

BIBLIOGRAPHIC DATA SHEET

1. CONTROL NUMBER
PN-AAH-3592. SUBJECT CLASSIFICATION (695)
DE10-C000-G635

3. TITLE AND SUBTITLE (240)

Banking innovations in India; a case of group lending for agriculture

4. PERSONAL AUTHORS (100)

Desai, B. M.

5. CORPORATE AUTHORS (101)

Ohio State Univ. Dept. of Agr. Economics and Rural Sociology

6. DOCUMENT DATE (110)

1979

7. NUMBER OF PAGES (120)

31p.

8. ARC NUMBER (170)

IN332.71.D441

9. REFERENCE ORGANIZATION (130)

Ohio State

10. SUPPLEMENTARY NOTES (500)

(In Paper no. 14, Second International Conference on Rural Finance Research Issues, Calgary, Canada, 1979)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

Credit
Group loans
Agricultural credit
Banks
Banking business
IndiaRural finance system
Mortgage
Innovations

13. PROJECT NUMBER (150)

931116900

14. CONTRACT NO.(140)
AID/ta-BMA-715. CONTRACT
TYPE (140)

16. TYPE OF DOCUMENT (160)

PN-PAH-359

IN
332.71
D441

Paper No. 14
Second International Conference on
Rural Finance Research Issues
Calgary, Canada
August 29-31, 1979

BANKING INNOVATIONS IN INDIA
-- A CASE OF GROUP LENDING
FOR AGRICULTURE --

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BANKING INNOVATIONS IN INDIA
-- A CASE OF GROUP LENDING FOR AGRICULTURE --

B.M. Desai*

1. Introduction

In India both structural and operational changes have been introduced in recent years to increase credit to the poor households. The former includes creation of special institutions like Regional Rural Banks, restriction on loan portfolio in terms of some proportion of loans being reserved for smaller farmers, provision of concessional refinance being conditional to making loans to such farmers, making outright grant as a risk fund to strengthen bad debt reserves of the lending institutions and so on. Operational changes include potential productivity and repayment capacity instead of collateral criterion of lending, providing supervised credit through agri-card¹ and such other mechanisms, providing loans on a group basis etc. Some of these changes can be termed as innovations in the sense that they facilitate providing and/or acquiring financial services at lower unit transaction costs.

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1 An agri-card entitles the account holders to purchase their seasonal recurring requirements from approved dealers on presentation of the card without any transaction in cash.

This paper is restricted to the study of a group lending innovation² for agriculture. Many banks have introduced this innovation, although detailed statistics about this experiment are not available in official publications. Moreover, analytical literature on this innovation in India is non-existent or at best scanty.³

Our pilot study is restricted to one branch of one of the nationalized commercial banks due to limited funds and time. While the bank had introduced this innovation in 1969, the selected branch executed the group lending scheme in 1974, two years after the branch was established in a town in Maheboobnagar district of Andhra Pradesh. Group loans in this branch constituted 30 to 75 per cent of loan amounts disbursed during 1975 to 1978. Such loans were given for both crops and farm assets like wells, pumpsets, bullocks, dairy animals and poultry. The account holders were spread over many villages. Because of limited funds and time the study was restricted to 87 group borrowers organized into 24 groups, and 49 individual borrowers. We shall refer the former as "Group" and the latter as

-
- 2 Under this innovation, the loans provided to a group of people are guaranteed by all the members of the group unlike the loans provided to each individual on a mortgage or a third party guarantee.
 - 3 One exception to this is a study on "Innovations in Banking: The Indian Experience, Part I: Impact on Deposits and Credit", C. Rangarajan, Indian Institute of Management, Ahmedabad, 1978, Chapter 4.

"Mortgage" borrowers. These borrowers had taken crop loans⁴ during 1978-79 agricultural year. The selected borrowers were spread over 23 villages in 4 contiguous talukas in Maheboobnagar district. The "Mortgage" sample accounted for over 70 per cent of total "Mortgage" accounts of crop loans of 1978-79. The corresponding proportion in the case of "Group" borrowers was 25. The selected farmer-borrowers were interviewed for the agricultural year 1978-79.

2. Objectives and Methodology

Two-fold purposes of this paper are:

- (a) To develop an analytical framework to determine equilibrium conditions under which "Group" lending is an innovation; and
- (b) To empirically validate or invalidate the potential advantages and disadvantages of the group lending innovation.

Because of insufficient variation in interest rate among different borrowers as well as over time we are compelled to pursue the second objective instead of quantifying the impact of the innovation on equilibrium interest rate and loan amount. Despite the data difficulty, we wish to pursue the first objective of developing a framework because it would provide a *pricri* justification for the introduction of this innovation. More significantly, it would help

4 Since this innovation could have different implications for current (crop loan) and capital (farm assets) loans, the findings of this pilot study would have limited applicability. To illustrate, the lower default risk advantage of the innovation could be relatively more for crop loans than for capital loans.

us identify the conditions which banks should emphasize to ensure that "Group" lending remains an innovation. This is necessary because this innovation is characterized by both advantages and disadvantages.

Before we proceed further, it should be clarified that the empirical analysis of the second objective will be carried out such that the homogeneity of the two samples, namely, "Group" and "Mortgage", in respect of characteristics other than the collateral given by them to the bank would also be tested. Multi-variate discriminant analysis would be attempted for this purpose.

3. Analytical Framework

3.1 Demand and Supply Categorization of Potential Advantages:

Conceptually four potential advantages of "group" lending innovation have been identified.⁵ These can be categorized as influencing supply of credit, and demand for loans. The former would include;

5 See, for example, Adams Dale W. and Jerry R. Ladman, "Lending to Rural Poor Through Informal Groups: A Promising Financial Market Innovation?" Economics and Sociology Occasional Paper No. 587, Agricultural Finance Program, Department of Agricultural Economics and Rural Sociology, The Ohio State University, Columbus, Ohio, U.S.A.

- (1) Lower default risks which would arise from the mutual pressure of the members of the same group. Such peer pressure and collective responsibility would invoke recalcitrant borrowers to repay, and thereby reduce the risk of default for the lenders.
- (2) Lower unit transaction costs to the lenders that would result from making, administering and collecting one sizable loan rather than a number of small individual loans.
- (3) Scale economies implied in providing technical and other support services more efficiently and also in spreading scarce manpower to reach a large number of clients.

While the last two factors could easily be interpreted as influencing the supply schedule, the first one of lower default risk could also be interpreted similarly, since it implies providing lower allowance for default risks. Such allowance in the form of bad debts reserves is practiced by some lenders. And it forms one of the elements in determining the supply price of credit.⁶

The demand influencing advantage is the lower unit transaction costs to the group borrowers as compared to the individual borrowers. Borrowers' costs in transacting every 100 Rupee group loan would be

6 See, for example, Credit for Small Farmers in Developing Countries, G. Donald, Westview Press, Boulder, Colorado, 1979, Chapter 9.

lower because they would save time, transportation costs, expenses incurred in obtaining the necessary documents and certificates before loan sanction, besides saving in costs required for giving mortgage and/or third party guarantee as a security for the loan.

In India many banks including the one selected for this study have aimed at only two of the four potential advantages of the group lending innovation. One of these is the borrowers' advantage in transacting a group loan, while the other is the advantage of lower default risks. The former is a demand advantage, whereas the latter is a supply advantage. Despite such restrictive aims, we will conceptualize the framework considering all the three supply advantages and also the demand advantage of the innovation.⁷

3.2 Model without Potential Disadvantages: From the preceding discussion together with the initial assumption that the innovation has no potential disadvantages, we can hypothesize that at a given interest³ rate both the supply and demand schedules for loans could be more to the right when "group" lending and borrowing innovation is introduced. It is in this context, "group" lending is an innovation. Depending on the extent of shifts in these two schedules the new equilibrium interest rate and loan amount would be determined. Three distinct scenarios can be hypothesized in this regard.

7 This choice has a clear merit in as much as the conclusions derived from a framework which incorporates all the four advantages would be reinforced more sharply if they were based on a framework incorporating only two of the four potential advantages.

Scenario 1: Where supply shift is smaller than the demand shift ($SS < DS$)

Scenario 2: Where supply and demand shifts are matching or equal ($SS = DS$)

Scenario 3: Where supply shift is larger than the demand shift ($SS > DS$)

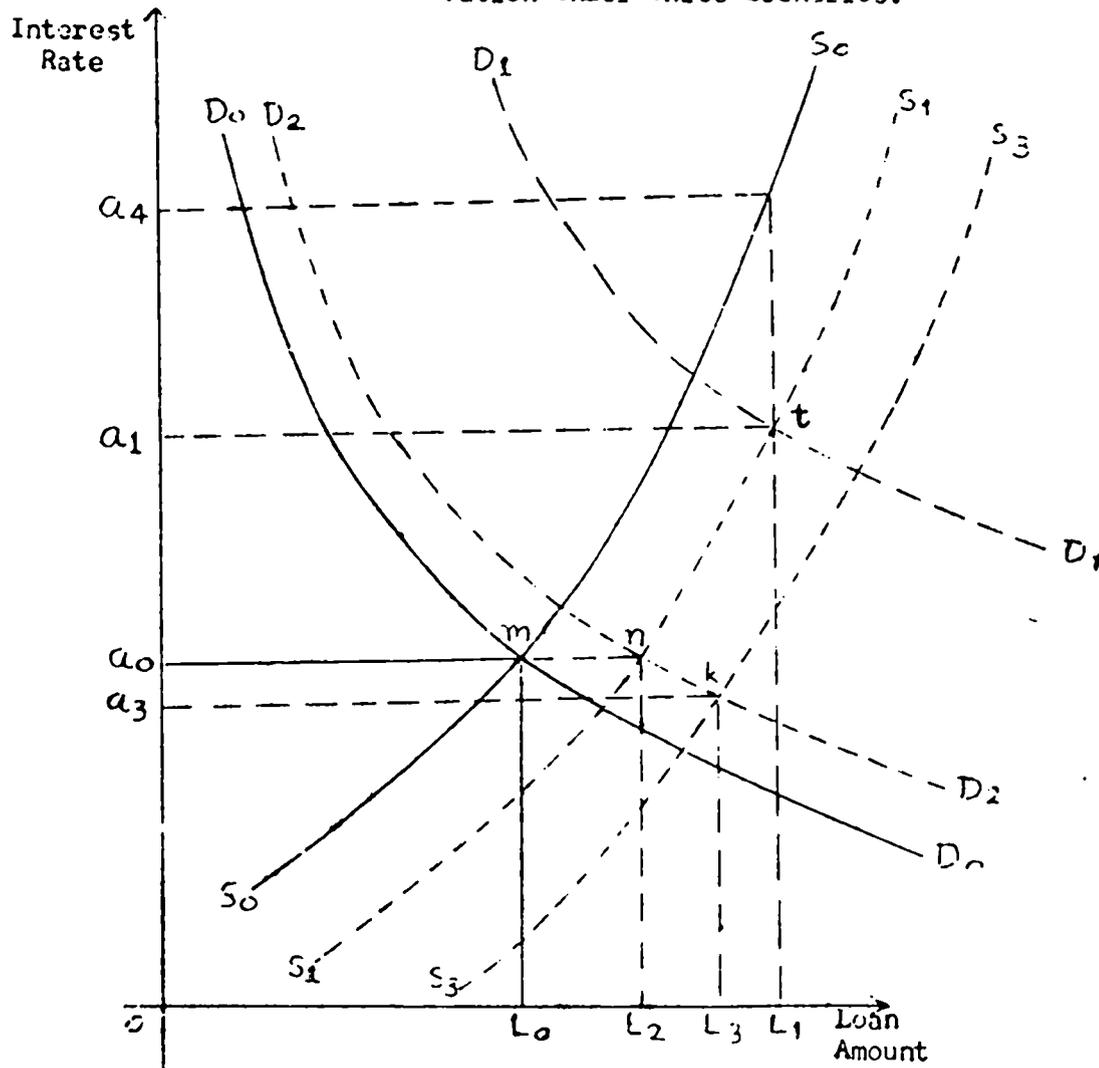
Diagram 1 shows the impact of the introduction of the innovation considering these three scenarios.

Before we introduce the potential disadvantages of the innovation into this model, we should clarify that even the Scenario 1 represents an innovation, despite supply shifts being smaller than the demand shifts. This is because the interest rate of O_0 under this Scenario is lower than the interest rate of O_1 at which only the new demand, O_1 , can be satisfied if the supply schedule were not to shift from $S_0 S_0$ to $S_1 S_1$.

3.3 Model Incorporating Potential Disadvantages: Let us now introduce potential disadvantages to evaluate the "net" (i.e. Δ) impact of the innovation. On the supply side, these disadvantages can arise, for example, from higher probability of "collusion" among group members which would be counterproductive to the advantage of lower default risk. Other supply disadvantages are higher costs in forming groups, and much thinner spread of manpower leading to

Diagram 1

Loan Demand and Supply Schedules Before and After the Introduction of the Group Lending and Borrowing Innovation Under Three Scenarios.



- Notes:
- (1) m represents the equilibrium situation prior to the introduction of the innovation.
 - (2) t represents the equilibrium situation of Scenario 1 where $SS < DS$.
 - (3) n represents the equilibrium situation of Scenario 2 where $SS = DS$.
 - (4) k represents the equilibrium situation of Scenario 3 where $SS > DS$.

lower repayment rate because of selection of untested new borrowers and poor supervision. On the demand side, the potential disadvantages can arise from loss of individual discretion involved in being a member of a group, and also from the individual costs of maintaining group membership. The main implication of these disadvantages is that they would shift back the supply and demand schedules to the left. We, therefore, introduce disadvantages to hypothesize positive, negative and zero "net" or "increment" (i.e. Δ) shifts in each supply and demand schedules. These are presented in a 3 x 3 matrix in Table 1 in which "Yes" and "No" are marked to convey whether "group" lending is an innovation or not.

Considering all the nine cases, we can identify the following "necessary" and "sufficient" conditions which must hold for "group" lending to remain an innovation:

- (1) Necessary condition: $\Delta DS > 0$ or $\Delta SS > 0$
- (2) Sufficient condition: (a) $(\Delta DS) (\Delta SS) \geq 0$
 (b) If $(\Delta DS) (\Delta SS) < 0$, then
 $|\Delta DS| > |\Delta SS|$ or $|\Delta SS| > |\Delta DS|$
 constitute the sufficient condition.

In four out of nine cases, the necessary condition itself is not satisfied. These are cases 1, 3, 7 and 9 in which more loan amount at lower or same or even higher interest rate is not

Table 1 Hypothesized "Net" Impact of "Group" Lending After
the Introduction of Potential Disadvantages

Net Demand Shifts (ΔDS)	Net Supply Shifts (ΔSS)		
	$\Delta SS = 0$	$\Delta SS > 0$	$\Delta SS < 0$
$\Delta DS = 0$	No Case 1	Yes Case 2	No Case 3
$\Delta DS > 0$	Yes Case 4	Yes Case 5	Yes* Case 6
$\Delta DS < 0$	No Case 7	Yes* Case 8	No Case 9

- Notes:
- 1) No stands for "Group" lending is no longer an innovation.
 - 2) Yes stands for "Group" lending continues to be an innovation.
 - 3) Yes* stands for "Group" lending continues to be an innovation, provided $|\Delta DS| > |\Delta SS|$ or $|\Delta SS| > |\Delta DS|$.

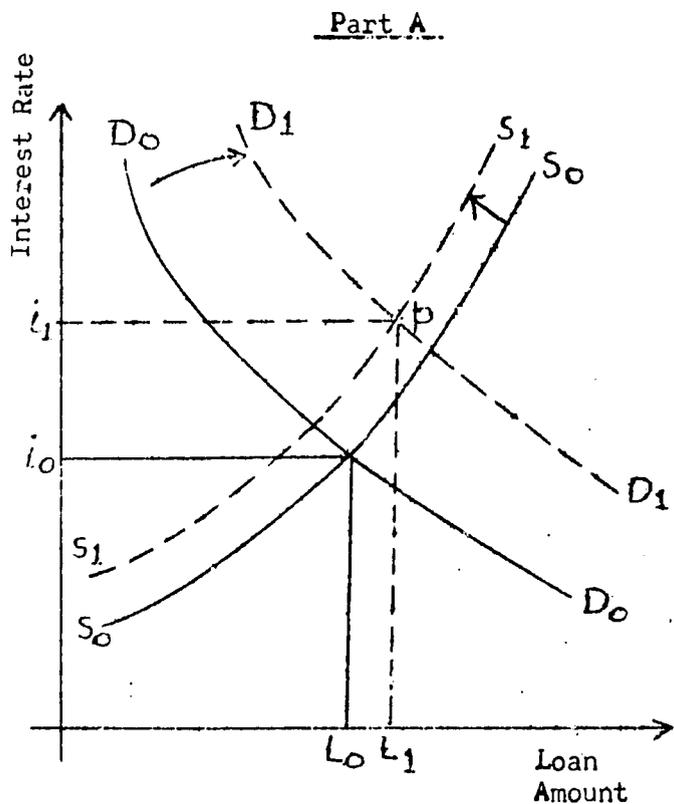
possible. Cases 2, 4 and 5 satisfy the "necessary" condition as well as the "sufficient" condition (a) stated earlier. The remaining two cases 6 and 8 satisfy the "necessary" condition as well as the "sufficient" condition (b) mentioned earlier. In part A of Diagram 2 'p' represents case 6, while 'n' in part B of this diagram portrays case 8.

3. 4 Conclusions: From the preceding it can be concluded that for the "group" lending to be an innovation both the necessary and sufficient conditions must be simultaneously satisfied. Moreover, when $(\Delta DS) (\Delta SS)$ is expected to be negative due to $\Delta SS < 0$, it is critical for the banks to mobilize as large a demand advantage as possible so that the "net" demand shifts (ΔDS) more than outweigh the ΔSS resulting from shift to the left in the loan supply schedule.⁸ Converse would be the case if $(\Delta DS) (\Delta SS) < 0$ due to negative ΔDS . Lastly, these conclusions would hold as long as interest rates are kept flexible rather than rigid as is the case now.⁹

8 This kind of a situation appears to be applicable to the bank under study which aimed at only one of the three potential supply advantages, namely, lower default risk. Since the probability of realizing "net" advantage from this factor is tenuous, it is critical to enlarge the advantages on the demand side. For this, in addition to saving mortgage fees of the borrowers, the bank can undertake such measures as reducing the number of certificates which borrowers are required to submit along with their loan applications, minimizing the time required in the processing of loan applications, and requiring only one member to visit the bank for certain selected work.

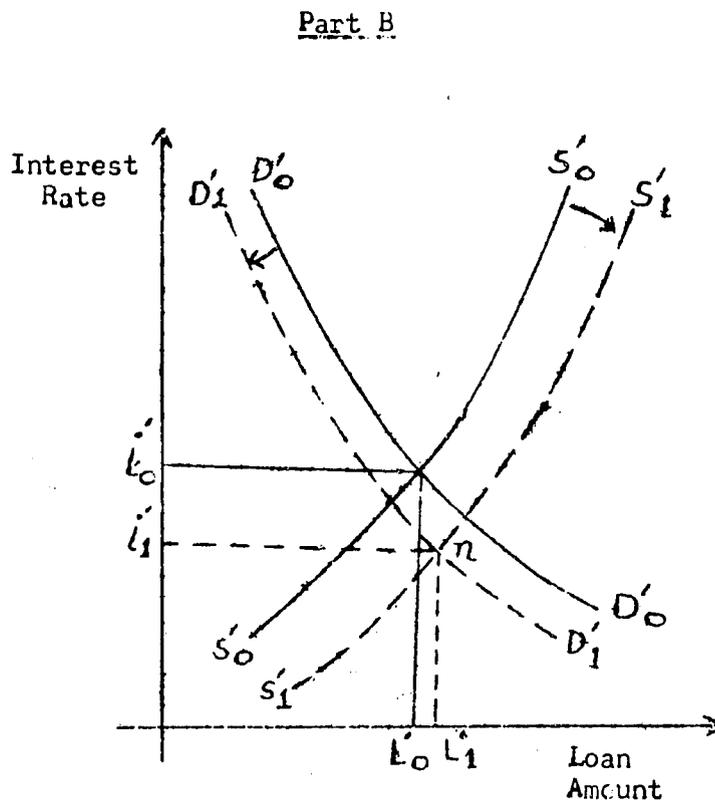
9 Precisely for this reason Adams and Ladman have questioned the promise of the "Group" lending innovation experiences in Philippines, Ghana, Bolivia, etc. See Adams et al, op. cit.

Diagram 2 Equilibrium Interest Rate and Loan Amount under "Net" Shifts in Demand and Supply Schedules



Case 6

Point 'p' represents $(\Delta DS)(\Delta SS) < 0$ and $|\Delta DS| > |\Delta SS|$.



Case 8

Point 'n' represents $(\Delta DS)(\Delta SS) < 0$ and $|\Delta SS| > |\Delta DS|$.

Earlier it was mentioned that the bank had introduced the "group" guarantee scheme (a) to reduce the borrowers non-interest costs of borrowing, and (b) to improve its loan recovery and thereby reduce the default risks. The former would be examined by comparing the costs incurred by the "Group" and "Mortgage" borrowers for borrowing every Rs.100. Similarly, the latter would be studied through a comparison of loan repayment rate of the two types of borrowers. We first report the results on these two potential advantages. In addition, we also report the type of disadvantages perceived by both the "Group" borrowers and the branch officials. We finally discuss the factors which discriminate the two types of borrowers to examine whether the difference between them can be attributed to their borrowing status alone or to both the other characteristics and the borrowing status.

4.1 Costs of Borrowing -- A Demand Advantage: Four different items of non-interest costs of borrowing are those for (a) obtaining certificates which are required to be submitted with the loan application,¹⁰ (b) transport to visit the bank office, (c) time spent in negotiating

10 Eight different types of certificates are required by the bank. Three of these are to be obtained from the village accountant to show the proof of land ownership, land use and no dues towards land revenue/tax. Four more no dues certificates are required from the Tehsil Panchayat, Block Development Office, Co-operative Land Development Bank and Primary Agricultural Co-operative Society. The remaining certificate of non-encumbrance is required from the Sub-Registrar's Office. In addition, the borrower-client must declare in his application any dues which are outstanding with other commercial banks, private parties including money lenders.

the loan, and (d) obtaining documents related to the registration of the collateral when loan is sanctioned. Excepting the time cost all other costs are out-of-pocket costs for the sample borrowers.

Because of saving in costs for the registration of mortgage deed for the "Group" borrowers, their costs on item (d) for borrowing every Rs.100 are lower than those of the "Mortgage" borrowers. These costs are lower by about Rs.3 to 4 (See Column 12 in Table 2). However, the costs on the remaining three items are higher for the "Group" borrowers than for the "Mortgage" borrowers. Indeed, the saving in costs on obtaining collateral registration is more than outweighed by the higher costs on these three items. As a result, the non-interest cost for the "Group" borrowers is Rs.10 as against Rs.9 for the "Mortgage" borrowers.

But this sample average reduces to about Rs.7 or 8, if we exclude 26 of the 87 "Group" borrowers who borrowed less than Rs.250. Their non-interest costs worked out to Rs.35 for every loan of Rs.100. More than 50 per cent of these Rs.35 was for obtaining innumerable certificates. Moreover, all the four items of the non-interest costs were higher for them than for other borrowers. (See Table 2) To conclude, the demand related advantage of the "Group" guarantee scheme appears to be, at best, marginal, considering the sample average of 61 borrowers. For the very small borrowers, however, even such marginal advantage seems doubtful, though the "Mortgage" sample did not consist of such

Table 2: Costs of Borrowing of Sample Farmers from A Nationalized Bank in 1978-79 by Loan-size Groups

Average size of loan	Interest costs for 12 months	Non-interest costs for 12 months				Total	Clm.(2)	Clm. (2)	Clm. (4)	Clm. (5)	Clm. (6)	Clm. (7)
		(a)	(b)	(c)	(d)		as a % of Clm.(1)	as a % of Clm. (1)				
1	2	3	4	5	6	7	8	9	10	11	12	13
"Group" Borrowers												
193	26	35	13	3	15	66	13.5	13	7	2	8	35
470	56	42	9	5	15	71	11.9	9	2	1	3	15
902	120	39	14	6	15	74	13.3	4	2	1	2	9
1833	246	34	12	4	15	65	13.4	2	1	0.2	1	4.2
2900	479	30	13	4	15	62	15.5	1	0.5	0.1	0.5	2.1
Sample Average (1):												
725	100	38	12	5	15	70	13.8	5.2	1.7	0.7	2.1	9.7
Sample Average (2):												
952	132	40	11	5	15	71	13.9	4.2	1.2	0.5	1.6	7.5
"Mortgage" Borrowers:												
490	58	40	11	6	38	95	11.8	8	2	1	8	19
916	113	43	10	7	57	117	12.3	5	1	0.8	6	12.8
1440	192	44	12	6	78	140	13.3	3	0.8	0.4	5	9.2
2681	415	49	12	6	125	192	15.5	2	0.4	0.2	5	7.6
6000	952	52	15	13	272	352	15.9	1	0.2	0.2	5	6.5
Sample Average:												
1717	246	45	12	7	89	153	14.5	2.3	0.7	0.4	5.2	8.9

(a) Costs for obtaining certificates required with the loan application.

(b) Costs for transport to visit the Bank Office.

(c) Costs for time spent.

(d) Costs for documents related to collateral registration.

Sample Average (1) is based on data collected from 57 farmers.

Sample Average (2) is worked out after excluding 25 farmers whose average loan amount was Rs.100.

comparable borrowers. We would finally mention that as many as 27 farmers thought that the opportunity to borrow under the "group" guarantee scheme leaves land unencumbered and thereby it permits borrowing against this land in case of emergency.

4.2 Default Rate -- A Supply Advantage: Default rate is worked out in two different ways; one, default amount as a percentage of loan amount due for recovery, and two, number of defaulters as a percentage of total number of borrowers. Results are reported in Table 3. Four findings can be highlighted from these results. One, irrespective of the two measures of default rate the performance of the "Group" borrowers, contrary to a priori expectations, was inferior to that of the "Mortgage" borrowers. Two, this finding holds even when the two samples are compared after excluding 26 small "Group" borrowers. Three, the finding also holds for two of the four loan amount groups for which the comparison of the two samples is possible. Lastly, the differences in the two sample averages is statistically significant; 't' values being 2.02 for the first measure and 2.46 for the second measure of default rate. To conclude, the claim of "Group" guarantee scheme for supply advantage arising from lower default rate appears to be a mirage.

4.3 Borrowers' and Lenders' Perceived Disadvantages: The "Group" borrowers had perceived some disadvantages of the innovation. "Loss of freedom" was expressed by most farmers. While some farmers did not articulate

Table 3:

Default Rate of Sample Farmers Borrowing from A
Nationalized Bank in 1978-79 by Loan Size Groups

"Group" Borrowers				"Marginal" Borrowers			
Avg. Loan Amount Borrowed (Rs.)	Avg. Loan Amount Overdue (Rs.)	No. of Borrowers	No. of Defaulters	Avg. Loan Amount Borrowed (Rs.)	Avg. Loan Amount Overdue (Rs.)	No. of Borrowers	No. of Defaulters
1	2	3	4	5	6	7	8
193	120 (62.2) ^a	26	16 (61.5) ^b	-	-	-	-
470	355 (75.5) ^a	29	22 (75.9) ^b	430	490 (100.0) ^a	3	3 (100.0) ^b
902	616 (68.3) ^a	21	15 (71.4) ^b	916	579 (63.2) ^a	20	12 (60.0) ^b
1833	1666 (90.9) ^a	6	6 (100.0) ^b	1440	989 (68.7) ^a	13	3 (61.5) ^b
2900	1500 (51.7) ^a	5	3 (60.0) ^b	2681	1920 (71.6) ^a	7	5 (71.4) ^b
-	-	-	-	6000	2250 (37.5) ^a	4	2 (50.0) ^b
Sample Avg. 1 725	504 (69.5) ^a	87	62 (71.3) ^b	Sample Avg. 1741	1023 (59.0) ^a	47*	30 (63.8) ^b
Sample Avg. 2 952	668 (70.2) ^a	61	46 (75.4) ^b				

* Excluding 2 farmers whose loans were not due for repayment.

a. Figures in these parentheses are percentages to average loan amount borrowed.

b. Figures in these parentheses are percentages to No. of borrowers.

this disadvantage in a more specific form, some others perceived that the freedom to get a future loan was adversely affected under the "group" guarantee scheme. This is because of the non-repayment of loans by some members of the group. 63 of the 87 sample borrowers reported this disadvantage.¹¹ Despite this, many farmers perceived "not" benefit of the scheme which they could not have obtained had they borrowed individually.

The officials of the branch selected for the study experienced that the unit transaction costs for "group" loans are lower for only one of the six different activities. This is the case with providing technical assistance by the bank's field-staff. However, the cost is higher for two activities, namely, execution of documents and collection of overdue loans. For the remaining three activities of processing loan application, loan use supervision, and collection of loans, the unit transaction costs are same for both the "Group" and "Mortgage" borrowers.

The higher unit transaction costs for executing documents arise because the bank requires separate loan application to be filed by each member of the group. This means obtaining signature of all the members on every loan application. It also additionally implies

11 Precisely for such disadvantage, the Bank has recently decided to relax the condition to sanction future loan to those members of the group who would promptly repay the loan.

executing documents separately for all the members at the time of loan sanction. Moreover, the bank requires to execute five documents from each member for "Group" loan as against only two documents for "Mortgage" loan.¹² As regards collection of overdues, the bank has to issue notices not only to the defaulters but to all the members of the group which usually consists of 3 or more farmers. Thus, for every defaulter of a "Group" loan, at least 3 notices have to be issued. Against this, for every defaulter of a "Mortgage" loan only one notice has to be issued.

To conclude, the borrowers' perceived disadvantages are mainly in respect of getting a future loan, since there exists uncertainty about the prompt repayment of loan by every member. The Bank experienced disadvantages in respect of recovering overdues and executing documents for the "group" guarantee scheme. Its experiences in recovery of "Group" loans as well as "Mortgage" loans are not unmixed so as to clearly recognize the superiority or otherwise of the two types of loans.

12 These five documents are: (a) Sanction Advice Letter, (b) Demand Promissory Note, (c) Hypothecation Agreement, (d) Agreement to Mortgage with Power of Attorney and (e) Delivery Letter. Against these, the two documents executed with "Mortgage" borrowers are: (a) Sanction Advice Letter, and (b) Mortgage Deed.

4. 4 Factors Discriminating "Group" and "Mortgage" Borrowers: So far it was assumed that the differences in the unit transaction costs and repayment rate of "Group" and "Mortgage" borrowers could be attributed to their differences in borrowing status alone. In other words, it was assumed that these two samples are homogeneous in respect of every characteristic other than the collateral they had given to the bank. Is this the case? To examine this question we have applied multi-variate discriminant analysis by considering several characteristics like (1) farm size, (2) farming experience, (3) distance between the village, major plot, residence, market place and the bank office, (4) past paddy production, (5) caste or tribe status, and (6) technology as reflected in crop-pattern adopted by the farmers. Before we analyse the results of the discriminant analysis we present the mean values of these variables in Table 4. Six observations can be highlighted from this Table. One, the average owned farm size of "Group" borrowers was 16.41 acres as against 11.30 acres for "Mortgage" borrowers. Despite the larger farm size for the former, the market value of an acre of owned land was about the same for the two samples. This is because part of the owned land of the "Group" borrowers was uncultivable and inferior in quality. Two, three of the four different measures of farm size show that the two samples were not much different from each other (See Table 4). Three, farming experience of the "Mortgage" sample was more than that of

Table 4: Mean Values of the Selected Variables for "Group" and "Mortgage" Samples

Variables	Mean Values		Variables	Mean Values	
	Group	Mortgage		Group	Mortgage
1. Farm Size	-- -- -- Acres -- -- --		5. % of Scheduled Caste and Tribes to total borrowers	55.5	57.1
1.1 Owned Land	16.41	11.30	6. Technology		
1.2 Operational Land	10.56	10.27			
1.3 Net Irrigated Land	4.06	4.68	6.1 % of HYV paddy to Irri. Groundnut plus Paddy Acreage	55.1	82.2
1.4 Value of Owned Land	-- -- -- Rupees/Acre -- -- --		6.2 % of HYV Paddy to Total Paddy Acreage	66.5	78.2
2. Farming Experience	-- -- -- Years -- -- --		6.3 % of Irri. Groundnut to Total G.nut Acreage	24.9	20.4
2.1 Borrower's	16.38	21.04	6.4 % of Unirri. G.nut to Unirri. G.nut plus Paddy Acreage	44.6	24.5
2.2 Maximum in the Family	22.00	26.57	6.5 % of Jowar to Jowar plus Ragi Acreage	68.1	41.3
3. Distance	-- -- -- K.M. -- -- --				
3.1 Village to Bank Office	29.05	23.22			
3.2 Major Plot to Bank Office	29.00	17.00			
3.3 Residence to Major Plot	2.21	0.27			
3.4 Major Plot to Market Place	16.60	17.00			
3.5 Residence to Market Place	15.46	20.57			
4. Past 3 Yrs. Avg. Paddy Production	-- -- -- Quintals -- -- --				
	58.08	59.93			

the "Group" sample. Four, the distance from the village and the major plot to the bank was more for the latter sample than that for the former. This is also true of the distance from major plot to the residence, although converse is the case for the distance from market place to the residence. Five, the proportion of less privileged social groups like scheduled castes and tribes was higher among "Group" borrowers than among the "Mortgage" borrowers. Six, the technology as reflected in the proportion of HYV paddy, and unirrigated groundnut cultivated was inferior in the former sample as compared to that in the latter.

When the differences between the mean values of all the variables were tested simultaneously by applying discriminant analysis, it was found that the 'F' statistic is significant at 1 per cent. This suggests that the mean values of the variables under study are not same for the two samples. Secondly, the estimated discriminant function has a very reliable predictive value. As can be seen from Table 5, only 7 per cent of "Group" borrowers and 19 per cent of "Mortgage" borrowers were misclassified by the estimated function. Thirdly and more importantly, the differences between the mean values of all the variables for the two samples is largely accounted for by the distance and technology factors; the proportion claimed by these two being 94 (see Table 5). Therefore, the function was reestimated after omitting these two factors. As expected, the 'F' value of the new function is statistically insignificant. Moreover, its predictive ability

Table 5: Results of Discriminant Analysis Applied to "Group" and "Mortgage" Borrowers

Variables	Coefficient of Disc. Function	% Accounted for in the Discrimination
1	2	3
1. Owned Land	0.06347	6.92
2. Operational Land	0.04960	0.33
3. Net Irrigated Land	-0.09909	1.52
4. Per Acre Value of Owned Land	-0.00003	-1.23
5. Borrowers' Farming Experience	-0.00869	0.89
6. Maximum Farming Experience in the Family	0.01840	-1.91
7. Distance from Village to Bank	-0.10369	-12.14
8. Distance from Major Plot to Bank	0.19801	51.48
9. Distance from Residence to Major Plot	-0.03365	0.48
10. Distance from Major Plot to Market Place	0.15760	-1.73
11. Distance from Residence to Market Place	-0.34018	35.99
12. Past Paddy Production	0.00350	-0.14

	1	2	3
13. Scheduled Caste & Tribe	-0.09604	0.17	
14. % of HYV Paddy to Irri. G.nut plus Paddy	-0.01655	5.77	
15. % of HYV Paddy to Total Paddy	0.00946	-2.38	
16. % of Irri. G.nut to Total G.nut	0.01187	1.15	
17. % of Unirri. G.nut to Unirri. G.nut plus Paddy	0.00848	3.71	
18. % of Jowar to Jowar plus Ragi	0.01981	11.40	

'F' Value = 7.022 which is significant at 1%

$$D1 = + 2.4199$$

$$D2 = - 2.1984$$

$$D = 0.1107$$

% of Misclassified Borrowers in

"Group" Sample = 6.9

"Mortgage" Sample = 19:3

is very poor (See Table 6).

4. 5 Conclusions: To conclude, the two samples are not homogeneous in respect of characteristics other than the collateral they had given to the bank. Large part of the non-homogeneity of the two samples is accounted for by the 'distance' and 'technology' factors. "Group" borrowers were located much further away from the bank office than the "Mortgage" borrowers. Their technology was also inferior to that of the "Mortgage" borrowers. In as much as the former directly and positively contributes to raising the unit transaction costs of borrowing of the "Group" sample, the earlier mentioned doubts about the demand advantage of the "group" guarantee scheme may to some extent be deemphasized. Similar could be argued on the basis of the differences in the 'technology' factor, since inferior technology would imply smaller demand for loan and hence larger unit transaction costs. These interpretations can also be applied to the supply advantage arising from the lower default rate, since this rate is likely to have positive association with the 'distance' factor. It is also likely to be higher for the farmers with inferior 'technology'. Thus, "group" lending scheme appears to have a potential for demand advantage for the sample farmers. As regards its supply advantage resulting from lower default risk, it may be argued that the higher default rate among the "Group" borrowers could partly be offset by controlling the 'distance' and 'technology' factors better.

Table 6 Results of Discriminant Analysis Applied to "Group"
and "Mortgage" Borrowers After Omitting 'Distance'
and 'Technology' Factors

Variables	Coefficient of Disc. Function	% Accounted for in the Discrimination	
1. Owned Land	0.05527	38.86	'F' Value (8,127) = 2.007 which is insignificant. D1 = -0.923 D2 = -1.644 D = -1.284 % of Misclassified Borrowers in "Group" Sample = 29.9 "Mortgage" Sample = 34.7
2. Operational Land	-0.01003	-0.42	
3. Net Irrigated Land	-0.27563	27.37	
4. Per Acre Value of Owned Land	0.00001	2.65	
5. Borrower's Farming Experience	-0.03057	20.25	
6. Maximum Farming Experience in the Family	-0.01796	11.95	
7. Past Paddy Pro- duction	0.00019	-0.05	
8. Scheduled Caste & Tribe	-0.05314	-0.62	

5. Summing-Up

The main conclusions of the paper can be summarized as follows:

(1) The potential advantages and disadvantages of the "Group" lending can be categorized as influencing loan supply and demand schedules.

Loan supply schedule can shift to the right because of such potential advantages as lower default risk, lower unit transaction costs to the lenders, and larger scale economies in providing technical and support services. But this schedule can shift to the left also because of such supply disadvantages as higher costs of forming groups, and higher probability of "collusion" among group borrowers which would be counter-productive to the advantage of lower default risk. On the demand side, the main advantage of the "group" guarantee scheme arises from the lower unit transaction costs to the borrowers because of saving in mortgage fees, time and transport costs. Against this, the demand disadvantage can arise from loss of individual discretion in being a member of a group. Thus, depending on the "net" (i.e. Δ) shifts in loan supply (SS) and demand (DS) schedules, the equilibrium interest rate and loan amount would be determined.

(2) For the "group" lending to remain an innovation both the 'necessary' and 'sufficient' conditions must simultaneously be fulfilled.

These are:

Necessary: $\Delta DS > 0$ or $\Delta SS > 0$

Sufficient: (a) $(\Delta DS) (\Delta SS) \geq 0$

(b) If $(\Delta DS) (\Delta SS) < 0$, then

$|\Delta DS| > |\Delta SS|$ or $|\Delta SS| > |\Delta DS|$

(3) If $(\Delta DS) (\Delta SS) < 0$ due to $(\Delta SS) < 0$, then it is critical for the banks to mobilize as large a demand advantage as possible so that the "net" shift in demand schedule to the right more than outweighs the "net" shift in supply schedule to the left. Conversely, when $(\Delta DS) (\Delta SS) < 0$ due to $(\Delta DS) < 0$, then the supply advantage must be enlarged to more than offset the "net" shift in demand schedule to the left.

(4) Preceding conclusions are derived assuming that the interest rates are flexible instead of rigid as is the case now.

(5) While we could not empirically examine the impact of the "Group" lending on equilibrium interest rate and loan amount due to data difficulties, the data collected from the sample farmers showed that the "Group" guarantee scheme has a potential to demonstrate its potential demand advantage and also the supply advantage arising from the lower default risk. This is possible when 'distance' and 'technology' factors for the "Group" borrowers are better controlled.

(6) The above conclusion is derived because these two characteristics accounted for a very large proportion of differences between the "Group" and "Mortgage" borrowers. The application of discriminant analysis after omitting these two variables showed that the mean values of such other variables as farm size, experience, past paddy production and

caste/tribe status were same for the two samples. The predictive ability of the reestimated function was considerably lower than that of the function based on all the characteristics.

(7) We, therefore, contend that the part of the higher unit transaction costs for the "Group" borrowers (Rs. 10 per 100 rupee loan as against Rs. 9 for the "Mortgage" sample) was attributable to the differences in the 'distance' and 'technology' factors. Similarly, their higher default rate (70 per cent as against 59 per cent for the "Mortgage" sample) could be attributed to these two factors.

(8) The sample "Group" borrowers perceived disadvantages in terms of loss of freedom particularly to get the future loan when some members of the group fail to repay the loan.

(9) The bank officials experienced such disadvantages as higher unit transaction costs in executing documents and in recovering overdue loans for the "Group" guarantee scheme. The former was due to the fact that the bank requires separate loan application to be filed by each member of the group. This means obtaining signature of all the members on every loan application. It also implies executing documents separately for all the members at the time of loan sanction. Moreover, the bank requires to execute five documents from each member for "Group" loan as against only two documents for "Mortgage" loan. As regards collection of overdue loans, for every defaulter of a "Group" loan, at least 3 notices

have to be issued, since the minimum size of a group is three.
But for every defaulter of a "Mortgage" loan only one notice has
to be issued.

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