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**CREDIT AND BANGLADESH'S FOODGRAIN MARKETS:
NEW EVIDENCE ON COMMERCIALIZATION, CREDIT
RELATIONS, AND EFFECT OF CREDIT ACCESS**

Nuimuddin Chowdhury

**International Food Policy Research Institute
Bangladesh Food Policy Project**

**Funded by USAID under Basic Order Agreement
Contract No. DAN-4111-B-00-9112-00
Delivery Order No. 7**

March 1994

The authors accept full responsibility for the views expressed in this report. The contents do not necessarily reflect the official position of USAID or Government of Bangladesh.

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ABSTRACT

One of the best-kept secrets of the gradual transformation of Bangladesh's rice economy, especially during the 1980s, has been about rapid gains in the commercialization of rice peasantry with a visible egalitarian streak. Increments in output have overdosed on low-grade unstandardized, coarse rice, while a process of growing diffusion of HYVs in both dry and wet seasons implied a seasonally divisible rice marketing. Population growth and tepid growth rates of industrial labor absorption have led to petty commodity trade especially becoming extremely crowded. The evolving market chain has improved its capacity to tenaciously ship amid lean inventories and low operating margins, reflecting low time opportunity costs and the laboriousness of the marketing itself.

Rapid commercialization of rice economy sharply contrasts against a backdrop of stepmotherliness of formal financial institutions bred perhaps out of dated stereotypes that a more intimate knowledge of a maturing of rice markets now renders a costly baggage. Mills are largely counted in the banks' credit circuits: traders are, more often than not, counted out. Both the issue and restriction of bank credit to mills and nonmills, respectively, are due to credit policy. Despite some nominal revisions to credit policy effected more recently, traders remain underbanked. The numbers suggest clearly that the prevailing pattern of access to bank credit is inadequate relative to the financial magnitudes implicated if current proposals about reforming either public rice procurement or the distribution of wheat aid to Bangladesh have to come to fruition any time soon.

Credit networks, especially in the rice economy, are dominated by trade credit, on *dadan* and over-the-counter terms. These two credit types split fifty-fifty in the aggregate. Significantly enough, agents with bank credit ceilings underdose on *dadan* credit. *Dadan* does not, it seems, imply statements about relationships of financial subordination between the most well-accessed, which CC-holders are, and the tightly-strapped. Agents without bank CC overdose on *dadan* credits. A preponderant share of all credit, whether *dadan* or *paikari*, is absorbed by itinerant traders. This is a measure of the fluidity in the spatial marketing links, and of itineracy of it all. Reciprocity is a more apt code for the flavor of the relationship between the *dadan*-issuer and the itinerant traders, than economic subordination. This is why about nine-tenth of credit transactions are interest-free, the principal motive being to be able to assemble in bulk.

A two-stage procedure is employed to show that while, in a multivariate framework, both formal and noninstitutional credit directly and significantly affect firm productivity. However, the impact of access to the latter on productivity is significantly more than for bank credit. This result is plausible, in that the agents who are cut out from the banks' loop have the incentives of beating their handicap by turning stocks more rapidly, than others. In this trade, to ship more and more at some lean margin is destiny, and so is trade credit for a great majority of those making a living off rice markets.

I INTRODUCTION

One of the poorest countries of the world, Bangladesh showcases all the tensions spawned by the combination of (i) an extremely high population density; (ii) low natural resource endowment; (iii) a narrow production base and an associated heightened susceptibility to external shocks; (iv) low domestic saving and investment effort, which contrasts sharply with a fairly large overhang of corporate sector debt; (v) excess liquidity in the banking system in the midst of apparently weak demand. At just over 4 odd percent, the overall growth in the gross domestic product (GDP) of the economy has been not dismally poor, albeit not certainly impressive either during the period since 1985/86. Agriculture, which absorbs about a quarter of the economy's GDP, has had growth rates of about 3% per year during this period. Three-fifths of this growth have been on account of the "service sector" (World Bank, 1992, p. 3). Such a pattern has accentuated concerns about the future sustainability of even the admittedly low overall growth rate achieved more recently. The trend of longterm real rice prices is heading downwards. Moreover, as an analysis of the moving average seasonal prices has shown, the problem of downward variability of seasonal prices during the months of June through August has thrust itself. This has of late impaired production incentives.

Against this background, concern has mounted of late whether more could be done in terms of structures of public foodgrain procurement, if any, that could potentially support market prices more consistently. The objective of this paper is to present a body of new evidence bearing on whether, in that context, there is a case for reexamining

the range and objectives of the existing credit instrumentalities in foodgrain markets. The information presented does reasonably establish that such a case can be made. This paper is accompanied by another piece by Mahfooz Rahman which will address instrumentalities in more specific terms (Rahman, 1994).

Data and methodology

Virtually all data used in this paper are sourced from three primary sample surveys: IFPRI Farm Survey 1989/90; IFPRI Rice Market Survey 1989/90; IFPRI Wheat Market Survey, 1992/93.¹ These sets of primary data are supplemented by secondary data, mainly relating to cereal production and public marketing, gathered from official sources.

The structure of the paper

Section II reports on the production environment in which storage and spatial-arbitrage decisions of Bangladesh's rice market agents are coordinated, as also selectively lights upon structural and marketing-conduct aspects of the agents composing the rice market. (For a similar account of the wheat market, see Chowdhury 1993c.) This section is unavoidably long: without a full understanding of farmer marketing, it becomes hard to understand the nature and significance of the infrastructure of credit that has been spawned over many years by the market itself. Section III is about the pattern of credit outstanding by sources in rice and wheat markets. The evidence presented here clearly shows that, while credit

¹ For the first two, detailed account of the methodology can be seen in Chowdhury, 1992a. For the second, detailed methodology can be seen in Chowdhury 1993c.

markets are adequate for turning stocks of mainly low-grade coarse rice with high velocity, credit availability is clearly short when the set of available marketing options is expanded to include some form, hopefully of more transparent market accountability, of public grain acquisitions (e.g. open tenders). Section IV is about the effect of bank credit access on productivity. Section V summarizes the major conclusions of the paper.

II PRODUCTION AND COMMERCIALIZATION IN RICE ECONOMY

Agricultural growth in Bangladesh has, fundamentally, been about cereal output, especially rice (Table 1). Growth in rice output has been driven by the expansion of output of dry-season boro rice (Table 2). While the privatization and liberalization of fertilizer market has played an important role in this, the decisive growth factor in all this, especially since 1988, has been the liberalization of the market for minor irrigation equipment. Farmer investment in minor irrigation has accelerated expansion of irrigated area from an average of 0.5% of net cultivable area per year during the 1970s to about 2.5% per year at the end of 1980s (World Bank, 1993; p. 18). Wet-season output² has grown extremely vigorously during the quinquennium to 1992/93: this, quite plausibly, is due to a shift towards high-yield-variety (HYV) aman, under irrigated condition, on flood-free land. As well as having a measure of annual production growth, there has been an equalization of the relative rice output shares on a dry season-wet season basis. This has important implications for seasonal price spreads (Bouis, 1983); farmer storage incentives and marketing strategy, and demand for capital.

Increasing rice output has spawned relatively rapid increases in commercialization (Table 3): the rate of growth of the size of rice market has topped growth rate of population. Close to two-thirds of the boro output is

² Bangladesh's rice season divides off into a wet-season, aus and aman rice, and a dry-season, the boro rice. Aus is planted in May-June and harvested in August-September; aman is planted mainly in June to August and harvested in November-December. Boro is planted in January-February and harvested in May-June.

Table 1 — Trend growth rates of area and production of farm crops, 1973/74 - 1989/90¹

Crop	(percent per year)			
	1973/74 to 1983/84		1979/80 to 1989/90	
	Area	Production	Area	Production
Foodgrains	1.20*	2.74*	.13	2.33*
Rice	0.72*	2.19*	0.05	2.42*
Wheat	18.33*	26.47*	1.77	0.19
Nonfoodgrains	-0.53	0.57*	-1.73*	-0.28

Notes: 1) Growth rates are estimated by fitting semi-logarithmic trend equations. Estimates that are significant at 5% error probability level or less are suffixed by * sign.

Source: Mahmud et al, 1993, Table 2.1.

Table 2 — Trend growth rates of area, production and yields of rice crops

(Percent per year)

Crops	1973/74 - 1983/84			1979/80 - 1990/91		
	Area	Production	Yield	Area	Production	Yield
MV Aus	9.2°	6.2°	-3.0°	1.3	3.1°	1.7°
All Aus	-0.3	0.8	1.1°	3.2°	2.1°	1.1°
MV Aus	7.1°	5.2°	2.1°	6.3°	7.0°	0.8°
All Aman	0.8°	1.7°	0.9°	0.5°	1.8°	2.3°
MV Boro	6.1°	6.8°	0.7	10.9°	10.4°	-0.4
All Boro	3.0°	5.1°	2.1°	7.7°	8.5°	0.8°
All MV Rice	6.8°	5.8°	1.1°	7.2°	7.5°	0.25
All Rice	0.7°	2.2°	1.5°	0.01	2.6°	2.6°

Sources: Mahmud et al, 1993, Table 2.3

Notes: Growth rates have been rounded to one place after decimal.
MV stands for high-yielding-variety (HYV)

Table 3 — Growing farm technological change and commercialization in Bangladesh's rice economy, 1979-1990

Year(s)	Rice Production (MMT)	Proportion of area planted with HYVs		Estimated marketed surplus ratio	Gross surplus (000MT)
		Aman	Total		
1960s	10.8	0	0	15.0	1620
1976/77-1978/79	12.5	6	13	34.0 ^a	4250
1979/80-1981/82	13.4	16	21	36.0 ^a	4824
1982/83-1984/85	14.4	18	26	38.7 ^a	5573
1986-1987	15.4	21	30	42.0 ^a	6468
1989-1990	17.8	28	38	49.0	8722
1992-1993	18.4	40	56	55.0	10200

Notes: (a) These average are computed from Dr. Madan Dey Ph.D dissertation (Dey 1988). The estimate for 1986/87 is from Dr. Akhter Ahmed Ph.D thesis (Ahmed 1990). For 1989/90, this is a direct estimate in which data from IFPRI Farm Survey were used. For 1982/83, the estimates are from a survey of 884 farms from sixteen new districts in Bangladesh (IFPRI/FPMU, 1994).

marketed (Chowdhury, 1992a). The diffusion of the technology of cultivating an irrigated winter rice by raising yields rather dramatically has transformed the odds against even a marginal farmer generating a small rice surplus.³ Rice production appears to have accelerated its growth rate accelerated its growth rate during the quinquennium through 1992/93, as compared to the period theretofore (World Bank, 1993). Amid outwardly shifting market supply, demand tended to grow relatively slowly, due to growing selfsufficiency on farms (Chowdhury, 1992b) structural change in labor contracts (Chowdhury, 1993a), a shift favoring nonrice cereals associated with urbanization. Real price of rice, nominal prices being deflated by implicit GDP deflator, has fallen over the long haul (Haggblade, 1993). While prices of rough rice have recently been seen to be vulnerable to free fall during the boro

³ Even marginal land owners (those with upto 0.49 acres of land) can sometimes generate a net surplus of paddy. Anyone who sells more paddy than he buys is surplus farmer. A functionally landless farmer with, say, 0.4 acre of arable land but with three primeaged male farm workers can rent in on crop-share basis 0.66 acre of paddy land. Their operated area would be 1.06 acre. If they raise BR11 and BR8, they will raise 23.4 mds (after paying crop shares) during aman season and 44 mds during boro/aus season --- in all 67.4 mds. At the rate of .165 MT/person/year of rice (or .2475 MT paddy/person/year), and assuming each marginal farmer has six eaters, such a household will require 39.78 mds (equal to 37.32 kgs each) [$.2475 \times 6 \times 26.79 = 39.78$]. This will still leave about 27 mds. of marketable surplus. These numbers are fairly representative of all marginal farmers except those who have neither land nor adult male workers. The latter is probably a small proportion among marginal farmers.) In the year through November 1990, marketing of paddy by marginal farmer on the sample was 21 maunds (Chowdhury, 1992a). If quite a decent proportion of marginal farms can typically generate a small rice surplus, this ought to be true of small farmers (with between 0.5 to 2.49 acres of owned land) *a fortiori*.

marketing season, prices of rice inputs, (e.g., Wage rates, fertilizer prices, etc.) in sharp contrast have been shown to be inflexible downward (IFPRI/FPMU, 1993). This implicates rice production incentives for the irrigated winter rice harvested in May-June. Public grain procurement appears to need a greater dedication to forms and structure, such as open tendering, that have potentially significant effects on market prices. In short, this calls for a structural change in public procurement of grain.⁴

Seasonality of rice production and prices

Over the past quarter of a century, Bangladesh's seasonality of rice production underwent a profound change (Fig. 1). During the quinquennium to 1969/70, sixty-two percent of the year's rice output were harvested in December-January, while the next sizeable rice crop was harvested in September. Rice prices then were at their seasonal lowest in December, and at their highest in September-October (Fig. 2). Two decades on, thanks to the diffusion of rice HYVs, the December harvest's proportionate share has shrunk to just over a half, while nearly a third is harvested relatively soon afterwards. This harvest of boro is especially heavily marketed. Price seasonality has become bimodal more recently, with one peak in March-April, and another in September and October. The typical period of trade storage, which would likely take its cue from seasonality, has fallen significantly over this period: from a typical storage period of about 4 months in the late 1960s to about one month in 1989/90 (Farruk, 1972, p. 76;

⁴ See World Bank 1992; Ahmed et al, 1993; Rahman, 1992 on the emerging consensus about the need to establish transparency in matters of public operations in foodgrain markets, in view of the Government's weak fiscal performance overall.

Chowdhury, 1992a, p. 273). As seasonal price spreads have fallen almost continuously into the late 1980s (Chowdhury, 1988), arbitrage trade over time has become increasingly less profitable imperative for storage. As the pace of urbanization has quickened, spawning a scattering of growth centres that over time coalesced into critical market masses, arbitrage over space became more profitable. Remunerative marketing strategies, given a mass commodity market driven by relatively low-grade rice, now set great store by rapid turnover of stocks at competitive margins. Seventy six per cent of farmers' marketing during the year through November 1990 were coarse rice (Table 4). The Directorate of Food (DOF), the largest single institutional buyer of coarse rice, bought off one of the highest quantities of rice during this period.

Changing geography of production and commercialization

Regional variations in terms of agronomic constraint and intrinsic irrigation advantages have resulted in marked geographical differences in growth rates of rice production. There has been a considerable fluidity to the recruitment of "high-flying" regions (Mahmud et al. 1993, Table 2.10): sources of rice production growth have, spatially, been shifting. Such a pattern fosters germination of new primary market contacts, the early availment of which can prospectively be a key to competitive supplies. Rice is virtually unparalleled among field crops in Asia in terms of the ease with which dense market contacts proximate to the farmers, both physically and economically, spring up in an elastic fashion as per capita regional surpluses increase (Barghouti et al.). The farmer's marketing is typically spaced out over time (Table 5). Also, within any given translates into an month, the farmer markets in small

batches (Table 6). And, as stated before, commercialization embraces all classes of farms, not just the large or the medium (Appendix Table - 2). Marginal and small farms market, too. All this elastic, labor-intensive marketing response at the primary market level to the emergence of new and shifting sources of marketable surplus. This should not be hard to take in an economy where, according to official labor force data, virtually all of the 50% or so increments to the civilian labor force during 1974 and 1984/85 has been absorbed by the nonagricultural sector (Osmani, 1990, p. 55). Trade has absorbed the single largest proportion of the incremental labor force.⁵ With a geographically fluid recruitment of "growth-points", with rice's marketable surpluses being farmer's a premier source of liquidity, and with commodity markets pulling labor resources with low opportunity costs within their embrace, rice markets have registered spawning of spatially new marketing channels (Chowdhury, 1992a). For this reason, to understand the structure of foodgrain markets is important in this study. This presentation need only be brief, as the details have already been reported elsewhere (Chowdhury, 1992a; Chowdhury 1993c).

⁵ No doubt, the official data are plagued by inherent difficulties of accurately classifying workers into agricultural/nonagricultural groups in an economy featuring pervasive duality of work roles (Khan and Hossain, 1989). However, the emergence of relatively crowded conditions in the availability of market agents comprising the supply side of the markets, especially at their primary stages, does not stretch credulity.

Fig. 1 - Changes in output seasonality,
1960s, 1980s

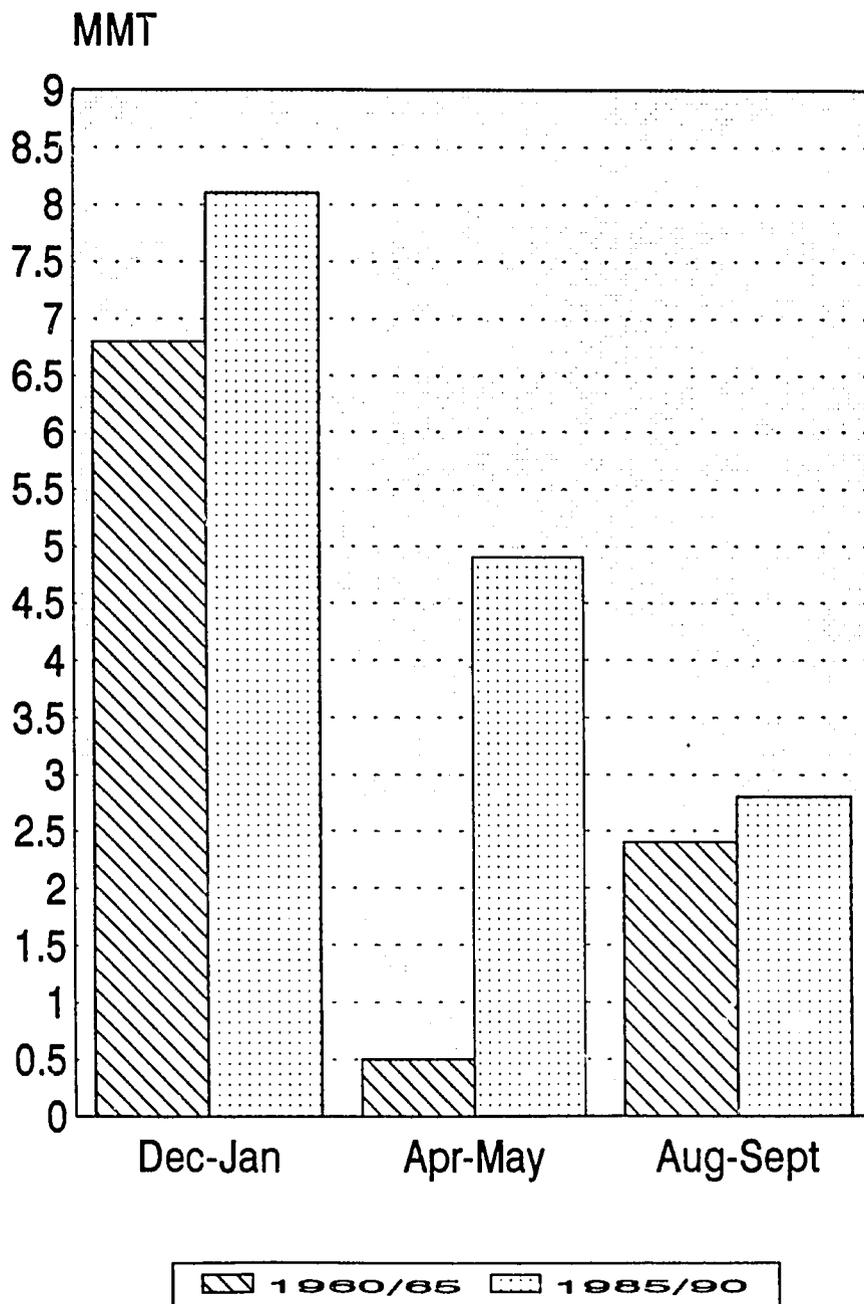
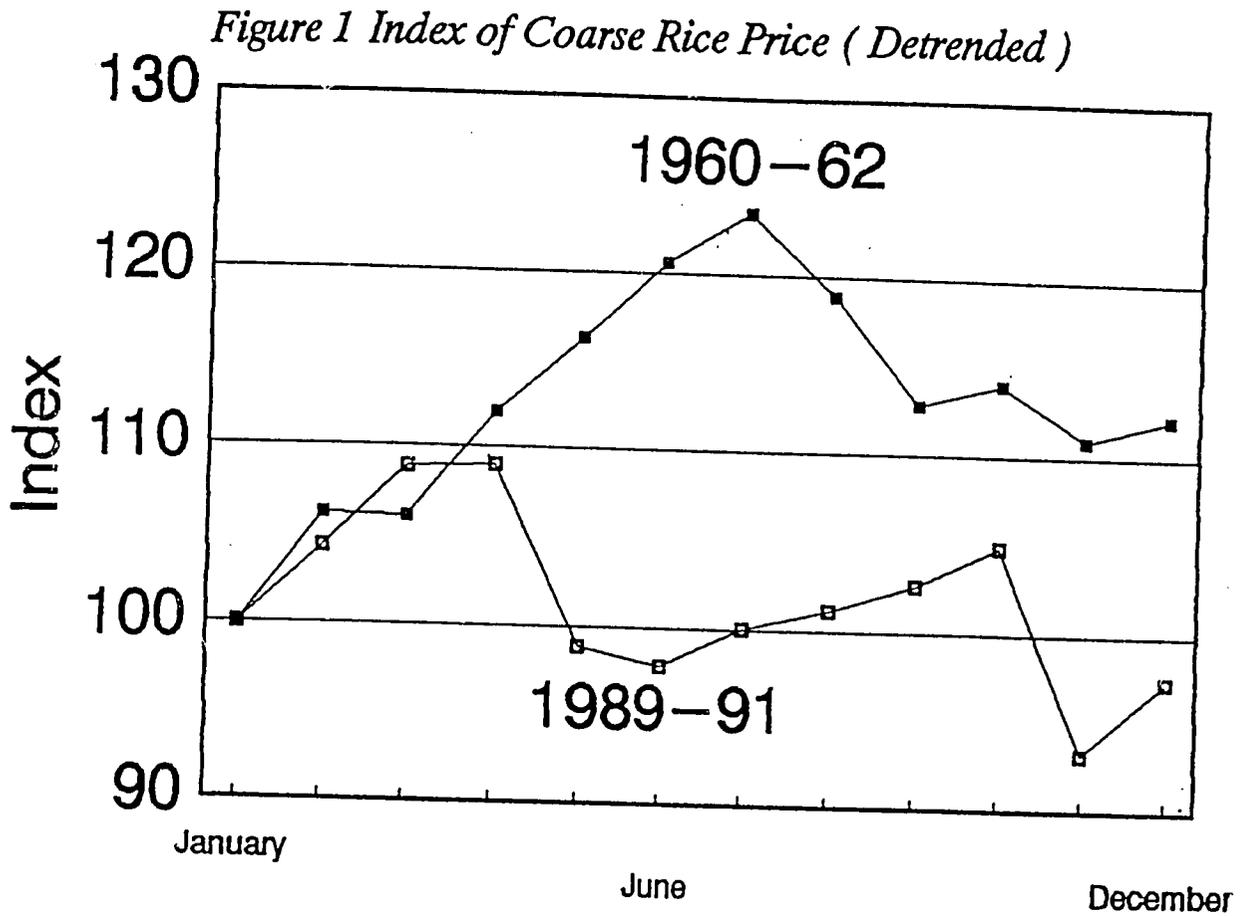


Fig. 2



Source: Haggblade 1993

Table 4 — Coarse rice centrality of rice marketing, 1989/90

Month	Marketing per farmer by month by grade		
	Coarse rice	Noncoarse rice	% of coarse rice
November	11.2	4.19	72.7
December	7.9	3.63	68.5
January	5.9	3.91	60.1
February	6.6	3.38	66.1
March	5.9	4.03	59.4
April	11.3	5.44	67.5
May	24.6	3.60	87.2
June	12.6	1.99	86.3
July-August	15.9	3.65	81.3
Sep.-Oct.	13.6	3.80	78.1
All months	116.0	37.6	76.0

Source: Appendix Table 1

Table 5 — The decentralization overtime of farm marketing of paddy, the year through November 1990

(Percent of quantity marketed)

Farm size classes	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Marginal Farms	11.29	11.94	7.79	12.0	2.51	15.6	15.31	8.4	8.61	3.85	1.6	0.8	100
Small Farms	9.41	6.13	6.15	10.6	7.09	11.1	14.11	7.1	6.65	14.1	3.9	3.2	100
Medium Farms	9.35	5.98	5.28	11.0	10.26	9.85	15.42	9.8	5.78	5.36	6.2	5.5	100
Large Farms	8.67	7.00	5.76	11.5	10.42	9.45	16.94	8.0	4.67	6.79	5.0	5.6	100
All Farms	8.92	6.69	5.67	11.3	10.09	9.72	16.32	8.4	5.13	6.92	5.2	5.4	100

Source: IFPRI Farm Survey, 1989/90

BEST AVAILABLE DOCUMENT

Table 6 — Divisibility of farmer marketing, 1989/90

Month	Paddy quantity marketed per farm per time he goes to market	No. of times per month per farm of marketing
Nov	107	2.9
Dec	8.9	2.9
Jan	9.5	2.6
Feb	10.6	2.7
Mar	8.0	2.4
Apr	10.2	2.5
May	14.7	2.4
Jun	11.8	2.3
Jul	11.4	2.2
Aug	9.6	2.0
Sep	11.2	1.8
Oct	13.1	1.7

Source: IFPRI Farm Survey, 1989/90

BEST AVAILABLE DOCUMENT

Rice markets are no doubt relatively crowded (Table 7). But they are more congested at the level where itinerant traders operate. As already stated, the farmer markets prudently, as, to him, paddy surpluses on farm is like money in the bank, indeed probably better. Farmers have adequate storage capacity for rice/paddy (IFPRI Farm Survey, 1989/90). All of this have empowered the farmer. Fifty two per cent of the marketing by the average farmer are snapped up by the itinerant traders at the farmgate (Chowdhury, 1992a). The itinerant traders, low on time opportunity cost and driven by poverty, buy at the keenest prices possible. Itinerant traders also seek to enhance their reputation or "goodwill" in the market: once established, this creates a market niche, even when they are low on equity. In a market context rife with changes that are hard to call, "goodwill" can be a substitute for equity or cash, upto a point.⁶

Growing labor-intensiveness of trading

Formal credit requirements depend, in part, upon the time lag between input purchase and realization of output sales proceeds, and upon technologically-datum minimum efficient scale of inventories. Agents could alternate

⁶ It is important to put this in the context of a market piling mainly low-grade, unstandardized, coarse rice into the circulatory process, where turnover maximization is the key to profits. The sharp price declines of 1992 and 1993 have highlighted, not without a measure of private financial casualty, the need to grow out of this undifferentiated millpond. The markets may have to brace for a structural change. Or, the rules of engagements for public procurement may tip the balance of consideration in favor of open, competitive tenders for standardized grades. Under those changed circumstances, "goodwill" may not be enough as a substitute for equity.

Table 7 — Approximate number of market functionaries in the rice markets, 1989/90

Agent categories	Number (000s)
Agents operating in paddy markets	
Itinerant merchants	47.6
Wholesalers	9.5
Automatic mills	.09
Major rice mills	.48
Small rice mills	19.7
<i>Kutials</i>	15.6
<i>Crushers</i>	15.3
Subtotal	108.27
Agents operating in rice markets	
Itinerant traders,	30.6
Wholesalers	5.1
Retailers	45.0
Subtotal	80.7
Grand total	189.0

Source: IFPRI Market Survey 1989/90

Note: These numbers are mostly based on updates on the results of Bangladesh Bureau of Statistics Census of Economic Establishments of 1986; statistics with the Bangladesh Shilpa Bank (BSB) and Bangladesh Shilpa Rin Sangstha (BSRS); World Bank's report; trade associations; other trade source. The number of itinerant traders, and crushers, probably are underestimates.

between "just-in-time" stocks policy and "stockpile-at-keen-prices" policy, depending on the market structure.⁷ Lean stock strategies were commonplace. Hence the conclusion that emerges is that in the year through November 1990, rice's marketing chain performed labor-intensively.

This should not come as a surprise: the number of rice's marketing agents has simply grown apace. Even as farmers' marketing ratio has risen from a mere 15% two decades ago to more than a half in 1992/93, in the aggregate traders' number has grown very significantly indeed since independence. The number of wholesalers at Badamtoli, Bangladesh's most exclusive rice market, was 4 in 1968, 13 in 1973, 173 in 1984 and 300 in 1993 (Ravallion, 1987; Haggblade, 1993). Swelling of the ranks at easier-to-enter segments of the market can only have been more egregious. Most new entrants in the more accessible segments come from relatively poorer rural households. Intense competition in price is pervasive.

The need for formal credit

Need for credit corresponds to (a) minimum "efficient" scale of operation; (b) input procurement and output marketing strategies; and (c) technologically-datum work-in-process lags. In the present paper, credit needs associate freely with working capital requirements (Sen, 1964). Also,

⁷ Should one mention in the same breath some other feature(s) of the economy at hand, for example, the prospective returns to seasonal or annual storage? The manner in which a market generates and disseminates information as to future shortages is, to be sure, about its pricing conduct. However, an open and permissive market structure is a necessary, albeit not a sufficient, condition for it to have a competitive price conduct, too. Rice's is, on the whole, an open and "permissive" market (see Chowdhury 1992a).

for present purposes, prevailing "norms" regarding adequacy of credit availability are critically influenced by imperative procurement and marketing options. In the study year, available marketing options were (a) selling to the Directorate of Food amid a contractual setup that fostered lax quality control; and (b) marketing through private chains of mainly parboiled rice. There were (a) no effort by any market player or institution to purchase rice through open competitive bids with minimum allowable offer quantities to match (see above); (b) no transparent logic translating relatively low domestic prices with a case for promoting rice exports; (c) no powerful market imperative for putting a premium on millers moving up-market in terms of quality. Categories at (a) and (b), were they to have become operative under the circumstances that are likely to prevail in the nearterm future, are almost certain to raise the stakes for rethinking institutional finance. Shifting fundamentals in rice markets have raised the stakes in favor of (a) and (b) being made operative (Rahman, 1993; World Bank, 1992; ADB, 1993). For instance, the shift in the fundamentals has paralleled an upstaging of the export price parity, (EPP) as distinct from the import parity price (IPP), as being the more relevant world reference price for Bangladesh's rice. The price policy context for the nearterm has changed markedly, without adequate warning. Under these circumstances, the empirical evidence to be presented hereunder must be seen as germane to a period that, however recent in calendar time, is rather removed in terms of operative policy contexts. At any rate, this rings to be true tenable as far as the merits of the case for improving the access to institutional finance in order to reduce the private costs of adjusting to new market fundamentals is concerned.

Marketing agents in rice: a classification

The number of agents in a market, preferably classified by their role and, more to the point, their capitalization is an important aspect to its structure. Rice markets divide off into a paddy segment and a rice segment. Traders set themselves off ratherly unambiguously into one or the other segment. One common feature is about the presence of a large class of itinerant traders and a smaller class of wholesalers. Five classes of paddy processors (mills, etc.) straddle both segments. It may perhaps not be amiss to briefly introduce each of classes agents, beginning of paddy agents.

Itinerant traders

Perhaps among the most populous category, paddy itinerant traders typically come from small-farmer class (Table 7). Their number has probably swollen by a factor of twelve to fifteen since 1973 --- if the growth in the number of market participants at more exclusive tiers is any guide. Undercapitalized, they bring to the market their low time opportunity cost and their intimate knowledge about the marketing traits and options of the farmers in their neighborhood.⁸ Those operating on own account purchase paddy on farm, and at primary markets, then regrade it the paddy before shipping it. Bangladesh's paddy collection costs fare 2.6% of average purchase cost of paddy in 1989/90, and has fallen from 3.1% in 1982/83. This is suggestive both of the lower unit nonlabor costs and of keener unit labor cost:

⁸ In 1989/90, the average small farmer had marketed 41% of his total output (Chowdhury 1992a). The itinerant paddy trader may, for that reason, have a fair amount of his own produce being marketed. He is ideally located to buy off paddy from other farmers at keen costs.

the latter derives from the swollen marketplace. Cost of paddy collection per ton-km is about 12 cents in 1989/90. This is considered as being lower than in other major rice-belt Asian countries (FAO, 1972). These agents matter to rice marketing costs in Bangladesh being low, as they buy off 52% of what the farmers sell at the very farmgate (Chowdhury, 1992a). Paddy being bulky, it is important to the farmer that the distances he has to cover be as short as possible. These itinerant traders see to it that Bangladeshi farmer has no distance at all to cover for more than half of his sales.

This class of agents are almost entirely bypassed by the banking system (see below), albeit not without reason. However, they happen to be important destinations for onlending by agents with bank credit ceilings (Table 18).

Paddy wholesalers⁹

These agents do not spontaneously pass themselves off as wholesalers: they maintain they are merely *aratdars* or commission agents, who merely arrange sales between prospective buyers and sellers for a predetermined commission. However, in practice, *aratdars* easily shade into being wholesalers: "strong complementarities exist between those two roles, creating an incentive towards horizontal integration of functions" (Chowdhury, 1992a, p. 49). As well as satisfying indents placed by out-of-town *beparis*, they will buy on own-account, frequently using durable longterm relationships forged with other wholesalers in important assembly markets. They are among the

⁹ Because the roles of these wholesalers have been elaborated elsewhere (Farruk, 1972; Islam et al 1985; Crow, 1989; Chowdhury, 1992a), we shall abbreviate this presentation.

relatively most capitalized of rice market agents, as they have to extend finances to buyers who are short or because they have to sell on credit amid thick competition.¹⁰ We estimate the number of paddy wholesalers at a little over 5000 (Table 7).

The rice mills

Bangladesh's paddy processors, as distinct from traders, divide off in two broad classes: those that subsume the ownership, in whole or in part, of a certain array of fixed assets; and those who, not owning such structures, have to rent a package of processing services. Automatic mills, major rice mills (MRMs) and small rice mills (SRMs) compose the first category; *kutials* and *crushers* the second.¹¹

Twenty or so years ago, when about 15% of the rice output of the country was marketed, rice mills were what today would be treated as MRMs. These parboil paddy using standard industrial boilers, that wait upon public safety certification, and mill using Engleburg hullers (Ahmed, 1988; Rahman, 1988; Chowdhury, 1992a). Steamed paddy is

¹⁰ When asked, a typical *aratdar* would argue that the extension of interest-free credit for very short terms (three days or so) is prerequisite to beating the competition. Otherwise, buyers will move on, and business will fold. Certainly, it is true that credit obligations are pervasively reciprocal in this market (Chowdhury, 1993b). At the same time, any opportunity will not be lightly missed to profitably invest in tying future deliveries of grains from regions with low costs, or abundant supplies, or other "special characteristics", using credit instruments of economic control, albeit of a varying stringency, called *dadan* (Crow, 1991; Hashemi, 1990).

¹¹ Our estimates of the number of these agents in Bangladesh's rice economy can be seen in Table 7.

then manually dried on *chatahs*, swathes of concrete-carpeted area within the mill compound. The dried paddy is manually hauled for milling, usually in the cool temperatures at night, so that breakages stay low.

Automatic mills made their first visible entry in the rice economy in the late 1970s, amid the first major acceleration of the disbursement, through such conduits as Bangladesh Industrial Bank (BSB) and Bangladesh Shilpa Rin Sangstha (BSRS), of longterm industrial loan on preferential terms. Unlike the non-modernized commercial rice mills, these have involved a relatively high component of foreign exchange in total investment cost. Also while older MRMs utilized predominantly locally made equipment as well as a significant amount of labor to carryout premilling operations, the modern integrated plants involve almost entirely imported equipment. This includes equipment utilized for precleaning, soaking, parboiling and drying. Automatic mill's can not run economically with batches of less than 35 or so metric ton (MT). Paddy wholesalers, who tend to be under-banked as will be shortly be shown, can not understandably cope with storage demands commensurate with durable marketing for such large mills. Automatics rely upon itinerant traders to purchase paddy on the basis of per-maund (i.e. per 37.3 kgs.) commission, ranging between Tk. 3-5, depending on geography. But this can not entirely obviate the effects of a relatively stable pace of farmer marketing of surpluses (Table 4). The automatic mills are therefore more dependent upon the Directorate of Food (DOF), or upon other institutional agents (e.g. the Grameen Krishi Foundation in Rangpur). Automatic mills supposedly have a leg-up on rivals by virtue of being able to process paddy regardless of rain or hail. Their presumable advantage was

that they could mill especially coarse paddy at high volumes at lean unit costs.

Early feasibility studies had favorably rated the automatic mills as good risks for disbursement of project-aid disbursements. Even given an apparently unremunerative unit milling charge allowed on Government paddy, hidden subsidies and slacks in statutory rice-outturn requirement translated into attractive rates of return (World Bank, 1983, p. 44). In practice, however, many automatic mills failed to vindicate their own feasibility billing. Financial performance of the mills, implemented with the proceeds from multilateral project assistance, was, in 1983, "rated as disappointing" (World Bank, 1983). Of course, facilities of those mills were then, supposedly, at their prime. The World Bank's assessment sounds all the more pessimistic for that reason.¹²

During the 1980s, DOF would procure a lot more paddy than rice. This paddy was milled within the framework of a scheme called "Godown Supplies" on the basis of a fixed milling commission. For several years, paddy was consigned from the Local Storage Depot (LSD) to the designated mill, without the former securing the recovery of the milled rice within due time through some legal instrument. This led to

¹² To probe too closely the reasons for the relatively inept performance of the aided-automatic mills would take us far afield. These included (i) severe mismatch between available milling capacities and the quantity of paddy that the captive DOF could procure; (ii) management "by proxies"; (iii) adverse selection of technology, especially of mechanical dryer. In fact, a much greater degree of their machine pacedness impart these mill significant managerial complexity, which has to be overcome, usually through hands-on application by the owner himself. It turned out that a large proportion of these mills were managed by proxy. The result was relatively poor financial results.

a fairly widespread practice of scalping, at usually higher market prices, of a part of what in reality was publicly owned grain. Eventually, while this led to a clutch of law suits, some of which are pending even today (five to seven years after they were started), this gap was plugged in the "revamped" Millgate Purchase (MP). This latter contained clauses seeking to secure public ownership by requiring bank guarantees or financial assets as sureties.¹³

Only a half of the automatic mills on the sample of IFPRI Market Survey had access to a bank cash credit (CC) that was current. After this foregoing narrative, this should not come as a surprise.

The third category of mills is comprised by small rice mills. These represent one of the two icons of Bangladesh's rice markets, the other being the crushers. These two account for about 90% or so of the total quantum of rice privately marketed. This segment matters because of their extremely crowded ranks. Bangladesh has properly invested in building new rural roads and rebuilding old ones, thus helping to open up the countryside. At the same time, the outreach of rural electrification has grown, as has the physical access to water. When access to power, water and market access are all facilitated, the number of the so-called "husking mills" naturally expanded rapidly. They are no doubt extremely rudimentary facilities, and are not always safe beyond reproach. However, the markets want a large quantity of mainly coarse, low-grade rice, on the cheap. On this count, these lean and mean producers are hard to beat.

¹³ But even the MP had to be terminated, as it too was abused.

The former has proliferated especially rapidly since the late 1970s. From under two thousands around 1977, the number of SRMs has grown to 19.7 thousand by 1989/90. These average a drying yard capacity of 9.1 MT.¹⁴ Each is fitted out with a motor about 15 horsepower (HP) capacity, which means a milling capacity of roughly 0.5 ton/day.

The distinguishing characteristic of the SRMs is not only the divisibility of their millage, which makes them well-adapted to the capitalization of the typical paddy trader, but also their geographical outreach without losing the benefits of location on all-weather roads, or being eminently "truckable" (see below). Not only has their number grown briskly. Their representative specimen has registered a measure of business growth that compares quite favorably with MRMs and automatics (Table 8). On the IFPRI sample, 47% of the SRMs had access to a bank CC.

¹⁴ During the cooler dry-season (stretching from November through February), it may take three days drying for the paddy to be millable. During the hotter summer days, this might take about two days. The size of the drying yard therefore puts the operative cap on the ceiling rice outturn for SRMs. The average SRM on the IFPRI Market Survey sample registered own-account millage of 849 MT of paddy. To this should be added the demand for millage by crushers and crushers, on the order of another 535 MT of paddy. Given the average capacity of a drying yard, this implies a chatal takes an average of two days to dry

Table 8 — Growth of drying-yard capacity per mill between 1985 and 1990

Categories of mills	No of units	Chatal capacity (Mds/day)			Turnover/year (MT)
		1985	1990	% change in 1990 upon 1989	% change in 1990 upon 1989
With-CC units					
Automatic/MRM	26	410	624	52	58
SRM	35	152	285	88	52
Without-CC units					
Automatic/MRM	28	501	632	26	12
SRM	39	123	200	63	48

Source: IFPRI Market Survey, 1989/90

Note: Drying yard, or *chatal*s, is a fairly homogeneous specimen of the physical capacity of non-integrated rice mills. Growth in capacity can properly be measured using this variable.

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III THE ISSUE OF CREDIT AVAILABILITY IN FOODGRAIN MARKETS

Table 9 and 10 show what proportions of establishments in rice and wheat markets have a bank credit ceiling (CC) in 1989/90 and 1992/93, respectively. In both markets, a significantly higher proportion of mills have a CC than have traders.

The Portfolio of Outstanding Debt in Rice Trade, 1989/90

In this report, we present the pattern of the dues outstanding at a particular point of time of various marketing agents in the rice and wheat markets by respective source.¹⁵

We identify the relative importance of five credit sources: (i) the banks; (ii) the trade; (iii) noninterest source; (iv) and interest-bearing noninstitutional sources. In addition, there was, in the study year, yet another source of financial support, in the form of the now-defunct Millgate Purchase (MP) of paddy by the Directorate of Food (DOF). Before proceeding any further, it is imperative to explain why the financial involvements due to the MP matter to the present discussion.

¹⁵ Elsewhere, the pattern of gross disbursement and receipts during a period of observation with respect to various sources was reported (Chowdhury, 1993b). In that study, net disbursement flow was related to throughput during a given observational period. Because that study was concerned only with trade credit, outward or in, net disbursement relative to the value of the throughput was not without some relevance in the context of understanding the dense networks of credit. However, when dues owed to banks' credit get involved, one has to speak of outstanding dues, and receipts. In this report, we look at: this is because the moot issue is about the incidence and adequacy of liabilities owed to a variety of creditors, including banks.

Table 9 — Percentage of agents in rice markets with bank credit ceilings, 1989/90

(Tk. 000)

Agent type	Number of agents	% of agents with CC	Average credit ceiling (Tk.000)
Paddy itinerants	68	5	15
Paddy wholesaler	47	30	172
Automatic mills	20	50	1805
Major mills	34	56	347
Small mills	75	47	249
Kutial	65	2	40
Crusher	110	4	181
Rice wholesaler	81	16	184
Rice retailer	58	-	-
Rice itinerants	79	10	177
All	637	17	378

Source: IFPRI Rice Market Survey 1989/90

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Table 10 — Percentage of Agents in wheat markets with bank credit ceilings, 1992/93

(Tk. 000)			
Agent type	Number of Agents	% of Agents with CC	Average credit ceiling
Traders			
Itinerants	45	0	0
Wholesaler	71	49	162
Retailer	12	0	0
Subtotal	128	27	90
Millers			
R3 Miller	108	49	81
Atta Chakki	25	12	19
Major Miller	32	78	1277
Compact Miller	38	58	538
Subtotal	203	51	347
Other	24	25	110
All	355	40	238

Source: IFPRI Wheat Market Survey, 1992/93

The MP has been described, and commented upon, on several occasions (World Bank, 1992; Ahmed et al., 1993, pp. 20-22). For present purposes, the MP was virtually always a device for securing advance payment from the DOF on account of the paddy to be procured for it purchased.¹⁶ Advance payment implies interest-free public loan effective for the duration of the MG contract. During the study year, this duration was one of six months. The orders of financial magnitude involved were very large indeed. To give an example, an automatic mill with a fortnightly MP contract of 250 MT would have secured two tranches per month of Tk. 1.47 million each in advance payment (equivalent of \$ 42098).¹⁷ Because MP season lasted six months or so in the study year, the above hypothetical contract amounted to an interest free loan from the Government equivalent to the value of *half* the fortnightly capacity.

Institutional sources, i.e. scheduled banks, account for about 31% of the debt outstanding against rice's marketing agents in 1989/90 (Table 11).¹⁸ However, millers are banks' client of choice: they absorb two-thirds of outstanding dues to banks (Table 11). Wholesalers account for about 23% of that.

¹⁶ Against a bank guarantee equivalent to 60% of the value of the paddy quantity equivalent to the fortnightly milling capacity of the contractor, the MP contract would become effective. The way the system was implemented (Ahmed et al., 1993), it was used, without impunity, as an excuse for advance payments.

¹⁷ In 1989/90, paddy procurement price was Tk. 220 per md. The figure in the text was obtained thus: 250x26.8x220.

¹⁸ Each number in this table relates to the entire rice market, and is obtained by blowing up sample averages on the basis of population weights. This gives a rough feel for the orders of magnitude versus the credit markets for rice.

The information in Appendix Table 3 is put more aggregatively in Table 11, even as we attempt to light upon the pattern of net indebtedness by sources for broad classes of market agents. The aggregation is motivated to more sharply contrast the direction of indebtedness. A few findings may be briefly noted. First, the overall economy of rice marketing agents happens to be in a state of financial surplus: receivables exceed payables, when all sources and uses thereof are accounted for. This implies that some agents have to specialize in issuing financial claims against others in the rice trade on the strength of their access to *nonbank* resources. This corollary is plausible, because bank resources have already been accounted for in arriving at the overall surplus. Perhaps, this injection of the surplus is to be associated with a number of paddy and rice wholesalers having been in the trade long enough to amass a great deal of operating surplus. It is this surplus that is now deployed by the marketing agents in financing rice trade. Second, an interesting contrast sets millers off from the traders, in that the former are on balance financially deficit households. An overwhelming proportion of the millers' deficit is owing to the banks, and to the resources mediated under the aegis of the MP. This is the basis for saying that millers have a measure of access to bank finance. Third, the traders mainly issue financial claims within the informal economy, using the networks of trade credit. All in all, traders' deployment of own-account surplus is an important part of the marketing of rice in Bangladesh. Fourth, the millers' are the sole beneficiary of the hidden subsidies mandated by the particular modalities of public procurement of rice in the year at hand.

Table 11 — Distribution of economy-wide net indebtedness by classes of market agents and by sources, rice markets, 1989/90

Market agents	Informal source	Bank	Government	Total
(Tk. Million)				
Paddy traders	1518	-418	0	1100
Millers	359	-1640	-538	-1819
Kutials/crushers	53	-104	0	-51
Rice traders	2095	-336	0	1758
All classes	4025	-2498	-538	-989
(Percent)				
Paddy traders	38	17	0	n.a
Millers	9	66	100	n.a
Kutials/crushers	1	4	0	n.a
Rice traders	52	13	0	n.a

Source: IFPRI Rice Market Survey, 1989/90

Note: Each number in the top panel is the difference between receivable and payables.

Table 12 — Profit ploughback by marketing agents into rice trade

Categories of market agents	Number in the economy (000s)	Percentage of profit ploughed back into rice trade
Paddy Traders	57.1	30.8
Millers	20.2	19.7
Itinerant processors	30.9	21.3
Rice traders	50.1	32.2
All	158.0	28.0

Source: IFPRI Market Survey 1989/90.

Note: The sample of establishments was asked as to what proportion of the profits they made during the five years through the year of the interview they each had ploughed back into their respective rice business. Admittedly, this is a very private question for the traders to field. In another country, researchers may not even bother to include such a sensitive question in the survey instrument. But we had established considerable rapport with our respondents. So we asked the question, and our respondents did not entirely let us down.

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There is some evidence that traders' ability to deploy a part of the economic surpluses owes, to an important degree, to past ploughback of operating profits (Table 12). The database we use here, admittedly not an ideal one, is one that is based on the same sample of rice market agents as the one underlying all the other information presented in this paper. The procedure is consistent. The crucial information we use is about the proportion that, on average, market agents had ploughed back from the profits they had reaped in the quinquennium through the year of the survey.¹⁹

The information shows that the traders register ploughback proportions that are significantly higher than for millers. The differential in the ploughback performance naturally creates a greater capacity to deal with financial aftereffects of rice exchange. Also note that the number of traders is so overwhelmingly larger than for the millers. A much larger base naturally translates into a correspondingly large pool of surplus that can be tapped.

This evidence also serves to underscore the continuity of the operational experience of the traders in the process of rice exchange. Rice markets are inhabited not by agents that act like birds of passage. This is plausible to say because a high proportion of the market agents (59%) register a positive measure of profit ploughback: about three-fifths of the establishments are in it for the long haul.

¹⁹ For each respondent, the ensuing annual percentages were simply averaged for the five years. This is reported in Table 12.

Portfolio of debt

The above presentation has been in terms of aggregates. It will do no harm to also look at the *sample averages*, if only in order to get a better feel for the orders of magnitude relative to individual establishments. This is now done in Table 13 below.

Mills' portfolio of debt is heavily skewed toward the scheduled banks: 89% for automatic mills, 65% for MRMs and 56% for SRMs (Table 13). For paddy wholesalers, the said percentage is 33% while for rice wholesalers it is 20%. For those itinerant traders and crushers, who, numerically, sustains the basis of the market's laboriousness and lean costs, the direct access to bank debt is markedly tenuous. (However, there is much onlending to qualify this).

The Significance of Bank Resources at DOF's Disposal

It is only the mills that tap into rich veins of the bank credit resources placed at the disposal of the DOF for Millgate Purchase (Table 13). Traders are mostly outside this loop by definition. Only 1700 or so mills had the advantage of MP in their favor in 1990/91, while the total number of mills in the country was more than 20,000. Clearly, the bank resources funneled through the DOF, by cutting the traders out of the circuit, were having only a more limited impact on market prices, than a system of open, competitive tender could.²⁰ This is where the rules of

²⁰ This is not the place where this can be elaborated. Suffice it to say that if traders as well as millers are free to bid in open tenders, the participation overall in it is likely to be much greater, than has been the case in the MP. If rice is being bought by the DOF through open tenders at terminal markets in deficit regions in an effort to privatize not only the processing but also the

(Footnote continued)

Table 13 — Outstanding payables per sample establishment by debtors and creditors, rice markets, 1989/90

(Tk. 000 per establishment)

Categories of market agents	Dues payable to others				Total	% to bank	Interest-free credit from the DOF through the MP
	Bank	Trade sources	Non-interest sources	Money lenders			
Paddy-buyers							
Itinerant traders	.6	12.4	4.0	3.4	20.4	2.8	0
Wholesalers	41.2	67.5	15.3	1.0	125	32.9	0
Automatic mills	897.4	99.0	1.6	14.5	1012.5	88.6	355
Major rice mills	194.1	61.1	32.1	13.2	300.5	64.6	199
Small rice mills	74.8	39.7	13.5	6.0	134	55.8	52
Kutials	0	2.0	0.9	0.8	3.7	0	0
Crushers	6.8	26.9	7.8	3.9	45.4	14.9	0
Rice agents							
Wholesalers	34.5	110.7	20.6	6.1	171.9	20.0	0
Retailers	0	3.3	1.7	0.5	5.5	0	0
Others (Itinerants etc.)	4.5	15.6	10.8	2.5	33.4	13.4	0

Source: IFPRI Rice Market Survey, 1989/90

Note: Sample estimates.

transportation of grains to be publicly distributed -- a big prospective saver --- then participation by rice traders, as opposed to millers alone is a crucial precondition to such intervention supporting prices at all.

engagements of public interventions in foodgrains market, their imperatives for private capacity to carry foodgrain stocks, albeit for only a limited part of any market season, and the mandate for public credit policy are joined together. This warrants a close look at the stocks and credit access on the part of the rice marketing agents in the study year.

For market agents, grain stocks represent a type of claims against participants in future transactions. In essence, the decision to store, which usually carries with it the decision to pay for the cost of storage, is based on one's calculation that market prices will rise by more than the cost of storage. Storage is therefore inherently intertemporal. But so is credit: for credit too is about transacting in future claims against deficit agents. Storage and the issue of credit are intertwined in a market economy. That is why they want to be looked at in tandem.

This research has been able to evaluate the stockholding behavior and the patterns of indebtedness by source in the rice trade. The information is reported in Table 14 below. While the mills had a fair measure of nominal access to bank lending, the relative want of access by traders was conspicuously high. This has already been seen before. Also, the average scale of credit ceiling accessed by even rice mills, large or small, was small relative to the scale of operation that would be warranted if open tenders were to become the dominant mode of public procurement (see Table 14). For instance, even the automatic mills' access to bank credit is small as compared with a tender regime with a minimum bid quantity of 300 MT, which itself is a small quantity for purposes of a public operation. Both major and small rice mills are trivialized when it comes to service the open tender procurement regime. It arises quite

inescapably that the prevailing access to formal finance is unlikely to materially assist in the free public tender experiment becoming even a semblance of success. Some financial reengineering seems called for.

Wheat markets, too, register the same structure of debt, as the one for rice market (Table 15).

Here, again, the mills are more often than not integrated into banks' lending network. The traders are not.

Why is this commonality? Upto a large extent, this is due banking regulation. Bangladesh Bank had restricted all bank credit to other than rice mills or flour mills up until February 6, 1990. On February 7, 1990, the Bangladesh Bank waived the restriction on rice and paddy trade only. The wheat data in Table 15 relate to 1992/93, when bank credits to wheat traders were still taboo. For rice, our data relate to the year to November 1990: credit restrictions against traders of paddy or rice were in force for a part of the period. Overall, credits to both rice and wheat trade have been poor relations of banking control. The perception of the central bankers has been that the traders will take speculative positions in grain trade using the resources of the banking sector. As already stated, mills that are registered with the Directorate General of Food are entitled to financing on value of 21 days working capital needs.

It is of course also true that mills are deemed to be better creditworthy by banks (Table 9). About the same can be said for the wheat markets (Table 10). The idea sticks that, as far as cash revolving credit by the banks in foodgrain distribution is concerned, mills are relatively more bankable than are traders. Why is this so? To an extent, the answer has also to do with the capacity or

Table 14 — Stocks and Credit in the Bangladesh Rice Trade

	Rice Millers			Rice whole- salers
	Small mills	Major mills	Automatic mills	
Number of Enterprises	19,700	480	88	5,100
Average stocks per establishment (tons)				
Peak season (January)	38	68	190	13
Lean season (September)	20	12	72	5
Credit received				
average outstanding (000 taka)	167	257	1,039	164
from traders (%)	44%	32%	13%	82%
from bankers (%)	56%	68%	87%	18%
Cash requirements for tendering (000 taka)				
300 ton minimum lots	3,000	3,000	3,000	3,000
100 ton minimum lots	1,000	1,000	1,000	1,000
Existing bank credit as percent of tender requirements				
300 ton minimum lots	3%	6%	30%	1%
100 ton minimum lots	9%	8%	90%	3%

Source: IFPRI Policy Brief # 2.

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Table 15 — Outstanding payables per unit by debtors and creditors, wheat markets, 1992/93

(Sample average/Tk. 000s)

Categories of market agents	Dues payable to others				Total	% to bank
	Bank	Trade sources	Non-interest sources	Money lenders		
Wheat-buyers						
Itinerants	0.0	0.14	0.00	0.01	1.15	0.0
Wholesalers	161.6 0	283.20	0.00	23.20	468.00	34.53
Retailer	0	3.12	0.0	0	3.12	0.0
Mills						
Roller	80.90	113.50	0.0	3.20	197.60	40.94
Atta Chakki	18.80	4.17	0.0	3.0	25.97	72.39
Major millers	1276. 80	992.0	0.0	106.90	2375.7 0	53.74
Compact millers	538.1 5	214.60	0.0	31.57	784.32	68.61
Other	110.3 9	422.51	0.0	2.28	535.18	20.63

Source: IFPRI Wheat Market Survey, 1992/93

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willingness of prospective borrowers to put up collateral. This is taken up next.

Land ownership, collateralization, credit access

Banks assess credit risk on the force of the value of collateral. In a land-scarce Bangladesh, land, even if unirrigated agricultural land, can be a collateral of choice.²¹ Prima facie, the expectation is natural that agents securing banks' CC access will register higher average land ownership than those without it. However, there is need to allow qualifications to this general rules.²² Also, we expect a larger proportion of CC agents to register access to prime business land.²³

The evidence suggests that agents with bank access average significantly higher farm land: 3.1 acres against 0.83 acres (Table 16). This difference is not exactly breathtakingly large. Moreover, it is doubtful that banks are likely to be easily sold on agricultural land's collateral value.²⁴ The difference in terms of the homestead

²¹ Unirrigated land, even when lying fallow, has registered inflation-beating price gains, suggesting that land ownership is on a premium (Hossain, 1988).

²² For instance, an unit of farm land may fetch a pittance relative to urban land, or infrastructurally developed land. One has to segregate land by location and type in this discussion.

²³ Presumably, business located on infrastructurally prime land are likelier to cash in on the rent spilled by public investment on infrastructure, and in theory, be better credit risks.

²⁴ Managers of Bangladesh's scheduled bank, being transferrable, are often "outsiders" to their station of duty. Land records are often not current. The chances of adverse selection may be perceived to be high if excessive
(Footnote continued)

Table 16 - Land ownership by rice marketing agents

	CC units			Without CC units		
	Farm land	Industrial land	Home-stead land	Farm land	Industrial land	Home-stead land
Paddy itinerants	2.2	n.a	0.38	4.2	n.a	0.11
Paddy wholesalers	4.9	n.a	0.10	4.2	n.a	0.17
Automatic mill	45.6	1.9	0.42	6.60	1.7	0.06
Major rice mill	14.3	2.16	0.20	4.8	2.19	0.23
Small rice mill	8.7	1.0	0.08	6.3	.69	0.19
Kutial	1.8	n.a	0.02	0.6	n.a	0.07
Crushers	2.0	n.a	0.05	2.7	n.a	0.13
Rice wholesalers	8.1	n.a	0.07	3.5	n.a	0.12
Rice retailers	n.a.	n.a	n.a.	0.7	n.a	0.03
Rice itinerants	4.9	n.a	0.19	4.3	n.a	0.07
All	3.1	1.03	0.16	0.83	0.73	0.12

Source: IFPRI Market survey, 1989/90

Note: Average for all agents is population-weighted, not sample-weighted.

reliance were to be placed on farm land. Besides, farm land, even if owned *bona fide*, is likely to be owned in many small parcels, adding to the unit information cost, as also to future enforcement cost of loan recovery in case of default.

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land between with- and without-CC agents is not statistically significant. This therefore does not seem relevant to the issue. That leaves business or industrial assets to consider. Agents with bank credit ceiling register significantly higher average ownership of industrial land, than without-CC agents: average ownership of 1.03 acres of prime industrial land is significantly higher than the matched average of 0.73. True, average ownership of farm land by CC-holders is significantly higher than for non-CC establishments. (But this is unlikely to be really germane to the issue of a CC). Also, the evidence suggests that a higher proportion of CC units are located on all-weather roads, as also have better-built access roads leading to them, as is shown by the last column (Table 17).

Determinants of bank credit "access"

We estimate a Probit equation to isolate the determinants of the probability that a given marketing agent has a CC. First of all, we need a rationalization of the expected signs on various coefficients.

One can think of three kinds of variables. One is about one feature of the supply side of the credit market, presently evaluated by the number of scheduled bank branches per thousand population (BB). The greater the density of branches, the greater presumably is the inter-bank or interbranch competition for profitable outlets, and the lower the unit transaction costs of securing and the utilizing a bank CC. This should return a positive coefficient. Second, whether the region where the agent's business is located is a progressive farm-cum-marketing region would help influence whether taking out a bank CC is economically a sensible idea. Many agents may believe that capital will turnover faster in an agriculturally-and-

Table 17 — Difference in location between CC units and others

Categories	Proportion of establishments that	
	are located conveniently to all-weather roads	can load a heavy-duty from its godown
CC units	87	88
Without-CC-units	66	65

Source: IFPRI Market Survey, 1989/90

infrastructurally more developed district, thus permitting a higher rate of return on capital. This may increase the odds that a bank CC will be preferred, as compared with another agents who is located in an underdeveloped region. Progressive region (PROG) dummy, we expect, will have a positive coefficient.

The next class of variables is about the establishments themselves. We hypothesize that mills are more likely than traders to be issued with a CC, because these have some considerable and mostly verifiable real assets in their ownership, which are likely to pass for satisfactory collaterals. We expect the mill dummy (DM3 or DM8) to return positive coefficients. DM3 takes the value of one for small rice mills and zero otherwise; DM8 takes the value of one for automatic mills or major rice mills, and zero otherwise. Value of fixed assets owned by the establishments on the sample (FC) is another variable included. Its sign is expected to be positive.

Marketing agents would likely have spheres of marketing of different radii. Paddy has to be purchased and shipped to the mill; the milled output has to be sold. We postulate that the radius of an establishment's market sphere can be linearly related to the number of other marketing agents it regularly transacts business with (REG). The higher is REG help out with, the greater is the agent's need for liquid capital to possible disbursements. This should have a positive coefficient. Finally, in this category, the final variable is whether the agent owns any other establishment other than the one under study (DIVERS).²⁵

²⁵ For wheat market agent, whether the agent has an statutory allotment letter that permit it to lift wheat from the DOF (ALLOT) is included.

Finally, there is a class of variable that has to do with the entrepreneurs' personal characteristics. In this category, we include three variables, viz., the number of years for which the entrepreneur has been actively associated with this business (EXP), the agent's education (EDU) and his age (AGE).

The results suggest that mills in both markets are significantly more probable than are traders to have access to banks, that specific experience and education promote a favorable CC outcome. Finally, the out reach of the agent's market contact, proxied by REG in this exercise, matters too, in the manner hypothesized (Table 18).

Banks appear to highly value experience in weighting an application for access. As stated already, rice markets have a fair measure of fluidity, both in terms of geographic sources of growth and varietal diversity. In such a setting, much can ride on hands-on experience. Education also matters. The better-educated can naturally make a more convincing pitch than the less-educated about one's bankability. And the capacity of an agent to deal with a large marketing sphere can promote the image of his being better able to managing volume variability and risks.²⁶

The branch density variable has the intuitively plausible sign for the rice market results. For the wheat market, enterprise diversification (DIVERS) is a significant determinant of CC access.

²⁶ The fact that these four variables are correspond to bank CC access in the same manner for both markets point up a general model underlying CC sanctioning behavior by branch managers.

Table 18 — Probit-function estimates of effect of establish, territorial and entrepreneurial variables on bank credit access, Rice and Wheat markets

(N=578)

	Rice		Wheat	
	Coefficient	T-stat.	Coefficient	T-stat.
Constant	-3.4	-6.6*	-2.6	-7.4*
DM1	1.01	4.6*	-	-
DM2	1.07	3.6*	.669	3.3*
FC	.133E-06	1.6	.883E-09	.06
PRCG	.154	.9	.198	1.3
EDUC	.109	4.6*	.108	4.8*
EXP	.037	4.3*	.0186	2.1*
DIVERS	.096	.41	.496	2.5
BB	.0219	.81	-	-
REG	.0053	2.2*	.0028	1.7**

Source: IFPRI Rice Market Survey, 1989/90;
IFPRI Wheat Market Survey, 1992/93

Note: A maximum-likelihood estimator was used. The symbol * shows that the coefficient is significant at 5% error probability level. ** denotes that the coefficient is significant at 10% error level.

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Trade Credit: Profile and Performance

The relationships of trade credit on the part of those who issue such credit have been presented elsewhere, albeit in terms of gross and net credit issue over a period of time (Chowdhury, 1993b). Presently, we report on the structure of credit issued that is receivables against a variety of marketing agents in the rice markets.

Trade credit is actively disbursed in this market. It flows relatively freely and both ways. Quite often, the same agent who is receiving trade credit also disburses it during the same period (Tables 19, 20).²⁷ Trade credit relations reflect a possible convergence of economic interests of the underlying agents. More than anything else, such a switching of roles by the same agent as well as its pervasiveness promotes the image of a regime with a lot of give and take in its forging of the credit infrastructure. Sharing and reciprocity is the currency of this credit exchange (Chowdhury 1993b).²⁸

Access to CC and terms of disbursement of trade credit

Crow has advanced a thesis about credit contracts in Bangladesh's rice markets being, to an important degree, rigged by the economically powerful in order to extract surpluses of the relatively vulnerable (Crow, 1991). Dadan, a contract representing varying degrees of tying tendencies,

²⁷ The same was established for rice markets earlier on (Chowdhury, 1993b).

²⁸ Certain other accounts of credit relations in the rice markets underscore a streak of hegemonic credit relations in rice markets, driven by the capacity of its protagonists to use credit leverage and feed off poorer, subordinate, agents (Crow, 1991). The present body of data does not lend much credence to this.

is a central facet to Crow's analysis. In Crow's writing, *dadan* contracts with significant usurious content are much in evidence in a backward district, through not on the developed farm district, on his sample. Crow does not, however, expose his thesis to beyond a descriptive assertion: in particular, he does not offer any test of casual hypotheses.

The Probit-function estimates of a multivariate determination of the incidence of disbursement on *dadan* as distinct from ordinary over-the-counter credit address some of these causalities (Table 21). The results would appear to be germane to the structural characterization of the kind being proposed by Crow. They would also be important as causal analyses of credit behavior of agents in foodgrain markets of Bangladesh.

The results of the foregoing exercise are reported, and interpreted below.

There is no evidence that CC access, controlling for the type of mill at issue, is any the more preferential to the *dadan* mode of disbursement of trade credit. And *dadan* forms are no favorites of the mills either: in fact, mills, absorbing most of the bank credit, eschew *dadan*. Overall, *dadan* forms are not a vehicle of choice for onlending banks' money. A really sprawling market sphere outreach, proxied by REG, promotes the use of *dadan*, perhaps in order for the lender to manage his volume variability.²⁹ Lenders located at the progressive farm regions eschew the *dadan* instruments particularly strongly: here, perhaps infrastructure performs, rendering *dadan* unattractive. This lends credence to the point that Crow's *dadan* results are

²⁹ Crow has pointed up *dadan* disbursements as being price-fixing, or trade-tying.

Table 19 — Switching between disbursing and receiving trade credit in Rice Markets, 1992/93

Name of Business	% of establishments			% of establishments		
	Only Receiving	Only Disbursing	Both Receiving & Disbursing	Only Receiving	Only Disbursing	Both Receiving & Disbursing
			Units with CC			Units without CC
Paddy Itinerants	33.3	0.0	66.7	21.5	7.7	64.6
Paddy Wholesaler	0.0	21.4	78.6	0.0	18.2	81.8
Automatic Mills	0.0	30.0	70.0	10.0	60.0	10.0
Major Rice Mills	15.8	10.5	73.7	6.7	6.7	86.7
Small Rice Mills	20.0	14.3	65.7	5.0	15.0	72.5
Kutial	0.0	0.0	100.0	15.6	17.2	48.4
Crusher	0.0	0.0	100.0	1.9	10.4	84.9
Rice Wholesaler	0.0	7.7	92.3	1.5	10.3	86.8
Rice Retailer	0.0	0.0	0.0	12.1	3.4	74.1
Rice Itinerants	0.0	12.5	75.0	0.0	29.6	52.1
All	10.3	14.0	74.8	7.2	14.3	70.2

Source: IFPRI Rice Market Survey

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Table 20 — Switching between disbursing and receiving trade credit in wheat markets, 1992/93

Wheat buyers agent	% of units receiving only	% of units disbursing only	% of units both receiving and disbursing	% of units receiving only	% of units disbursing only	% of units both receiving and disbursing
Itinerants	0	0	0	4	31	36
Wholesaler	0	3	97	0	3	97
Retailer	0	0	0	33	0	58
R3 millers	0	2	98	0	4	96
Atta Chakki	0	33	0	0	23	23
Major millers	0	0	100	0	14	86
Compact millers	0	14	86	0	69	31
Wholesaler of flour	0	0	100	0	6	94

Source: IFPRI Wheat Market Survey, 1992/93

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Table 21 — Probit-function estimates of effects of structural, enterprise and entrepreneurial variable on the terms of on-lending/lending, rice market

(N=578)

Variables	Disbursement on dadan terms		Disbursement on over-the-counter basis	
	Coefficient	T-stat	Coefficient	T-stat
Constant	-2.44	-9.2*	0.77	4.4*
CC	0.301	1.5	.232	1.0
DM3	-0.734	-2.8*	-.124	-.55
DM8	-0.839	-2.4*	-.275	-.07
FC	.104E-06	1.8**	.476E-08	.07
REG	.01	4.7*	.697E-02	2.1*
PROG	-.477	-3.1*	-.349	-2.66*
EXP	.0248	3.2*	-.007	-.93
EDUC	.1102	5.4*	.04	2.8*

Source: IFPRI Rice Market Survey, 1989/90

Note: The symbol * denotes the coefficient at hand is significant at 5% error probability level

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representative more of backward farm regions with relatively ill-formed markets (Chowdhury, 1990). Interestingly, education and experience both improves the odds for *dadan* disbursements. It may be that the *dadan* disbursement in this market is not so much about a binary issue in terms of very significant *power differentials*, as about a matter of *business savvy* and *perspective*. The first of these corresponds to education, the second to perspective and a long view. The institution of *dadan* giving is suggestive of managerial maturity, not primitive accumulation.

On the whole, the incidence of *dadan* is not simply a question of economic power relationship. It is a more complex issue involving (i) geographic differences in unit costs of marketing; (ii) the long-term relationships, nurtured by a business pragmatism associated with education and specific experience.

Pattern of disbursement by credit-access status, rice trade, 1990

The ability of a market agent to draw upon a bank credit line is deemed to be a preferred form of credit access. In the literature, significant emphasis is laid upon whether, and what networks of, onlending of finances tapped from formal sources exist. We report in the following the results that address this issue. Note at this stage that the rice economy has two major credit channels, viz. over-the-counter *paikari* and *dadan*. Also in this section, we examine the relative importance of *dadan* and *paikari* credit by credit access status (CAS) of the creditor for different source-destination pairs.

The patterns of lending and onlending are set off from each other, depending on the CAS of the agents. It will be plausible to assume that the onlending by firms that have a

CC with a bank can stylize the patterns of onlending of resources mobilized from formal sector institutions. It is also true that, for those with CCs, bank debt dominates nonbank debt and even liquid assets. Conversely, the disbursement by firms without any CCs is typical of the patterns of onlending of "equity" resources.³⁰ It is for the first time that such a profiling of the disbursements in the rice economy has been estimated (Table 22).

Three results clearly stand out. First, taking an overall view, *dadan* and *paikari* credit roughly balance each other: disbursement per firm averages at Tk. 314 and 313 thousand, respectively.³¹ Significantly, this strikingly close overall balance is apparently belied by sharp differences in debt profolio behavior of the with-CC firms, and the others. Summing over all destinations, firms with CCs onlend significantly more heavily on *nondadan* terms, than on *dadan* terms. As already stated, mills, banks' clients of choice, avoid *dadan* instruments. On the other hand, firms without bank CCs issue *dadan* credit on a somewhat larger scale than for *paikari* credit. However, the difference this time is not statistically significant.

A corollary may well be noted in passing here. *Dadan* loans are in the words of Crow, trade-tying: they are cash loans from large traders to small ones, and tie the borrower to make all transactions through the lender while the loan is outstanding (Crow, 1992). "This form of interlinked

³⁰ These firms are lending either out of their equity resources, or out of "quasi-equity" resources. Even when they are onlending resources tapped from other informal sources, they are usually "guaranteeing" those disbursements by their equity or goodwill or some such thing.

³¹ These averages are population-weighted. The weights are reported in the appendix.

transaction provides much of the working capital for small traders in many of the grain markets of Bangladesh, but is rare in [advanced areas]" (Crow, 1992, p. 4). The above implies as though the prevalence of *dadan* is about the demand for capital by the undercapitalized and about the access of those with greater clout to meet that demand. Access to a secure credit line from a bank would, at least *prima facie*, appear to be a trademark of the ability to lend *dadan*. If lucrative opportunities to tie many smaller traders in subordinate, tied situations were simply ripe for the picking in many grains markets of Bangladesh, it would appear likely that traders with CC with banks should have enjoyed some comparative advantage in exploiting them. It would be hard to beat CC-holders' capacity to absorb the demand for cash loans.³² If *dadan* credit create a state of personalized monopsony, as is maintained by Crow (1992), this is not so much due to differential access to credit at institutionally-determined lower-than-market interest rates. The compulsions to the availment of *dadan* are more diffuse and fluid, with the fluidity of the geography of rice's marketing chain to match (Mahmud et al, 1993; Chowdhury et al, 1994).

Itinerant merchants by representating the first stage of an intensely competitive marketing chain are the cutting edge of grain assembly, which is of great tactical importance. Significantly enough, these itinerant traders are the single most important destination for credit, regardless of credit access and of its type. Firms with

³² The CCs have to be adjusted once a year --- a period long enough to accommodate two *dadan* finance cycles in terms of the marketing of *kharif* and *rabi* season rice. Thus, the legalities of adjusting the books do not subtract from *dadan*'s technical feasibility.

bank CC juggle their credits to the itinerant traders until both ordinary and *dadān* credits are each about two-thirds of the total. But firms without bank CCs have *dadān* credits to the itinerant traders to be their favourites.

Given rapidly shifting geography of the location of the surplus production, relentless crowding of the market chains and gradual erosion of the gross marketing margin, reciprocity is a better code for the flavor of the relationship between the *dadān* issuer and the itinerant traders, than economic subordination. Further evidence to this effect is presented shortly below.

A policy of monetization of wheat aid: is credit supply adequate?

There is a growing conviction that wheat aid should, *in toto* or in part, be monetized at port. The proceeds realized from the auction could then be directed to some target groups through cash transfers. From 1994 onward, all of the US wheat donations to Bangladesh implicated by the mandate of CARE, the US voluntary agency, is going to be bulk-sold.³³ The question arises if the financial capacity of the market can cope. In order to assess the situation, it is imperative to look at stocks and credit in tandem (Table 23). The idea is to auction wheat off at the port to the highest bidder, while trying to ensure the fullest possible participation in it of all millers and traders of any consequence. This, by rendering unnecessary the current practice of storing and transporting the grain at public expense, is likely to save the treasury money. If private trade is competitive, the market could be counted upon to

³³ Traditionally, US has accounted for some one fifth of all wheat donation to Bangladesh.

Table 22 — Patterns of credit disbursement by credit access and by types of credit transactions

(Thousand Taka/establishment)

Type of agents	Paikari Credit				Dadan Credit			
	Itinerant Traders	Whole-salers	Others	All destination	Itinerant Traders	Whole-salers	Others	All destination
	Firms with credit ceilings				Firms with credit ceilings			
Mills	242.5 (69)	99.0 (28)	10.3 (3)	351.8 (100)	53.9 (73)	19.7 (27)	0.0 (0)	73.6 (100)
Traders	539.5 (72)	187.5 (25)	26.0 (3)	753.0 (100)	453.8 (64)	177.5 (25)	75.0 (11)	706.3 (100)
Others	131.8 (54)	105.7 (44)	4.5 (2)	241.9 (100)	55.0 (100)	0.0	0.5	55.5 (100)
All	264.6 (67)	117.9 (30)	11.5 (3)	393.9 (100)	130.2 (69)	43.6 (23)	14.4 (8)	188.2 (100)
	Firms without credit ceilings				Firms without credit ceilings			
Mills	63.0 (62)	24.8 (24)	13.2 (13)	101.0 (100)	69.9 (49)	0.0	73.2 (51)	143.1 (100)
Traders	1004.0 (57)	463.5 (26)	284.9 (16)	1752.3 (100)	793.9 (79)	201.7 (20)	12.5 (1)	1008.0 (100)
Others	90.7 (45)	57.9 (29)	53.2 (26)	201.7 (100)	235.3 (82)	2.5 (1)	49.0 (17)	286.8 (100)
All	152.9 (50)	84.3 (28)	67.0 (22)	304.2 (100)	264.5 (80)	16.3 (5)	47.9 (14)	328.7 (100)
	All firms				All firms			
Mills	147.2 (67)	59.6 (27)	11.8 (5)	218.7 (100)	62.4 (56)	9.2 (8)	38.8 (35)	110.5 (100)
Traders	888.1 (59)	394.6 (26)	220.3 (15)	1502.9 (100)	709.0 (76)	195.6 (21)	28.1 (3)	932.7 (100)
Others	92.2 (45)	59.7 (29)	51.3 (25)	203.2 (100)	228.3 (82)	2.4 (1)	47.1 (17)	277.9 (100)
All	164.2 (52)	87.7 (28)	61.4 (20)	313.2 (100)	250.9 (80)	19.0 (6)	44.5 (14)	314.5 (100)

Source: IFPRI Rice Marketing Survey, 1989/90

Note: Figures in the parentheses are row percentages

distribute the grain on the cheap. In the current system, leakages from public rationing source a good part of market supplies, and shadowy deals that have to be made market margins up.

As with rice, the prevailing scale of credit absorption and stocks in the wheat trade is clearly inadequate. Credit to small millers and wheat traders will have to increase by a factor of 10 to 30 allow private agents to participate effectively in the bulk sales. Bangladesh Bank (BB) made some considerable progress in liberalizing foodgrain credit access, vide circular no 27 of October 1992. However, the bankers' practice, powerfully driven by collateral considerations, has somewhat lagged behind the requirements.

On common consent, wheat monetization deserves a fair trial. The banking system is overseeing a growth of excess liquidity. The government has covenanted not to issue to the banking system any sectoral directives, and leave managers to their own tactics. While decentralization helps depoliticize banks' debt portfolio and keeps low the number of "white elephants" funded by public deposits, what guarantee is there that it, in one stroke, will also breathe competition into the mindset of the bank managers which, ultimately, is needed to induce them to go and search bankable ideas? What does it do to the internal incentives of the managers, which also seem germane to bankers' performance. Because these structural determinants of financial sector performance are hard to impact in the short run, the hands-off policy may have had the effect of reining in disbursement, without a movement towards greater meritocracy chalking up more productive loans. The "excess liquidity" would then be a result to follow naturally.

Table 23 — Stocks and credit in Bangladesh wheat trade

	Wheat mills			Atta chakki	Wheat wholesaler
	Major	Compact	Roller		
Number of enterprises	53	196	445	11300	1000
Average stocks per establishment (MT)					
Peak season: June	451	196	39	17	11
: August	378	159	35	13	11
Lean season : February	170	72	14	9	225
Credit received (Tk. 000)					
Average credit ceiling	1277	538	81	19	162
Cash requirements for tendering (Tk. 000s)					
500 MT minimum lots	3014	3014	3014	3014	3014
200 MT minimum lots	1206	1206	1206	1206	1206
Existing bank credit ceiling as % of tender needs					
500 MT minimum lots	42	18	3	1	5
200 MT minimum lots	106	45	7	2	13

Source: IFPRI Wheat Market Survey, 1992/93

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Trade credit: terms and conditions

The point has been made that the compulsion to enter into informal credit contract or arrangements in a market with rapidly shifting opportunities, and contingencies, is often reciprocal. It would be nice to be able to document this in terms of the price of informal credit as a service. For this reason, we probed our respondents about whether they paid a *de facto* price for using informal credit through higher prices. In the rice market, in 88% of credit transactions, *dadan* ones included, the debt issued is interest-free. There is support in this evidence for saying that, given the crowded state of the competition, credit is an unavoidable lubricant to commodity circulation, and that rice markets do not subsume a money market.

In the wheat markets, the proportion of credit transactions where credit is priced as a service, at about 65%, is significantly higher than for rice. This cross-grain difference is due to the fact that wheat's distributive circulation is more discontinuous --- a touch-and-go affair --- than for rice.³⁴

³⁴ Cross grain credit-related differences would be reported on by this author separately.

IV. DOES FORMAL CREDIT DECISIVELY MATTER? A CAUSAL MODEL

To answer this question, we set up a two stage procedure, following Bingwanger and Khandker (1992). The impact of credit on output is mediated by a joint dependence of output, credit demand and credit supply on other variables such as technology, prices, geography, human capital and entrepreneurship. Credit advanced by formal lending agencies is an outcome of both the supply of and demand for formal credit. It may be hypothesized that the formal credit available to the trader, i.e., his credit ration, enters his decision to use variable inputs, such as production labor or paddy. Credit used and enterprise output may be jointly determined. There is a need to unscramble supply of formal credit from its demand.

Following Bingwanger and Khandker, a two-stage procedure is proposed to solve this identification problem. The number of branches that banks choose to have in a district is assumed exogenous to enterprise credit demand: this is used to identify the credit equation with formal credit outstanding as the dependent variable with, among others, the number of branches as explanatory variables. Predicted supply thus obtained is uncorrelated with the residuals of the output equation. This can properly be used to estimate output equation.

In symbols, this is what we set out to do

$$FCRED_i = F (BB_i, PROG) \quad (1)$$

$$Y_i = P(FCRED_i, NICRED_i, T_i, EDUC, PROG, E. \quad (2)$$

where	FCRED	=	Formal credit per employee (Tk. 000)
	BB	=	Density of bank branches (No. per sq.mile)
	PROG	=	Progressive district dummy
	PROD	=	Labor productivity (value added per employee, Tk. 000s)
	NICRED	=	Trade credit per employee (Tk. 000)
	T	=	Technology
	EDUC	=	Education (No. of years of formal schooling)
	EXP	=	Experience (No. of years)
	CAPLAB	=	Capital-labor ratio (Tk. 000)

The model is estimated using Two Stage Least Squares, for reasons adduced already.

Results

After estimating the model, we would like to answer the question posed in the foregoing in the affirmative: formal credit matters. If formal credit ration of a given agent increases by 10%, value added per person employed rises by 0.8%. The effect is statistically significant. However, output responds more strongly to noninstitutional credit. Here, a 10% increase in noninstitutional credit leads to a 3.3% increase in output. Education matters positively, too, as does, albeit less significantly, mechanization, proxied here by capital-labor ratio.

Table 24 — Two-stage least-squares estimates of enterprise output, Bangladesh rice trade, 1989/90

(N=578)

Variables	Coefficient	T-statistic
Constant	38050	0.4
CAPLAB	0.41**	1.7
FCRED	3.66*	2.9
EXP	5878	1.5
EDUC	17340*	2.2
NICRED	8.86*	8.3
DM6	-20696	-0.2

Source: IFPRI Rice Market Survey, 1989/90

Note: *denotes coefficient significant at 5% level;
 **denotes coefficient significant at 10% level.

V SUMMARY OF MAJOR CONCLUSIONS

While agricultural growth in Bangladesh has been driven by cereals, and especially rice, the rate of commercialization of rice outgrew its production. Major increases in seasonal rice harvest, virtually all coarse grain, during early summer, and diffusion of HYVs during the wet-season, have both contributed here. All the same, much of the increments to the labor force, pushed off from agriculture, were absorbed especially in trade. Meanwhile, public investments in infrastructure, despite some inevitable "leakages", began coming on steam. All this has underwritten a quiet marketing *coup d'etat*, in which two icons have been (i) growing marketing sovereignty of the farmer; and (ii) a mainly labor-intensive way of marketing of rice by fairly crowded ranks of agents. For the latter, the *esprit de corps* has been the maximization of the turnover-to-stock ratios, at all stages of marketing. This is well-adapted to the kind of divisible, in both space and time, marketing strategies that most agents have forged.

However, amid longterm rice prices trends headed downward, and the problem of downward price instability, especially during the boro season, getting aggravated, its high time to mount more transparent forms of public procurement. These are, however, likely to accelerate, especially for brief spells, the need for credit demand --- an acceleration that will dwarf the prevailing average credit availability. Similarly, for wheat, existing bank credit ceilings are dwarfed by the prospective requirement plausibly warranted, should a large part of bilateral wheat aid be monetized in bulk at port. On both scores, the credit imperatives of "prospective" price policy appear to have outgrown the market.

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Appendix Table - 1

Sample size of the data sets used in the paper

IFPRI Farm Survey, 1989/1990		IFPRI rice Market Survey, 1989/1990		IFPRI Wheat market Survey, 1992/92	
Type of farms	Number	Type of marketing agents	Number	Type of marketing agents	Number
Marginal	30	Paddy itinerent	68	Wheat itinerent	45
Small	136	Paddy wholesaler	47	Wheat wholesaler	71
Medium	255	Automatic	20	Wheat retailer	12
Large	258	Major mills	34	Roller mills	108
		Small mills	75	Atta chakkis	25
		Kutial	65	Major mills	32
		Crusher	110	Compact mills	38
		Rice wholesaler	81	Other	24
		Rice retailer	58		
		Rice itinerent	79		
All	679	All	637	All	355
No. of districts covered	21		21		20

Source: IFPRI Farm Survey 1989/90; IFPRI Rice Market Survey, 1989/90; IFPRI Wheat Market Survey 1992/93

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Appendix Table - 2

Table — Monthly average marketing by grade, 1989/90

(Mds.)

Districts	Farm size class	Non-coarse paddy									
		Agrahyan	Poush	Magh	Falgun	Choitra	Boishakh	Jaisthya	Ashar	Shraba/ Bhadra	Ashwin/ Kartik
North-West	Marginal Farms	0.92	1.31	0.62	0.68	0.93	0.00	0.49	0.29	0.35	0.35
	Small Farms	1.29	1.91	1.42	1.65	1.06	1.66	1.50	0.65	1.02	0.56
	Medium Farms	2.73	1.99	1.96	1.96	2.49	3.93	0.52	0.79	0.93	1.78
	Large Farms	6.34	6.21	6.54	6.18	8.15	7.88	6.64	2.49	4.63	5.76
Other	Marginal Farms	1.05	1.15	0.12	0.06	0.23	0.34	0.23	0.00	2.31	0.15
	Small Farms	1.62	0.91	1.40	0.99	0.18	1.67	1.27	1.36	1.05	0.60
	Medium Farms	5.03	2.70	3.36	2.54	1.54	5.15	2.82	2.10	3.43	2.55
	Large Farms	6.83	6.85	7.77	5.64	8.08	11.10	6.35	4.91	11.26	10.86
All	All Farms	4.19	3.63	3.91	3.38	4.03	5.44	3.60	1.99	3.65	3.60
		Coarse paddy									
		Agrahyan	Poush	Magh	Falgun	Choitra	Boishakh	Jaisthya	Ashar	Shraba/ Bhadra	Ashwin/ Kartik
North-West	Marginal Farms	1.50	2.76	2.16	1.34	0.32	5.05	4.08	2.05	1.88	0.39
	Small Farms	6.87	3.36	3.32	2.01	1.75	5.64	8.72	4.26	6.57	2.69
	Medium Farms	9.63	6.94	5.59	4.88	5.46	7.54	21.32	14.39	10.81	11.82
	Large Farms	22.65	16.63	10.13	14.04	13.31	16.11	51.09	22.63	29.99	25.34
Other	Marginal Farms	1.20	0.32	0.38	0.00	0.00	0.65	2.77	1.00	0.81	0.08
	Small Farms	2.54	1.59	1.66	1.37	0.54	5.04	6.24	2.74	5.04	4.93
	Medium Farms	5.57	2.69	1.91	2.95	2.29	8.51	12.73	6.02	13.06	8.84
	Large Farms	12.69	9.96	9.93	9.55	6.70	23.92	27.91	16.66	22.08	19.69
All	All Farms	11.24	7.95	5.91	6.64	5.97	11.37	24.63	12.68	15.97	13.66

Source: IFPRI Farm Survey, 1989/90

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Appendix Table - 3

Economy-wide receivables and payables, rice trade, 1989/90

(Tk. million)

Agent type	Receivable from trade	Payable to trade	Payable to bank	Noninstitutional Credit		Total payable	Payable to bank as % all payable	Govt. free credit	Total payable
				Other Noninterest	Interest Bearing				
Paddy Trader	728.83	591.71	27.31	192.74	164.22	975.99	2.80	0	976
Paddy Wholesaler	2534.25	641.47	391.25	145.75	9.38	1187.85	32.94	0	1188
Automatic mill	21.52	8.71	78.97	0.14	1.27	89.09	88.64	31.2	120
Major Rice Mill	37.69	29.33	93.18	15.40	6.35	144.25	64.59	96.7	241
Small Rice Mill	1527.15	781.72	1467.65	266.48	118.07	2633.92	55.72	409	3043
Kutial	131.50	31.52	0.00	14.32	12.15	57.99	0.00	0	58
Crushers	569.96	411.49	103.67	119.63	59.91	694.71	14.92	0	695
Rice Wholesaler	2291.12	564.63	175.75	105.30	30.99	876.67	20.05	0	877
Rice Retailer	159.87	148.63	0.00	78.16	22.30	249.09	0.00	0	249
Others	1624.02	555.83	159.90	384.96	89.00	1189.69	13.44	0	1190
All	9625.91	3765.05	2497.68	1322.87	513.65	8099.25	30.84	0	8099

Source: IFPRI Rice Market Survey 1989/90

Note: Population weighted estimates.

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Appendix Table - 4

Table — Receivable on trade credit by type of issuing mills and by recipients, Bangladesh wheat market, 1992/93

(Tk. 000)

Type of agents disbursing	Nos. of Units	Recipients										Total	% of Sample
		Itinerant Traders	W.Salers/Aratders	Roller Millers	Comp/Maj. Millers	Elected Official	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers		
R3 Miller	108	14.0	15.7	0.0	0.0	0.0	88.6	42.3	5.0	20.9	0.0	106.3	53.2
Atta Chakki	25	1.5	0.0	0.0	0.0	0.0	1.6	0.0	0.0	3.8	0.0	6.9	12.3
Major Miller	32	223.3	232.9	0.0	0.0	0.0	1731.3	59.5	12.9	676.3	0.0	2036.2	15.8
Compact Millers	38	23.3	41.5	0.0	0.0	0.0	583.4	131.9	10.4	19.0	0.0	815.5	18.7
All	203	47.7	52.8	0.0	0.0	0.0	429.5	56.6	7.8	126.5	0.0	720.8	100.0

Source: IFPRI Wheat Market Survey 1992/93

Table — Structure of receivable on trade credit by type of issuing mills and by recipients, Bangladesh wheat markets, 1992/93

Type of agents disbursing	Itinerant Traders	W.Salers/Aratders	Roller Millers	Comp/Maj. Millers	Elected Officials	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers	Total
R3 Miller	7.8	8.0	0.0	0.0	0.0	45.1	21.5	2.6	15.2	0.0	100
Atta Chakki	21.9	0.0	0.0	0.0	0.0	22.8	0.0	0.0	55.3	0.0	100
Major Miller	7.6	7.9	0.0	0.0	0.0	59.0	2.0	0.4	23.0	0.0	100
Compact Millers	2.9	5.1	0.0	0.0	0.0	71.5	18.2	2.0	2.3	0.0	100
All	6.6	7.3	0.0	0.0	0.0	59.6	7.8	1.1	17.6	0.0	100

Source: IFPRI Wheat Market Survey 1992/93

Appendix Table - 5

Table — Receivable on by types of issuing traders and by recipients, Bangladesh wheat markets, 1992/93

Type of agents receiving	Ncs. of Units	Itinerant Traders	W.Salers/ Aralders	Roller Millers	Comp/Maj. Millers	Elected Official	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers	Total	% of Sample
Faria & Bepari	45	0.1	3.7	0.4	0.5	0.0	0.0	0.0	0.0	0.7	0.0	5.4	29.1
Wholesaler	71	118.1	60.7	78.1	183.8	0.0	58.4	28.5	4.7	17.6	0.0	528.0	48.0
Retailer	12	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.8	1.4
Others	3	7.3	0.0	1.7	33.3	0.0	528.7	0.0	0.0	0.0	0.0	571.0	8.1
Wholesaler of Flour	21	18.0	0.0	0.0	0.0	0.0	84.52	176.5	93.1	171.6	0.0	543.7	0.7
All	152	58.0	29.4	35.8	77.3	0.0	49.4	37.7	15.1	32.2	0.0	334.8	0.7

Source: IFPRI Wheat Market Survey 1992/93

Table — Structure of receivable of trade credit by type of issuing traders and by recipients, Bangladesh wheat markets, 1992/93

Type of agents receiving	Itinerant Traders	W.Salers/ Aralders	Roller Millers	Comp/Maj. Millers	Elected Officials	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers	Total
Faria & Bepari	1.7	88.5	7.4	8.7	0.0	0.0	0.0	0.0	13.7	0.0	100
Wholesaler	22.4	11.5	14.4	31.0	0.0	11.1	5.4	0.9	3.3	0.0	100
Retailer	90.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	8.8	0.0	100
Others	1.3	0.0	0.3	5.8	0.0	92.6	0.0	0.0	0.0	0.0	100
Wholesaler of Flour	3.3	0.0	0.0	0.0	0.0	15.5	32.5	17.1	31.8	0.0	100
All	17.3	8.8	10.7	23.1	0.0	14.7	11.3	4.5	9.8	0.0	100

Source: IFPRI Wheat Market Survey 1992/93

Appendix Table - 6

Table — Payable on trade credit by types of receiving millers, Bangladesh wheat markets, 1992/93

Type of agents receiving	Nos. of Units	Itinerant Traders	W.Salers/ Aratders	Roller Millers	Comp/Maj. Millers	Elected Official	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers	Total	% of Sample
R3 Miller	108	20.0	102.2	1.5	0.0	0.0	0.9	0.0	0.0	1.2	1.4	127.2	53.2
Atta Chakki	25	2.0	0.4	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	4.5	12.3
Major Miller	32	260.9	733.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	994.8	15.8
Compact Millers	38	31.5	203.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	235.7	16.7
All	203	58.0	208.1	0.8	0.2	0.0	0.5	0.0	0.0	0.9	0.7	269.2	100.0

Source: IFPRI Wheat Market Survey 1992/93

Table — Structure of payable on trade credit by type of receiving mills Bangladesh wheat markets, 1992/93

Type of agents receiving	Itinerant Traders	W.Salers/ Aratders	Roller Millers	Comp/Maj. Millers	Elected Officials	Flour/Atta W.Salers	B.B Factories	Restaurants	Others	Importers	Total
R3 Miller	15.7	80.3	1.2	0.0	0.0	0.7	0.0	0.0	0.9	1.1	100
Atta Chakki	56.6	9.0	0.0	34.3	0.0	0.0	0.0	0.0	0.0	0.0	100
Major Miller	26.2	73.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100
Compact Millers	13.4	88.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	100
All	21.5	77.3	0.3	0.1	0.0	0.2	0.0	0.0	0.3	0.3	100

Source: IFPRI Wheat Market Survey 1992/93

Appendix Table - 7

Table -- Payable on trade credit by types of receiving traders, Bangladesh wheat markets, 1992/93

Type of agents receiving	Nos. of Units	Itinerant Traders	W.Salers/Aratders	Roller Millers	Comp/Maj. Millers	Elected Official	Flour/Atta W.Salers	B.B. Factories	Restaurants	Others	Importers	Total	% of Sample
Faria & Bepari	45	0.3	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.2	29.6
Wholesaler	71	44.7	154.8	12.3	100.8	0.0	0.0	0.0	0.0	1.2	7.0	320.8	48.7
Retailer	12	1.7	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	3.1	7.9
Others	3	25.0	0.0	0.0	420.0	0.0	0.0	0.0	0.0	0.0	0.0	445.0	2.0
Wholesaler of Flour	21	8.2	18.8	1.2	280.3	0.0	242.2	0.0	0.0	0.0	0.0	528.7	13.8
All	152	22.4	74.8	6.0	91.3	0.0	33.5	0.0	0.0	0.7	3.3	232.0	100.0

Source: IFPRI Wheat Market Survey 1992/93

Table -- Structure of payable on trade credit by type of receiving traders Bangladesh wheat markets, 1992/93

Type of agents receiving	Itinerant Traders	W.Salers/Aratders	Roller Millers	Comp/Maj. Millers	Elected Officials	Flour/Atta W.Salers	B.B. Factories	Restaurants	Others	Importers	Total
Faria & Bepari	24.0	40.5	13.2	0.0	0.0	0.0	0.0	0.0	22.3	0.0	100
Wholesaler	13.9	48.3	3.8	31.4	0.0	0.0	0.0	0.0	0.4	2.2	100
Retailer	54.4	1.2	27.2	0.0	0.0	9.0	0.0	0.0	8.3	0.0	100
Others	5.8	0.0	0.0	94.4	0.0	0.0	0.0	0.0	0.0	0.0	100
Wholesaler of Flour	1.2	3.2	0.2	49.4	0.0	46.0	0.0	0.0	0.0	0.0	100
All	9.7	32.2	2.6	39.4	0.0	14.4	0.0	0.0	0.3	1.4	100

Source: IFPRI Wheat Market Survey 1992/93

Appendix Table - 8

Table — Number of enterprises with bank CC, and without, 1989/90

	(000s)	
	With CC	Without CC
<u>Paddy processors</u>		
Itinerant traders	2.1	45.5
Wholesalers	2.83	6.67
Automatic mills/major mills	.31	0.26
Small rice mills	9.2	10.5
Kutials	.23	15.37
Crushers	.55	14.7
<u>Rice agents</u>		
Rice wholesalers	.82	4.28
Itinerant traders	3.06	27.5
Rice retailers	-	45.0
Total	19.1	169.8

Source: IFPRI Rice Marketing Survey, 1989/90