Chapter - VI

EFFICIENCY IN RELATION TO SOCIAL OBJECTIVES

6.1 Concept of Efficiency in Relation to Social Objectives

In view of the economic and social objectives of banking industry after nationalisation, new dimensions have been added to the functions of commercial banks in India. These include opening of branches in rural areas, lending to priority sector, mobilisation of savings from agricultural community, etc. These aspects of efficiency do not necessarily get reflected in costs and earnings. It is possible that the branches which are operationally efficient in terms of costs and earnings, may not be socially efficient and vice-versa. Hence, the norms for evaluating the performance of banks in general and of branches in particular have been changing.

In view of these new dimensions, the evaluation of banks performance in India in some of the recent studies like those by Shetia and Venkatachalam,[1] RBI Committee[2] and K.V. Narindranath[3], is made on the basis of the following criteria in general.

1. Fulfilling social responsibilities in reaching the hitherto neglected sections and segments of the society.
2. Improving the productivity of employee or utilising the manpower resources most efficiently.

(3) Improving the profitability or managing the financial resources optimally.

(4) Providing excellent customer services.

Thus, efficiency of banks is now measured in relatively broader perspective. In some other studies on economies of scale, like those by Gramely,[4] Edward[5], operational efficiency of a bank is examined from the point of view of size-cost relationship only. However, there are few studies such as those by Greenbaum[6] and Hester[7], which are directed specifically towards the social concept of efficiency in resource utilization by assigning appropriate weights to the services of bank. In this connection, Gramely observes that "the amount of resources used to provide a given quantity of banking services, evaluated in terms of its social value, would provide a measure of the social efficiency".[8]

Thus it would be of interest to evaluate the performance of the branches also in terms of social objectives fulfilled by the branches, such as priority sector lending, credit needs of the hitherto neglected segments of the community, mobilisation of savings from the rural sector, etc. In other words, broader and more comprehensive scale of assessment may be used for judging the performance of rural and urban branches.

In order to examine the efficiency of rural and urban

branches and of smaller and larger branches, an index based on certain indicators of social efficiency has been developed in this study. Since quantification of these indicators by the technique of regression is not possible, the technique of principal component analysis has been resorted to.

6.2 Indicators of Social Efficiency

Following seven indicators have been selected for measuring social efficiency :

i) Ratio of priority sector advances to total advances (X_1)
ii) Ratio of agricultural advances to total advances (X_2)
iii) Ratio of direct-agricultural advances to total agricultural advances (X_3)
iv) Ratio of small industries and small business advances to total advances (X_4)
v) Ratio of agricultural deposits to total deposits (X_5)
vi) Number of agricultural deposit accounts to total number of deposit-accounts (X_6)
vii) Number of agricultural advance accounts to total number of advance accounts (X_7)

It is to be noted that the selected indicators do not necessarily represent an exhaustive list. The selection is based on trial and error method dropping some indicators or

adding new indicators. Nonavailability of data has also precluded some variables for inclusion in the analysis.* However, it can be said that each of the indicators satisfies the broad analytical consideration and hence qualifies for inclusion

The behaviour of different indicators in different size-groups of all, rural and urban branches is shown in Table 6.1. The selected indicators are denoted in ratio form to show the relative importance of each indicator in measuring social efficiency.

It is seen from the table that lending to agricultural sector is more in the rural branches while lending to small industries and small business is more in urban branches. However, because of predominance to agricultural sector advances and predominant role of rural branches in these advances, ratio of priority sector advances to total advances (Column 1) is higher in rural branches. Rural branches have been also able to mobilise deposits from agricultural sector, which constituted about 20% of the total deposits.

For further understanding of the relationship between the efficiency of larger and smaller branches, and rural and urban branches, we have resorted to the technique of principal component method, a part of factor analysis technique.

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* For example, data on advances under differential interest rate scheme, advances to marginal and small farmers, etc., were not readily available in a compiled form.

Table 6.1 : Indicators of Social Efficiency - 1979

Size-group of Branches (Volume of Business in lakhs-crores of Rs.)	No.of Branches	Ratio of priority sector advances to total advances	Ratio of agricultural advances to total advances	Ratio of direct agricultural finance to total Agrl. advances	Ratio of small industries and small business advances to total advances	Ratio of agricultural deposits to total deposits	No.of agricultural deposit accounts to total no.of deposit accounts	No.of Agricultural advance accounts to total no.of advance accounts
		X_1	X_2	X_3	X_4	X_5	X_6	X_7
		1	2	3	4	5	6	7
RURAL BRANCHES								
Less than 10 lakh	19	0.89	0.52	0.95	0.36	0.263	0.3020	0.5530
10-50 lakh	61	0.91	0.61	0.99	0.30	0.219	0.2230	0.7160
50lakh-1 crore	32	0.94	0.66	0.97	0.25	0.183	0.1870	0.7190
1-5 crore	29	0.61	0.28	0.98	0.34	0.208	0.2180	0.7350
All Branches	141	0.74	0.42	0.93	0.31	0.204	0.2130	0.7170
SEMI-URBAN BRANCHES								
10-50 lakh	6	0.49	0.00	0.00	0.49	0.004	0.0063	0.0000
50lakh-1 crore	15	0.56	0.12	0.86	0.44	0.053	0.0299	0.4020
1-5 crore	48	0.65	0.19	0.90	0.46	0.049	0.0646	0.3770
5-10 crore	6	0.46	0.03	0.95	0.36	0.016	0.0170	0.3890
Above 10 crore	5	0.57	0.16	0.99	0.18	0.017	0.0206	0.2810
All branches	80	0.51	0.17	0.69	0.34	0.030	0.0450	0.5700
ALL BRANCHES								
Less than 10 lakh	19	0.89	0.52	0.95	0.36	0.263	0.3020	0.5530
10-50 lakh	67	0.86	0.54	0.99	0.32	0.194	0.1995	0.7070
50 lakh-1 crore	47	0.85	0.53	0.96	0.29	0.128	0.1289	0.6220
1-5 crore	77	0.64	0.22	0.94	0.19	0.092	0.1066	0.4600
5-10 crore	6	0.46	0.03	0.95	0.36	0.016	0.0170	0.3890
Above 10 crore	5	0.57	0.16	0.99	0.18	0.017	0.0206	0.2810
All branches	221	0.67	0.24	0.83	0.33	0.060	0.0962	0.5230

Table 6.1

Source: Calculated on the basis of data for 1979 given in Appendix Table No.7.

Notes : 1. In rural branches, there are no branches doing the business above 0.5 crores, and in urban branches, there are no branches doing the business less than 10 lakh rupees.

2. Ratio of priority sector advances to total advances is derived by dividing the sum of agricultural advances and small industries and small business advances by total advances.

6.3 Methodology for Preparing Index of Social Efficiency

The main task in constructing the index of social efficiency, based on several indicators, lies in determining the weights of the variables and the methodology for combining them. The appropriate procedure is to determine weight of individual indicator according to its contribution to social efficiency.[9]

There are two approaches for evaluating the performance of individual branch. First one is simple index method and the second one is weighted index method. The principal component method of factor analysis is a sophisticated technique of giving objective weight to individual indicator.

In the first method, equal weights are attached to indicators so that the composite index will be based on total scores obtained for each ... by adding their indicator-wise ranks. In this method, the weights are arbitrarily given and multicollinearity among the variables is not taken care of. So the results of this method may not be accurate. Hence, the sophisticated method of 'Principal Component Analysis' has been applied in constructing composite index of development.[10]

"The principal component analysis is an empirical technique of 'breaking down' a correlation or covariance matrix into set of orthogonal component or axes equal in number with that of original variates".[12]

The principal component method constructs a set of new variables (P_i) called principal components, out of a given set of variables x_j ($j=1, \ldots n$). The new set of variables P_i ($i=1 \ldots n$) i.e., principal components are linear combination of standardised variables with weights in terms of factor loadings. Thus, principal component P_i is determined as,

$$P_i = a_{1j}Z_1 + a_{2j}Z_2 + a_{3j}Z_3 \ldots a_{nj}Z_n$$

where,

P_i = 1 to n are new uncorrelated components

a_{ij} = i=1 to n and j = 1 to n, the coefficients are the factor loadings

Z_j = 1 to n, are the observed variables, as standardised.

Each component makes a maximum contribution to the sum of the variance of the variables. Formally, the first principal component contributes a maximum to their total variance, the second principal component, uncorrelated with the first, constitutes to the residual variance and so on. The sum of the variance of all principal components is equal to the sum of the variance of the original variables.

The important steps[12] involved in adopting this technique are as follows :

i) The correlation matrix of chosen indicators for index of social efficiency, based on observations in respect of rural, urban and all branches, is obtained.

ii) Factor loading (a_{ij}) is derived by dividing each of the correlation coefficients by the square root of the grand total of correlation coefficients of all variables.

iii) Characteristic root or eigen value denoted by the subscript λ of the principal component, is derived by summing the square of loadings.

iv) The percentage contribution of P_1 in the total variance of Xs is derived by dividing eigen value (λ) by number of variables (n) and multiplying it by 100 i.e. $P_1 = \frac{\lambda}{n} \times 100$.

v) The value of factor loadings has been normalised by dividing it by eigen value. This gives the coefficient of principal component. This is done because this function minimises the error variances and also maximises sum of squares of correlation coefficients with all the variables.[13] (while its own variance is 1).

vi) For preparing index, the original variables in different size-groups are standardised as shown in Table 6.2 by dividing x_1 by its standard deviation, i.e., $z_1 = \frac{x_1}{\sigma}$. However, the values of principal components (index) will be different depending on the way in which the variables are used.

Table 6.2 : Standardisation of Original Variables

Size of Branches (Volume of Business in lakhs and crores of rupees)	No.of Branches	Ratio of priority sector advances to total advances	Ratio of agricultural advances to total advances	Ratio of direct agricultural finance to total Agril. advances	Ratio of Small Industries & small business advance to total advances	Ratio of agricultural deposits to total deposits	No.of Agricultural deposit accounts to total no.of deposit accounts	No.of Agricultural advance accounts to total no.of Agril. accounts
		Z_1	Z_2	Z_3	Z_4	Z_5	Z_6	Z_7
		1	2	3	4	5	6	7
RURAL BRANCHES								
Less than 10 lakh	19	6.30	3.41	62.64	7.37	8.87	6.97	7.32
10-50 lakh	61	6.52	4.00	65.28	6.22	7.39	5.15	9.49
50 lakh-1 crore	32	6.74	4.33	63.96	5.18	6.17	4.32	9.52
1-5 crore	29	4.37	1.34	64.62	7.04	7.02	5.05	9.70
All branches	141	5.30	2.76	64.62	6.42	6.83	4.92	9.49
URBAN BRANCHES								
10-50 lakh	6	5.19	0.00	0.00	4.34	0.26	0.31	0.00
50-1 crore	15	5.93	1.64	2.32	3.99	2.13	1.45	2.60
1-5 crore	48	6.09	2.59	2.43	4.08	3.09	3.13	2.44
5-10 crore	6	4.87	1.09	2.56	3.37	1.03	0.82	2.52
Above 10 crore	5	3.92	2.45	1.05	1.59	1.10	1.39	1.32
All branches	80	5.40	2.32	1.56	3.01	1.93	2.12	2.59
ALL BRANCHES								
Less than 10 lakh	19	4.92	2.66	4.47	4.62	2.87	3.05	3.54
10-50 lakh	67	4.75	2.79	4.66	3.89	2.12	2.01	4.91
50 lakh-1 crore	47	4.79	2.73	4.51	3.53	1.40	1.30	4.36
1-5 crore	77	3.54	1.14	4.20	2.31	1.00	1.07	3.20
5-10 crore	6	2.54	0.41	4.47	4.62	0.17	0.17	2.70
Above 10 crore	5	2.62	0.93	4.83	2.19	0.19	0.29	1.95
All branches	221	3.15	1.24	3.90	4.01	0.74	0.97	3.63

Note: 1. In rural branches, there are no branches doing the business more than Rs.5 crore and in urban branches there are no branches doing the business less than Rs.10 lakh.
2. Standardisation of original variables is done with the help of Table 6.1. Standardise value, i.e., $Z_i = X_i/\sigma_i$

vii) Index of social efficiency for different size-groups of all, rural and urban branches is obtained by multiplying each standardised variable with weight (i.e., coefficient of each variable) and summing all obtained values. This can be written as

$$P_1 = \sum_{j=1}^{n} \frac{a_{1j}}{\lambda} \times \frac{X_1}{\sigma_1}$$

viii) The coefficients of correlation between chosen indicator and social efficiency is found out to understand the relationship between individual indicator and social efficiency.

The data required for selected indicators to construct index of efficiency in relation to social objectives for 141 rural and 60 urban branches are for the year 1979 and for six districts namely, Baroda, Broach, Panchmahals, Surat, Dulsar and Dangs.

6.4 Index of Social Efficiency

The index of social efficiency has been computed with the help of indicators, $X_1, X_2, X_3, X_4, X_5, X_6, X_7$, for all, rural and urban branches for the year 1979. The first principal component provides the index of social efficiency (S) which is given in Table 6.3.

Table 6.3 : Index of Social Efficiency

Size Group of Branches	Rural Branches	Urban Branches	All Branches
Less than 5.10 lakh	22.3109	-	4.4060
10-50 lakh	23.2681	1.0624	4.5218
50 lakh-1 crore	22.8087	3.4257	4.1548
1-5 crore	21.9529	4.3197	3.1390
5-10 crore	-	2.6816	2.1678
Above 10 crore	-	2.6911	1.7723
All Branches	22.3567	3.5231	2.9109

Note: Index is based on normalised equations for first principal component according to principal component method.

The index of social efficiency for different size-groups of all, rural and urban branches denoted by S_1, S_2 and S_3 respectively is computed with the help of following normalised equations 1, 2 and 3 respectively.

Normalised Equations for First Principal Component.

$$S_1 = 0.263048Z_1 + 0.259902Z_2 + 0.256152Z_3 - 0.038745Z_4 + 0.063928Z_5 + 0.164972Z_6 + 0.252068Z_7 \quad \ldots(1)$$

$$S_2 = 0.229358Z_1 + 0.260278Z_2 + 0.259695Z_3 - 0.077098Z_4 + 0.160523Z_5 + 0.185332Z_6 + 0.251222Z_7 \quad \ldots(2)$$

$$S_3 = 0.227638Z_1 + 0.263006Z_2 + 0.269288Z_3 - 0.046522Z_4 + 0.055953Z_5 + 0.223868Z_6 + 0.279123Z_7 \quad \ldots(3)$$

* Z_1 to Z_7 are standardised variables of original variables. X_1 to X_7 presented in Table 6.2.

The corresponding correlation matrix for all, rural and urban branches is given in Tables 6.4, 6.5 and 6.6 respectively.

Following conclusions are drawn from the index of social efficiency.

(i) The first principal component explains 46.78%, 45.38% and 42.29% of the total variance of seven variables in all, rural and urban branches respectively. The corresponding eigen values (λ) for first principal component in all, rural and urban branches are 3.27296, 3.17268 and 2.96059 respectively.

(ii) The coefficients of correlation between the index of social efficiency (b) and the selected variables in all, rural and urban branches are given in Table 6.7.

When all branches are considered, as observed from the table, relatively higher positive values of all variables reflect higher social efficiency. However, when effect of rural-urban environment is taken into account, the behaviour of these variables is different in rural and urban branches. Variables X_1, X_2 and X_5 are having relatively higher values and are positively related to social efficiency in rural branches. The corresponding coefficients of correlation are 0.97939, 0.95505 and 0.66114 respectively. Thus, priority sector advances, agricultural advances in particular and

Table 6.4 : Correlation Matrix for Computing P_1 for Measuring Social Efficiency in All branches

	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1	1.00000	0.57461	0.56904	0.18560	0.02382	0.17705	0.51731
X_2	0.57461	1.00000	0.98433	-0.60657	0.02457	0.48046	0.86574
X_3	0.56904	0.98433	1.00000	-0.59001	0.01569	0.44169	0.85464
X_4	0.18560	-0.60657	-0.59001	1.00000	-0.21794	-0.38464	-0.52104
X_5	0.02382	0.02457	0.01569	-0.21794	1.00000	0.17992	0.04717
X_6	0.17705	0.48046	0.44169	-0.38464	0.17992	1.00000	0.47046
X_7	0.51731	0.86574	0.85464	-0.52104	0.04717	0.47046	1.00000
$\sum_{r=1}^{7}$ rij	3.10743	3.32894	3.27533	-1.13460	1.07303	2.36494	3.23428 / 15.243
Coefficient($\hat{a}_j$) for P_1	0.24304	0.25990	0.25613	-0.08874	0.08392	0.18497	0.25296=3.90428

Percentage variation Explained = 46.78

Eigen Value(λ) = 3.27474

Note: Correlation matrix is obtained on the basis of individual branch data for all (221) branches for the year 1979.

Table 6.5: Correlation Matrix for Computing P_1 for Measuring Social Efficiency in Rural Branches

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	
X_1	1.00000	0.59504	0.59131	0.22769	-0.06014	0.02263	0.54781	
X_2	0.59504	1.00000	0.98378	-0.59666	0.22348	0.26655	0.83954	
X_3	0.59131	0.98378	1.00000	-0.58345	0.19033	0.23073	0.83548	
X_4	0.22769	-0.59666	-0.58345	1.00000	-0.26907	-0.27977	-0.47137	
X_5	-0.06014	0.22348	0.19033	-0.26907	1.00000	0.82055	0.15784	
X_6	0.02263	0.26655	0.23073	-0.27977	0.82055	1.00000	0.29005	
X_7	0.54781	0.83954	0.83548	-0.47137	0.15784	0.29005	1.00000	
$\sum_{r=1}^{7} r_{ij}$	2.92514	3.31253	3.25413	-0.09263	2.04299	2.35872	3.19735	$\sqrt{16.09326}$
Coeff.$(\hat{a}_j)$ for z_1	0.22963	0.26027	0.25569	-0.07799	0.16052	0.18533	0.25122	=4.01226

Percentage variation explained = 45.32%

Eigen value(λ) = 3.17203

Note: Correlation matrix is obtained on the basis of individual branch data for rural (141) branches for the year 1979.

Table 6.6 : Correlation Matrix for Computing F_1 for Measuring Social Efficiency in Urban Branches

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	
X_1	1.00000	0.35042	0.35281	0.42478	0.06014	0.19613	0.30750	
X_2	0.35042	1.00000	0.96545	-0.46583	-0.06490	0.66032	0.07541	
X_3	0.35281	0.96545	1.00000	-0.43200	-0.07533	0.57107	0.05792	
X_4	0.42478	-0.46583	-0.43200	1.00000	-0.27439	-0.37119	-0.43073	
X_5	0.06014	-0.06490	-0.07533	-0.27439	1.00000	-0.01199	0.02275	
X_6	0.19613	0.66032	0.57107	-0.37119	-0.01199	1.00000	0.64253	
X_7	0.30750	0.07541	0.05792	-0.43073	0.02275	0.64253	1.00000	
$\sum_{r=1}^{7} r_{ij}$	2.67778	3.32087	3.15992	-0.54936	0.65628	2.62687	3.27538	$\sqrt{15.7111}$
Coeff.$(\hat{a}_j)$ for F_1	0.22760	0.28300	0.26920	-0.04668	0.05593	0.22326	0.27912	=3.96372

Percentage variation Explained = 42.29%

Eigen value (λ) = 2.96050

Note: Correlation matrix is obtained on the basis of individual branch data for urban 150 branches for the year 1979.

agricultural deposits to total deposits are positively related with social efficiency, whereas, small industries and small business advances (X_4) is negatively related with social efficiency. This may perhaps be due to the fact that rural branches are predominant in agricultural advances.

In urban branches, negative values of some variables, namely X_1, X_2 and X_4, and low value of X_3 reflect lower social efficiency. Priority sector lending is also relatively low in urban branches, which can be seen from the value of X_1. However, relatively higher values of some variables, namely X_5, X_6 and X_7 reflect higher social efficiency. The corresponding coefficients of correlation are 0.81951, 0.75087 and 0.97239.

Table 6.7 : Coefficient of Correlation Between Index of Social Efficiency and Selected Indicators

~~Size-group of~~ Selected ~~Branches~~ Indicators		Rural branches	Urban branches	All branches
Ratio of Priority sector advances to total advances	(X_1)	0.97659	0.35141	0.96057
Ratio of agricultural advances to total advances	(X_2)	0.99505	-0.11952	0.94047
Ratio of direct agri. finances to total agri. advances	(X_3)	0.03984	0.01535	0.00746
Ratio of small ind.and small business advances to total advances	(X_4)	-0.50943	-0.24004	0.37837
Ratio of agri.deposits to total deposits	(X_5)	0.66114	0.81941	0.91895
Ratio of Agri.Deposits accts. to total no.of deposit accts.	(X_6)	0.05795	0.75087	0.87714
Ratio of agri.advances accts. to total no.of adv.accts.	(X_7)	0.15390	0.97239	0.92716

This implies that if agricultural deposits, number of agricultural deposit-accounts and advance accounts are increased, it will enhance advances to priority sector and increase social efficiency of urban branches. But at the same time, as rate of interest on agricultural and small business advances is relatively low, and processing of these accounts involves higher operating cost, profitability will be negatively affected.

(iii) It appears from Table 6.5 that in the index of social efficiency, higher values are recorded by branches having volume of business between 10-50 lakhs rupees in rural branches and 1-5 crore rupees in urban branches. The corresponding value of index is 23.2651 and 4.3197 for rural and urban branches respectively.

It may be concluded, therefore, that smaller branches in rural areas are socially more efficient than larger branches. This may be ascribed to the fact that the proportion of priority sector advances, particularly agricultural advances are more in smaller branches. In urban areas, medium size branches, i.e, 1-5 crore rupees aremore efficient.

(iv) It is also interesting to note that between rural and urban branches, rural branches are found to be socially more efficient than urban branches.This is evident from Table 6.5. The index of social efficiency in rural branches

is higher than urban branches. The corresponding index of social efficiency in all, rural and urban branches (average of all branches in eachcategory) is 2.9109, 22.3587 and 5.5231 respectively).

The higher social efficiency of rural branches may be due to the fact that rural branches more are oriented to agricultural advances, whereas urban branches, even though they advance to priority sector, they are still more oriented to commercial and institutional advances.

6.5 Conclusion

Following conclusions are derived from the foregoing discussion.

(i) It emerges from the discussion, that between rural and urban branches, on the whole, rural branches are more efficient than urban branches in relation to social objectives. This finding is in line with the earlier finding of relative cost efficiency of rural branches over urban branches.

The higher social efficiency of rural branches may be ascribed to the fact that rural branches are more oriented towards agricultural advances, whereas urban branches are oriented more towards commercial and institutional advances, eventhough they advance to priority sector.

(ii) Rural branches have been successful in mobilising agricultural deposits, which can be seen from the positive relationship of this variable with social efficiency. The 'incidence of deposits'* per account is very high, in rural branches than urban/branches.

(iii) In urban branches, the positive relationship between social efficiency and other variables, namely agricultural deposits, number of agricultural deposit accounts and number of agricultural advance accounts (X), reflect higher efficiency. However, the incidence of deposits and advances is low, which is reflected in lesser number of deposits and advance accounts.

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* Incidence of deposits is derived by dividing total deposits by number of deposit accounts holders. Higher incidence shows more spread of deposit habits.

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