans that are of smaller size. Indeed, this would be an important measure for the bank to employ in order to serve larger numbers of farmers.

Why don't banks tend to do this? First, as noted previously, they may be required by law or believe it to be financially prudent, to employ cumbersome CDSs. Second, the vested interests of the bureaucracy might resist it. Third, it is clear, that given the strength of the first two factors that it is very convenient for the bank to employ a CDS that has high embodied \overline{BTC}_{II} to ration credit among borrowers when an excess demand for bank credit exists due to the concessionary interest rate.

Lenders will also tend to ration credit in favor of repeat borrowers rather than first-time borrowers because the lender has lower transactions costs in dealing with clients with whom they have had a successful experience. Such behavior causes banks to tend not to seek out new clients when they can allocate their loans among previous borrowers.

The Role of Interest Rates

If r_I and/or r_{II} were changed the market structure would be affected. If r_I were raised, fewer farmers would want to borrow from moneylenders and

more would want to borrow from the bank. If r_I were lowered the moneylenders could capture more of the market. Competitive forces will determine the level of r_I .

As noted previously, strong arguments have been raised in support of eliminating the concessionary interest rate of the bank. The present analysis shows the consequences of such action on lender and borrower behavior and market structure. If the bank were to raise r_{II} the individual farmer would want to borrow less from the bank. The level of L at the point of indifference would rise and consequently more farmers would prefer to work with moneylenders and fewer with the bank. Therefore, if r_{II} were raised, and if the bank wanted to reach the same number or even larger numbers of farmers than before, the bank would need to lower \overline{BTC}_{II} sufficiently to compensate the farmers for the rise in r_{II} and, thus, keep them from preferring to work with the moneylender. If \overline{BTC}_{II} were not lowered by the required amount then the bank would tend to lose clients to the moneylenders. Adams and Nehman (1979, p. 175) come to this same conclusion and go on to argue that raising the interest rate will, indeed, force the bank to lower \overline{BTC}_{II} in order to remain competitive.

The Bolivian Case

The upper valley of the Department of Cochabamba is an area densely populated by small farmers living on small parcels of land that resulted from the land reform. Data from three provinces of the Upper Valley illustrate the role of CDSs and their embodied interest charges and transactions costs on lender and borrower behavior and the structure of financial markets in the Valley.

A study by Ladman and Torrico (1981) shows that in 1979 there were three types of lenders in the Upper Valley that were making most of the agricultural loans: moneylenders, the Bolivian Agricultural Bank and an integral cooperative. The present study focuses on the first two. In 1979 there were 873 different money-

lenders that had registered loans in the capital cities of the three provinces that made 1,079 loans, valued at 10.5 million pesos, for agricultural purposes. The single office of the Bank made 209 loans valued at 15.2 million pesos. The Bank served 1.2 percent of the farm families in the provinces and the moneylenders 5.0 percent.

As shown in Table 1 the mean sizes of loan were 72.7 and 9.6 thousand pesos for the Bank and moneylenders respectively. Bank loans, commonly for investment in cattle, were typically 60 months in length. Moneylender loans were typically 3 months in length and were directed to a wide array of purposes. It is clear that the moneylender tended to make loans for small amounts and shorter terms whereas the Bank's loans were for much larger amounts and longer terms. The above models for lender and borrower behavior explain why these patterns of credit were observed.

As shown in Table 1 there is a wide difference in the levels of annual interest rates charged by the Bank and the moneylenders, 13 and 48 percent respectively. Borrower transactions costs for new Bank clients are 3,850 pesos and those for clients of the moneylender are 87. Given these costs the farmer prefers to borrow from the moneylender for small loans and the Bank for large loans. The borrower's point of indifference between the two lenders is 10,751 pesos.

Up to that point a farmer would prefer to borrow from the moneylender even though it means paying the 43 percent interest because the high average borrowing cost of working with the Bank would exceed the average borrowing cost of working with the moneylender. At the point of indifference average borrowing costs are 43.8 percent. For those borrowing from the moneylender most is due to transactions costs, 35.8 percent. In order to maximize profits the farmer will want to obtain a size of loan that is equivalent to

Table 1. - Average Terms of Loans and Costs for Moneylenders and Bolivian Agricultural Bank - in the Upper Valley, Cochabamba, 1979.

<u>Item</u>	<u>Moneylender</u>	<u>Bolivian Agricultural Bank</u>
Length of Loan (months)	3	60
Loan Size (1,000 pesos)	\$9.6	\$72.7
Annual Interest Rate (%)	48	13
Lender Fixed Costs	Very Low	Very High
Lender Transactions Costs per Loan	Very Low	Very High
Borrower Transactions Costs: Total (TH ₂)	\$87	\$3,350
Out-of-Pocket Costs: Total	\$76	\$2,450
Out-of-pocket Costs: Application Phase (TH ₂)	\$70	\$1,950
Time Costs: Total [⊗]	\$11	\$1,400
Time Costs: Application Phase [⊗]	\$9	\$900

[⊗] Time valued at \$50 per 8-hour day.

Sources: Moneylenders - Ladman and Torrico (1981) and lender and borrower sample surveys.

Bolivian Agricultural Bank - Kvaran (1981), borrower sample surveys and interviews with bank.

where the marginal returns from credit are equal to the rate of interest. In the case of the client of the moneylender, this is near the point of indifference because of the low average transactions costs. For those borrowing from the Bank the optimum loan size greatly exceeds the loan level at the point of indifference due to the much lower interest rate. In the process of expanding loan size the average borrower transactions costs are considerably lowered and profits increase.

The role of borrower transactions costs in influencing the profitability of credit and in causing farmers to prefer to work with one of the two lenders is clear. Some farmers may not want to borrow from the Bank because the borrowing threshold exceeds their optimum loan size. Furthermore, it should be recalled that the out-of-pocket borrowing threshold also will influence the choice of lender. In order to complete the requirements to obtain a Bank loan the farmer must cover 1,950 pesos of direct expenses. Many farmers may not have that much cash and be relegated to working with moneylenders although they would prefer to borrow a much larger amount from the Bank. It is doubtful that farmers would not have the 70 pesos that are required to obtain a loan from a moneylender, and, therefore, would not be excluded from credit on this account.

Borrower behavior converges with lender behavior to determine the structure of the market. A sample survey of moneylenders in the Upper Valley showed that moneylender transactions and fixed costs are virtually nil. Further that moneylending is a secondary occupation where persons lend funds obtained from saving or earnings in other occupations. The moneylender typically meets with a client only twice, once at the time of loan application and again when the loan is repaid. Thus little time is involved in direct transactions with the client. Over time the moneylender has accumulated knowledge about the client and in such a way can make a quick judgement about his credit worthiness. Moneylending requires no office and very simple records. Under these circumstances a lender can expect to break even with a small loan volume. The fact that 81 percent

of the lenders made only one loan per year attests to this. Therefore, moneylenders are easily disposed to making small loans.

In contrast, the complex CDS of the Bank leads to high lender transactions costs. The regulations and operating procedures of the Bank require that bank agents visit with the farmer several times in the office and once at the farm site prior to closing the loan. Disbursements and repayments and inspection trips require the agent to spend more time in the course of the loan. Extensive paperwork and documentation must be filed for each step. An accountant is required in each office to keep the books. Moreover, the highly centralized administration of the Bank leads to high fixed costs.

Given that the Bank has a record of running significant annual losses it would be expected that it would be attracted to making larger loans in an attempt to break-even or minimize its loss. It appears that the Bank has done this. Current research by Kvaran (1981) shows that, in the Upper Valley, the Bank has both extended the size, as well as the term, of loans to small farmers over the past five years.

In such a way, given the CDSs, borrower and lender behavior converge to structure the market in the Upper Valley. The Bank tends to make larger loans to a few farmers and the moneylender makes small loans to a considerably larger number of farmers. High bank transactions costs cause many farmers to prefer to work with moneylenders. Were the moneylenders not in existence, many farmers who want credit would be forced to do without it.

If the Bank wants to reach a larger proportion of the small farmers wanting credit it would be necessary for them to change their CDS to cause lower borrower transactions costs. This would most likely only come about by a reduction in their own transactions costs. As now structured, the Bank's CDS serves as an effective means of credit rationing by excluding farmers who can't meet the borrowing threshold, causing many farmers to prefer to deal with moneylenders, or forcing

farmers work with moneylenders because of the high out-of-pocket borrowing threshold.

Conclusions

In recent years, when evaluating the performance of rural financial markets and their ability to reach small farmers, most emphasis has been placed on the role of the interest rate. In large part this has been due to the fact that many agricultural credit programs have employed concessionary rates, and the consequences of this underpriced credit on market performance needed to be stated. This paper has demonstrated, however, that while the role of the interest rate is very important, that such emphasis is too narrow for, indeed, it is the complete CDS, including both the interest rate as well as the embodied borrower and lender transactions costs, that determine not only how rural financial markets perform, but also how they are structured.

CDSs that embody high transactions costs are shown to exclude some farmers from borrowing. They also encourage both lenders and borrowers towards larger loans, given any rate of interest, because with larger and longer-term loans both lender and borrower will lower the average lending or borrowing costs and, therefore, lead to higher revenues for both parties. In contrast, loan size is not nearly as important to either the lender or borrower for a CDS that embodies low transactions costs because, in this case, average transactions costs are quite low and the lending and borrowing decisions rest more on the interest rate.

Thus, the transaction costs component of the CDS explains why several credit institutions can exist side-by-side, but charging considerably different interest rates. Lenders, such as most agricultural development banks, with lower interest rates but high transactions costs, will cater to farmers wanting larger and longer-term loans whereas lenders with higher interest rates and low transactions costs, such as moneylenders, will serve the farmers with smaller and shorter-term loans. Given the structure of the two lenders' CDSs, both the

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moneylender and the agricultural bank are performing important functions.

Without either institution a portion of the demand for credit would not be served.

It is often argued that a goal of the agricultural bank should be to supplant the moneylender. It is clear from this analysis that this will not be possible unless the bank were to considerably lower its transactions costs. Indeed, it is the high bank transactions costs that encourage many farmers to prefer to work with the moneylender.

Earlier studies have persuasively argued that the low bank interest rates should be raised. The analysis of this paper demonstrates that such action would tend to cause more farmers to prefer to work with the moneylender unless there were a lowering of borrower transactions costs so as to compensate the farmer for higher interest costs. Thus, it is clear that if the agricultural development banks are to serve a larger proportion of the smaller farmers, either with or without higher interest rates, that they must develop CDBs that embody lower lender and borrower transactions costs.

Can transactions costs be lowered? Examination of the five reasons for high transactions costs set forth above suggests that they can. The first three reasons, (a) to protect bank funds, (b) to provide for internal control, and (c) to educate the farmer, combine to require extensive procedures and paperwork which add up to considerable time and expense for both lender and borrower. In practice many of these procedures do not serve to meet bank objectives or can be simplified by innovations.

Little understood is the principle of fungibility, but as Von Fischke and Adams (1980) have argued it is very prevalent and virtually impossible to control. Therefore, the farmer will tend to use credit as he judges it in his best interest regardless of the voluminous paperwork that is presented to justify the loan. This suggests that much paperwork is superfluous.

As shown in the Bolivian case, the paperwork and many documents required of farmers by banks to obtain a loan serve only as stumbling blocks for them

in obtaining credit. The paperwork and documents need to be carefully reviewed to determine if they are really necessary and be simplified or eliminated according to the lender. Moreover, farmers must make many trips and spend considerable time in travel. These portions of borrower transactions costs could be greatly reduced by taking the bank to the farmer by means of more offices in remote villages or mobile banks.

What should be the bottom line is whether or not the farmer repays the loan. Thus, what is important is to establish a simple system that will screen prospective borrowers for credit worthiness and encourage those granted loans to repay or else lose the right to future credit. Lessons can be learned from successful cooperatives who use credit committees of farmers to review simple applications, where the committee members are able to judge the credit worthiness of a prospective borrower based upon first-hand knowledge of the farmer and prevalent agricultural practices in the region. Cooperatives and groups often use the principles of joint liability in order to establish peer pressure to encourage repayment.

Banks typically require extensive record keeping and review of loan applications at several levels. By reducing the amount of paperwork and the number of documents the sheer volume of record keeping would be reduced. The multiple reviews of loan applications could be eliminated by granting greater autonomy and responsibility to local bank agents. Financial records could be screened to determine just what information is necessary for bank records, and procedures to collect extraneous data discarded. Foreign donors often exacerbate the problem by requiring separate documents for loans made from their credit lines. The need for this should be carefully scrutinized. If uniform procedures could be established for all credit lines bank operations would be simplified and less costly.

Farmer education in financial planning has often not been successful. Most farmers do not understand income statements and balance sheets and it usually results that the bank agent fills out the documents. Educational

programs to introduce new technology could be handled by extension services and not be a cost of delivering credit. If they are part of the credit program a separate charge can be assessed for these services.

The above are suggestive of what might be done to lower lender and borrower transactions costs of credit delivery. Research on simplified CDSs and pilot studies are necessary to determine what means might be successfully employed. Many of the suggested means, and others that might be developed, will fly in the face of the conventional wisdom surrounding good banking practices and small farmer credit programs. This, however, is not a valid reason for failing to evaluate existing procedures and innovate new practices.

It is often argued that the state must protect public and foreign donor funds by requiring all of these costly procedures in order to try to avoid bank losses. This line of reasoning may be fallacious. First, inclusion of such procedures may be an important factor leading to operating deficits in the bank and requiring public sector subsidies to cover the loss. Second, such thinking confuses private and social costs. With high transactions costs the bank appears to be protecting its own private interests yet there is a high social cost of not offering lower-cost credit to larger numbers of small farmers. It is likely that the benefit-cost ratio for the economy as a whole would be higher if more farmers were served and public sector interests were less-well protected. It should be noted, however, that it is not clear that the suggested innovations would lead to larger bank losses. Indeed, if they are properly established it is quite probable that bank performance would improve. As Adams and Ladman (1979) have shown, an important factor contributing to the success of small-farmer group loans has been the investment of time and efforts to properly organize groups.

The fourth reason for high transactions costs was the need to make work for large numbers of persons on the public payroll. Where this situation exists,

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there will be inertia against change. The willingness of the government to confront the interests of this group of workers will be a factor that will influence the ability of the bank to innovate.

Finally, a fifth reason was that the bank used high transactions costs per loan as a means to ration credit and reduce their total level of transactions costs. The result would be that some farmers would be excluded from bank credit and those that received credit would receive larger and longer-term loans. The theoretical analysis and evidence from Bolivia support this argument. This reason is particularly important where concessionary interest rates lead to low bank revenues. Unless the interest rate is raised or lender transactions costs are lowered such rationing will continue, and the bank cannot be expected to want to make smaller loans and reach a larger proportion of the small farmers. It should be recalled that a rise in the bank's interest rate without a lowering of transactions costs will discourage farmers from borrowing from the bank. Thus, to be successful in reaching more farmers, a policy of raising interest rates in combination with lower transactions costs will be necessary.

Clearly, the key for agricultural development banks to reach larger numbers of small farmers and to supplant the moneylender is the lowering of lender and borrower transactions costs. To do this will require that present bank CDSs be carefully evaluated and restructured in order to simplify procedures, lower out-of-pocket costs and lessen time requirements. There will be resistance to such changes that result from the conventional wisdom of bank lending and the vested interests of bank bureaucracies. To not do so, however, will leave small-farmer credit programs continuing to serve a relatively small portion of the rural poor who participate in rural financial markets and leave ample room for the moneylender to operate.

ENDNOTES

1. In practice, LTCs can not be considered in isolation from other costs. For example, it is likely that there is a trade off between them and RC; if the lender were to reduce \overline{LTC} by spending less effort in supervision and control it is likely that there would be a rise in the risk that a loan may not be repaid. On the other hand, lowering \overline{LTC} has certain complementarities with other costs. For example, such action should reduce the need for central administration because there would be fewer procedures and paperwork to monitor, and, thus, lower fixed costs. The net effect of lowering LTC on C would depend on the sum of all these effects.
2. This is a simplifying assumption to avoid expositional problems. The farmer is likely to have savings to use in his farm operations. The effect of these savings could be readily incorporated into the model.
3. The work is shown as follows:
 1. $r_I \cong r_2$
 2. $(R - BC_I) \cong (R - BC_{II})$ by substitution
 3. $BC_I \cong BC_{II}$ by subtraction of R and multiplication by -1
 4. $(IC_I + BTC_I) \cong (IC_{II} + BTC_{II})$ by substitution
 5. $\frac{(IC_I + BTC_I)}{L} \cong \frac{(IC_{II} + BTC_{II})}{L}$ dividing by L to obtain average costs
 6. $(r_I + ABTC_I) \cong (r_{II} + ABTC_{II})$ rewritten in above form
4. The study by Miller and Ladman (1981) supports this view. It shows that high transactions costs associated with the amount of paperwork as well as the amount of time required to travel to the lender are important factors in impeding small farmers in Southern Bolivia from using Bank credit.

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