Performance of Indian Commercial Banks — Identifying the Key Discriminators

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Abstract

Profitability of Banks assumes greater importance in the changing scenario of autonomy and financial reforms. The objective of the study is to develop a Discriminant function for bank profitability using the most significant ratios and is confined to 78 commercial banks. This Analysis identified only five variables i.e., X4 (Priority Sector Advance / Net Advances), X5 (Interest Income / Total Assets), X6 (Net interest Spread / Total Assets, X7 (Non-interest income / Total Assets) and X9 (Wage Bills / Total Expenses) among the 13 variables as the significant discriminators of bank profitability (ROA-the dependent variable). The canonical correlation of the Discriminant function is 0.653 which indicates a fairly strong relationship between the groups and the Discriminant function. The classification accuracy was 75% (21/28) in Foreign banks, 54% (13/23) in private banks and the least 60% (17/27) in Public Sector banks. The Discriminant model developed and the reduced set of five key variable provide an empirical tested framework for financial decision-making in the Indian banks.

Performance of Indian Commercial Banks — Identifying the Key Discriminators

The importance of commercial banks in directing the activities in an economic system is indeed overwhelming. Banking occupies a crucial place in undertaking the development effort and acts as a vehicle for socio-economic transformation as well as catalyst to economic growth. To quote Bhaba (1956), "Banking is the kingpin of the chariot of economic progress. As such its role in expanding economy of a country like India can neither be underestimated nor overlooked." One of the major concern in the Indian Financial Sector is the low profits churned by the commercial banking industry.

The performance of a bank can be measured by a number of indicators. Profitability is the most important and reliable indicator as it gives a broad indication of the capability of a bank to increase its earnings (Verghese, 1983). Profitability assumes greater importance in the changing scenario of autonomy and financial reforms. The viability of banks depends largely on the adequacy of profits and profitability. Profits, in banking terms refers to the excess of interest spread over burden, whereas profitability is a ratio of net earnings to the total funds used. Profitability in the banking parlance denotes the efficiency with which a bank deploys its total resources to optimize its net profits and thus serve as an index to the degree of asset utilization and managerial effectiveness.

Objective and Schema of Presentation

In this study, bank profitability is measured by the net returns generated out of the total resources deployed. This is given by Return on Assets i.e. net profits as percentage of total assets. This paper is an attempt to identify the most critical profitability ratios

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using a multivariate analysis technique, called Discriminant analysis. Discriminant Analysis involves deriving the linear combination of the two (or more) independent variables that will discriminate between the a prior defined groups (Aakar, Kumar, Day, 1998).

The objective of the study is to develop a Discriminant function for bank profitability using the most significant ratios parameters, and also to measure the direction and extent to which each of such ratios influence bank profitability. The ratios or factors that effect bank profitability are many in number and no study could possibly be exhaustive in including the entire list. For the purpose of analysis, few representative determinants of profitability are selected (as discussed later).

The paper is divided into four sections. Section I presents a review of the past studies on measuring performance of banking in India. Section-II discusses the major determinants of bank profitability that are considered as independent variables in our analysis. Section III outlines the scope and design of the study. Section IV explains the process of Discriminant analysis in detail and develops the Discriminant function for bank profitability. Section V includes the validation of the Discriminant function, the limitations of the study and the concluding remarks.

Section I : Literature Review

In the past, some studies relating to financial performance of banks have been conducted and are reviewed below :

Verghese (1983) conducted an in depth study on profits and profitability of commercial banks during the decade 1970-79. The major issues analyzed by her were : (i) Has there actually been a declining trend in the profits and profitability of Indian Commercial Banks in the seventies ? (ii) What are the main determinants of profits and profitability of the Indian banks during this period ? Raut and Mohanty (1985) attempted to analyse the reasons for declining profitability of a co-operative central bank. They concluded that the declining trend of profitability could arrested by increasing the ratio of time deposits in total deposits. Mishra (1992) analyzed the profitability of scheduled commercial banks in India taking into account the interest and non interest income, interest

expenditure, manpower expenses and other expenses. He concluded that the growing pre-emption of funds in the form of SLR, CRR, faster increase of expenses as compared to the income, advances and total investment than interest income and few more have contributed to the declining profitability of commercial banks. Aggarwal (1992), Malhotra and Kaur (1992) and Elvia and Bansal (1993) have adopted the regression model and empirically stated that reserve requirements, bank rate, lending to priority sector at lower rate of interest, unprofitable expansion of bank branches in rural areas are the major determinants of profits and profitability of public sector banks in India. Amandeep (1993) in her study on profitability of commercial banks has attempted to examine the trends in profits and profitability of twenty nationalized commercial banks. Using the multivariate analysis, she concluded that it is the efficient management of the burden (as against the widely believed 'interest element) which plays a major role in determining the profitability of commercial banks. Parasuraman (2001) attempts to measure the performance of major banks in India in the year 1998-99 under the criteria of EVA. The study found that ranking of banks under Return of Assets assumes close resemblance to the ranking under EVA, whereas the ranking under other criteria like total income, interest, as percentage of total assets, spread, and net profits do not match with the ranking under EVA, Das (2002) has studied the interrelationships among capital, non-performing loans and productivity using data on public sector banks for the period 1995-96 through 2000-2001 and finds the three parameter to be intertwined, with each reinforcing and to a degree, completing the other.

Section II : Determinants of Bank Profitability

Indian banking has the distinction of being driven by the dual forces of Government interventions in the form of RBI (Reserve Bank of India) stipulations, and the efficiency of internal bank management. This is in addition to investment behavior of the consumers and the trend of public savings in the economy. Two of the major RBI interventions that affect profitability are : CRR (Cash reserve Requirements) and Priority lending norms. Higher CRR restrict the banks from lending extravaganza and higher priority lending i.e., Priority Advances / Net advances shrinks the bottom line of these individual banks because the return on the advances are relatively less.. The efficiency of bank

operations / management can be judged on four broad parameters. They are are follows :

a)   Liquidity of the bank (L) – The financial ratios (measured in Percentages) measuring liquidity in banks are : Credit / Deposit ratio (C/D), Investment / Total Deposits Ratio (I/TD) and Long term Deposits / Total Deposits (LD/TD) ratio. Higher C/D ratio and I/TD ratio results in less liquidity, while lower LD/TD ratio increase the liquidity of the bank.

b)   Return Performance (RP) : Three basic parameters that measure returns generated by bank are : Interest Income, Non-interest income and Net interest Spread, all divided by Total Assets, Net interest spread is the difference between interest income and interest expenditure. Higher the net spread, higher the profitability. The other return ratio is Return on Investments, made out of the deposits mobilized by the bank.

c)   Expense Parameters (EP) – Three ratios are used under this. They are Wage bill / Total Expenses, Cost of Deposits and Cost of Borrowings. All these normally have negative effects on profitability.

d)   Operational Efficiency (OE) – Non-performing Assets (as percentage of net advances) and International cost (divided by total assets) are usually the prime measure of operational efficiency. Higher figures in any one may erode long term profitability of the bank concerned.

The dependent variable, ROA is given by the following functional relationship; ROA = f (RBI, L, RP, EP, OE), where RBI denotes the interventions of Reserve Bank. Only one parameter, i.e. Priority Sector Advances / Net Advances is studied under this. The total number of independent variable (profitability determinants) studies is thirteen.

Section III : Scope and Design of the Study

This study is confined to the major scheduled commercial banks in India. The sample consists of 78 banks – 27 public sector banks, (PSB) 23 private banks (PVT) and 28 foreign banks FB). The data relates to the year 1999-2000. The source of data is official website of Reserve bank of India (www.rbi.org.in)

The dependent variable (ROA) has been viewed as position or status in quantitative term, and hence measured on nom-metric scale. For this purpose, those banks which showed ROA of above 1.0% have been priori assigned into high profitable group (with categorical value of 1) and those with ROA less than 1.0% are grouped as low profitable banks with categorical value 0. The group-wise distribution of banks is as follows :

Table – 1

Categorical Value	Number of Banks
0	41 (23-PSB ; 06 – PVT ; 13 – FB)
1	37 (04-PSB ; 17 – PVT ; 15 – FB)
Total	78 (27-PSB ; 23 – PVT ; 28 – FB)

The 13 independent variable or ratios (given as Per-centages) are as follows

X1	-	Credit / Deposit
X2	-	Investment / Deposit
X3	-	Term Deposits / Total Deposits
X4	-	Priority Sector Advance / Net Advances
X5	-	Interest Income / Total Assets
X6	-	Net interest Spread / Total Assets
X7	-	Non-interest income / Total Assets
X8	-	Intermediation Cost / Total Assets
X9	-	Wage Bills / Total Expenses
X10	-	Cost of Deposits
X11	-	Cost of Borrowings
X12	-	Return on Investments
X13	-	Net NPA / Net Advances

As discussed in the previous section, all the above 13 ratios fall in five groups – RBI interventions (X4); Liquidity (X1, X2, X3); Return Performance (X5, X6, X7, X12); Expense Parameters (X9, X10, X11) and Operational Efficiency (X8, X13).

The technique used for developing the Discriminant function of bank profitability is Stepwise Discriminant Analysis. Discriminant Analysis has the objectives of – determining linear combinations of

predictor variables to separate the groups, testing whether significant differences exist between the groups based on group centroids and identifying the variables which count most in explaining the intergroup differences (Green, Tull, Albaum, 1988). Out of the various measures i.e., smallest F ratio, Rao's V Variable, Wilk's Lambda, Mahalanobis Distance, the study employs Wilk's Lambda with minimum value (required for entry) as 3.84 and maximum value (for removal of the independent variable) as 2.71. At each step, the variable that minimizes the overall Wilk's Lambda is entered. The computation ends when any further entry of variables fail to minimize the Wilk's Lambda.

Section – IV Analysis and Findings

The Multiple Discriminant analysis was carried out using SPSS software package (version-10) and the process involved 7 steps with the final Wilk's Lambda of 0.573. The first step featured the selection of X13 (net NPA / net advances), followed by X9 (Wage bills / total expenses) in next step. One variable entered at each of next three step i.e., X6 (Net interest Spread / Total Assets) in step 3; X7 Non-interest income / Total Assets) in step 4 and X4 (Priority Sector Advance / Net Advances) in step 5. In step 6, X13 is removed and in next step (final), X5 entered, After step 7, no other variable was found to have the tolerance level / F value more than the minimum value and hence the process was stopped.

Thus, Discriminant Analysis identified only five variables i.e., X4,X5,X6,X7 and X9 among the 13 variables as the siginificant discriminators of bank proitability (ROA-the dependent variable). The relative importance of these 5 independent variables in terms of their standardized canonical coefficient and Discriminant loading as are given in table – 3.

Table – 3

Variables	Standardized Weights	Discriminant Loadings
X 4	0.790	-.066
X 5	-.598	-.018
X 6	.970	.355
X 7	.673	.370
X 9	-1.112	-.403

The Discriminant Function arrived at is :-

$$Z = 0.790 \times 4 \ -0.598 \times 5 \ + 0.973X7 \ - \ 1.112X9$$

All the five variables are in the standardized form.

The canonical correlation of the Discriminant function is 0.653 which indicates a fairly strong relationship between the groups and the Discriminant function. The centroids of the two groups are : -0.787 for Group 0 and .921 for Group 1. The cut off Z score is determined as : $(41(-0.787)+37(.921)/ 78$, which is equal to 0.0232.

Out of the five variables, X6 (net interest spread / Total Assets) and X9 (wage bills / Total expenses) have already been the most acknowledged variables influencing profitability in banks and the Discriminant function confirms the same. Although X4 (interest income/total assets) was found to have negative Discriminant coefficient, but the effect is nullified by positive coefficients of other two income parameters (X6 and X7). Priority sector advances as percentage of total assets has positive coefficient of 0.790. In the overall analysis, the study finds that one RBI factor(X4), three Return Parameters (X5, X6, X7) and one expense ratio (X9) effected profitability in banks. Liquidity factors (X1, X2, X3) did not figure in the Discriminant function and neither in any of the steps. The operational Parameter (X 13) although entered step 1 was removed in step 6.

Section V : Validation of the Model, Limitations and Concluding Remarks

The validity of the model (Discriminant function) is assessed by calculating the analysis sample (78 banks) and hold out sample (22 banks). The hit ratio for analysis sample was 49 / 78 = 63.7%. The classification accuracy was 75% (21/28) in Foreign banks, 54% (13/23) in private banks and the least 60% (11/27) in Public Sector banks. The hit ratio for the 20 hold out sample was found to be 75%.

The major limitations of the study is that both the sample selected (number of banks) and the Variables (13 independent variables) are not exhaustive in themselves, but they are definitely representative of the population (of all scheduled banks in India) and the variables are to good extent, the major

determinants influencing the bottom line in banking operations. The other limitation relates to that of the technique (Multiple Discriminant analysis) and financial ratios per se. It is to be kept in mind that the analysis pertains to only one year data, and any general conclusions has to be a qualified one.

In spite of the above shortcomings, the paper paves a path for future research measuring bank profitability. The Discriminant model developed and the reduced set of five key variables provide an empirical tested framework for financial decision-making in the Indian banks.

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