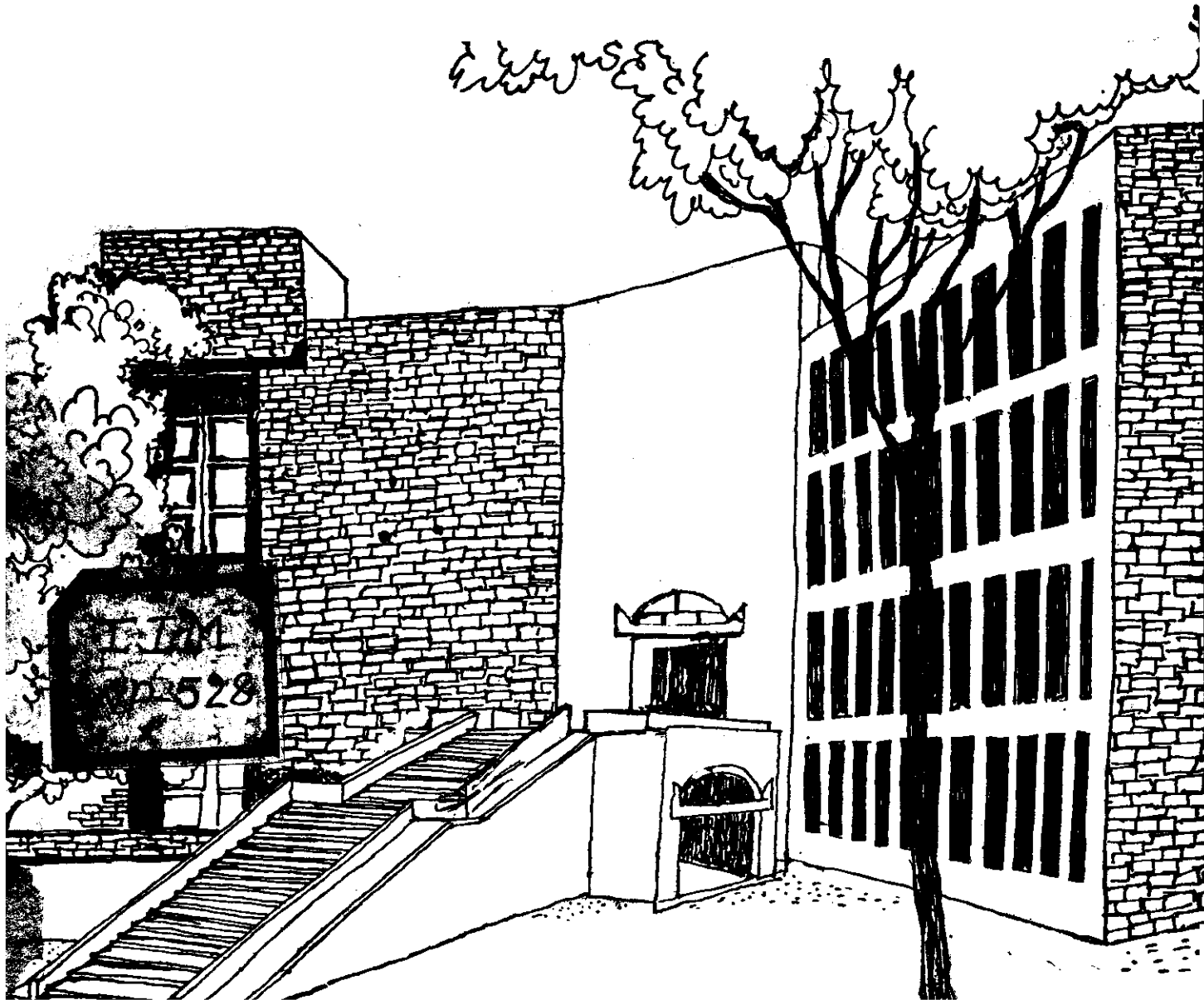


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GROUP BASED SAVINGS AND CREDIT
PROGRAMMES IN RURAL INDIA

By

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ABSTRACT

This paper suggests that the groups which undertake multiple activities like selling, purchasing, borrowing, etc. are likely to be more successful than the groups which merely borrow. Another criterion suggested is that the members of the group be homogenous in their production technology and geographical proximity. Fulfilment of these criteria would facilitate meeting conditions necessary for group-action, namely, organizational good, collective good, individual gain and compensatory pay-off.

To judge whether or not group action is successful two indicators are examined. These are loan delinquency rate, and scale economies in costs incurred by the members of the group. These are studied for primary agricultural credit societies (PACS), primary agricultural marketing societies of general type (PAMSG), commodity-based primary cooperative societies (PAMSE) like sugar, cotton, fruits and vegetables, and milk, and the group guarantee scheme (GRUG) of the commercial banks.

Comparison of the three types of cooperatives shows that PAMSE is most successful group-action followed by the PAMSG, and then the PACS. Indeed, PACS unlike the other two primaries have experienced scale diseconomies. This suggests that in their case there exists a scope to reduce their operations. More preferably, their operations-mix like that of PAMSE and PAMSG may to some extent be shifted from lending to selling and purchasing. On group guarantee scheme it was found that the loan delinquency rate is lower for the group as against the mortgage borrowers who are homogenous in every respect except their borrowing status. Similarly, group borrowers have experienced greater scale economies than the mortgage borrowers.

GROUP-BASED SAVINGS AND CREDIT PROGRAMMES IN RURAL INDIA*

B.M. Desai

Introduction

Rural areas in India have many different types of group-based saving¹ and credit programme. There are institutional programmes like primary agricultural credit cooperatives societies (PACS), primary agricultural marketing societies (PAMS), and group guarantee scheme of commercial banks (GRUG). There are also spontaneous rotating savings and credit associations like Nidhis and Chits (ROSCA), community assets like soil conservation and irrigation tanks building associations promoted by voluntary agencies (CAVA), and collateral pooling groups which make ownership and use of indivisible assets like well or tractor possible among their members (COPU). All these programmes have diverse organizational structures; they range from highly structured and government sponsored cooperatives, and semi-structured group guarantee scheme to fairly unstructured informal local associations.

PACS and PAMS undoubtedly constitute very significant group-based experiences in rural India. They have a long history and are in the process of changing from single purpose to multi-purpose

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and from generalized to specialized agencies. Extensive literature and aggregative data are readily available on these experiences. But literature on more interesting micro-experiments, like ROSCA, CAVA and COPU, is scant and inaccessible. This paper will attempt to analyse PACS, PAMS and GRUG.

Objective :

The objective of this paper is to develop operational hypotheses and to test them with a view to study the following three propositions:

- 1) Group-based savings and credit programme is capable of achieving its intended functions of lower default risks, and scale economies to the beneficiaries as well as to the agencies when groups are formed to sell and/or to purchase rather than to borrow. This is because group-based marketing unlike credit² operations make it possible to achieve functional identity among its members by distributing market power equally. Without such identity it is difficult to realize the two important conditions of group-action, namely, collectiveness³ of the good and organizational⁴ nature of this good. Moreover, formation of groups to jointly sell or purchase can, not only enlarge transaction but also enhance compensatory profit⁵, besides individual profit.

Group-based programme

- 2) \angle is capable of attaining its intended functions when a group is formed for multiple rather than single activity like borrowing alone. This is because multi-purpose group can provide more flexibility and sources through which functional identity, collective good, organizational good, individual profit, and compensatory pay-offs can be promoted. Moreover, organizing credit in isolation of such other services as extension, selling of modern inputs, and marketing and processing of output is self-defeating to the very objective of improving incomes.

Such programme

- 3) \angle can attain its intended functions when a group is homogenous in all respects and particularly in its geographical proximity and production technology. This is because such a group would have mutual trust among its members to strike better distribution of compensatory profit, besides individual profit, arising from collective responsibility.

The above propositions can be best studied by undertaking primary field-survey and its associated participant observation method of analysis. However, due to lack of resources and time we have relied on review literature, aggregative data, and to some extent on a small sample survey which we had carried out earlier.⁶

Rationale for Cooperative and Group Guarantee Reforms

These two reforms have been introduced to improve rural ~~poor's~~ share in formal or institutional credit. They are chosen ~~for~~ both economic and non-economic reasons. But there are important differences in the emphasis attached to these factors.

Cooperatives were introduced in India mainly to organize a force to counter the usurious power of the village money lenders.⁷ PACS came to be organized after the enactment of Cooperative Credit Societies Act in 1904. This act was subsequently revised in 1912 to promote organization of societies in fields other than credit. But the starting of multi-purpose cooperatives not receive its momentum until the Reserve Bank of India (RBI) recommended them in 1937 and until Five Year Plans provided ~~state~~ support for them. Single-purpose credit societies were preferred because credit was perceived to be the most important need of the farmers. Moreover, unless credit was organized on a group-basis, the virtues of self-help, thrift, and modernized attitudes that are necessary to deal with the local money lenders could not be promoted. Single-purpose societies were also considered to be relatively easier and less costly to manage. But as experience with such societies was gained, it was realized that multi-purpose cooperatives, that provided not only credit

but marketing and consumer services, were in a better position to counter the money-lender-cum-trader. The features of administration by honorary management and local participation, unlimited liability of the members,⁸ and small and simple operations were to help reduce costs and risks of rural finance operations.⁹ Lastly the cooperatives were visualized to receive state partnership in both equity-capital and administrative leadership.¹⁰

Group guarantee scheme unlike the cooperatives had its origin in the collateral related difficulties which hampered the rural poor's access to institutional credit. Neither the clear and heritable land title nor the hypothecation of reasonably assured crop harvest, nor the guarantee of the reputable third party could be available from the rural poor. The joint liability principle, peer pressure, and collective responsibility implied by group lending were considered to act as a substitute for the conventional collateral. But the concern to reduce costs to the lenders and borrowers in particular was also strongly shared.¹¹ Thus, what was not explicitly considered for this reform, unlike for the cooperative, was the motive to create a force to counter the money lenders. Similarly, State participation in equity-capital and administrative leadership was not considered. Only the state assistance in the form of provision for extension, input supplies, and concessionary refinance was considered.

Scope of Activities of PACS, PAMS, and GRUG

PACS : The main activities of PACS as defined in their by-laws differ, but all include the borrowing of funds from members or others to be utilized for crop and medium-term loans to members. While this clearly shows the twin functions of deposit collection and lending, the provision to borrow from the federating union of primaries and the rhetoric of non-existence of surpluses lead the PACS to depend more on external borrowings for their lending operations. Such external dependence for loanable funds increases due to the perception that the funds deposited with the PACS are not safe. Where the by-laws are wide in scope and recognize multiple purposes for cooperativization; PACS, despite their name to the contrary, provides for supply of agricultural inputs, implements, and domestic consumer needs, besides undertaking marketing of agricultural produce of their members. Thus, over time, single-purpose societies seem to have gradually yielded place to multi-purpose societies.¹² This is supported by the finding that the share of credit operations declined from around 80 per cent in late 50s and early 60s to little over 60 per cent in late 70s. At an all-India level PACS can still be termed as single activity cooperatives because credit operations account for more than 60 per cent.

PAMS : As noted earlier non-credit societies have been brought under official umbrella since 1912. But their spread has remained limited and slow. It is so even now, despite its success, particularly in the fields of marketing of some commodities like sugarcane, cotton, and milk. The basic activities of PAMS are to procure, assemble, store, finance, insure, standardize, sell and transport agricultural produce, inputs, and consumer goods for their members. While such are the activities of general purpose marketing cooperatives (PAMSG), the activities of the commodity based marketing cooperatives (PAMSE) include not only pulling and joint sale of the produce, but also its processing and making available technical advice, input supplies, credit and in some cases even deposit collection.¹³ Some of these activities, particularly processing and input supplies, are carried out by the federating unions of the primaries. The examples are the sugar factories and milk dairies (AMUL type) in the cooperative sector. Thus, PAMSE unlike PACS and to some extent PAMSG are the examples of group action that are vertically integrated. Such integration and the implied backward and forward linkages¹⁴ of the production system are initiated mainly through joint sale and purchase rather than through joint borrowing.

GRUG : Unlike PACS and PAMS, GRUG is much simpler in its activities and loose in its organizational structure. This scheme is mainly promoted by the nationalized commercial banks. Under this scheme the banks extend crop and term loans to those who cannot provide mortgage and or a third party guarantee. Such people are formed in a group of three or more and are required to stand as guarantor to each other. In case of a term loan, hypothecation of an asset, which is jointly acquired, owned and used, is also taken. Banks provide technical assistance. They typically want each member to execute all the documents, for loans are disbursed directly to individual members of the group. To exercise the advantage of peer pressure, banks issue overdue notices not only to the defaulters but also to the members of the group. Banks often allow the concerned group to appoint a leader. Wherever possible they make informal arrangements for supply of agricultural inputs and services to their clients.

Functions of PACS, PAMS and GRUG

From the preceding discussion it can be stated that a few functions are commonly pursued by all these three programmes. Following our earlier work¹⁵ on group lending these may be generalized as follows;

1) Agencies promoting these programmes may experience scale economies in their costs of operations which could result during application, implementation, and collection or repayment phases of the programme. Undoubtedly, costs under each of these three phases would be lower for one sizeable loan or any other transaction like joint sale or purchase than that for a number of small individual transactions. Such scale economies arise not only in the lead activity but also in other activities like providing extension, technical, or other services including deposit collection.

2) Lower default risks would arise from the mutual pressure of the members and joint responsibility. For a group-based programme such risks arise not only for loans, but also for joint sale and joint purchases. This benefit of lower default risks would arise provided members of the group do not collude. Probability of such collusion to occur would be lower if a group is homogenous and is initiated to first jointly sell and/or purchase goods and services.

3) Beneficiaries of these programmes may also enjoy scale economies in their costs of transactions with the agencies administering the programmes. This would result from saving of time, documentation, and of transport costs to visit the agencies. Such savings could be enjoyed by the beneficiaries in each of the

three phases of application, implementation, and repayment mentioned earlier. The greater the number of activities organized on a group-basis greater are such savings.

Operational Hypotheses and Methods for Studying PACS, PAMS and GRUG

Here the questions are : Have these functions been realized by the three programmes ? How can their performance be explained in this regard ? Before we answer these questions we would have to formulate operational hypotheses and methods that are feasible to study on the grounds of available data.

Considering out-of-pocket non-interest¹⁶ costs as management costs, it is hypothesized that PAMSG and PAMSE in particular would experience greater scale economies than those experienced by PACS. Secondly, loan delinquency rates are lower for PAMSG and PAMSE as compared to those for PACS. Thirdly, higher scale economies, and lower loan delinquency rates would be experienced by the multi-activity PACS (MPACS) as compared to those witnessed by the single-activity PACS (SPACS). Fourthly, group borrowers (GRUB) would experience higher scale economies and lower delinquency rate as compared to those achieved by the mortgage (MORB) borrowers who are all homogenous in every respect except in their borrowing status.

To test the first hypothesis, cost functions ^{were} ~~was~~ estimated by utilizing all India data for various types of primary cooperatives for 1959-60 to 1978-79 period. In this function, management costs per society are considered to depend on size of operations (which is defined to include value of agricultural produce purchased and processed, agricultural inputs marketed, agricultural loans advanced, and deposits collected) per society. Double-log form of cost function¹⁷ was chosen, since cubic function did not fit satisfactorily as judged from the signs and significance of the coefficients. In this double-log cost function if the coefficient associated with the size of operations variable is less than 1, it suggests scale economies. On the other hand, if it is greater than 1, it suggests scale diseconomies. The hypothesis on delinquency rates of PACS and various types of PAMS is also studied by using all India data for 20 years from 1959-60 to 1978-69. The third hypothesis on scale economies of SPACS and those of MPACS is studied by ~~separately estimating~~ the cost functions of the type described earlier for these two types of cooperatives. Single purpose PACS (SPACS) are defined as those societies whose lending operations account for more than 60 per cent in their total operations. Those PACS whose lending operations account for 60 or less percentage in the total operations are termed as multi-purpose PACS (MPACS). An average PACS in Gujarat, Himachal Pradesh, Kerala, and Punjab

belongs to the latter category, while in Andhra Pradesh, Bihar, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal it falls under the first category. The data utilized to estimate the cost function and delinquency rate refer to 1959-60 to 1978-79.

The hypothesis on larger scale economies of the GRUG scheme of commercial banks is also tested by separately estimating the double-log form of cost function for the group and the mortgage borrowers of crop loans. Cost of borrowing is defined to include both interest and non-interest costs since interest rate varies with the amount of borrowing. Borrowing costs so defined are regressed on the amount of borrowing. Delinquency rates of GRUG and MORB samples are also compared to know whether the GRUG scheme has achieved its intended function of lower default risks. In studying these two samples, discriminant analysis is applied to find out whether these two sets are homogenous or not.

Empirical Analysis of PACS, PAMS and GRUG

Table 1 provides results on scale economies/diseconomies and loan delinquency rates of PACS and different types of PAMS. Table 2 shows similar results for single purpose PACS (SP.PCS) and

multi-purpose PACS (MPACS). Results of scale economies, and loan delinquency rates of GRUB and MORB samples are given in Table 3.

Before these results are discussed, it may be mentioned that the findings on scale economies/diseconomies in these tables are based on the estimate of 24 cost functions of the type described earlier. All these cost functions are a good statistical fit as judged from their \bar{R}_s^2 and 't' values; \bar{R}_s^2 range from a low of 0.51 to a high of 0.99, and 'F' values associated with all of them, and the 't' values associated with the regression coefficients are statistically significant at 1 per cent.

The first table shows that primary marketing cooperatives (PAMS) are more successful group experiments than primary credit cooperatives (PACS). In this regard following findings can be highlighted from this table.

Table - 1

Scale Economies/Diseconomies, Delinquency Rates
and Share of Credit Operations of an Average PACS
and Various Types of PAMS, India

Types of primary Cooperatives	Scale Economies/ Diseconomies Parameter*	Delinquency Rate** (%)	Share of Credit Operations (%)
1. Primary Agricultural Credit Societies (PACS)	1.17	39.8	63.9
2. Primary Agricultural Marketing Societies (PAMS)	0.74	17.9	21.2
3. General Purpose Primary Agrl. Marketing Societies (PAMSG)	0.85	21.8	8.2
4. Commodity-specific Specialized Primary Agrl. Marketing Societies (PAMSE)			
4.1 Cotton (PAMSC)	0.74	7.7	44.7
4.2 Sugarcane (PAMSS)	0.73	7.6	2.0
4.3 Fruits & Vegetables (PAMSFV)	0.47	11.4	41.9
4.4 Milk (PAMSM)	0.85	31.9	8.2

* This parameter of greater than 1 implies increasing costs to scale and hence diseconomies of scale, while parameter of less than 1 implies decreasing costs to scale and hence economies of scale.

** Delinquency rate in this and other tables is computed by taking percentage of overdues to outstanding loans.

- 1) All types of PAMS have experienced scale economies, while PACS have experienced scale diseconomies.
- 2) Commodity based specialized PAMS (PAMSE) have by and large experienced greater scale economies than the general purpose PAMS (PAMSG).
- 3) Among the PAMSE those cooperatives which deal in high value as well as highly perishable commodities like fruits, vegetables and sugarcane have enjoyed greater scale economies than the others.
- 4) When the scale parameter is statistically tested to find out whether it is significantly greater than or equal to or less than 1, it is found that in the case of PACS it is greater than 1, whereas in the case of all types of PAMS it is equal to 1. As mentioned earlier, the former suggests scale diseconomies, whereas the latter indicates neither scale economies nor diseconomies.
- 5) The delinquency rate of PACS is consistently and substantially higher than that of the different types of PAMS.
- 6) Among the various types of primary marketing societies this rate is higher for the general purpose PAMS than that for the commodity-based specialized PAMSE. Only exception, however, is the primary milk collection societies (PAMSM) which have a

higher loan delinquency rate than the other types of PAMS. But this result is mainly influenced by the poor loan recovery records of PAMSM in states other than Gujarat where the famous cooperative dairy, AMUL is located. In this state the loan delinquency rate of milk primaries never exceeded 10 per cent point in the years under study.

The existence of constant or decreasing costs to scale and the lower delinquencies in various types of primary marketing cooperatives may be attributed to certain basic features of these PAMS. These cooperatives unlike PACS have been formed to sell and purchase rather than to borrow. Moreover, some of these PAMS, like PAMSFV, PAMSS, and PAMSC, have been formed to undertake multiple activities which facilitate achieving horizontal integration and in some cases like PAMSS, and PAMSC, they facilitate achieving even vertical integration. Absence or inadequate existence of these features among PACS in most states in India may have led to the emergence of scale diseconomies in them. It may have also instilled lack of discipline among their members to repay loan.

As regards the hypothesis that the multi-purpose PACS (MPACS) is more successful group experiment than the single purpose PACS (SPACS), Table 2 shows the following :

Table - 2

Scale Economies/Diseconomies, Loan Delinquency Rates and Share of Credit Operations per MPACS and SPACS, India

Details	Multi-activity Primary Agrl. Credit Societies (MPACS)*	Single-activity Primary Agrl. Credit Societies (SPACS)**
1. No. of states	4	11
2. Size of operations per society (Rs. lakhs)	1.24	0.44
3. Share of credit operations (%)	54.00	70.00
4. Scale economies/diseconomies parameter @	0.84	1.12
5. No. of states wherein primaries have experienced scale economies	2	3
6. Loan Delinquency Rate (%)	33.00	42.00
7. No. of states with loan delinquency rate of 30 or less per cent	3	nil

* States where the share of credit operations in their total operations accounts for 60 or less per cent are designated as MPACS.

** States where the share of credit operations in their total operations accounts for more than 60 per cent are categorized as SPACS.

@ This is an average of the parameter estimated for PACS in each of the states belonging to the two categories, namely, SPACS and MPACS.

- 1) MPACS have experienced scale economies, while SPACS have experienced scale diseconomies.
- 2) Two of the four states where PACS are MPACS have enjoyed scale economies, the corresponding number in the case of SPACS is 3 out of 11.
- 3) The statistical test of scale parameter being significantly different from 1 shows that it is not so; implying thereby that the PACS in all states have experienced constant costs to scale.
- 4) Loan delinquency rate is 33 per cent in the case of MPACS, whereas it is 42 per cent in the case of SPACS.
- 5) Delinquency rate of 30 or less per cent is found in three of the four states where PACS can be categorized as MPACS. Such low delinquency rate is, however, not found in any of the states where PACS are SPACS.

The findings of the sample study of the group (GRUB) and mortgage (MORB) borrowers as reported in Table 3 show the following :

- 1) Scale economies have been experienced by both the types of borrowers. However, the GRUB sample has experienced greater scale economies than the MORB sample. Indeed, the scale economies could have been still larger for the GRUB sample had the bank not insisted upon filing loan applications individually.¹⁸
- 2) The scale parameter is statistically not significantly different from 1 for both the samples, suggesting thereby that the group as well as mortgage borrowers have experienced constant costs to scale.
- 3) Loan delinquency rate of GRUB sample was 17 per cent as against 31 per cent in the case of MORB sample.

These findings may be interpreted to suggest that the group guarantee scheme is a successful experiment at least in respect of achieving lower loan delinquency, if not in achieving the scale economies as well. Such a result may be attributed to the earlier described basic features of the group guarantee scheme. This is particularly because the GRUB and MORB samples are homogeneous in their attributes including production technology and location from the bank. These samples differ from each other mainly in relation to their borrowing status, i.e. the kind of collateral offered by them.

Table - 3

Scale Economies/Diseconomies, Loan Delinquency Rate,
and Discriminant Analysis Results of the Group and
Mortgage Borrowers from an Andhra District

Details	Group Borrowers (GRUB)	Mortgage Borrowers (MORB)
1. Size of sample	25	22
2. Parameter of scale economies/ diseconomies	0.76	0.86
3. Loan delinquency rate (%)	16.60	30.50
4. Results of discriminant analysis		
4.1 Percent of borrowers misclassified by the estimated function	4.00	13.60
4.2 F value (18, 26)	1.73	which is insignificant at 5% and therefore suggests an acceptance of the null hypothesis that the two samples are same in their 18 attributes.

Conclusions and Implications

Three intended functions of a group based savings and credit programme are lower default risks, scale economies to the agencies, and to the beneficiaries. The first of these three functions is studied for three major programmes in India, namely, credit cooperatives (PACS), marketing cooperatives (PAMS) including commodity based primaries (PAMSE), and group guarantee scheme of the commercial banks (GRUG). The function of scale economies to the agencies is, however, studied for PACS and various types of PAMS, whereas the scale economies to the beneficiary-farmers is examined only for the GRUG scheme of a commercial bank.

It is hypothesized in this paper that the delinquency rate would be lower for those groups which are formed to jointly purchase and/or sell as compared to those which are formed to jointly borrow. It is also hypothesized that the former group would achieve higher scale economies than the latter. Secondly, it is hypothesized that the multiactivity group would have better potential to achieve lower loan delinquencies, and greater scale economies, than the single activity groups. Thirdly, it is hypothesized that the farmers who borrow from a commercial bank by providing a group guarantee would have lower delinquency rate, and greater scale economies than those who borrow by providing a mortgage.

The first hypothesis is tested by comparing the performance of the primary agricultural credit societies (PACS) with that of the primary marketing societies (PMS) including some commodity based primaries (PAMSE). The second hypothesis is tested by comparing the performance of the multiactivity PACS (MPACS) with the single activity PACS (SPACS). The third hypothesis is tested by comparing the sample of farmers who provided two different kinds of collateral, namely land mortgage, and group guarantee.

Loan delinquency rate is the lowest for PAMSE, followed by the general purpose PAMS, and then the PACS. Similarly, PACS have experienced scale diseconomies, whereas various types of PAMS have experienced constant or decreasing costs to scale. The result of scale diseconomies for PACS suggests that in their case there exists a scope to reduce their operations. Alternatively, their portfolio or operations mix could to some extent be shifted from lending to selling of agricultural inputs and purchase of agricultural produce. This suggestion is offered because the general and specialized PAMS as well as the multiactivity PACS have experienced constant or decreasing costs to scale and lower delinquency rate. As regards the third hypothesis, it was found that the loan delinquency rate is lower for the group borrowers as against that for the mortgage borrowers. Similarly the group borrowers have experienced greater scale economies than the mortgage borrowers. Realization of these potential advantages of the

group guarantee scheme may be attributed to the differences in the borrowing status of the two samples. The selected farmers are homogenous in every other respect including and especially in their production technology and location from the bank.

From the preceding findings three important criteria may be identified to promote group-based savings and credit programmes in the future. These are: 1) formation of groups to sell and purchase rather than just to borrow, 2) promotion of groups to undertake multiple activities that facilitate horizontal and vertical integration, and 3) formation of groups of people who are homogenous in their production technology and geographical proximity. Fulfilment of these criteria would enhance the chances of meeting certain conditions necessary for a successful group action. These conditions are functional identity, collective good, organizational good, individual gain, and compensatory pay-off.

NOTES

1. Saving is deferred consumption. It could be in the form of physical or financial asset. It is in this wider sense that this term 'savings' is referred here. In this context then the cooperative **farming** societies could also be studied here, though we have excluded them.
2. By using some other indicators, Doherty and Jodha convincingly show some support to this hypothesis. Thus, the experiences of credit cooperatives and milk cooperatives in two villages of Vijapur Taluka show in 1969-70 the following :

<u>Particulars</u>	<u>Credit Cooperatives</u>	<u>Milk Cooperatives</u>
Period of operation (years)	18	7
Working capital (Rs.'000)	22	36
Proportion of owned resources (%)	35	93
Total members	39	372
Beneficiary members (%)	13	100
Average landholding of beneficiaries (ha)	17.8	5.3
Services received per beneficiary (no.)	2	6
Per-beneficiary value of transactions with/through the society (Rs.)	632	2218

Source : Doherty, Victor S., and N.S. Jodha, 1979:

3. Collective good is identified by impossibility of excluding any member of a group from its consumption, if one member consumes it. Examples of pure collective good are national defence and malaria eradication programme. (Olson 1971) In this paper, however, those goods which can be divided among members and individually disposed off are also considered as collective goods.

4. "Organizational Good" is defined as that good which is not available unless the potential beneficiaries organize themselves to procure it. (Olson, 1971)
5. Compensatory pay-off is the profit over and above the individual profit that a member of any group action expects. Such additional or increment in pay-off is necessary for the transaction costs and loss of individual discretion in joining and cooperating with the group. (Olson 1971)
6. See Desai 1982.
7. For evidence on this see for example, RBI 1945, 1954, 1969; Hough 1966; Engelmann 1968; and Catanaach 1973.
8. Even this feature had to be changed to limited liability since it could not be implemented in practice. As late as 1960 there were nearly 60 per cent of PACS with unlimited liability principle of cooperation. By 1978-79 this percentage had declined to 13.
9. For evidence on this see for example, Belshaw 1959; Hough 1966; and Schiller 1967.
10. For evidence on this see Hough 1966; Engelmann 1968; and Singh 1970. Paradoxically, it is this feature which seems to have constrained the rural poor's access to formal credit the most.
11. See Chari 1971; Beliraya et al. 1979; and Raju 1981.
12. Farmers Service Societies (FSS), and Large Agricultural Multi-purpose Societies (LAMPS) are yet other illustrations of extension of such Societies. While the former are organized in most areas, the latter are mainly promoted in tribal areas. But both of these are not covered in this paper.
13. For a comparative study of credit and marketing cooperatives in Surat, Mehsena, and Junagadh districts of Gujarat, see Jodha 1974.

14. Backward linkage arises from agriculture's increasing demand for inputs and assets produced in the non-agricultural sector. Forward linkage, on the other hand, results from increasing demand of the non-agricultural sector for agricultural products to use them as inputs in its processing enterprises. Demand for processing not only the main products of agriculture but also its by-products and waste-products does increase in the course of economic development. For some interesting ideas on identifying and managing cooperatives that integrate these activities, see Gaikwad 1982; and Gaikwad and Gupta 1983. Note that they illustrate this case for a variety of crops including paddy.
15. See Desai 1982 as well as 1983.
16. Interest costs are excluded due to non-availability of data. However, this exclusion does not imply limitation in the test of the operational hypotheses under study, particularly because there is no scale economies in interest costs. For a similar argument, though in a different context, see Rangarajan et al 1972.
17. An important limitation of such a cost function is that it sets no limit on the size of operations as it pays to expand the output infinitely.
18. Such insistence has also led to higher transaction costs to the lender for group as against mortgage loans. While this could not be quantified due to non-availability of data, the experiences of the officials of the concerned bank also indicated that lender costs were lower for group guarantee scheme only in providing technical assistance by the bank staff. In all other activities like processing loan application, execution of documents, loan use supervision, and recovery of loans these costs were either higher or about the same for the group borrowers. For details, see Desai 1982.

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