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**CREDIT RELATIONS AMID BANGLADESH'S RICE MARKETS:
WHERE SHARING IS THE CURRENCY**

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EXECUTIVE SUMMARY

(i) Prospective millers in Bangladesh's rice economy are likely to face a relatively wide range of technological options, with unit fixed capital requirements to match (Table 2). Best-practice techniques, e.g. automatic mills, price out most except a favored few, to be sure. But the market's response has been to circumvent the capital constraint via adoption of the small rice mill option. Quite against technology-theoretical predictions, the proliferation of the less mechanized small rice mills (SRMs) has served the rice farmer well. Fixed capital requirements have not significantly barred entry and stifled competition (Chowdhury, 1992, Table 29) in rice-milling. The qualification implied in the above sentence is deliberate: to muster Tk. 10 lakh (approximately US Dollar 25000), which a SRM takes to create was beyond the capacity of innumerable venture capitalists in rice markets.

(ii) The extent and character of the demand-supply balance for operating capital, frequently abbreviated as *credit relations*, was perfunctorily researched in the literature (Chowdhury, 1992, pp. 32-33). It was maintained, all too blithely, that high-cost preharvest trader-farmer credit contracts did not exist in rice markets (Farruk, 1972; Islam et al. 1985). This has recently been documented to be incorrect in certain specific cases (Crow, 1989). Using a relatively limited number of case studies, Crow demonstrated the presence of preharvest credit contracts, especially in a few backward farm regions, which ostensibly charged the farmer usurious rates. These contracts have been named *dhaner upore* (DU): the loan is repaid in *predetermined paddy quantities* to be paid after harvest, the implicit prices being throwaway ones. The present research shows that both Farruk/Islam et al. and Crow were off the whole truth. Of course, preharvest DU contracts exist in Bangladesh's rice system, but only 4% of the farms on IFPRI Farm Survey sample had been party to at least one such contract. The incidence of the Bangladeshi farmer being haplessly tied via DU contracts is *quantitatively insignificant in the general case* (Table 3). Less than 20% contracted any noninstitutional credit, though such loans only cost 19% in interest annually, as against 16.6% on bank loans. Only 14% took bank credit for farming. Overall, the sample strongly suggested the presence of internal financing. Significantly enough, farmers collectively sourced a nonnegligible part of trade credit demand. This incipient relative solvency was due to greater availability of rice surpluses, even on the populous category of small farms.

(iii) Trade credit is both actively disbursed and received in virtually all tiers of this market. Networks of trade credit are dense: more than three-fourth of all agents disburse trade credit and about two-thirds receive it. Market-wide disbursement per year amounted to Tk. 39.6 billion, while receipts amounted to Tk. 25.7 billion. Net disbursement was estimated at Tk. 33.9 billion, or Tk. 179.5 thousand per establishment. The total net disbursement corresponds to the marketing of 7.77 MMT of privately marketed rice, worth about Tk. 62.7 billion at wholesale stage of the market. Net disbursement is about 54% of throughput. Thus, informal credit markets have a strong presence. Paddy and rice wholesalers/*aradars*, who account for only 20% of the sample, account for 60% of disbursement and 58% of receipt of trade credit. A strong circularity in credit flow is here evident, receipts being followed by disbursements. Credit relations are based upon a *convergence* of business interests cutting across primary and secondary levels of the market. Sharing, not exclusion, seems to be the dominant trait of this web of credit relations. Second, *dadan* credit, arguably with greater tying conditionalities than for the over-the-counter credit, accounts for only 24% of firm-to-firm credit, and only 16% of total disbursements on the sample. *Dadan* is a far cry from being a preeminent credit source. Clearly, this implies that credit relations ameliorate conditions of operating capital paucity on the part of traders. And yet credit, substantively, is not nearly as inequitable as argued by some recent authors. Informal credit performs a fairly positive role in rice markets.

I Introduction

Conditions of widespread poverty and associated problem of suboptimal saving, weak state of financial intermediation all combine to elevate the workings of the credit markets into a place of significant importance in the process of growth and distribution in developing countries. Bangladesh is no exception. The roles that credit markets perform can be illustrated most vividly relative to commodity markets in general, and to foodgrains markets in particular. This is because these grain markets enjoy broad basis, frequently national in scope, and embrace millions of farmers of a variety of economic standings. As markets evolve, often under the impact of public investment and subsidy policies, foodgrains output increase considerably, with increased demand for credit requirements to match. Increasing output creates pressures toward mounting commercialization, marked changes in terms of the distribution of the appearance and ownership of stocks, and thus some changes in the structure of demand for credit. Flexible yet competitive channels for the flow of credit would likely translate into market conduct regime, having fast and responsive adjustment of volumes and prices in the grain markets of Bangladesh. It is, therefore, important to look at the working of credit markets in Bangladesh.

This paper has three objectives, viz.

- (a) to define what can reasonably be meant by the role of capital at various levels of the rice trade;
- (b) to identify fixed capital requirements by agents in the rice markets;

- (c) to evaluate how credit markets in the rice economy perform relative to two major imperatives viz. allocating and pricing credit.

A brief survey of the literature

There is not a very sizeable literature about the role and consequence of credit in rice markets of Bangladesh. The conventional wisdom, imparted by Farruk (1972) and Islam et al (1985), was that wholesalers/aratdars were the most important source of credit for rice market agents, that there was no evidence for preharvest credit contacts between farmers and traders of any kind. The general impression left by these papers was that credit networks were doing an efficient job of fostering the pace and outreach of market exchange. Crow (1989) reversed this generally positive strain, by showing for samples selected from three areas in Bangladesh that preharvest contacts exist between vulnerable peasantry and relatively liquid traders, that economically dependent petty traders toil on using stridently manipulative credit contracts which erode their economic well-being, and that the traders' interface with usually poor peasantry is suffused with onesided, typically trader-preferential, consequences. Hashemi (1989) has lent partial support to Crow argument.

The problem of this literature is that none of these studies is based on what can be called a largescale, geographically representative data basis. There remains the need to carry out a more exhaustive examination of the issues of the role of credit in rice markets. This is the objective of this paper.

Data and Methodology

All data used in this paper have been generated in the course of the IFPRI Farm and Market Survey. For the methodology of these two surveys, see Appendix-I to this paper.

II Access to Capital, and role of Capital at Various Levels of Trade

In any given market, at any particular time, production, ownership, enterprise and exchange arrangements each exhibits structural features. Thus ownership may be structured through patterns of equity and debt claims of varying degrees of complexity. Enterprise may be structured through various enterprise-sharing arrangements. Exchange arrangements may be structured through a body of custom regulation, law and facilitating services. Market structure, then, is the totality of such separate structures (Paul, 1964, p. 40).

One of the most telling specimens of the ownership arrangements in a structural context revolves around the role of capital---the capitalization required for minimum efficient scale (MES) --- and the cost conditions of raising the capital required. Two issues arise: one is the size of capitalization requirements. The second involves two elements: the relationship between the size of firm and risk-diversification; and the resource cost of raising capital. Together, this pair may amount to entry barriers. This makes it imperative to look at issues of capitalization and access to capital. Before proceeding any further however, a few conceptual issues need to be briefly touched upon.

The bases of establishment size-correlated capital cost differences

These differences owe to three factors. First, start up costs are nearly fixed whether the volume of equity or debt claims sold to raise capital is large or small (Archere and Faerber, 1966, pp. 69-83). Cost as a percentage of total equity finance raised is usually inversely correlated with both size of issue and size of the issuing firm. Second, larger establishments may be perceived capable of earning more stable profits, or warding off defaults or bankruptcies. In theory, greater stability in earnings of large firms is supposed, among other reasons, to spring from a greater ability to spread risk. For example, a large multiplant enterprise is likely to serve more geographic markets or to offer more distinct product-packages. This makes it better able to weather a demand contraction in any single market or product segment (Scherer, 1980, p. 105). Third, the unit cost of borrowing is everywhere likely to rise disproportionately to the amount to be borrowed, given the size of the borrower's assets. This has been named the principle of increasing risk (Kalecki, 1937, pp. 440-447). The fourth basis springs from entrepreneurs associated with small and large sized ventures belonging to very different situations of supplies of savings, with different costs of funds. Where land ownership profoundly affects germination of economic surpluses seeking remobilization in nonfarming, a marked degree of inequality of land ownership necessarily translates into marked differences in the subjective costs of funds. Many poor potential entrepreneurs are simply priced out of any startup because their time preference, reflecting conditions of dire poverty, is excessively high. The amount of capital they can put up front as venture

capital is too small relative to prevailing capitalization norms. Other entrepreneurs, coming from more favorable conditions of surplus creation, may apply a significantly lower rate of time preference and thus come forth with larger venture capital.

Capitalization Levels in Rice Trade

Capitalization requirements are of two kinds: fixed and working. Traders have modest fixed capital needs: a lump sum "possession money" for a premise including perhaps a godown space, some furniture and fittings, an iron safe etc. In 1989/90, a typical space for an arat at Dhaka's historic Badamtoli wholesale market, located on prime land adjacent to Dhaka's most important communication artery --- the Old Ganges --- cost an average of Tk. 300,000 or so by way of possession-money. This is the average returned from a survey of wholesalers carried out by IFPRI in six of the major terminal and assembly markets. Collateral fixed capital cost come to another 'Tk. 50,000. For traders, especially wholesalers, the principal component of capital requirements is in the form of working capital. Following Sen (1954), the need for working capital is defined in terms of input and output inventories, and of the value of work-in-process.¹

¹Virtually all production processes involve a lag between the commission of inputs and the appearance of output ready for sale. The value of the inputs representing different degrees of processing is doubtless a part of the plant's capitalization. Input stocks may include but not be limited to routine advance payments for input purchases, as well as suppliers' credit that are routinely issued while selling. Both features are present among the ownership arrangements in Bangladesh's rice markets.

For mills, capital requirements spring from the need to pay for plant and machinery and to meet their purchase and installation charges, and pay for other fixed assets (land, building and physical structures, vehicles, furniture and fixtures, etc.). If plant and machinery are imported, the resulting need to buy foreign exchange and to negotiate a deal with external companies will doubtless run up larger initial fixed costs. For processors, the need for working capital arises for the same reason as for traders.

There are basically four ways an entrepreneur can raise money for fixed capital, viz. by investing own venture capital or by issue of common stock, by borrowing for the long term, by suppliers' credit and by profit-sharing arrangements with the suppliers, especially foreign suppliers, of plant and equipment. The last-noted is a variation on raising capital by floating stock, but with a critical difference. In this case, profit sharing arrangements may permit savings by allowing shorter plant run-in times, as foreign collaborators have greater inducements to rapidly commence commercial, as distinct from, trial production.² The equity floatation route is resorted to when stock markets are well-developed, which has not been the case in Bangladesh. Not one of the 88 automatic and semi-automatic mills operating in 1988/89 was a public limited companies listed on a stock exchange.³ In Bangladesh, longterm debt for financing fixed assets in the rice processing industry has mainly been a preserve of the

²This assumes that there is sufficient competition in the industry producing the plant and equipment at issue.

³Only about 25% of these establishments are private limited companies.

handful of specialized banks e.g. the Bangladesh Shilpa Bank (BSB), Bangladesh Shilpa Rin Sangstha (BSRS) and Bangladesh Krishi Bank (BKB). Between them, these three have helped finance establishment of about 65 automatic and semi-automatic rice mills between 1976/77 and 1989/90. Six scheduled banks have helped finance ten of the other mills. Mostly, these banks have required, that at least 30% of the total worth of the project be funded by the sponsors' own equity. Most sponsors have put up land, frequently highly overvalued, as their stake in equity. A typical automatic mill stands on a plot about 2.5 acre of prime and convenient land. The ownership of such a parcel of land is the exclusive privilege of only a handful of Bangladesh's entrepreneurs. The implication is that the longterm debt finance route is not overly accessible in the realities of Bangladesh's money market.

Suppliers' credit or profit-sharing arrangements have not been resorted to by the entrepreneurs in the milling industry. India remained by far the largest source of milling machinery and equipments during the 1970s and 1980s. Bangladeshi sponsors would no doubt have welcomed the benefits of suppliers' credit on affordable terms. However, the Indian exporters, almost invariably private concerns, were weak at mobilizing export finance. Also, their product quality turned out to be below par --- providing ample justifications for *not* entertaining *deferred* payments. The realities of both capital and money market were such that, except for about 60-70 automatic and semi-automatic mills, virtually all other of the thousands of entrepreneurs in this industry were largely internally financed. A large majority of the equipment in use by the major rice mills and the huller mills used electric motors made either in China,

or Pakistan, or assembled in Bangladesh. The huller themselves could be put together by local foundries using crude methods. There is no evidence of any presence of vertical integration between rice milling and rice-mill machinery making. All in all, the entrepreneurs in the rice milling and trade were pretty much left to their own devices. They all began small, with the exception of the automatic mills.

Fixed Capital Requirements of Paddy Processors

We attempt to formulate some stylized fixed capital requirements, on replacement cost basis, of four classes of paddy processors, viz. the *kutials*, the small huller mill, the major rice mills and automatic rice mills. Before presenting the estimates themselves, it may be apt to dilate upon underlying assumptions. The automatic mill is assumed to have a capacity of roughly 1000 mds per day operating on 270 days. It is supposed to have a mechanized drying unit, but is also fitted with a drying yard with a capacity of 186 quintals (500 mds) per day capacity. Employment in a mill of this capacity ranges from 35 to 40, with an average of 38, of which 14 are white-collared and the rest blue-collared. About 16% of the workforce are women, mostly in the latter category.

Most mills of this type have been built on land ranging from 2.5 acres to as much as 5 acres, with an average of 3 acres. One basic difficulty in evaluation of their fixed capital lies with land. Operating mills have acquired land variously. Some have opted for leasing plots with 99-year-long maturity from semi-government bodies, like the Bangladesh Small and Cottage Industries Corporation (BSCIC).

Some have privately purchased land. The unit cost of acquiring these various land resources in 1989/90 vary considerably, from Tk. 11 lakh per acre in Birganj in Dinajpur in FY90 prices or Tk. 125 lakh in Shaikhghat in the heart of Sylhet, which is included in our sample. Unit price of land depends on many factors, including proximity to markets, access to infrastructure, and the prospects of appreciation of value etc. For our purposes, we take three acres to be the standard, and land values in 1989/90 prices, before development, to be Tk. 1 million per acre.

Table 1 elaborates upon the breakdown of the land of 3 acres.⁴

⁴It will be wrong to think that this represents the industry standard. The institutional structure for standardization is fairly weak in Bangladesh: any consensus would be hard to build on what the industry standard is. However, a majority of the automatic mills in Bangladesh do broadly conform to these estimates.

Table 1-- Standard Layout of a 2 THP automatic rice mill in North-West of Bangladesh

Category of asset	(Area in 000 sq.ft)	
	Area	
	sq. ft	decimal
Drying yard	28.8	66
Godown	17.9	41
Mill premises	17.9	41
Other areas	66.1	152
Total mill area	130.7	300

Source: IFPRI Market Survey 1989/90

The major rice mills use up land ranging between 1 acre to 3 acre depending on the region. The cost of land averages at about Tk. 1 million per acre. Daily milling capacities range between 1 MT per hour to 1½ MT per hour, depending on soaking, parboiling and drying capacity. On our sample, milling capacities averaged about 540 mds. per day. Replacement cost of the motor(s), boilers, accessories and the hullers themselves averaged Tk. 550 thousand. A *chatal* with drying capacity of 400 mds (149 quintals) would require about 14420 sq.ft of land and, in FY90 prices, would cost about Tk. 450000. The machinery are all largely housed in structures using CI sheets and metalled floors. The real limit to a plant's capacity is set by those of soaking reservoirs and/or the drying yard. During the aman season when temperatures are low, ideal results could take about two successive days of drying. The intervening night is of use in tempering the grain: sustained but long exposure to sunshine creates cracks in grain endosperm and increases the percentage of brokens. Milling of own-account grains is usually done after dusk, through the night. Entrepreneurs balance their manufacturing facilities by building a *chatal* roughly about the capacity of their soaking tanks. A typical major rice mill will likely be fitted out with storage capacity for about 1200 mds of paddy and 500 mds. of rice --- in all, about 2000 mds of paddy. Storage space typically is about 400 sq. ft, and cost about Tk. 80,000 to build in FY90 prices. The typical mill, housing a 30 HP motor, will occupy about 1700 sft of space, and cost Tk. 320 thousand to build. Such a mill cost Tk. 3.5 million to build, in toto, in 1989/90. Such a mill typically employed about 25 workers, one-fifth of them while-collared.

The small mills avoid investing in standard boilers: in other respects, are scaled down versions of a major rice mill. These have two-thirds or so of the capacity of a major rice mill. However, their capital costs are yet cheaper, mainly because of use of more rudimentary auxiliary devices (like steamer made of oil-drums, etc.) and frequently less accessible locations. Also, the structures tend to be below par. Their employments is three-fourths or so of that for major rice mills.

Table 2 below demonstrates glaring differences in the degree of mechanization between the automatic, the major rice mills and the small rice mills. Thus, capital-labor ratio for the automatic mills is found to be Tk. 0.42 million, as compared with Tk. 140,000 for major rice mills and Tk. 53000 for the small rice mills. For the *kutials*, mechanization is much smaller.

The high degree of mechanization of the automatic mill has a high average depreciation to match. Capacity utilization and the level of capitalization per unit of output are inversely related. Thus capital requirements are vastly different among the four classes of paddy processors. This is the most important reason why automatic mills or the MRMs are so unimportant as components of rice milling industry, and also why the small rice mills are its veritable staple.

Working capital requirements will add to the overall capital requirements. Smooth operations require that, while

Table 2 -- Replacement cost of capital, and the degree of mechanization

	1989/90			
	Automatic mill	Major mill	Small mill	Kutial
Land	3000	2000	660	nr
Building/structures	4500	850	140	nr
Plant/equipment	7500	550	150	nr
Others	1000	100	50	nr
Total	15000	3500	1000	60
Workforce	38	25	19	3
Capital-labor ratio	421	140	53	20

Notes: These figures are rough averages reflecting cost conditions in four major surplus districts of Dinajpur, Rangpur, Bogra and Rajshahi. NR stands for not reported.

at least one day's requirements of paddy is stored *qua* working stock, one day's supplies will be in the soaking reservoirs, while another day's requirement is being dried, another day's requirement is being milled. This means that input stock and work-in-process between them add up to four days' of value of output. Output inventories will doubtless add another two days' output. This implies that working capital requirements average the value of 6000 mds. of paddy for an automatic mill or Tk. 1.5 million; of 2000 mds. of paddy or Tk. 0.5 million for a major rice mill and Tk. 0.32 million for a small rice mill.

The days of setting up automatic mills using project aid have become *passe*. And to raise privately enough money to build one is pretty much beyond the capacity of any one industrialist. Most new entrants into rice milling during the past quinquennium or so had rejected the automatic mill. This does not pay. The technology has too long a pay-back period (about 6-7 years in 1989/90 prices) as against 4-5 years in the case of a major rice mill. Most of the new entrants to rice milling during the five years through 1989/90 are the huller mills. Undoubtedly the great majority of these new entrants are fitted out with unstandardized steaming devices located within small rice mills. This has been a response to the paucity of capital available to prospective entrepreneurs.

Access to Capital

Access to capital raises such issues as (1) The likelihood that a given entrepreneur will be able to raise any amount of money at any realistic rate of interest, and (2) how rapidly liable rates of interest increase when the

amount to be borrowed increases. Amid well-functioning contingency and risk markets, with a variety of debt instruments representing various degrees of default risk, maturities, cost of collection etc., the probability will be small that an entrepreneur will be unable to raise money at any rate of interest. Where exchange arrangements called for by orderly development of risk and contingency markets are not created by public policies, credit participants will of their own accord fill the void, if the private pay-off is sufficiently large. Even when these arrangements are at the behest of unregulated oligolists, they will provide positive access, admittedly expensive, of capital to a class of potential debtors who would otherwise remain totally drained of capital resources, beyond what little they themselves can garner. The other aspect of access has to do with rates of interest charged.

Realities of the Access to Operating Capital in Rice Markets in Bangladesh

In theory, there are four major sources of capital for entrepreneurs in Bangladesh's rice market: banks, moneylenders (lending on interest) or traders lending to earn interest equivalents; friends/relative; own finance. Banks signify institutional credits. All other forms of credit, whether interest-seeking or not, are termed noninstitutional credit in the literature. The conventional wisdom is that an overwhelmingly large majority of deficit units are "refused" access to institutional credit by statutory requirements of collateral (frequently demanded in form of land, jewelry, and the like). The ensuing demand is diverted to the noninstitutional segment of the market. However, the demand for funds swamps available supply.

Conditions of lenders' market emerge. It is alleged that interest rates are likely enough to perpetuate usury, and gross economic and social inequities (Crow et al. 1991). Indeed, some authors have gone to the extent of saying that surplus units, especially large traders, have capitalized upon the powerlessness of deficit units and interlocked their domination of capital and grain markets to extract large surpluses on the cheap (Crow and Murshid, 1990; Crow, 1989).

Crow and Murshid work has pointed up several type of credit contracts in the rice markets in their study areas. These include *dhaner upore* (DU) contract, *dadan*, and usual trade credit. DU contracts require that the debtor repays the loan in a stated quantity of paddy: this quantity is so determined that it amounts to exceedingly high interest rates. *Dadan* contracts involve wholesalers advancing operating capital to itinerant merchants, on condition that the latter will supply paddy or rice to the former at a preferential price. Trade credits are bridge loan contracts, where sellers' cash receipt is smaller than the value of the deal. The underlying price may or may not be higher than for cash sales. Mostly, though, it is 1 per cent higher.

We now proceed to expose the weakness in the line of reasoning just cited, before we report on the credit relations prevailing in Bangladesh's rice economy on the basis of results from the IFPRI Market and Farm Surveys.

The Crow and associates' argument is wanting in that it preoccupied itself with the cost of the *dadan* or *dhaner upore* credit for the debtor: its benefit for the debtor is

quite inadequately recognized. It can be argued that the use of credit, however expensive, enlarges the feasible resource set for a previously tightly-strapped deficit unit and changes its factor price ratio during all-too-critical parts of income-generating seasons by enough to translate into a more *productive* use of the abundant input, namely labor. By releasing or relaxing a binding capital constraint during the most critical part of the economic seasonality, the use of credit effectively *lowers* the price of the input in short supply in terms of output to be produced, thus enabling the producer to move up the production function. The marginal product of capital, arguably is high at relatively low levels of capital absorption for peasant farming if the production function is concave.⁵ Second, the Crow argument virtually assumes away the cost of administering the credit, especially the cost of making amends for the absence of functioning risk and

⁵ This need not be surprising. Where crop yields are precariously dependent upon timely mobilization of labor, and where morbidity or sickness rules family labors out of action, the capacity to hire labor and/or to apply a certain quantity of fertilizer can potentially spell the difference between a lost crop and a harvest at average yield. A *dhaner upore* credit contract could frequently be such a catalyst. By allowing the farmer to raise 20 mds. to an acre, instead of 5 mds, the farmer would have it in his advantage to borrow at *DU* rates of 10 mds of paddy per Tk. 1000 to mature after four months: the farmer is better off by 5 mds. of paddy. This example, no doubt oversimplified, drives home the point that whether a credit contract is usurious also depends upon the incremental capital output ratio. None of the studies by Crow and Murshid have been careful enough to stress this point. But they have overlooked the fact that an assertion that credit and grain markets are interlocked is an empirical proposition, which cannot really be resolved without an account of the cost as well as the productivity of credit. Such an analysis calls for estimation of production functions that allow computation of benefit-cost ratio of noninstitutional credit which no author has as yet attempted to do.

contingency markets. Because the issues here are somewhat subtle, a fuller discussion seems in order.

One class of creditors' cost involves that of enforcing contract clauses. The failure by the debtor to comply may stem from two factors, viz. (i) environmental risk (crop loss) which may disable the debtor to generate planned surplus; (ii) the potential gains of violating the repayment-in-kind clause of the contract. Risks of crop-losses sapping, totally or partially, the capacity to repay have to be borne, at least partly, by the creditors: there is no risk market to speak of. Risk of default on the loan due, say, to the death of the debtor has also to be covered: there is no contingency markets to speak of. Risk and contingency are critical inputs amid production environments characterized by covariate prediction risk, extremely small financial resiliency by debtor and single-crop production system. As for the second factor, enforcing the repayment-in-kind clause of the contract involves information cost, too. These costs are mainly in order to ensure that the debtor does not sell the produce someplace else. It is easier to ensure at little or marginal cost when the creditors happen to be rich and influential peasants in the area of debtors' residence, because then local kinship ties and hierarchical status could function as nonmarket sanctions against such breach of contract. Itinerant paddy traders hailing from outside the area at hand may here have a cost disadvantage. This is one important reason why pure paddy traders were found not to provide *dadan* based credit in Nalitabari and Ajmiriganj areas in Bangladesh in sample surveys (Hashemi, 1989, p. 13). The creditor has to pay for spreading information regarding the indebtedness of his clients in the market area, in an effort to handicap the

latter. Second, his agents have to shadow the creditors closely. Besides, the DU contracts seem to be concentrated in remote and flood-prone areas where, by implication, the public provision of financial and physical security is in short supply (Crow and Murshid, 1990). When the provision of security, a public good, is supplanted by local-level economic hierarchy of trader-financiers and absentee landlords, this translates into a selective provision of such security--- freedom from robbery and default --- that is denied to external traders (Crow et al. 1991, pp. 116-7). These trader-financiers are also the sources of much of the DU credit funneled in one of three study areas of Crow and Murshid.

III Discussion of Results

The extent of Dhaner Upore Credit Contracts⁶

Table 3 reports on the frequency of DU credit contracts. We report on the proportion of farmers on IFPRI Farm Survey with such debt obligations, the average duration of such credits, and the creditor traits, the (weighted) average interest rate charged. In general, these results do not lend much support to those of Crow et al.

Only 4% of the sample respondents had entered into at least one DU contract (Table 3), as against 14% for bank credits (Table 4), and 18% for other noninstitutional credits (Table 4).

Second, the proportion of marginal or small farms who contract any DU credit is significantly higher (at 9%) than for the medium and large farms (at 3%). However, amount of credit contracted per farm is found to be Tk. 7.6 thousand for the two smallest sizeclasses as a whole, as against Tk. 8.32 thousand for the medium and large farm as a whole --- not a significant difference. Therefore, even the medium or large farms are in the act of contracting DU credit on similar orders of magnitude as small ones. Just about

⁶All results about credit relations using IFPRI Farm Survey 1989/90 reported in this section relate to contracts made during the five months through the middle of April, 1990. These five months represent a period of above-average credit demand stress: HYV boro, the most cash-intensive crop, has to be cultivated in this season.

Table 3 -- The extent and character of *dhaner upore* contracts, 1989/90

	Ownership size class					Type of districts	
	Marginal	Small	Medium	Large	All	Progressive	Nonpro- gressive
No. of farms taking DU	2	13	10	5	30	13	17
Total no. of farms	30	137	254	258	679	443	236
% of farm taking DU	7	9	4	2	4	3	7
Average amount taken in DU (Tk. 000)	22.0	5.4	9.5	5.96	8.0	5.05	3.0
Average duration of DU credit (weeks)	6.5	6.8	7.3	5.4	6.7	4.9	8.1
Average interest rate per month	33.3	19.8	28.1	45.9	31.8	29	33

Source: IFPRI Farm Survey, 1989/90

**Table 4 -- Access to Institutional and Other
Noninstitutional Credit**

	Ownership size class					Deficit type	
	Marginal	Small	Medium	Large	All	Progressive	Non- progressive
	Institutional						
No. of farms taking bank credit	1	21	30	44	96	45	51
% of farms taking bank credit	3	15	12	17	14	10	22
Average amount taken in bank credit (Tk. 000)	2.2	3.8	4.8	10.0	6.9	5.0	8.6
Average duration of bank credit (months)	4.0	4.0	4.0	5.0	4.3	4.0	5.0
Average interest per year (%)	16.0	15.7	18.0	16.4	16.6	17.6	15.7
	Noninstitutional Credit						
No. of farms taking noninstitutional credit	2	25	53	44	124	70	54
% of farms taking such credit	7	18	21	17	18	16	23
Average amount taken in informal credit	3.0	4.4	3.5	8.3	5.4	6.0	4.5
Average rate of interest per year (%)	120	19.3	15.2	18.8	19.0	11.0	29.4

Note: Interest rates are weighted averages, weights being sizeclass specific total credit contracted.

anyone may be forced to raise money this, admittedly expensive, way.

The average DU credit was contracted about 7 weeks prior to the boro harvest, or, in other words, in the last week of March, 1990. The average interest rate per month is 32% for the sample of DU debtors: the average interest rates do not appear to be excessively high, given the short maturity of these unsecured loans. They are certainly much higher than those on institutional loans. But the latter invariably are collateralized by immoveable assets, like land or real estate. Pledge of land, naturally, lowers interest rates of collateralized loans. But the rates are no doubt high as seasonal averages.⁷

Access to Bank and other Informal Credit

Table 4, featuring two panels, reports on the relative role of formal-sector and informal credit on the study sample farms. Knowledge of the formal sector credit access illuminates the capitalization backdrop of the farms whose marketing and storage behavior are here under study. Several features of the information in this table are worth noting. First, 14% and 18% respectively of farms contracted any amount of institutional and noninstitutional credit. Second, interest rates on noninstitutional loans averaged at 19%, as against 16.6% for bank credits. Third, it should come as a modest surprise that such a small proportion even of small and medium farms are contracting noninstitutional

⁷ It is well to stress at this point that the demand for DU credit is highly seasonal. Specialized creditors face lean demand during about half of the year.

credit even though it is not costly. This is because the literature on credit is full of unsubstantiated assertions as to wide farm incidence of high-cost informal credit. Our contention is that such stereotypes must be discarded. The evidence from IFPRI Farm Survey 1989/90 strongly shows that even small and medium-sized farms, the staple of the eligible peasantry believed able to service an informal loan, do not overwhelmingly need to contract such credit. Why? We do not claim to know the whole answer. But, partly, the answer is that, at least as far as rice cultivating households are concerned, the onfarm availability of rice surpluses, riding on the crest of an intricate seasonality, has increased both the quantity and predictability of farm working capital. There is greater credit-related "self-sufficiency" even for small and medium farms. Conditions of lenders' market, which in the past might have characterized the rural credit scene, are no longer valid as description of current reality.

In sum, the following conclusions may be reached. First, the incidence of the farmer being haplessly tied via usurious credit contracts like *dhaner upore* is quantitatively insignificant. Second, less than twenty percent of farmers contracted any noninstitutional credit: fourteen percent contracted institutional credit. Overall, the sample strongly suggested the incidence of *internal* finance. Arguably, this was, to an important degree, due to the greater availability on rice surpluses, even on the populous category of small farms (Chowdhury, 1992, Table 69). Third, the cost of informal credit is only marginally higher than that for institutional credit.

Having examined farmlevel credit relations, it is now imperative to report on the character and consequences of credit networks in rice milling and trade.

Some Insights into the Rice Traders' Access to Operating Capital

The following material is structured as follows. First, we examine the structure of the receipt of trade credit or *dadán* by source on study sample. Next, we examine the structure of disbursement of trade credit by source and by destination.

Table 5 reports on the volume of trade credit or *dadán* received per establishment during the study year.

The following findings may be highlighted. First, the wholesalers/*aratdars*, are among the largest *individual* types of debtors of trade credit. Although they are only 20% of the sample, they account for 58% of the trade or *dadán* credit received on the sample. Automatic mills, too are slightly overrepresented. Besides these two categories, every other is underrepresented as beneficiaries of credit/*dadán*. This findings should be a solid rejection of a patron-client relationship where the supposed patron --- the *aratdar* --- never borrows. Significantly, nine tenths of paddy *arats'* trade credit are disbursed by the paddy *beparies*; the rest are financed by farmers and *farias* (Table 6). Significantly, paddy itinerant merchants receive the greatest bulk of their trade credit from the farmers and the next largest relative share from other *aratdars*. The

Table 5 -- Receipt of credit or *dadán* per establishment by source, 1989/90

(Tk.000s)

Types of agents receiving	No. of units	Sources										Total	% of Sample	% of credit/ <i>dadán</i> receipt
		Paiker	Bepari	Faria	Crusher	Kutial	Farmer	Aratdar	Miller	Retailer	Others			
Paddy trader	68	.9	3.0	2.7	.2	0	13.1	8.6	.4	0	0	28.9	10.7	2.4
Paddy wholesalers	47	0	203.9	11.1	1.9	1.3	10.4	2.4	2.1	0	0	233	7.4	13.6
Automatics	20	0	166.2	0	0	0	22	83.5	4.5	0	0	276.2	3.1	6.9
Major rice mills	34	0	19.6	4.7	.1	0	5.2	104.8	0	0	0	134.4	5.3	5.7
Small rice mills	75	2.5	20.4	5.7	2.8	0	11.1	64.5	.2	0	.7	107.9	11.76	10.0
<u>Kutials</u>	65	0	.4	3.0	0	0	2.1	2	1.7	0	0.9	10.1	10.2	0.8
Crushers	110	.7	19.5	2.4	0	0	3.6	61.7	.5	0	0	88.4	17.3	12.1
Rice wholesalers	19	0	33.8	3.5	1.5	9.5	.4	24.4	3.6	.7	4.2	81.8	3.0	1.9
Rice <u>aratdars</u>	62	0	244.5	5.1	66.6	6.7	20.2	1.3	87.4	0	0	431.9	9.7	33.3
Rice retailers	58	.9	.0	0	.7	1.5	0.1	2.9	1.2	0	.2	7.5	9.12	0.5
Others	79	0	33.7	3	31.1	3.8	1.3	19.6	32.5	0	1	125.1	12.4	12.4
All	637	.6	66.5	4.3	10.9	1.7	8.9	29.7	13.1	0	.4	136	100	100

Source: IFPRI Market Survey 1989/90

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Table 6 -- Structure of credit or dadan receipt by source, 1989/90

		(%)										
To	From	Piker	Bepari	Faria	Crusher	Kutial	Farmer	Aratdar	Miller	Retailer	Others	Total
Itinerant paddy traders		3.1	10.3	9.5	0.8	0	45.2	29.8	1.4	0	0	100
Paddy wholesalers		0	87.5	4.8	0.8	0.5	4.5	1	0.9	0	0	100
Automatic mills		0	60.2	0	0	0	8	30.2	1.6	0	0	100
Major rice mills		0	14.6	3.5	0.1	0	3.9	78	0	0	0	100
Small rice mills		2.3	18.9	5.3	2.6	0	10.3	59.8	0.2	0	0.7	100
<u>Kutial</u>		0	3.9	27.5	0	0	21	19.5	17.2	0	8.9	100
Crusher		0.8	21.1	2.7	0	0	4	69.8	0.5	0	0	100
Rice wholesalers		0	41.4	4.3	1.9	11.7	0.5	29.8	4.4	0	5.1	100
Rice aratdars		0	55.6	1.2	15.4	1.6	4.7	0.3	20.2	0	0	100
Rice retailers		11.9	0.2	0.1	9.9	20.4	0.9	38.4	15.6	0	2.5	100
Others		0	26.7	2.7	24.7	3	1	15.6	25.7	0	0.8	100
All		.4	48.9	3.1	8.0	1.3	6.6	21.8	9.6	0	0.3	100

Source: IFPRI Market Survey 1989/90

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largest benefactor of this trade credit are the *aratdars*/wholesalers, located further downstream. The fact that the farmer should be a prominent source of credit for the paddy itinerant merchants, and, at a further remove, for wholesalers is intuitively suggestive of growing solvency of the farmers in Bangladesh. The automatic mills are more amply in the debt of trade transactors, but their aggregate importance in trade credit is small. Small rice mills, however, are an important category of credit receivers. All in all, *aratdars* and *beparis* are the trade-creditors of some significance in this economy.

The Pattern of Disbursements of Trade Credit in the Rice Market

In order to round off our understanding of the demand as well as supply of trade credit, it is imperative to now look at the magnitude and pattern the disbursement of trade credit in the rice distribution economy. Table 7 reports on the structure of disbursements by sources on the study sample. Table 8 reports on disbursement per establishment by receivers.

The principal findings of Table 8 are as follows. First, paddy and rice *aratdars*/wholesalers, who account for 20% of the sample, account for fully 60% of the disbursement of informal credit. We are, no doubt, to recall that these agents also accounted for 58% of the *receipt* of trade credit, too. This suggests a strong circularity in the credit flow: a Taka of credit resource that is received is also likely to be disbursed in credit. This derives, basically, from the circulation of trade credit being a very important determinant of the turnover of business. In other

words, credit relations are based upon a convergence of business interests cutting across primary and secondary levels of the market. And convergence is the opposite of collusion within a particular section of market agents. Second, the next most important set of disbursers embrace the automatic mills, the large rice mills and the small rice mills, in that order. Third, *dadān* credit accounts for only about 24% of total firm-to-firm credit: the rest is bridging credit. Fourth, *dadān* distributions are only 16% of the total disbursements on the study sample.⁸ This data does not support the position that *dadān* is a preeminent source of credit in this market. This finding about the *dadān* is corroborated by the relative insignificance of DU or other forms of *dadān* credit contracts among farmers, as already reported. Nearly three-fourths of the disbursements to the *beparis* originate from paddy wholesalers, and from rice *aratdar*/wholesaler.

⁸Total disbursement means bank credit disbursement plus informal credit disbursement. The last observations are valid, but the necessary tabular evidence is not presented for space reasons.

Table 7 -- The Structure of the Disbursements of Trade Credit by Source and by Recipients, Bangladesh Rice Market, 1989/90

(%)

From \ To	Pal-ker	Bepari	Faria	Crush-er	Kuti-al	Farmer	Arat-dar	Mill-er	Retal-ler	Vokra	Total
Paddy itinerant traders	5.1	0	13.3	16	2.1	5.5	34.6	18.8	2.6	1.9	100
Paddy wholesalers	11.1	47.5	1.5	16	.2	.6	1	21.9	0	.3	100
Automatic mills	33.5	33.4	0	1.4	.3	0	27.9	0	1.6	1.9	100
Major rice mills	47.4	19.4	.3	.7	0	0	31.9	.4	0	0	100
Small rice mills	22.7	6.4	.4	2.7	0	1	64	1.4	1.3	0	100
Kutial	3	0	86.6	.1	0	.7	6.1	0	2.5	.9	100
Crusher	39.0	19.7	.2	.9	0	0	31.3	1.3	7.3	.3	100
Rice wholesalers	7.8	20.4	0	55.9	0	0	10.1	4.7	.6	.4	100
Rice aratdars	61.3	17.3	.1	10.3	1.9	0	1.5	4.3	2.5	.8	100
Rice retailers	22.9	2.8	0	0	0	.7	0	0	1.6	72	100
Others	33.5	29.2	.1	5.9	1.9	.5	19.4	5.8	2.9	.7	100
All	36.9	23.9	1.7	12.7	1.0	0.3	13.3	7.3	2.0	0.9	100

Source: IFPRI Market Survey 1989/90

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Table 8 -- Disbursements of Trade Credit by Source and by Recipients, Bangladesh Rice Market, 1989/90

(Tk. 000)

From \ To	Paik-ker	Be-pari	Fa-ria	Crush-er	Kuti-al	Far-mer	Arat-dar	Mill-er	Retai-ler	Consu-mer	Total
Paddy itinerant traders	2.3		0	7.2	4	2.5	15.6	8.5	1.2	.9	45.1
Paddy wholesalers	81.3	0	11	116.7	1.3	4.3	7.5	156.9	.1	1.9	731
Automatic mills	207.2	347	0	8.8	1.6	0	172.6	0	9.9	11.7	618
Major rice mills	78.5	206.3	.5	1.1	0	0	52.9	.6	0	0	165.8
Small rice mills	45.8	32.1	.8	5.4	0	2	128.7	2.7	2.7	0	201.2
Kutial	1	13	30.1	0	0	.2	2.1	0	.9	.3	34.7
Crusher	44.9	0	.2	1.1	0	0	36	1.5	8.4	.4	115.1
Rice wholesalers	66.7	22.7	.2	478	.1	0	86.3	40.6	5.5	3.7	855.7
Rice aratdars	735.4	174.6	1.5	123.1	23.1	0	18.3	51.2	29.7	9.1	1199.4
Rice retailers	3	207.9	0	0	0	.1	0	0	.2	9.4	13
Others	73	.4	.2	12.8	4.2	1.0	42.4	12.7	6.4	1.6	217.9
All	116.3	63.6	5.4	39.9	3.3	1.0	41.9	23.1	6.4	2.9	315.5

Source: IFPRI Market Survey 1989/90

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The structure of the disbursement is intuitive. A few descriptive observations are in order. First, paddy wholesalers route most of their disbursements to paddy beparis (43%), paddy paikers and crushers (27%). The rice mills do not appear to be an overly important customer of wholesalers' credit. Second, rice wholesalers funnel their trade credit to the crushers (69%) --- and most of the remainder to rice itinerant merchants (26%). Rice *aratdars* channelize 83% of their disbursement favoring two classes of itinerant rice merchants.

Trade credit is of wide prevalence on this sample, the average establishment disbursing Tk. 316 thousand in the entire 1989/90 rice market season (Nov. 1989 - Oct. 1990). The market-wide estimate of trade credit disbursed is one of Tk. 59.6 billion during the year.⁹ Virtually, every tier of the market chain --- even the lowly *kutials* etc., and retailers --- reports some degree, however small, of disbursement. Trade credit thus appears to be the grist of the rice-market mill, the durable lubricant. Just as about every class of agents are represented among the sources of credit, every class is also represented among the its beneficiaries. Rice has a national market, and it is no surprise to see that trade credit is a thoroughgoing facilitator in all this.

⁹This is obtained by multiplying Tk. 316 thousand by 188.9 thousand, which is our estimate of the total number of market agents in the rice market.

Table 9 reports on the pattern of net disbursement by categories of marketing agents. The overall result which emerges from this table is that rice wholesalers/*aratdars*, and the rice mills are the two most important collective sources of net disbursement in this market. Because of their overwhelmingly large number, the small rice mills are particularly important source of finance.¹⁰ Even *kutials* and crushers are net disbursers of credit.¹¹

¹⁰An estimated 18.4 thousand small rice mills account for Tk. 1.7 billion worth of net disbursement, while the automatic mills generate only Tk. 30 million worth. The corresponding figure for the major rice mills is Tk. 15 million.

¹¹These two categories together disburse net credit on the order of Tk. 803 million during 1989/90 rice market season.

**Table 9 -- Disbursements and Receipt of Trade Credit, by
Categories of market Agents, 1989/90**

(Tk.000/unit)

	Dadan	Paikari Baki	Disbursement	Receipt	Net disbursement
Paddy itinerant traders	9.1	36.0	45.1	28.9	16
Paddy wholesalers	351	380	731	233.0	498
Automatic mills	164	454	618	276	342
Major rice mills	30.9	134.9	166	134	32
Small rice mills	20.3	180.9	201	108	93
<u>Kutial</u>	.46	34.2	34.7	10	25
Crusher	19.1	96	112	88	24
Rice wholesalers	156	699.6	855.6	82	774
Rice aratdars	375	824.3	1199	432	767
Rice retailers	-	13	13	8	5
Others	72.9	145	218	126	92
All	90	215	305	126	179

Source: IFPRI Market Survey 1989/90

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APPENDIX-I**FARM AND MARKET SURVEY METHODOLOGY****1. IFPRI Rice Market Survey**

The overall objective of this survey is to assess the structure conduct and performance of Bangladesh's rice markets. The rationale for such a study flows from the argument that specific content and scope of public interventions in rice markets can enrich itself by gleaning insights about the conduct and performance of rice markets.

The particular objectives of this survey are to:

- i) to estimate the country-wide marketing margins in rice, and more particularly, to determine whether and by how much, traders earn more than competitive profits;
- ii) to assess the degree of integration, both temporal and spatial, in rice markets;
- iii) to assess the role of stocks in the traders' business, and in particular, to pinpoint the determinants of trade-level rice stocks;
- iv) to determine the factors influencing costs of marketing, and assess the structure of marketing costs;
- v) to assess the overall competitive health of rice marketing;

METHODOLOGY

A sample survey has been designed to achieve the study objectives. Districts were first stratified in order their proportion of net cropped area under high-yielding variety (HYV) strains, under modern irrigation, and the number of rice mills located in them in 1986/87. They were finally stratified on the order of a synthetic index, comprising these component indicators. Twenty one districts were selected from the ordered list of districts with probability proportional to population of the various quartiles. A sample of 636 processors/traders from these districts exhaustively representing the whole gamut of market agents have been interviewed twice during twelve months through June 1991. These districts are representative of all major agroclimatic and cropping - pattern variations. Moreover, in the country they cover districts representing varying densities of paddy processors per thousand population, according to 1981 Census. Firms from twelve "surplus" and nine "deficit" districts composed the sample. Surplus districts are those generating a surplus in their cereal production in 1988/89 over cereal "normative requirement" on government definition. In all, there were 115 paddy traders and 521 rice traders.

2. IFPRI Farm Survey

The overall objective of this survey is to understand the consumption, marketing and storage behavior of surplus-generating cultivator households in Bangladesh. These households comprise the first and most important rung in the private decision making chain with regard to disposal of output as between consumption and marketing. Consequently, this survey complements the Market Survey by potentially illuminating the rice marketing and storage behaviour of cultivator households in the survey districts comprising the sample for the Market Survey. In that sense, this should be considered an extension of the Market Survey.

The specific objectives of this survey are

- a) to estimate the overall size of the rice market in 1989/90, and to compare it with that for past years, in an effort to assess the overall change in the degree of commercialization in Bangladesh's rice market;
- b) to quantify the role of income, prices, seasonality and infrastructure in determining farm-level consumption, marketing and seasonal stocks of rice;
- c) to estimate overall size of onfarm rice stocks ex-production, for the various seasons of the year;
- d) to understand the impact of public procurement on private marketing behaviour;

- e) to explore quantitatively the extent to which preharvest contacts between traders and farmers help or hinder competition;

METHODOLOGY

Primary data are being generated from a sample survey covering thirty four upazilas drawn from twenty one districts. The district level selection is the same as for the Market Survey. A commonality in the district-level coverage between the two surveys follows directly from the Farm Survey being, essentially, an add-on to the Market Survey. From each of the surplus districts two upazilas were randomly selected, except that the second selection was modified somewhat by a purposive consideration: we wanted to have the two UZs represent a gradation in terms of infrastructural status. Within each selected upazila, two unions were selected by the field research team after visiting the upazilas, when a community level survey was carried out. At this stage, this community survey involved interviews with upazila level public functionaries, particularly in the Upazila complex (e.g. the Upazila Agricultural Officer), Block Supervisors, rice traders etc. On the basis of these interviews, two unions per upazila were selected, one each to represent a gradation at once with respect to adoption of modern rice technology and the access to all-weather roads. Within each selected unions, one village was selected. The focus of the study was on the determinants of the marketing and storage behaviour of surplus-generating cultivator households, it was imperative to *oversample* medium and large farms, in the interest of retaining large enough subsamples in those strata. The reason, is that, especially, the large households account

for a disproportional share of total offers to market (Ahmed, 1991). Once the villages were selected, a census of households in large and medium farms was conducted. The final sample was selected from the village -level enumeration. In all, 620 cultivator households were selected from twenty one districts representing thirty four upazilas.

The survey instrument includes questions on (a) demographic, educational and occupational data regarding the household; (b) land ownership and utilization, tenancy status, technology adoption and cropping pattern; (c) production of rice and other crops; (d) rice consumption by source, (production and purchase) rice marketing and storage by month by seasons; (e) net income from crop - and noncrop agriculture; (f) non - agricultural income; (g) pattern and cost of marketing; the use and terms of institutional and other agricultural credit; (i) prices at which coarse and noncoarse paddy were sold by the farmers during the months; labour demand and wages rates; and (j) infrastructural details of access to markets.

In addition to household level data, an effort was made to collect upazila-level data regarding the farm-technology, irrigation and credit environment of the households. It is proposed to use this second set of data in order to identify, econometrically, household-level demand influences from the impact of exogenous changes in institutionally determined supply.

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