The Role of Commercial Banks in Providing Agricultural Credit (Factors Responsible for Overdue Position) - A Study with Reference to Tamil Nadu in India

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Abstract

Agricultural sector occupies a key position in the Indian economy. It provides employment to about 65 per cent of the working population of India. Around one-quarter of India’s National income originates from the agricultural sector. It is imperative that the problems of farmers are addressed with a sense of urgency. Agriculture being a State subject, the bulk of public investment in agriculture takes place at the level of States and the Central Government supports the States as a catalyst. On the basis of difference in the socio-economic characteristics of the borrowers, linear discriminant analysis was used to classify the borrowers into defaulters and non-defaulters and again the defaulters were classified into willful defaulters and non-willful defaulters. The exact amount of non-performing assets and ever dues percentage wise as well as absolute amount-wise are going on increasing. The bad and doubtful debts, funds blocked in suit-filed accounts and decreased debt and funds in the hands of willful defaulters are showing an upward trend. Most of the borrowers are non-willful borrowers in selected areas. Thus it could be concluded that the marginal farmers had performed well not only in the prudent investment they had made on the financial and physical assets, but also in the better and more efficient utilization of factors and inputs in the study area. Agricultural credit, particularly commercial bank credit, promoted agricultural inputs to meet their various day-to-day agricultural expenses. Besides it had also motivated them to adopt intensive methods of cultivation. It could also be inferred that the recovery performance, which was found to be better in the study area, had in its turn induced the effective functioning of the Lead Bank in the study area.

Keywords: Agriculture; Overdues; Linear discriminant analysis; Commercial banks

Introduction

Agricultural sector occupies a key position in the Indian economy. It provides employment to about 65 per cent of the working population of India. Around one-quarter of India’s National income originates from the agricultural sector. It is imperative that the problems of farmers are addressed with a sense of urgency. Agriculture being a State subject, the bulk of public investment in agriculture takes place at the level of States and the Central Government supports the States as a catalyst.

Like other industries, agriculture also requires capital. Small farmers and marginal farmers need credit since their capital is locked up in their loans and stock. They need funds to meet their operational expenses. Their credit need is high at the time of crop season. Millions of farmers are depending upon marginal and subsistence farming. Due to low yield, they are not in a position either to have ‘surplus’ for distribution or at times even to continue the production process successfully and economically. Due to these reasons they depend mostly on credit even for normal agricultural operations and have to pay a part of their income by way of interest later.

The problems and requirements for credit arise largely from the seasonal cycle of agricultural production which is superimposed on a largely perpetual and steady pattern of continuous consumption. Because of the marked contrasts in season of production and consumption pattern, the savings and credit demand of this process may be substantially relative to net income. When it is for stimulating the tempo of agricultural production through new production technology, it is necessary that the farmers must be provided with adequate and timely credit. New production technology includes intensive agriculture and modernization. It includes the use of high yielding variety of seeds, chemical fertilizers, creation of irrigational facilities, plant protection measures and introduction of farm machinery like tractors and combined harvesters.

There are many characteristics like consumption, expenditure, repaying capacity, family size, dependency ratio, occupational status, intensity of cropping, amount of loan borrowed from the financial institutions and annual income from farming which influence the repayment performance of loans taken by farmers. In this study, characteristics responsible for overdues are taken into account. The selected socio-economic characteristics are total land holdings in acres, operational size of land holdings in acres, level of education, caste, borrowers age in years, percentage of area under High Yielding Varieties (HYV), cropping intensity in percentage, percentage of income from farming, annual per capita family consumption expenditure per acre, fertilizers used in rupees, amount of loan borrowed from bank, and working capital used.

Some of these characteristics are qualitative and some others are quantitative in nature. Qualitative characteristics are quantifiable for calculation in this study. Some selected characteristics are more
important in determining the repayment capacity and some others are not like that. In this paper, identification of characteristics, which are having more power to decide the overdue is analysed.

The present study proposes to highlight the agricultural credit extended by the commercial banks in Tamilnadu and analyse the repayment performance of the borrowers. The commercial banks aim at intensive coverage of selected areas for meeting the priority sector credit needs, especially the agricultural credit requirements and ensuring effective supervision over the use of loans.

Bedi and Saxena [1] had found that the inadequate and untimely provision of credit had influenced adversely the responses of the Punjab farmers towards improved agricultural practices.

Based on the experience of the U.S.A. and other developed countries, Pattle [2] had argued, that where capital markets were not well – developed, the government must provide, at least in the initial years, most of the money required for the agricultural credit systems. There are many studies in which the importance of institutional credit in agriculture, in the context of new technology and agricultural development, is discussed. Dasgupta [3] concentrates mainly on technological change in relation to productivity by taking into account the changing class relations in the historic context. She draws the conclusions that the technical change will have a positive contribution but it would depend upon the horizontal and vertical spread of technology. She further observes that there is little contribution of the new technology to improve the overall living conditions, and the quality of life in the countryside. In future, the effect of new technology on these aspects will depend: (i) on the public policies to regulate labor and land market; (ii) on the control of choice of factor combination on larger farms; and (iii) on the investing part of the surplus originating in agriculture.

### Analytical Frame Work Methodology

Adopted for the collection of data, method of analysis and tools of analysis. Designing a suitable methodology and the selection of proper analytical tools are important for a meaningful and useful analysis in any research undertaking. In this section, an attempt has been made to describe the methodology which includes the reasons for the choice of study area, sample design, period of study, method. Primary data were used for the present study. A reconnaissance survey was conducted by meeting the farmers, particularly paddy cultivators, so that the researcher could get fully acquainted with various stages of agricultural operations, various kinds of investments made by farmers and the actual farming conditions. The selected farmers were contacted in person and the objectives of the study were clearly explained to them, and their co-operation was secured. The details regarding the characteristics of the sample farmer, his farm structure, the size of his holding, his cropping pattern, his investment pattern in farm assets, his costs and returns, the net incomes received by him and the other aspects relating to the present study were collected from each of the sample farmers through the personal interview method [4].

### Methods of analysis

Keeping in view the objectives of the study, the 600 sample beneficiaries were stratified into two categories, namely marginal and small farmers. Out of the 600 sample farmers, 232 sample farmers (38.67 per cent) and the remaining 368 sample farmers (61.33 per cent) are under the category of large and small farmer groups respectively. Further, the sample farmers were post stratified into non-defaulters and defaulters. Out of the 232 large farmers, 136 (58.52 per cent) belong to non-defaulter group and the remaining 96 (41.38 per cent) belong to defaulter group. In the small farmer group, out of 368 sample farmers, 156 (42.39 per cent) and 212 (35.33 per cent) belong to non-defaulter and defaulter groups respectively [5].

Credit institutions serving agricultural-sector needs developed in three phases. In the first phase, which lasted from 1947 to 1969, cooperative agencies were the primary vehicle providing credit. In the second phase, after nationalization of banks in 1969, commercial banks were assigned a role in providing agricultural credit but were supplementary to cooperatives (see Fiscal Administration, ch. 6). In the last phase starting in 1975, regional rural banks were established to provide credit. In the 1990s, agricultural credit is provided through a multiagency approach in the form of cooperatives, commercial banks, and regional rural banks. These institutions have gradually ensured that credit reaches the most remote agricultural and rural areas [6].

On the basis of difference in the socio-economic characteristics of the borrowers, linear discriminant analysis was used to classify the borrowers into defaulters and non defaulters and again the defaulters were classified into willful defaulters and non-willful defaulters [7-12].

The information collected from bank and the borrowers indicates the reasons and effects of overdues.

Deciding factors of repayment capacity of default borrowers was determined by

$$R = Y - [C + L + K]$$

Where,

- $R = \text{Repayment capacity of the borrower (in Rs.)}$
- $Y = \text{Total income from farming and other source (in Rs.)}$
- $C = \text{Total farm and off farm expenses (in Rs.)}$
- $L = \text{Pre – existing liabilities to be met within a year (in Rs.)}$
- $K = \text{Risk taking allowance to the farmer borrowers (in Rs.)}$

15 Percent of total income

**Linear Discriminant Function Analysis:** On the basis of difference in the socio economic characteristics of the borrowers, linear discriminant analysis was used to classify the borrowers into defaulters and non defaulters and again the defaulters are classified into willful defaulters and non-willful defaulters. The distance between two groups of borrowers was calculated by Mahalanobis D2 test [13-17]. Socio-economic characteristics and their significance were tested as a first step of analysis to make sure whether these groups of borrowers (defaulters and non defaulters or willful defaulters and non-willful defaulters) are significantly different from each other as regards the means of the characters under study.

Discriminant function is stated here

$$Z = \sum_{i=1}^{12} l_i x_i$$

$$Z = \ln x_1 + \ln x_2 + \ldots + \ln x_{12}$$

$$Z = \ln i(i = 1, 2, 3, \ldots, 12)$$

$$Z_i(i = 1, 2, 3, \ldots, 12)$$

where,

- $Z = \text{Total sum of discriminant score (it may be the score for}$
non-defaulters and defaulters or willful defaulters and non-willful defaulters)

\[ x_i = \text{The value of } i^{th} \text{ characteristics} \]
\[ l_i = \text{Total land holdings in acres (in own land, leased in, leased out land are taken into account)} \]
\[ x_2 = \text{Operational size of holdings in acres (cultivable land alone)} \]
\[ x_3 = \text{Level of education} \]
\[ \text{Score for illiterate} = 1, \]
\[ \text{Primary education} = 2, \]
\[ \text{High/Higher Secondary education} = 3, \]
\[ \text{Technical education} = 4, \]
\[ \text{Graduation and above} = 5 \]
\[ x_4 = \text{Caste} \]
\[ \text{Score for SC} = 1, \text{Other than SC} = 0 \]
\[ x_5 = \text{Borrower’s age in years} \]
\[ x_6 = \text{Percentage of area under High Yielding Varieties (HYV)} \]
\[ = \frac{\text{Total operated area under HYV’s}}{\text{Total operated area}} \times 100 \]
\[ x_7 = \text{Intensity of cropping in percentage} \]
\[ = \frac{\text{Total annual cropped area in acres}}{\text{Total land holdings in acres}} \times 100 \]
\[ x_8 = \text{Percentage of income from agriculture} \]
\[ = \frac{\text{Net income from agriculture}}{\text{Total income}} \times 100 \]
\[ x_9 = \text{Annual per capita family consumption expenditure (in Rs.)} \]
\[ = \frac{\text{Total consumption expenditure}}{\text{Family size}} \times 100 \]
\[ x_{10} = \text{Per acre fertilizers used (in Rs.)} \]
\[ x_{11} = \text{Amount of loan borrowed from the bank, and} \]
\[ x_{12} = \text{Working capital used (in Rs.) per acre} \]
\[ \text{(Seeds, weedicides, fungicides and pesticides are included)} \]

185 defaulters and 115 non-defaulters were selected for the study. Among 185 defaulters, there were 73 willful defaulters and 112 non-willful defaulters.

The socio economic characteristics which are considered here are shown in the matrix notation.

\[ S_{i} = d \]
\[ S_{IL} = \begin{bmatrix} S_{11} & \ldots & S_{1k} \\ S_{21} & \ldots & S_{2k} \\ \vdots & \ddots & \vdots \\ S_{k1} & \ldots & S_{kk} \end{bmatrix}_{12x12} \]
\[ l = \begin{bmatrix} l_1 \\ l_2 \\ \vdots \\ l_k \end{bmatrix}_{12x1} \]
\[ d = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \\ d_k \end{bmatrix}_{12x1} \]

where,
\[ l_i = \text{Discriminant function’s co-efficient vector} \]
\[ S_{xk} = \text{Pooled dispersion matrix, and} \]
\[ d_k = \text{Vector of difference in group means} \]

The variable considered is sufficiently discriminating between the groups of defaulters and non-defaulters or willful defaulters and non-willful defaulters are tested for its significance. Distance between two groups are measured with the help of Mahalanobis D² statistics. After transformation this D² statistic becomes an F statistic which is then used to see whether the two groups are different from each other. In the present analysis.

\[ S_{ij} = \frac{1}{N_a + N_b - 2} \left[ \sum X_i - \left( \frac{\sum X_i}{N_a} \right)^2 \right] \]
\[ S_{ij} = \frac{1}{N_a + N_b - 2} \left[ \sum X_i - \left( \frac{\sum X_i}{N_a} \right)^2 \right] \]

where,
\[ N_a = \text{Number of non-defaulters or non-willful defaulter,} \]
\[ N_b = \text{Number of defaulters or willful defaulter} \]

To work out the contribution of each character to the distance created (Z_a-Z_b) by the two population of the defaulter and non-defaulter or willful defaulter and non-willful defaulter, Mahalanobis D² was worked out as under and various steps involved in this analysis.

**Step 1:** All possible combinations of the twelve socio-economic characteristics pooled covariance matrix were obtained as follows:

\[ \sum (X_i X_k)_{ab} = \sum (X_i X_k)_{ab} \]
\[ \frac{1}{N_a + N_b - 2} \]

where,
\[ \sum (x_i x_k)_{ab} = \text{the sum of products between any two characteristics (i and k) in non-defaulters or non-willful defaulter groups.} \]
\[ \sum (x_i x_k)_{ab} = \text{the sum of products between any two characteristics (i and k) in defaulters or willful defaulter groups.} \]

**Step 2:** The value of the diagonal cells (pooled sum of squares) were:

\[ \sum (X_i^2)_{ab} = \sum (X_i^2)_{ab} \]
\[ \frac{1}{N_a + N_b - 2} \]

where,
The product of mean difference \((d_1, d_2)\) was obtained.

Now with the help of \(c_{ik}\) and \(d_1, d_2, \ldots, d_{12}\) matrices, the value of \(D^2\) based on all the twelve characteristics was obtained.

\[
D^2 = \sum_{i=1}^{12} \sum_{k=1}^{12} c_{ik} d_i d_k
\]

The inverted matrix \((c_{ik})\) was obtained.

The products of co-efficients and difference between means of the two samples were multiplied and then divided by \(D^2\) values. It gives the percentage contribution of individual characteristics to the total distance.

### Socio Economic Characteristics

Table 1 presents the selected socio-economic characteristics along with their mean values and their differences both for defaulters and non-defaulters.

### Identification of characteristics and results of discriminant analysis

The aim of the discriminant function analysis used here is to classify the borrowers into defaulters and non-defaulters and further defaulters are subdivided into willful defaulters and non-willful defaulters by a set of independent variables.

### Discriminant function for defaulters and non-defaulters

For defaulters and non-defaulters, the selected twelve characteristics data are fitted in discriminant equation. This is (Equation 1).

\[
Z = -1213X_1 + 3.1991X_2 + 0.0136X_3 - 1.0026X_4 - 0.0299X_5 + 0.25X_6 + 0.0143X_7 - 0.0028X_8 + 0.0081X_9 + 0.0135X_{10} - 0.0016X_{11} + 0.0018X_{12}
\]  

Discriminant function is applied to the twelve characteristics to see whether these characteristics discriminate the two groups significantly or not. The difference in the mean value of two groups for most of the characteristics turned out to be significant implying that these characteristics are important variables that influence the repayment

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Socio Economic Characteristics of the Borrowers</th>
<th>Mean</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Size of holding in acres ((X_1))</td>
<td>3.1216</td>
<td>3.1616</td>
</tr>
<tr>
<td>2</td>
<td>Operational size in acres ((X_2))</td>
<td>2.9516</td>
<td>3.1922</td>
</tr>
<tr>
<td>3</td>
<td>Literacy ((X_3))</td>
<td>1.4469</td>
<td>1.1762</td>
</tr>
<tr>
<td>4</td>
<td>Caste ((X_4))</td>
<td>0.9961</td>
<td>0.8451</td>
</tr>
<tr>
<td>5</td>
<td>Age of the farmer ((X_5))</td>
<td>39.1561</td>
<td>39.4616</td>
</tr>
<tr>
<td>6</td>
<td>Percentage of area under HYV’s to the total operated area ((X_6))</td>
<td>25.6961</td>
<td>23.3911</td>
</tr>
<tr>
<td>7</td>
<td>Cropping intensity in percentage ((X_7))</td>
<td>141.2411</td>
<td>127.6141</td>
</tr>
<tr>
<td>8</td>
<td>Percentage of income from farming to the total income ((X_8))</td>
<td>70.7716</td>
<td>59.2451</td>
</tr>
<tr>
<td>9</td>
<td>Per capita annual consumption expenditure in rupees ((X_9))</td>
<td>2941.4213</td>
<td>2566.1125</td>
</tr>
<tr>
<td>10</td>
<td>Per hectare fertilizer used in rupees ((X_{10}))</td>
<td>833.6211</td>
<td>907.1416</td>
</tr>
<tr>
<td>11</td>
<td>Size of the loan ((X_{11}))</td>
<td>8185.16</td>
<td>8169.2114</td>
</tr>
<tr>
<td>12</td>
<td>Working capital in rupees per hectare ((X_{12}))</td>
<td>431.2413</td>
<td>466.2010</td>
</tr>
</tbody>
</table>

Table 1: Mean Values and their Differences with Regard to the Socio-Economic Characteristics of the Borrowers, Defaulters.
The discriminant function is then applied to the remaining four socio-economic characteristics of the willful defaulters and non-willful defaulters. This characteristic contribution to the total distance is 88.91 per cent, and other followed characteristics are annual per capita family consumption expenditure in rupees (X₉) and level of education (X₃) and their percentage contributions to the total distance are 23.29 and 1.51 respectively. The relative importance of each characteristic is determined by its percentage contribution to total distance.

**Discriminant Function for Willful and Non-Willful Defaulters**

Table 4 shows the mean and their difference with regard to the socio-economic characteristics of the willful defaulters and non willful defaulters.

\[
Z = +1.6811X_1 -12.4125X_2 + 0.44622X_3 -1.3624X_4 + 0.00196X_5 -0.03453X_6 + 0.01944X_7 + 0.2162X_8 + 0.6129X_9 + 0.04693X_{10} -0.0074X_{11} + 0.4122X_{12}
\]  

From the Equation (3) all the characteristics turned out to be significant in classifying the defaulters into willful defaulters and non-willful defaulters. Relative importance of the characteristics’ percentage contribution to the total distance is measured and is given in Table 5. Important major characteristics which classified the defaulters into willful defaulters and non-willful defaulters are shown in Table 5.
The ‘t’ value is calculated for all the selected characteristics and is found that \( X_1, X_2, X_3, X_6 \) are significant. These characteristics are considered to be major characteristics for willful defaulters and non-willful defaulters. These characteristics discriminate one group of borrowers from other, by operational size of land holdings (\( X_2 \)), level of education (\( X_3 \)), percentage of income from agriculture (\( X_8 \)) and per acre fertilizer used in Rs. (\( X_{10} \)) are the major and significant characteristics and other characteristics \( X_1, X_4, X_5, X_7, X_9, X_11, X_12 \) are found to be insignificant and therefore excluded in the new equation for further analysis.

Discriminant function is returned by taking only these four major characteristics \( X_2, X_3, X_8 \) and \( X_{10} \) in the equation to inquire whether these characteristics alone are able to discriminate non-willful defaulters and willful defaulters in a significant manner. The new discriminant equation is given in (Equation 4).

\[
Z = -6.0114X_2 + 0.73112X_3 + 0.04691X_8 - 0.00076X_{10}
\]

From Equation (4) the percentage contribution of major characteristics to the total distance and ordering of characteristics are easily found. Operational size of land holdings (\( X_2 \)), level of education (\( X_3 \)), percentage of income from agriculture (\( X_8 \)) and per acre fertilizers used in Rs. (\( X_{10} \)) are high and would contribute higher value of Z and thereby placing the borrowers into non-willful category and vice versa.

The new function is found to be significant. This means that the four characteristics considered are useful in classifying the borrowers into non-willful defaulters and willful defaulters. The percentage to the total distance is measured in order to know the relative importance of these characteristics. This calculation is presented in Table 6.

From the Table 6 it has been revealed that, the operational size of land holdings (\( X_2 \)) is the first major characteristic which discriminates one group from the other, level of education (\( X_3 \)) and per acre fertilizers used in rupees (\( X_{10} \)) are getting second and third places in discriminating willful defaulters and non willful defaulters. These characteristics have their weights to the total distance measured as 100.96 and 0.36 per cent respectively.

### Major Findings

The exact amount of non-performing assets and overdues percentage wise as well as absolute amount-wise are going on increasing. The bad and doubtful debts, funds blocked in suit-filed accounts and decreased debt and funds in the hands of willful defaulters are showing an upward trend. Most of the borrowers are non willful borrowers in selected areas [18,19].

### Conclusions

Thus it could be concluded that the marginal farmers had performed well not only in the prudent investment they had made on the financial and physical assets, but also in the better and more efficient utilization of factors and inputs in the study area. Agricultural credit, particularly commercial bank credit, promoted agricultural inputs to meet their various day-to-day agricultural expenses. Besides it also motivated them to adopt intensive methods of cultivation. It could also be inferred that the recovery performance, which was found to be better in the study area, had in its turn induced the effective functioning of the Lead Bank in the study area.
Suggestions

- Agriculture in India, viewed as a way of life, was not considered a productive proposition by the socially, economically and technologically backward population. The inter-sectoral mobility of personnel, resources and technology was very limited and it had created a vicious circle of technological isolation in the agricultural sector.

- There is need for simplification of procedures for recovery of overdues of the commercial banks.

- There is need for collecting, compiling, tabulation of data relating to recovery of overdues made from time to time.

- Extension of repayment period in terms of successive crop failure due to natural calamities also is required.

- Fixing appropriate due dates in relation to crop calendar ensuring timely disbursement and recovery of loans is advisable.

- It is earnestly felt that the findings arrived at, and the valid suggestions made, in the wake of intensive study of agricultural credit with reference to commercial banks in Tamil Nadu carried out by the present writer will go a long way in enhancing the socio-economic level of farmers not only in the study area but all also over the entire country.

References


