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From Trader to Lender: Interlinked Contracts from a Credit Market Perspective

by

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Abstract

This paper addresses the implications of credit tying as a collateral substitute on the pattern of credit allocation in a rural financial market. Given that different lenders employ 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 information and enforcement problems in the credit market. Consequently, informal lenders transact only with specific segments of the rural borrowing population about whom they are relatively well-informed and with whom they are capable of enforcing repayment. This suggests that policy interventions which treat the informal credit market as if it were an undifferentiated whole may be missing their mark.

FROM TRADER TO LENDER: INTERLINKED CONTRACTS FROM A CREDIT MARKET PERSPECTIVE*

1. Introduction

Two prominent features of informal rural finance in low-income countries are that the informal creditor is seldom a full-time moneylender and that informal credit is usually combined with transactions in other markets.[1] 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 stands in contrast to the situation prevailing in the 1960s when landlords were the dominant source of informal credit in rural areas.

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[1]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 of the literature on interlinked transactions.[2] 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) have 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 by which a landlord sorts the high-ability tenants from a heterogeneous pool of applicants. The risk-sharing feature of interlinked transactions is examined in Kotwal (1985) where it is shown that consumption credit acts like insurance for the tenant borrower when there is production uncertainty.

Informal credit invariably plays an important economic role in models of interlinked transactions. However, these models do not necessarily have a credit market focus. Rather, the focus of the analysis has been the market for tenancies where moral hazard and adverse selection problems provide the rationale for interlinking. The 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 discussions of interlinked markets despite its

[2] 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) provides a survey of the literature.

observed tendency to become more pervasive with the commercialization of agriculture.[3] 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 agent making the pledge to pay is therefore, inherent in all credit transactions. In rural credit markets, however, the use of collateral to screen borrowers and to enforce debt contracts[4] is frequently inhibited by an inhospitable insurance and legal environment. Furthermore, the majority of rural borrowers may not possess sufficient amounts of the asset or 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.[5]

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[3] The literature on product-credit linkages is fairly recent. See Gangopadhyay and Sengupta (1987), Floro (1987), Bell and Srinivasan (1989) and Fabella (1992).

[4] A collateral is any asset that a borrower agrees to forfeit ownership of to his 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).

[5] 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.

This paper addresses the implications of credit tying as a collateral substitute on the pattern of credit allocation in a rural financial market. Given that different lenders may employ 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 information and enforcement problems in the credit market. Consequently, informal lenders transact only with specific segments of the rural borrowing population about whom they are relatively well-informed and with whom they are capable of enforcing repayment. This suggests that policy interventions which treat the informal credit market as if it were an undifferentiated whole may be missing their mark.

In the next section, the motivation for credit market involvement of traders is discussed. Providing the institutional setting for the discussion is the rice economy of the Philippines where the yield-increasing production technology has been widely diffused. The importance of trader-lenders in the informal credit market 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 lender who employs interlinking (i.e. an interlocker) over an informal lender who does not (i.e. a pure moneylender). This advantage is shown to translate into a more favorable loan contract, in terms of loan size and the interest rate, for a borrower who confronts both types of informal lender. Allowing for different borrower types and differences in lenders'

abilities to transact with each borrower type leads to the hypothesis that the allocation of credit in the rural credit market 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 results of empirical work 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 of informal 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 the objective to secure reliable sources of the traded good. This is especially the case 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

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

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 farmer's profit maximum which solves 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 price P at which he sells q and the purchase price p plus the cost c incurred for performing the trading function. Let c be increasing in Σq_i. The trader's profit may then be written as

$$\pi^T = (P-p)\Sigma q_i^* - c(\Sigma q_i^*) \qquad (2)$$

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

If the output market is competitive, the trader is unable to use p as an instrument for maximizing profits. Treating p as largely outside the trader's control,

the only way to increase profits is to increase his volume of trading, Σq_i^*. However, total volume bought and sold is the sum of the individual producers' q_i^*s, over which the trader does not have any control. The trader can, of course, try to increase Σq_i by increasing the number of producers from whom he buys the product. 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 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

$$\frac{dz^T}{dr} = -[P - p - c'(\Sigma q_i^*)]\frac{\partial \Sigma q_i^*}{\partial B^*}\frac{\partial B^*}{\partial r} < 0 \qquad (3)$$

shows that the terms at which the producer is able to obtain credit affects the trader's profits. Thus, a worsening of the terms faced by the farmer in the rural financial market adversely affects the trader's income from marketing. However, 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 a credit line, the trader can then require his borrowers to market their output through him.[6]

Local economies of scale in trading contribute to the competition for market share among traders, increasing the incentive for individual traders to obtain guarantees for output delivery at harvest time in exchange for credit provision. Two other reasons for trader lending are cited by Floro and Yotopoulos (1991): the alternative use that moneylending makes possible for the trader's capital during the planting season when trader's funds are idle and farm households need liquidity and a lower procurement price for the crop when delivery is stipulated to coincide with harvest when crop prices are low.

The foregoing suggests that from the trader's viewpoint, the credit transaction is necessary to the extent that it sustains his trading activity.[7] From the borrower's viewpoint, the attractiveness of informal credit arrangements lies in part in the inaccessibility of the organized or formal credit market to asset-poor borrowers who do not possess what is generally considered acceptable collateral. The interlinked arrangement, by ensuring the double coincidence of interests between the trader-

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[6] 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 additionally ensure that sufficient incentives exist for the borrower to honor the tie-in sale provision.

[7] 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 essentially similar to what can be found in existing models of interlinked credit and tenancy contracts.

lender and the 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 different 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 depicted is generally in accord with given the developments that affected agriculture and rural financial markets in the Philippines during the periods under consideration.

The share of informal loans to total volume of loans transacted 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 targetted small rural borrowers.[8] This program was able to increase the share of formal credit going to agriculture in its early years. However, after the credit program became burdened with arrearages

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

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				
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
Money-lender	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	0.9	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
Formal	25.1	20.0	78.4	32.0	12.8

[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: Table 3 in Nagarajan (1992)

problems, which eventually led to its demise in the early eighties, informal lenders 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 loan volume transacted in rice areas before 1960. However, after 1980 their share in the total amount lent had dropped to less than three percent. On the other hand the share of trader-lenders has increased from less than 10 percent to 41 percent within the last twenty-five years. The same trend can be observed for farmer-lenders whose share in total loans had risen to 25 percent in the 1980s from nil prior to 1960.

The change in the composition of informal creditors described above can be explained as a concomitant feature of the process of commercialization of rural economies. More specifically in relation to the Philippine rice economy, the impetus came from technical change 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. These changes had an impact on rural financial markets.[9]

The increased yields resulting from the modern rice varieties created profit opportunities in output marketing. Studies of the rice marketing system in the Philippines [Umali (1987), Umali and Duff (1988)], using survey data from Muñoz

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[9] A discussion of how technical change and land reform affected rural financial markets in the Philippine rice economy can be found in Esguerra (1993). See also Esguerra and Meyer (1992).

Nueva Ecija[9], 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 confined to the harvest season which is only two to three months long. Most owners of grain-buying stations report that their profits greatly depend upon the volume they handle and the rate of turnover. Because of this and the competition caused by many paddy buyers, individual traders find it in their interest to maintain regular and secure sources of paddy during the harvest. 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 would imply that traders evaluate the creditworthiness of loan applicants on the basis of ability to supply paddy at harvest time. The size of the borrower's marketable surplus is, therefore, an important screening variable for trader-lenders in their lending activity.

Information on the relative importance of trader-lenders in rural informal credit

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[9] Muñoz is one of the municipalities of Nueva Ecija. It serves as the town center for about twenty rice growing villages. Nueva Ecija is the primary rice growing province in Central Luzon, Philippines, 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.

markets is contained in two recent 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). While traders were less important in terms of their number, they were involved in more transactions than farmer-lenders; they also lent larger loans than farmer-lenders. Out of the 150 different lenders identified to be operating in the two villages, 57 percent were farmers and 17 percent were traders. Nagarajan's data, which cover three cropping seasons in 1988-1989, further show that of 599 informal loans transacted, traders accounted for 41 percent while farmers 39 percent. In terms of total loan volume, the share of traders was 63 percent while farmers had 21 percent.

Esguerra (1993) used data from two cropping seasons in 1987-1988 from four other villages[11] 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 biggest category of informal lenders was comprised of farmer-lenders which made up 48 percent of informal lenders. However, as a group farmer-lenders provided only

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[11] The villages are Villa Nati Sapang Kawayan, Villa Cuizon and Mangandingay.

24 percent of the total value of loans made, second to traders. Paddy 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.

With respect to how technical change and land reform have affected the rural economy's product and factor markets, the pattern described above has its parallels in other countries. As early as the latter half of the 1970s, Bardhan and Rudra (1978), writing about India, had already noted the trend 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 Philippine context these factors account for the prominence of farmer-lenders. The apparent 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)].[12]

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

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 (%)
Farmer	48	34	24	7.4
Moneylender	6	12	12	14.9
Trader/Miller	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: Table 4.6 in Esguerra (1993)

3. Tied Output Sale as a Collateral Substitute

The tying of credit provision 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 composed of those who need marketing services, and the second made up of those who have less need of the service.

Since typically a small farmer cannot afford to invest in storage and in acquiring his own means of transporting his output to the market, there is an incentive to use the services of a trader or marketing middleman. The middleman usually shoulders the cost of transporting the produce and relieves the farmer of storage problems. In the rice producing areas of Central Luzon in the Philippines, 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 with bigger marketable surpluses are, therefore, attracted to a credit cum marketing contract because of the reduction in the cost of marketing their output. Traders, on the other hand, prefer to deal with farmers with bigger marketable surpluses to the extent that there are local economies of scale in procuring and storing output. From a credit market standpoint, borrowers with bigger marketable surpluses will also tend to have a better ability to repay their loans. Thus, by indirectly screening out those loan

applicants of lesser ability to produce a marketable surplus, the linked output arrangement in effect also indirectly screens out the applicants of lower 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 on a portion of the proceeds of the output sale. The degree to which the lender can make the credit contract enforceable depends, however, upon the incentives that exist so that the borrower makes good on 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 the creditor is not the only marketing outlet available to the borrower, repayment is not necessarily guaranteed, as 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, which gives the borrower little opportunity to

escape repayment. At the extreme, buyers of the output may share information about their clientele, and knowledge that a co-worker in the trade is being cheated by a seller could result in their refusal to do business with that seller.

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

As a collateral substitute, however, the marketing link is necessarily an "imperfect" form of collateral in that it does not always assure the lender that he will be fully repaid. Since the produced crop is the collateral in this case, the presence of production uncertainty makes the returns from lending vulnerable to chance occurrences. In addition, as discussed above, the possibility exists that a borrower may engage in opportunistic behavior unless there are incentives strong enough to discourage this action. The marketing link, therefore, fails to qualify as an ideal form of collateral because it easily violates the requirement concerning the absence of collateral-specific risk [Binswanger and Rosenzweig (1986)].

In order to analyze how the trader-lender benefits from using market interlinkage as a collateral substitute, a model of a credit transaction is needed. The model presented here is based on that used by Milde and Riley (1988). Only a graphical analysis is presented below; a more detailed discussion can be found in Esguerra (1993).

Assume a risk neutral farmer-borrower maximizing expected profit, $E\pi$. Define a loan contract as a combination of loan size and interest rate, (B,r). 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 B, and r, the maximum points coinciding with the demand curve. One of the borrower's iso-expected profit curves is shown as $E\pi_a$. All points on the contour $E\pi_a$ yield for the borrower the same level of expected profit regardless of the interest rate and loan size combination. Iso-expected profit curves to the southeast direction denote higher expected profits for the borrower as they involve combinations of bigger loan sizes and lower interest rates.

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 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 a rising

portion. On the declining portion where loan sizes are relatively small, fixed costs are more important than default costs. 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 ability to service the debt will be constrained at some point by decreasing returns on his investment. 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 cost is 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 offer. Graphically, the equilibrium is defined by a point of tangency between the borrower's and lender's iso-expected profit contours. This is shown as point E in Figure 1 which is a familiar result seen in more recent credit market literature [Jaffee and Russell (1976), Milde and Riley (1988), Bell (1988)].

Suppose there is a trader-lender and the output market where he operates in is competitive. Let the trader's zero iso-expected profit contour be described by Z^T. In the linked 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 to the borrower

than can the pure moneylender. In terms of Figure 1, Z^T will lie below Z^S which means 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 is in no position to compete with the trader; any contract offer below Z^S will be unprofitable for him. Equilibrium is at point I involving a lower rate of interest and a bigger loan compared to point E.

The foregoing would seem to suggest a scenario where pure moneylenders are driven out of business by interlockers. This might be the case in a credit market regime where informal lenders can insist on exclusive contracts. The difficulty of enforcing such a clause in credit agreements, however, does not make the assumption a plausible one. If contracts are non-exclusive, the borrower may still resort to the pure moneylender if his dealings with the interlocker leave him with an unsatisfied demand for credit, which is always a possibility when collateral is imperfect. However, even in the unlikely situation wherein exclusive contracts can be enforced in the rural informal credit market, the pure moneylender may be the only other source of loans for borrowers who are not served by interlockers because they 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 do better than the pure moneylender since the scope economies enjoyed in interlinking are specific to transactions with good X producers. The presence of lenders who can offer interlinked loans, therefore, does not necessarily drive pure moneylenders out of the rural credit market.

This line of argument can be extended to the case of different borrower types and different lender types. Consider two borrower types, namely, farmers and landless workers, and two creditor types, farmer-lenders and trader-lenders. In fact these borrower and lender types are quite 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 on their farms as a collateral substitute. Loan contracts between farmer employers and their workers are enforceable to the extent that 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 information gathering about loan applicants who are landless workers. Obviously, it is the farmer-lender who is better equipped with the screening and enforcement technology for dealing with landless workers in the credit market.

Trader-lenders have an advantage over farmer-lenders in dealing with farmer-borrowers. This advantage derives from their ability to provide marketing services to

farmers and to benefit therefrom, an option not available to farmer-lenders. Traders can condition loans on their right to exclusively purchase the borrower's output, and through such linkage, enforce repayment.

The trader's advantage over the farmer-lender moreover derives from his lower opportunity cost of lending during the planting season. The trader's funds are usually idle during this period, putting him in an excellent position to meet the credit demand of farmers. 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 his funds to co-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 borrower and lender. A trader-lender cannot employ a marketing link to enforce loan repayment from a landless farm laborer whose marketable surplus is expected to be negligible. Neither can he condition a loan granted to a landless worker on the latter's commitment of farm labor services unless he himself were also engaged in farming or another activity for which he employs labor. Similarly for a farmer-lender, securing a loan given to a farmer-borrower by

means of a marketing contract can only be done at a high cost unless the lender has the capacity for hauling, storing and transporting the product to the wholesale market. Thus, the specificity of the screening and enforcement technology as embodied in the interlinked contract implies differential advantages for different interlocker types in dealing with particular clienteles in the rural credit market.

4. Some 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 relationship, whether personal or business, outside of the credit market. It also helps explain why all borrowers do not have equal access to all informal sources in the rural credit market.

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

households). Studies of how borrowers and lenders are matched in the informal credit market have examined the characteristics differentiating the clienteles of trader-lenders from those of farmer-lenders.

Floro (1987) studied the sorting behavior of trader- and farmer-lenders in three Philippine provinces using 1984 survey data from both developed and marginal areas in these provinces.[13] Borrowers were classified by income status, namely, poor, middle and rich households.[14] Conditional probabilities of credit disbursements to the different borrower classes were computed for trader-lenders and farmer-lenders. Floro found that in both 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 their having borrowed from any other source. Corollarily she found that trader-lenders allocated a larger proportion of their loans to rich farmers, while farmer-lenders did so to poor farmers.

Nagarajan's (1992) study of 127 farm households in two villages of Muñoz, Nueva Ecija revealed the same pattern that Floro found. Using farm size to classify

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

[14] 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).

households, the study found that 66 percent of reported farmer-lender loans were transacted with farm households operating less than two hectares, while a lower share (52 percent) from traders went to this category. Trader preference for bigger farm households was evident in that 48 percent of their loans went to those with farm sizes over two hectares; for farmer-lenders it was 34 percent. In terms of credit source by farm size, households operating less than one hectare of farmland borrowed more frequently from farmer-lenders while those with bigger farm sizes borrowed more from trader-lenders. In addition, Nagarajan found that 55 percent of trader-lender loans went to business partners in trading and that 58 percent of all trader loans went to borrowers who had been regularly borrowing from the traders for more than five years.

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, however, farm, landless and non-farm households were included in the borrower sample. Seventy-four percent of trader loans reported by borrowers in the sample went to farmer-borrowers. This represented 89 percent of the total amount of loans granted by traders in the sample covering crop year 1987-88. On the other hand, 44 and 22 percent of the number and volume, respectively, of farmer-lender loans reported by borrowers went to landless workers. The latter percentages are significant in view of the fact that landless farm laborers are generally poor,

possess no collateralizable assets and are normally considered bad credit risks. The figures suggest the comparative advantage of farmer-lenders in lending to this particular group of rural loan applicants consistent with the lenders' ability to enforce repayment through a labor-linked contract.

From the borrower's perspective, traders provided 35 percent of the total number and 38 percent of the total amount of loans received by farm households. Traders, therefore, lent primarily to farmers, and farmers borrowed mainly from traders. For 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 by landless households.

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 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 rather than trader-lenders, and that farm households with higher initial wealth (as measured by total value of physical assets excluding land) and a capacity to produce a bigger marketable output tend to be matched with trader-lenders.

Esguerra also estimated a multinomial logit model and found that the important characteristics differentiating the borrowing clienteles of trader-lenders and farmer-lenders were associated mainly with the capacity to produce a marketable surplus of paddy and the extent of participation 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 did borrowers from farmer-lenders. The inference, therefore, is that these borrowers are basically full-time farm cultivators rather 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. However, the farm size variable performed best as a predictor of the probability of transacting with a trader-lender 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 extent of a 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 support the hypothesis that farmer-lenders and trader-lenders sort borrowers based on ability to supply their labor services and marketable surplus, respectively, which are key inputs in these lenders' farming and trading activities.

5. Conclusion: Can the Informal Lender be Co-opted?

The preceding discussion of informal finance suggests that an essential feature of informal credit within interlinked contracts is the centrality of lender type in the credit transaction. This results from 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. This has a number of implications.

First, relative to a situation where formal credit sources are accessible, it implies that there are costs involved in finding a suitable informal lender. For instance, rice traders will not be predisposed to lend to vegetable growers. If there are no vegetable traders in a given locality, vegetable producers may have to pay the higher interest rate charged by a non-specialized informal moneylender (especially because the perishability of vegetables imparts a higher risk to financing this crop relative to rice). As a result, some otherwise profitable activities may be inhibited if the cost of financing them through the local informal credit market is deemed too high.

On the other hand, it may also be the case that the lack of opportunities for

market interlinkage -- rather than the existence of interlinkage itself -- results in borrowers being credit constrained. To the extent that lenders use interlinkages to circumvent the problems of limited information and enforcement in credit markets, borrowers in low-productivity, less commercialized areas with little marketable surpluses and few opportunities for the employment of farm labor may be faced with a higher cost of borrowing. Thus, improvements in the general condition of agriculture and agricultural markets that lead to more opportunities for interlinking can help loosen the credit constraint from the informal sector.

Second, informal credit markets are segmented as borrowing and lending tend to be restricted to a limited set of transactors. Segmentation is a necessary consequence of the sorting behavior of informal lenders to reduce transaction costs. While it solves the lenders' screening and enforcement problems, segmentation may actually reduce allocative efficiency. The activities financed may not necessarily be the most productive ones as informal lending has a tendency to be confined to a relatively limited geographic area which allows for the face-to-face dealings in the credit market. That is, segmentation is also spatial.

Spatial segmentation moreover increases the lender's exposure to correlated risks. The occurrence of a major adverse shock (e.g. drought, typhoons, flooding, etc.) may thus find the informal lenders in a village unable to respond to the demand for credit by households. Segmentation arising from the sorting behavior of different

informal lender types ultimately imposes a limit on the ability of rural borrowers to use borrowing to adjust to unanticipated income shortfalls arising from village- or province-wide exogenous shocks.

Clearly, there is potential for improvement. Borrowers and lenders can both benefit from a reduction in the transaction cost associated with search. The village economy can also benefit from the increased production and consumption activities which may have been previously inhibited due to market segmentation. Institutions which can perform the specialized function of financial intermediation make these benefits possible.

In view of the inaccessibility of formal finance to small rural borrowers on the one hand and the observed limitations of informal finance on the other hand, attention of late has turned towards the use of alternative credit delivery mechanisms. Linking formal with informal finance is one approach which is being explored with government support in the Philippines, as in other developing countries. The encouragement of various forms of credit delivery constitutes a conscious attempt on the part of governments to expand the reach of the formal credit system while exploiting the comparative advantages inherent in the informal sector.

Formal-informal finance interaction is neither new nor surprising. Banks are often sources of funds for traders and other informal moneylenders who make use of the deposit facilities of these institutions. Various studies conducted in the Philippines [Larson (1988), Agabin (1988), Geron (1988)] show that many informal

lenders raise their funds from formal sources. In fact, some informal lenders were rural bank owners [TBAC (1981)]. A not insignificant proportion of bank loans have also gone to borrowers who are informal lenders. The formal-informal linkage just described is understandable in view of the nature of the comparative advantages possessed by formal and informal lenders. While banks lend to traders and other informal lenders who can offer collateral and satisfy other conditions for bank loans, the latter, by on-lending to small farmers and landless farm workers, in effect act as conduits of bank funds to those with limited or no direct access to formal loans. This credit layering suggests a relation between formal and informal finance that is better described by complementarity rather than competition [Fioro and Ray (1992)].

The observed complementarity between formal and informal finance is the basis for government programs promoting formal-informal finance linkages to stimulate output growth and increase the flow of credit to small farmers.[15] The basic idea is to take advantage of the lower cost of funds in the formal sector while using the information, monitoring and loan enforcement technologies of informal lenders. In this way, not only are the strengths of the formal and informal sectors combined; the resources available through the informal sector are also enlarged.

This paper concludes with a discussion of some factors that must be taken into account in designing programs involving formal-informal sector cooperation to improve small farmer access to credit.

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[15] For the Philippines' experience with a specific program, see Esguerra (1987).

First, even as the formal-informal linkage purports to mitigate the screening, incentive and enforcement problems between the borrower and the formal lender (which could be the government or a private bank), it introduces an incentive problem between the formal lender and the informal lender. The nature of this problem is not independent of the chosen method for involving the informal lender in the lending program.

One method involves hiring the informal lender as an agent to assist the financial institution in the screening of potential clients and the supervision and enforcement of loan terms. The bank retains control over the decision on who obtains a loan and how much. The information and incentive problems that arise in this principal-agent relationship are only beginning to be analyzed [see Fuentes (1992)]. Essentially these have to do with the fact that it is difficult and costly for the formal institution to ascertain the veracity of the information passed on to it by the informal lender in the screening process, and the amount of effort expended by the informal-lender agent in monitoring and loan collection. What is the appropriate compensation package for the agent under this arrangement? Will such package be independent of informal lender type? Obviously there is a need to sort out the implications of this arrangement on the type of informal lenders that a bank would prefer to deal with and the agricultural environment in which this specific form of delivery mechanism will work.

Another method of incorporating informal lenders into official credit programs is for formal institutions to lend money to informal lenders with the proviso that they on-lend the money to borrowers targetted by the credit program. This scheme delegates to informal lenders the decision for allocating loans to applicants considered creditworthy. It in effect merely formalizes what is already going on in rural financial markets.

Under this scheme, if informal lenders are expected to take full responsibility for loan repayment,[36] 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 government money now replaces the moneylender's own resources for lending. Repayment rates will most likely be high, but it is doubtful if any credit expansion to borrowers not served before will have been achieved. Thus, it is questionable whether anything is gained in using informal lenders as channels for formal credit. Furthermore, it makes sense to ask whether the government should subsidize an activity that private agents will undertake on their own anyway.

A second consideration concerns the existing market structure in the informal credit market and the nature of the interactions among incumbent informal lenders.

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[36] This was the case under the program analyzed in Esguerra (1987).

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 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), credit tying imposes a limit on the extent to which informal finance can be relied upon as a source of investment or working capital. This indicates 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 answers are not clear-cut. 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 informational and organizational requirements of

credit delivery programs. 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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