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INTERLINKED CONTRACTS FROM
A FINANCIAL MARKET PERSPECTIVE**

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1. Introduction

Two prominent features of rural informal finance in low-income Asian countries are that the informal creditor is seldom a full-time moneylender and that informal credit is often combined with transactions in other markets.² Informal lenders include landlords and farmer-cultivators, agricultural commodity traders and input dealers, grain millers, ambulant merchants, retail storeowners, fixed-salary employees and occasional moneylenders. Investigations of rural credit markets conducted in various countries in the last ten to fifteen years show that traders and farmer-cultivators have become increasingly involved in moneylending [Bardhan and Rudra (1978), TBAC (1981), Floro (1987), Bell (1990), Siamwalla (1990)]. This observation contrasts with the situation prevailing in the 1960s when landlords were reported to be the dominant source of informal rural credit.

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² See, for example, the volumes edited by Adams and Fitchett (1992) and Ghate (1992). See also the symposium issue of the *World Bank Economic Review* (1990) on "Imperfect Information and Rural Credit Markets."

The rationale for combining credit with transactions in other markets has been the subject matter of the literature on interlinked transactions.³ More specifically, the complex relationship between landlord and tenant that encompasses both factor and product markets has been the focus of this literature. For instance, Braverman and Stiglitz (1982) and Mitra (1983) analyzed the linkage between consumption or production credit and a tenancy contract in terms of the incentive effect of borrowing on tenant effort. In Braverman and Guasch (1984) a credit cum tenancy contract is analyzed as a mechanism through which landlords sort high-ability tenants from a heterogeneous pool of applicants. The risk-sharing feature of interlinked transactions is examined by Kotwal (1985) who shows how consumption credit acts like insurance for tenant borrowers when there is production uncertainty.

While informal credit invariably plays an important economic role in models of interlinked transactions, the models do not necessarily have a credit market focus. Rather, the focus of the analyses has been the market for tenancies where moral hazard and adverse selection problems provide the rationale for interlinking. The interlinked markets literature has leaned towards demonstrating within the framework of sharecropping the efficiency of interlinked arrangements when information is asymmetrically distributed between two contracting parties. Moreover, trader credit has been relatively neglected in the interlinked markets literature despite its observed tendency to become more pervasive with the

³ An interlinked transaction is one in which two parties trade in at least two markets on the condition that the terms of all such trades are jointly determined. Bell (1988) surveys the literature.

commercialization of agriculture.⁴ As Bell (1988: p. 827) noted, "the interlinking of credit and output needs more specific attention than it has received so far."

This paper analyzes the interlinking of credit and marketing contracts from the perspective of a credit market transaction. A credit transaction involves the exchange of a good (the loan or financial service) now for a promise to pay a specified amount in the future. Uncertainty over the realization of the commitment, which is contingent upon the ability and willingness of the borrower to pay, is therefore inherent in all credit transactions. Collateral is regularly used to screen borrowers and to enforce debt contracts⁵ but its use in rural credit markets is frequently inhibited by an inhospitable insurance and legal environment. Furthermore, many rural borrowers lack sufficient amounts of assets considered acceptable as collateral (e.g. titled land) to secure their loans. Under these circumstances, both parties to a credit contract have an incentive to use collateral substitutes [Binswanger and Rosenzweig (1986)], of which credit tying or the interlinking of transactions is one form.⁶

This paper addresses the implications of credit tying as a collateral substitute on the operations of informal lenders in a rural financial market. Given that lenders employ

⁴ The few exceptions include Gangopadhyay and Sengupta (1987), Floro (1987), Bell and Srinivasan (1989) and Fabella (1992).

⁵ A collateral is any asset that the borrower agrees to forfeit to the creditor in the event of non-repayment of a loan. For an analysis of the screening role of collateral, see Bester (1985) and Besanko and Thakor (1988). The enforcement role of collateral is discussed in Benjamin (1978).

⁶ Other forms of collateral substitutes are third party guarantees, the threat of exclusion from future credit market transactions, social ostracism and joint liability. While interlinked transactions have been referred to as collateral substitutes, they have not been explicitly analyzed as such.

different forms of market interlinkage (e.g. labor-credit, land-credit, output-credit) or none at all, a key argument is that informal creditors differ in their abilities to deal with the information and enforcement problems in the credit market. Consequently, informal lenders limit their transactions largely to specific segments of the borrowing population about whom they are relatively well-informed and with whom they are capable of enforcing repayment. This implies that policy interventions which treat the informal credit market as an undifferentiated whole may miss their mark.

In the next section, the motivation for credit market involvement by traders is discussed. The institutional setting for this discussion is the rice economy of the Philippines where yield-increasing production technology, land reform and rural bank failures have shaped the evolution of the rural credit market. The importance of trader-lenders as a source of informal credit is shown using data from village surveys.

Using the notion that an interlinked contract acts as a collateral substitute, the third section illustrates the advantage of an informal rural lender who employs interlinking (an interlocker) over an informal lender who does not (a pure moneylender). This advantage is shown to translate into a more favorable loan contract, in terms of loan size and interest rate, for a borrower who confronts both types of lender. Allowing for different borrower types and differences in lenders' abilities to transact with them leads to the hypothesis that the allocation of informal credit is based on a matching system where a borrower's characteristics that are important from the viewpoint of the lender's non-credit market activities influence the probability of getting a loan.

The fourth section presents some empirical results using Philippine data that support the above characterization of the rural credit market. The paper concludes with a discussion of the limits of informal finance and some thoughts regarding policy intervention in rural financial markets.

2. Traders as Lenders

2.1 Motivation

One of the stylized facts about informal rural finance in low-income countries is the presence of commodity traders who provide production loans to farm producers with or without explicit interest and with the requirement that the output be sold to or through the trader-creditor. Since traders are essentially buy-and-sell agents, their involvement in informal credit is motivated mainly by their objective to secure reliable sources of the traded good. This is especially true for crops such as rice and corn which have a definite production cycle.

Suppose that a farmer produces output Q according to the production function $Q = Q(B; N)$ where B is a variable input and N is a fixed input. Assume that all variable inputs are financed from borrowing. At harvest time, the farmer sells his marketable surplus, q , at a given price p to the trader and repays his loan $(1+r)B$, where r is the contractual rate of interest on loans from the village moneylender. Household consumption of Q is x , a constant. The profit from operating the farm is

$$\pi^f = p[Q(B;N) - x] - (1+r)B \quad (1)$$

where the bracketed expression $[Q(B;N) - x]$ equals q , the producer's marketable surplus. Maximizing (1) with respect to B yields the first-order condition for the profit-maximizing level of borrowing, B^* , as a function of output price and the rate of interest, denoted by $B^*(p,r)$. Any B^* for a given value of x is associated with a $q^*[B^*(p,r)]$ which is the level of marketable surplus that B^* can support.

The source of the commodity trader's profit is the difference between the competitively determined market price P at which he sells q and his purchase price p plus the cost c incurred for performing the trading function. The trader's profit may then be written as

$$Z^T = (P - p - c)\Sigma q_i^* \quad (2)$$

where Σq_i^* is the total quantity of q purchased from producers $i = 1, 2, \dots, n$ and each producer sells his q_i^* . Clearly trader profits are positively related to q_i^* .

If the local output market is competitive, the trader is unable to set p so that the only way to maximize profits is to increase the volume of trading, Σq_i^* . However, the total volume bought and sold in the local market is the sum of the individual producers' q_i^* s, over which the trader has no control. The trader can, of course, try to increase Σq_i^* by increasing the number of producers from whom he buys products. But without an instrument to attract existing sellers, an increased market share may not be realized. With many traders, there is no certainty either that any new producer will sell to him. The trader's problem is,

therefore, how to induce more producers to sell their output to him as well as to influence the quantity of q_i purchased from each producer.

From (2) trading profits are affected through q_i^* by the producer's borrowing behavior as embodied in $B^*(r)$, his loan demand function. Suppose there is a change in r . Then

$$\frac{dz^T}{dr} = (P - p - c) \frac{\partial \sum q_i^*}{\partial B^*} \frac{\partial B^*}{\partial r} < 0 \quad (3)$$

shows that the interest rate at which the producer is able to obtain credit affects the trader's profits. Thus, an increase in interest faced by borrowers adversely affects the trader's income from marketing. But where the trader has no control over r , he cannot do anything about q_i . This provides the motivation for the trader's involvement in the credit market. By providing farm producers with a credit line, the trader can then require his borrowers to market their output through him.⁷

Local economies of scale in trading contribute to the competition for market share among traders and increase the incentive for individual traders to obtain guarantees of output delivery at harvest time in exchange for credit. Two other reasons for trader lending are proposed by Floro and Yotopoulos (1991): the alternative use of trader's capital through moneylending during the planting season when trader's funds are idle and farm households need liquidity; and the advantage that may derive from interlinking because of a lower

⁷ The tie-in sale provision in the loan contract does not necessarily guarantee that the borrower will make good on his promise to sell his output to the trader. The trader must still ensure that sufficient incentives exist for the borrower to honor the tie-in sale provision. Access to future loans is one such incentive.

procurement price for the crop delivered at harvest time when market prices are comparatively low.

This analysis suggests that, from the trader's viewpoint, the credit transaction is necessary to the extent that it sustains his trading activity.⁸ From the borrower's viewpoint, the attractiveness of the informal credit arrangement is due in part to inaccessibility of the formal credit market to asset-poor borrowers who do not possess collateral generally accepted by lenders. The interlinked arrangement, by ensuring the double coincidence of interests between the trader-lender and the farmer-borrower, can fulfill the role of a collateral substitute, without which lending may be highly risky for the former and borrowing prohibitively costly for the latter.

2.2 Relative Importance

Table 1 presents data taken from various surveys conducted at different times and in different geographic areas in the Philippines which show the share of various types of informal lenders in the total volume of loans transacted in rice-growing areas. The columns may not be directly comparable because of sampling differences and possible discrepancies in the classification of lender types. Variations in production environments across the areas covered in the surveys also limit data comparability. Nevertheless the pattern shown is in

⁸ The same may be said for farmer-lenders who engage in moneylending to reduce monitoring and recruitment cost of hired labor. The analytics involved are presented in Esguerra (1993) and are essentially similar to what can be found in existing models of interlinked credit and tenancy contracts.

general agreement with expectations given the developments that affected agriculture and rural financial markets in the Philippines during the periods under consideration.

Table 1: SHARE OF DIFFERENT LENDER TYPES IN TOTAL VOLUME OF LOANS TRANSACTED, VARIOUS YEARS, PHILIPPINES

Lender Type	1957-58 ^a Rice	1957-58 ^b Rice	1975-76 ^c Rice	1978 ^d Rice	1984 ^e Rice
	Percent of Total Volume of Loans				
Total Formal	25.1	20.0	78.4	32.0	12.8
Total Informal	74.9	80.0	21.6	68.0	87.2
Landlord	60.8	23.0	0.0	12.2	2.5
Trader	0.6	8.0	20.0	14.8	40.8
Moneylender	5.8	0.0	0.0	0.4	0.0
Input Dealer	0.0	0.0	0.0	9.6	0.0
Farmer	0.0	4.0	0.0	13.6	24.9
Other Merchants	0.0	28.0	0.0	0.8	0.0
Other Sources	7.7	17.0	1.5	15.0	19.0
Rice Miller	0.0	0.0	0.0	1.6	0.0

^a Survey area: Nueva Ecija province

^b Survey area: Nationwide

^c Survey area: Iloilo, Ilocos and Zamboanga provinces

^d Survey areas: Provinces of Bulacan, Camarines Sur and Isabela

^e Survey areas: Provinces of Cagayan, Nueva Ecija and Iloilo

Source: Nagarajan (1992)

The share of informal loans has always exceeded the share of formal loans, with the exception of the period 1975-76. This period coincided with the peak of Masagana 99, the government-sponsored subsidized credit program for rice which targeted small rural borrowers.⁹ This program increased the share of formal credit going to agriculture in its

⁹ Esguerra (1981) provides an analysis of the redistributive impact of this credit subsidy program.

early years. However, loan arrearages eventually led to its demise in the early eighties, and many rural banks subsequently failed. The informal lenders then reasserted their dominance over the rural credit market.

The composition of informal lenders has also changed over the years. Landlords accounted for 61 percent of the loan volume in rice areas before 1960, but after 1980 their share had dropped to less than three percent. What is striking is that the 1984 data contain information from two provinces other than Nueva Ecija¹⁰ not included in the 1957-58 data where land reform is not known to be as successful. So that even allowing for the possibility that the 1984 data might have underestimated the proportion of loans from landlords, the data still reflect a sizable decline in landlord share that has to be explained. On the other hand the share of trader-lender loans has increased from less than 10 to 41 percent within the last twenty-five years. The same trend can be observed for farmer-lenders whose loan share had risen to 25 percent in the 1980s from nil prior to 1960.

The change in composition of informal lenders described above can be explained as a concomitant feature of the process of commercialization of rural economies. In the Philippine rice economy, the impetus came from Green Revolution technological changes and land reform in the 1970s. With the new rice technology, the induced adoption of commercially produced inputs and the production of larger marketable surpluses hastened the development of both input and output markets. Tenurial arrangements were affected

¹⁰ Nueva Ecija is the primary rice growing province in Central Luzon, accounting for more than half the region's rice output. More than 90 percent of the cultivated area in Nueva Ecija is planted to rice.

by land reform and one option adopted by some former landlords was to become commodity traders. All these changes had an impact on rural financial markets.¹¹

The increased yields resulting from the modern rice varieties created profit opportunities in output marketing. Recent studies of the rice marketing system in the Philippines [Umali (1987), Umali and Duff (1988)], using survey data from Muñoz,¹² Nueva Ecija, show that the rice marketing functions (e.g. storing, milling, transporting and retailing) are carried out by different private agents. Traders and commission agents buy paddy directly from farmers for resale to rice millers who store and mill it into rice. Milled rice is then sold to wholesalers and retailers.

Umali reports rather high trading profits for traders operating in Muñoz. However, given the generally small volume of grain handled by traders and the seasonal nature of their activity, the profitability of buying and selling is concentrated in a fairly short harvest and post harvest season of only two to three months. Most owners of grain-buying stations report that their profits greatly depend upon their volume and rate of turnover. Because of this fact and the price competition caused by many paddy buyers, it is in the interest of individual traders to maintain regular and secure sources of paddy during the trading season. Lending to farmers during the cropping season on the condition that they get first claim to the borrower's harvest helps assure the traders of a stable paddy supply. This implies that

¹¹ A discussion of how technological change and land reform affected rural financial markets in the Philippine rice economy can be found in Esguerra (1993) and in Esguerra and Meyer (1992).

¹² Muñoz is one of the municipalities of Nueva Ecija. It serves as the town center for about twenty rice growing villages.

traders evaluate the creditworthiness of loan applicants on the basis of their ability to supply paddy at harvest time. The size of the borrower's marketable surplus is, therefore, an important screening variable that trader-lenders use in their lending.

Recent information on the relative importance of trader-lenders in informal credit markets is contained in two studies of the rural financial market in Muñoz, Nueva Ecija. In the villages of Maragol and Gabaldon, Nagarajan (1992) found a variety of informal lenders including farmers, traders, professional moneylenders, landlords, retail storeowners and other occasional lenders (e.g. school teachers and other professionals). Out of the 150 different lenders operating in the two villages, 57 percent were farmers and 17 percent were traders. While traders were less important in terms of number, they were involved in more transactions than farmer-lenders and they also lent larger loans. These data, which cover the three cropping seasons in 1988-1989, show that of 599 informal loans transacted, traders accounted for 41 percent and farmers 39 percent. In terms of total loan volume, the share for traders was 63 percent while farmers had 21 percent.

Esguerra (1993) used data collected from two cropping seasons in 1987-1988 from four other villages¹³ in Muñoz and found that traders and farmers constituted the major sources of informal loans in these villages (Table 2). Together these two lender types made up 56 percent of all informal lenders reported in the village surveys and accounted for 59 percent of the total amount of reported loan transactions. The largest single category of informal lenders was farmer-lenders who made up 48 percent of the number of informal lenders. However, they provided only 24 percent of the total value of loans made. Paddy

¹³ The villages are Villa Nati, Sapang Kawayan, Villa Cuizon and Mangandingay.

traders or rice middlemen clearly were the most important loan source in terms of their share in the total volume (35 percent). Their share in the total number of reported loans was 31 percent.

Table 2: THE RELATIVE IMPORTANCE OF INFORMAL LENDERS IN FOUR VILLAGES OF MUÑOZ, NUEVA ECIJA

Informal Lender Type	Number of Lenders	Percent Share in Number of Loans	Percent Share in Total Loan Volume	Average Monthly Interest ^c Rate (%)
Farmers	48	34	24	7.4
Moneylenders	6	12	12	14.9
Trader/Millers	16	31	35	9.1
Others ^a	45	17	19	10.4
All Informal Types	115	94	90	
Formal Sources ^b	5	6	10	3.3

^a Includes retail storeowners, input dealers, civil servants and occasional lenders.

^b Includes a rural bank, a commercial bank branch and a cooperative.

^c For loans requiring repayment in kind, rates were imputed from product prices.

Source: Esguerra (1993)

In terms of how technological change and land reform affected product and factor markets, the pattern described above for the Philippines has its parallels in other countries. As early as the 1970s, Bardhan and Rudra (1978) already noted the trend in India towards self-cultivation with the help of hired labor. They attributed this trend to the profitability of self-cultivation because of advances in technology and tenure legislation. In the Philippines, these factors help explain the prominence of farmer-lenders. The importance of traders as informal lenders is also consistent with the observations of other analysts

regarding the tendency for the share of trader-lender loans to grow with increasing commercialization [Bell (1988)].¹⁴

3. Tied Output Sales as a Collateral Substitute

3.1 Rationale

The tying of credit to output sales to the creditor serves as a collateral substitute in two ways. First, it acts as a screening device. The requirement to sell output to the creditor has the effect of sorting loan applicants into two groups: one group who needs marketing services, and the second group who have less need of these services. Small farmers often have an incentive to use the services of a trader or marketing middleman because typically they cannot afford to invest in storage and in acquiring their own means of transporting their output to the market, or cannot do so as cheaply as traders.

The middleman usually shoulders the cost of transporting the product and relieves the farmer of storage problems. In the Central Luzon rice producing areas, the common alternative is to hire the services of private vehicle owners (usually pedicab operators) who normally charge a fixed amount per sack of paddy. Small producers, but with larger marketable surpluses are, therefore, attracted to a credit cum marketing contract because of the reduction in marketing costs. Traders, on the other hand, prefer to transact with farmers with larger marketable surpluses to the extent that there are local economies of scale in procuring and storing output. From a credit market viewpoint, borrowers with

¹⁴ This tendency has been empirically observed in India by Bell (1990), and in Thailand by Siamwalla et al (1990).

larger marketable surpluses will also tend to have a better ability to repay their loans. Thus, by indirectly screening out those loan applicants with a lesser ability to produce a large marketable surplus, the linked output arrangement in effect also indirectly screens out applicants with less ability to repay loans.

Second, the marketing-credit link is an additional instrument for enforcing the loan contract. By acting as the buyer of the borrower's produce, the lender can more directly verify the borrower's repayment ability at harvest time, as well as simultaneously satisfy his claim to a portion of the proceeds from the output sale. The degree to which the lender can enforce the credit contract depends, however, upon the incentives that exist for the borrower to fulfill his promise to deliver the output to the creditor. If the creditor is the only outlet through whom the borrower can market his product, then enforcement of the credit contract is facilitated by the interlinkage of credit with marketing. If there are competing marketing outlets available to the borrower, repayment is not necessarily guaranteed, because the borrower may sell his output elsewhere and choose not to repay the loan. The possibility of this occurrence can be reduced, however, by several factors. Trader-lenders may engage in close monitoring of their borrowers' actions. They may informally employ village residents for the purpose of informing them about the timing and size of their borrowers' harvests. In most cases, traders will be present at harvest time to provide the means for hauling and transporting the borrower's output to the market, so this reduces the borrower's opportunities to escape repayment. At the extreme, output buyers may share information about their clientele, and the knowledge that a co-worker in the trade is being cheated could result in their refusal to do business with that farmer. The

switching of lenders undoubtedly occurs when one trader essentially buys out the contract of another, but probably both the farmer and the new trader expect this to mark the beginning of a long-term relationship in which the farmer will have access to loans.

On the borrower side, the savings in transaction costs resulting from the credit-marketing linkage, compared to two separate credit and trading contracts, may be significant enough to deter selling to traders other than the creditor. In addition, the linked transaction may make the possible discovery of undesirable behavior in one market and the costs of loss of reputation too costly for the borrower-seller because of spillover effects that threaten other transaction(s) [Bardhan (1989)]. For instance, if the borrower does not repay or sell his product through his lender, he may lose in two ways. He may find himself without any credit source in the next cropping season and he may also incur higher marketing costs because he lost a ready buyer in his former creditor. Under the circumstances presented above, the marketing-credit link makes the credit contract enforceable and, therefore, acts as an effective collateral substitute.

The marketing link, however, is necessarily an "imperfect" form of collateral substitute in that it does not always assure that the lender will be fully repaid. Since the crop is the collateral, production uncertainty makes the returns from lending vulnerable to chance occurrences.¹⁵ In addition, the possibility always exists that a borrower may engage in opportunistic behavior unless there are incentives strong enough to discourage this action.

¹⁵ Where crop insurance is available, some of the production uncertainty may be reduced. A trader-lender could require that insurance is purchased and even lend money for the premium.

The marketing link, therefore, fails to qualify as an ideal form of collateral¹⁶ because it easily violates the requirement concerning the absence of collateral-specific risk [Binswanger and Rosenzweig (1986)].

3.2 A Diagrammatic Exposition

A model of a credit transaction is needed in order to analyze how the trader-lenders and farmer-borrowers benefit from using market interlinkage as a collateral substitute. The model presented here is based on Milde and Riley (1988). Only a graphical analysis is presented below with a more detailed discussion found in Esguerra (1993).

Assume a risk neutral farmer-borrower maximizing expected profit, $E\pi$. Figure 1 shows the borrower's notional demand schedule $D(r)$ for loans from the informal credit market. Associated with the borrower's demand schedule is a family of iso-expected profit curves which are concave in the space of loan size, B , and the rate of interest, r , the maximum points coinciding with the demand curve. One of the borrower's iso-expected profit curves is shown as $E\pi_b$. All points on the contour $E\pi_b$ yield the same level of expected profit regardless of the interest rate and loan size combination. Iso-expected profit curves in the southeast direction denote higher expected profits as they involve combinations of larger loan sizes and lower interest rates.

¹⁶ That is, in the sense that the lender cannot fully recover the amount of the debt in case the borrower defaults.

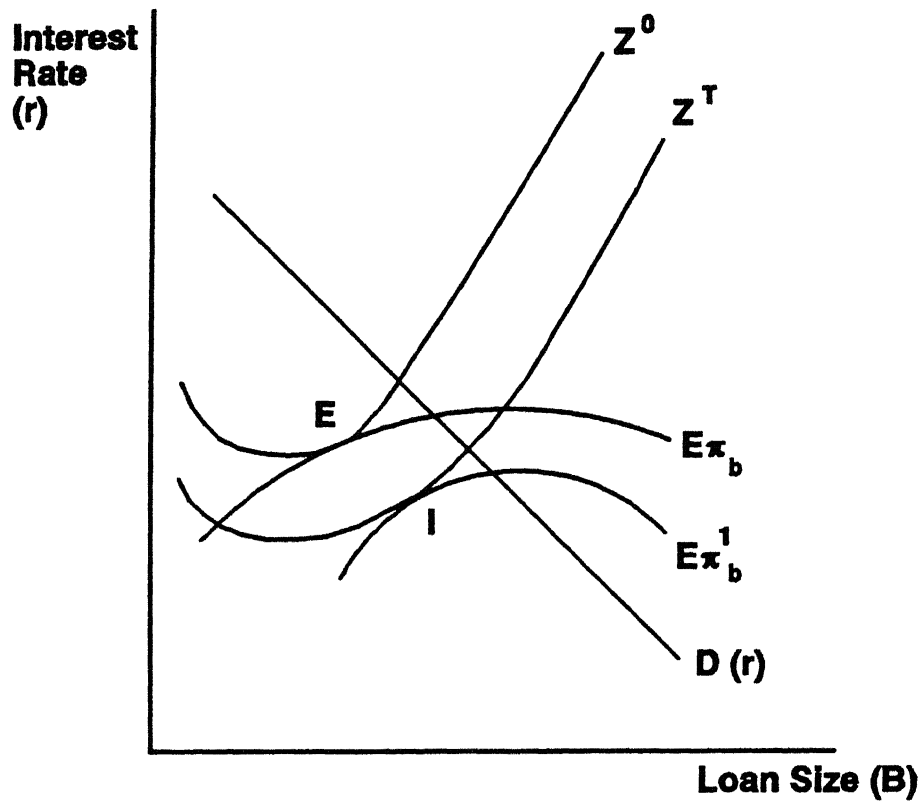


Figure 1. Contractual Equilibrium for Trader-Lenders and Moneylenders

There is a pure moneylender maximizing expected profit, z . Suppose that moneylending is characterized by free entry. Let Z^0 be the moneylender's zero iso-expected profit contour which is the locus of contracts (loan size and interest rate combinations) that yield zero profits for the moneylender. Above zero profit levels are denoted by iso-expected profit curves to the northeast of Z^0 . It can be shown that Z^0 will have both a declining and an increasing portion. On the declining portion where loan sizes are relatively small, fixed costs are more important than default costs, so increasing loan size reduces the effect of

these costs. As B increases, however, the probability of involuntary default increases since the borrower's repayment obligation increases while his debt service capacity will be constrained at some point by decreasing returns on investments. In addition, a larger loan size may increase default if it increases the incentive for a borrower to "take the money and run." For large values of B , therefore, default costs are the more important cost component influencing the lender's iso-expected profit curve.

In a competitive credit market, borrowers will maximize their expected profits by choosing a combination of r and B subject to the constraint that the moneylender does not make a loss on the contract offered. Graphically, the equilibrium is defined by a point of tangency between the borrower's and lender's iso-expected profit contours shown as point E in Figure 1. This is a familiar result seen in the recent credit market literature [Jaffee and Russell (1976), Milde and Riley (1988), Bell (1988)].

Suppose there is a trader-lender. Let the trader's zero iso-expected profit contour be described by Z^T . In the interlinked transaction, the trader-lender is able to combine the screening and enforcement functions of moneylending with his trading functions. The economies of scope realized in undertaking this joint activity translate into lower lending costs which allow the trader-lender to offer loans at more favorable terms than can the pure moneylender. Therefore, in Figure 1, Z^T lies below Z^0 so that for the same rate of interest (loan size), the trader-lender can offer the borrower a larger (lower) loan (interest rate) than the pure moneylender. The pure moneylender cannot compete with the trader because any contract offer below Z^0 will be unprofitable for him. Equilibrium is at point I involving

a lower rate of interest and a larger loan compared to point E so the borrower is clearly better off with the linked contract.

The preceding discussion would seem to suggest a scenario where pure moneylenders are driven out of business by interlockers. This could occur in a credit market regime where informal lenders can insist on exclusive contracts. The difficulty of enforcing exclusivity in credit agreements, however, does not make such a possibility probable. If contracts are non-exclusive, the borrower may still resort to the pure moneylender if his transactions with the interlocker leave him with an unsatisfied demand for credit, which is always possible when collateral is imperfect. However, even in the unlikely situation in which exclusive contracts can be enforced, the pure moneylender may be the only other source of loans for borrowers who do not possess the collateral substitute required by the interlocker.

The advantage conferred by the interlinked contract on the interlocker is limited to borrowers who are within the scope of the interlocker's non-credit market activity. For instance, the trader in good X reaps the advantage of scope economies by being a creditor to producers of good X. However, with respect to producers of good Y, the trader in good X may not be able to offer a better loan contract than the pure moneylender when the scope economies enjoyed in interlinking are specific to transactions with good X producers.¹⁷ The presence of lenders who can offer interlinked loans, therefore, does not necessarily drive pure moneylenders out of the rural credit market.

¹⁷ Another possibility is that the economies of scale of a large moneylender may swamp the economies of scope of a small trader.

This line of argument can be extended to the case of different borrower and lender types. Consider two borrower types, namely, farmers and landless workers, and two creditor types, farmer-lenders and trader-lenders, all of which are prevalent in the rice-growing areas of the Philippines. Farmers regularly deal with agricultural workers in the labor market, and can make use of the loan applicant's commitment of labor services as a collateral substitute. Loan contracts between farmer employers and their workers are enforceable because the outstanding debt can be subtracted from the worker's wages at harvest time. Traders cannot do the same with respect to landless workers. In addition, since traders usually operate from town centers, they have less intimate knowledge of village residents, and are unable to make use of the informal network of village social relations for gathering information about loan applicants who are landless workers. Obviously, it is the farmer-lender is better equipped with the screening and enforcement technology for dealing with landless workers in the credit market.

Trader-lenders, on the other hand, have an advantage over farmer-lenders in dealing with farmer-borrowers because of their regular contact in the product market. This contact produces information for traders regarding various farmers' resources and abilities to pay. Traders can then condition loans on their right to exclusively purchase the borrower's output, and through such linkage enforce repayment.¹⁸

The trader's advantage over the farmer-lender may also derive from a lower opportunity cost of lending during the planting season. The trader's funds are relatively

¹⁸ Part of the trader-lenders' advantages may be diminished in environments where farmers are accustomed to exchanging labor and other services.

abundant during this period, putting him in an excellent position to meet the credit demand of farmers.¹⁹ On the other hand, because of the concurrent timing of crop growth cycles and farm operations within an ecologically circumscribed agricultural region, a farmer will generally be constrained in his ability to lend funds to other farmers during the planting season.

Differences in the nature of the principal economic activities of informal lenders account for different forms of interlinked transactions. From a credit market perspective, these forms of interlinkage may be broadly interpreted as different screening and enforcement technologies which are lender- and borrower-type specific. That is, the advantage that derives from their use is limited by the nature of the economic activities of both the borrower and the lender. A trader-lender cannot effectively employ a marketing link to enforce loan repayment from a landless farm laborer who has little or no marketable surplus. Neither can he condition a loan granted to a landless worker on the latter's commitment of farm labor services unless the trader is also engaged in farming or another activity for which he needs to employ labor. Similarly, it is difficult for a farmer-lender to secure a loan made unless he already has excess capacity for hauling, storing and transporting a farmer-borrower's product to the wholesale market. Thus, the specificity of the screening and enforcement technology embodied in the interlinked contract implies differential advantages for different interlocker types in dealing with different types of clienteles in the rural credit market.

¹⁹ It is expected that the trader will liquidate his previous stocks over the growing season so his liquidity rises at the same time the farmer's liquidity declines due to production and consumption expenditures.

4. Evidence of Matching

The preceding analysis provides an explanation for the common observation that the informal credit market is actually composed of small market niches where lenders and borrowers are matched on the basis of some existing personal or business relationship outside of the credit market. It also helps explain why all borrowers do not have equal access to all informal credit sources.

When lending is done primarily to promote a related economic activity, the attributes of borrowers that contribute to the profitability of that activity become crucial screening variables for the credit transaction. In the case of trader-lenders who lend primarily to sustain their trading activity, it is expected that their loans will go mainly to farmer-borrowers who have large marketable surpluses of the traded commodity. On the other hand, farmer-lenders who lend in order to reduce labor recruitment and monitoring costs are expected to lend a proportionately larger share of loans to households with a higher rate of participation in the rural labor market (i.e. landless agricultural households, small subsistence farmers, large households).

Studies of how borrowers and lenders are matched in the informal credit markets in the Philippines have examined the characteristics that differentiate the clienteles of trader-lenders from those of farmer-lenders. Floro (1987) studied the sorting behavior of trader- and farmer-lenders using 1984 survey data from both developed and marginal areas in three Philippine provinces.²⁰ Borrowers were classified by income strata into poor, middle and

²⁰ Developed areas were defined as those which exhibited high productivity and a relatively high degree of commercialization, while marginal areas did not. The provinces were Cagayan, Nueva Ecija and Iloilo.

rich households.²¹ Conditional probabilities of credit disbursements to the different borrower classes were computed for trader-lenders and farmer-lenders. Floro found that in both the developed and marginal areas, the probability that rich farm households obtained their loans from traders was fairly close to unity, while the probability that poor borrowers obtained their loans from farmer-lenders was higher than the probability of borrowing from any other source. She also found that trader-lenders allocated a larger proportion of their loans to rich farmers, while farmer-lenders allocated more to poor ones.

Nagarajan's (1992) study of 127 farm households in two villages of Muñoz, Nueva Ecija revealed the same pattern found by Floro. When households were classified by farm size, the results showed that 66 percent of the reported farmer-lender loans were transacted with farm households operating less than two hectares compared with 52 percent of trader loans going to this category. The trader's preference for larger farms was evident in that 48 percent of their loans went to households with farm sizes over two hectares compared to 34 percent for farmer-lender loans. Farm households operating less than one hectare of farmland borrowed more frequently from farmer-lenders while those with larger farms borrowed more from trader-lenders. In addition, Nagarajan found that 55 percent of trader-lender loans went to persons classified as business partners in trading, and 58 percent of all trader loans went to borrowers who had been regularly borrowing from the traders for more than five years.

²¹ This classification was based on the annual net earnings of the 111 farm households included in the sample. For details, see Floro (1987) and Floro and Yotopoulos (1991).

The pattern of credit allocation in four other villages of Muñoz was examined by Esguerra (1993) using credit market data provided by 170 households. Unlike the two previous studies, farm, landless and non-farm households were all included in the borrower sample. Seventy-four percent of all trader loans went to farm households, representing 89 percent of the total volume of loans granted by traders during 1987-88. For the farm households, traders provided 35 percent of the total number and 38 percent of the total amount of loans received. Traders, therefore, lent primarily to farmers, and farmers borrowed mainly from traders.

On the other hand, 44 and 22 percent of the number and volume, respectively, of farmer-lender loans went to landless workers. For the landless households, farmer-lenders were the most important source of informal loans, accounting for 57 percent of the total number and 45 percent of the total volume of loans received. The amount of credit going to this group is significant in view of the fact that landless farm laborers are generally poor, possess no collateralizable assets and are normally considered bad credit risks. These data suggest the comparative advantage of farmer-lenders in lending to this particular group of rural loan applicants consistent with their ability to enforce repayment through a labor-linked contract.

Econometric tests of the probability of obtaining loans from the different informal lender types support the hypotheses that trader- and farmer-lenders choose their borrowers based on the requirements of their occupational specializations. Nagarajan estimated a multinomial logit model with the probabilities of obtaining loans from alternative informal sources (including none) as the dependent variable and borrower characteristics as

explanatory variables. She found that poorer households with smaller marketable surpluses had a higher probability of being matched with farmer-lenders than with trader-lenders. On the other hand, farm households with higher initial wealth (as measured by total value of physical assets excluding land) and a capacity to produce a larger marketable output tend to be matched with trader-lenders.

Esguerra also estimated a multinomial logit model and found that the important characteristics that differentiated the borrowing clienteles of trader-lenders from farmer-lenders were associated mainly with the capacity to produce a marketable surplus of paddy and to participate in the rural labor market. Based on various indicators of readiness to supply farm labor (e.g. landlessness, labor contract type, degree of dependence on labor income), borrowers from trader-lenders tended to participate less in the labor market than borrowers from farmer-lenders. The inference, therefore, is that these borrowers are more likely to be full-time farm cultivators than small subsistence farmers and landless rural workers. Farm size, which was used as a proxy for the ability to produce a marketable surplus, also discriminated the customers of trader-lenders from those of farmer-lenders. Borrowers from traders tended to have larger farm plots, but the farm size variable performed best as a predictor in the presence of dummy variables for different tenurial arrangements and village location. The dummy variables for tenure status were used as indicators of the borrowing household's command over the disposition of output. Land ownership was found to be crucial for entering into a contract with trader-lenders. In general the data supported the hypothesis that farmer-lenders and trader-lenders sort

borrowers based on ability to supply labor services and marketable surplus, respectively, which are key inputs in the lenders farming and trading activities.

5. Conclusion and Implications

The preceding discussion suggests that an essential feature of informal credit within interlinked contracts is the importance of lender type in the credit transaction. This is a consequence of the costliness of contract enforcement on the one hand, and the limited ability of borrowers to offer easily marketable collateral on the other hand. Restrictions on the range of possible assets that can be advanced as security for a loan -- because of unfavorable initial endowments or limited or absent (sales) markets -- restrict borrowers to lenders who have direct use value for the collateral (substitute) offered. The requirement for a double coincidence of interests to exist between borrower and lender basically distinguishes an informal credit transaction with interlinkage from a pure credit transaction with a financial intermediary.

The fact that labor-linked and product-linked informal credit transactions are most prevalent in several Asian countries raises the question of the conditions under which these types of financial transactions can be expected to appear and serve as a complementary source of finance, especially for small, low-income farm households. These conditions appear to include technological change which increases farmer demand for credit to purchase inputs, the production of a significant marketable surplus, and regulations or local customs which prevent tenancy contracts in which landlords provide most of the informal credit. There must be a sufficient volume of commodities produced with marketing margins

attractive enough to encourage the entry of specialized traders. Furthermore, the regulatory and institutional environment must be conducive to private (as opposed to parastatal or cooperative) trading; there must be sufficiently good transportation and communication systems to facilitate the assembly, transport and storage of commodities; and the formal financial system must not be a dependable supplier of rural loans. In other words, there must be a favorable enough environment for a significant group of farmers to be able to produce and a group of traders that want to compete in trading.

The existence of various types of informal interlinked credit contracts can make an important contribution to the financing of development, but the limitations are obvious and important. First because of the matching of borrowers and lenders discussed above, rural credit markets will tend to be segmented with a number of implications. One is that a farmer wanting to finance a new crop in an area where it is not typically grown will have difficulty in finding a suitable lender who is willing to make the loan. To the extent that the opportunities for linking credit with other transactions are associated with the development of agricultural markets, a second implication is that borrowers in low productivity, less commercialized areas will likely have less access to credit and face higher costs, as is the case with formal finance and most other services and commodities. A third is that the lenders, who by definition are limited to operations in fairly small geographic areas where returns are correlated, will be vulnerable to major shocks (droughts, typhoons, floods, etc.) and may be unable to meet the simultaneous demand for loans from many potential borrowers.

A second major limitation is that these interlinked contracts are most likely to be limited to short-term working capital for selected commodities and will not likely be the source of investment capital for machinery, equipment and land improvements. Finally, because of the cost of acquiring information, traders in newly privatized markets are likely to proceed slowly and may provide little credit initially until they have successfully developed relationships with a set of producers they can trust. Failure to do so would likely be fatal for traders in those countries where respect for contracts has disappeared.²²

Considering that this type of informal finance successfully meets some important needs, what should be the appropriate role of public policy? Are there things that governments and donors can and should do to stimulate interlinked credit contracts? The first obvious point is to reduce or remove impediments for traders to engage in such transactions. In some cases, financial institutions have been prohibited from making marketing loans because trading was considered speculative. The important point is that trader loans made prior to or during the production season can have a positive impact on production. This should be encouraged, not prohibited.

The institutional design challenge is to create an incentive-compatible contract that, on the one hand, utilizes the local agent's superior information and contract enforcement technology and, on the other hand, the financial institution's access to more and cheaper funds. One obvious way employed by some banks is to hire bank staff from the local community. A second way involves the development of three-party agreements involving

²². Peace and order problems in many parts of the Philippines in recent years are likely to have inhibited informal credit contracts because of the uncertainties faced by both farmers and traders. Similar problems likely exist in many African countries.

farmers, traders (including cooperatives) and banks. The farmers agree to produce and deliver to the trader. The trader screens the farmers prior to entering into the purchase agreement. The trader may provide seed and other inputs not readily available in the market. The bank provides the loan with the trader deducting the loan payments from the proceeds at the time of sale. These arrangements work particularly well when the trader (such as the wheat cooperatives in Brazil) is the only outlet for the farmers' product.

One attempt to use local involvement in loan screening and collection that was a great failure was the use of loan committees to compile lists of eligible farmer-borrowers in Bangladesh. Anyone who had enough influence to get placed on the list essentially received an entitlement to a loan. Many loans were converted into grants by the borrowers who defaulted and the committees did little to help the banks collect [Khalily and Meyer (1993)]. Some attempts are being made in African countries to utilize local village headmen to screen individual borrowers, witness loan documents, and in some cases co-sign the loans. There is little systematic information on how well these experiments are working. The use of the political chief of the village or the clan leader to screen borrowers and induce loan repayments seems to work well in Indonesia [Chaves and Gonzalez-Vega (1993)].

These examples demonstrate the nature of the information and incentive problems that arise in this particular principal-agent relationship. These problems are only beginning to be analyzed [e.g. Fuentes (1992)]. They concern the fact that it is difficult and costly for the formal institution to ascertain the veracity of the information provided by the agent in the screening process, and the amount of effort expended by the agent in loan monitoring and collection. Such considerations have implications on the type of informal lenders that

formal institutions would prefer to deal with and the agricultural environment in which any particular scheme for credit delivery will work.

Another method of incorporating locally based informal lenders into official credit programs is for formal institutions to lend money to informal lenders with the stipulation that they on-lend it to borrowers targeted by the credit program. This scheme delegates to informal lenders the decision for allocating loans to applicants considered creditworthy and, in effect, merely formalizes what is already going on in rural financial markets. If informal lenders are expected to take full responsibility for loan repayment,²³ then it is more likely that they will limit lending only to their regular clientele based on the system of borrower-lender matching discussed above. As a result, either the same borrowers will receive larger-sized loans, or some substitution of funds will occur as borrowed funds replace the moneylender's own resources for lending. Repayment rates will most likely be high, but it is doubtful that there will be a significant expansion of lending to borrowers not previously served. Thus, it is questionable whether much is gained in using informal lenders as channels for formal credit. Furthermore, it is reasonable to question if the government should in any way subsidize an activity that private agents will undertake on their own anyway.

Still another consideration concerns the existing market structure in the informal credit market and the nature of the interactions among existing informal lenders. If the informal credit market is competitive, the infusion of funds from the formal sector will more likely reduce interest rates and improve credit access. However, if informal lenders engage

²³ This was the case under the program analyzed in Esguerra (1987).

in some form of collusive behavior, then using informal lenders as conduits for formal sector funds is not likely to be beneficial for borrowers. The cost of funds for rural borrowers may not decline while rents from the program accrue to informal lenders [Floro and Ray (1992)].

In summary, informal finance performs a useful function in providing asset-poor households a way to gain access to credit. In particular, credit tying as a collateral substitute makes borrowing possible for rural households who would otherwise go without credit. However, because interlockers pursue lending only to support their main economic activities (e.g. trading or farming), the suggestion is that left to themselves, informal credit markets may be inadequate in completely substituting for formal institutions in rural areas.

It is obvious that while there is a role for policy in improving the situation in rural financial markets, the question of what strategy will work in a particular country, region or locale at a given time is fundamentally an empirical issue. There is no single approach or answer to the problem of credit delivery for small rural borrowers. Attempts to solve problems of one type, such as improving small borrower access to formal credit by using informal lenders as conduits, present new problems. What is clear from experience, however, is that failure has been avoided in those cases where due attention has been given to the specificity of the situation and the informational and organizational requirements of credit delivery programs [Chaves and Gonzalez-Vega (1993)]. It is in the search for the appropriate institutional forms and technologies for credit delivery where the greatest challenge lies. Here research can play an important role in clarifying how informal lenders behave and how rural markets function. Proposals abound for promoting formal-informal sector linkages in rural financial markets. Pilot projects of one type or another to improve

rural credit delivery are being implemented in developing countries in various parts of the world. Policy makers would do well not to think of driving the informal lenders out of business before stable and permanent alternative institutions for credit delivery to small borrowers are in place.

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