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Multivariate analysis of Indian banking sector performance: A camel framework approach

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Abstract

The objective of banking sector reforms in India was in line with the overall goals of the 1991 economic reforms of opening an economy, giving a greater role to markets in setting prices and allocating resources, and increasing the role of private sector. In the following years, reforms covered the areas of (1) stabilization of banks; (2) partial privatization of state owned banks; (3) liberalization including interest rate deregulation, the reduction of statutory pre-emption, and the easing of directed credit rules; (4) changes in the institutional framework, and (5) entry deregulation for both domestic and foreign banks. The increased opportunities for the banks provided by the deregulation have extended their portfolios, but at the same time introduced new uncertainties and risks. The present paper aims at examining the performance of Indian banking sector using CAMEL framework. CAMEL stands for Capital adequacy, Asset quality, Management, Earnings and Liquidity. We have used the modified version of this framework in which one more factor has been included i.e., Systems and Control.

Keywords: capital adequacy; asset quality; productivity; profitability; factor analysis; camel framework; return on assets

1.0 Introduction

Multivariate data analysis techniques have been broadly used due to the realization that in many scientific investigations it is necessary to analyze the simultaneous relationship among three or more variables. Multivariate Analysis can be simply defined as the application of methods that deal with reasonably large numbers of variables made on each object in one or more samples simultaneously. If the interest centers on the association between two sets of variables, where one set is the realization of dependence or criterion measure then the appropriate class of techniques would be those designated as dependence methods. If the interest centers on the mutual association across all the variables with no distinction made among variable types, one uses interdependence approaches.

Dependence Methods seek to predict one or more criterion measure based upon the set of predictor variable. Interdependence methods on the other hands are less predicative in nature and attempt to provide insight into the underlying structure of the data by simplifying the complexities, primarily through data reduction. Several changes have taken place in the operations and structure of the banking system with the introduction of Financial Sector Reforms in 1991. The increased opportunities for the banks provided by the deregulation have extended their portfolios, but at the same time introduced new uncertainties and risks. The present paper aims at examining the performance of Indian banking sector using CAMEL framework.

CAMEL stands for Capital adequacy, Asset quality, Management, Earnings and Liquidity. We have used the modified version of this framework in which one more factor has been included i.e., Systems and Control. This is based on one of the recommendations of the Padmanabhan Committee on "On-site Supervision over Banks". In general, CAMEL ratings are designed to reflect a bank's financial condition, its compliance with regulatory policies, and quality of its management and implementation of its systems of internal control.

Sample of the Study

In this study, we have taken into account the working of scheduled commercial banks, excluding Regional Rural Banks, considering their small share in total assets. To examine the overall performance we have selected eleven parameters largely covering four major areas Namely a) Capital Adequacy, b) Assets Quality c) Profitability and d) Productivity.

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Methodology

The Capital Adequacy is rated in relation to a) the volume of risk assets; and b) the volume of net worth. The lesser the risk assets and larger the net worth, the larger its cushion against solvency. The Asset Quality is rated with reference to a) the level, distribution and health of the classified assets; b) the volume of marginal and inferior quality assets; and c) the recovery performance. Two indicators viz., Return on Assets (ROA) and Net NPA as % to Net Advances have been taken to measure the asset quality. Increase in ROA and reduction in Net NPA indicates quality of assets.

The profitability is related to the earning performance of a bank. It is related to a) the ability to improve spread and reduce burden b) the ability to cover losses and provide capital; and c) quality and composition of net income. Higher spread and lower burden generally reflect financial strength and thus improvement in net profit. Four indicators have been chosen to measure the earning performance of the bank group.

The productivity is related to a) increase the capacity utilisation b) reduce the intermediation cost; and c) improve the business. Decrease in operating cost as well as establishment cost and increase in business per staff cost improves the productivity. Instead of relying on one indicator, productivity of the bank group is measured by the combined effect of the three indicators. To rank the various bank groups factor analysis technique has been used.

Data Collection

We have taken data for the period 1991-92 to 2010-11 from the various issues of Report on Trends and Progress of Banking in India and Statistical Tables relating to banks in India, published by Reserve Bank of India. To investigate the

performance, we have taken four time points a) 1996-97, middle of reform period and b) 2000-01, beginning of the new century, c) 2005-06, middle of the first decade and d) 2010-11, the latest available data.

Result and Discussion

1. Capital Adequacy

A limitation of the capital adequacy analysis is that the data available is from 1995-96 onwards. It has been found that the Capital Adequacy Ratio of the New Private Sector banks was high at the beginning of the commencement of these banks. Over the years, it deteriorated due to increase of their business portfolio in risk based assets.

During 1996-97, the Capital Adequacy Ratio of the New Private Sector Banks was the highest, followed by Foreign Banks, State Bank Group and Nationalised Banks. For the Old Private Sector banks, it was the lowest. During 2000-01, the Capital Adequacy Ratio of Foreign Banks was the highest and that of Nationalised Banks was the lowest. The Nationalised Banks were allowed to raise capital through Public Issue. During the first decade, all nationalized banks have raised their capital through Public Issue. Even some banks further augmented their capital through Follow-on Public issue with premium. Again, the fresh capital permeated by the Government has helped the banks to sustain high capital adequacy ratio. During 2005-06, the Capital Adequacy Ratio of Foreign Banks was the highest and that of Old Private Sector Banks was the lowest. During 2010-11, Capital Adequacy Ratio of all the Bank Groups was more than 13% and it was highest for Foreign Bank and lowest for State Bank Group. The details are presented in Table –I.

Table I: Performance of Bank Group in Capital Adequacy Ratio

Rank	YEAR			
	1996-97	2000-01	2005-06	2010-11
1	New Private Sector Banks	Foreign Banks	Foreign Banks	Foreign Banks
2	Foreign Banks	State Bank Group	New Private Sector Banks	New Private Sector Banks
3	State Bank Groups	New Private Sector Banks	Nationalised Banks	Old Private Sector Banks
4	Nationalised Banks	Old Private Sector Banks	State Bank Group	Nationalised Banks
5	Old Private Sector Banks	Nationalised Banks	Old Private Sector Banks	State Bank Group

2. Asset Quality

Return on Assets (ROA) is measured by Net Profit to Total Assets. Due to introduction of income recognition and provisioning of non-performing assets, Indian Banks had made the net losses in the early 1990's. Among the bank groups, Nationalised Banks were affected badly. They had booked net losses during 1992-93, 1993-94 and 1995-96. Foreign Banks had also posted net losses during 1992-93. For all the bank groups, it declined during 2000-01 as compared to the earlier years. Return on Assets increased for all the Bank groups up to 2003-04 and then it declined mainly due to introduction of new capital adequacy norms and higher provisioning. Again it improved during 2008-09 for all Bank Groups. ROA has declined during 2010-11 mainly due to increase in NPA ratio. Non-Performing Assets as % to Net Advances, of State Bank Group, Nationalised Banks and Foreign Banks, declined during 2000-01 as

compared to the previous year, whereas it increased for New as well as Old Private Sector Banks. It further declined during 2006-07 for State Bank Group, Nationalised Banks, Old Private Sector Banks and Foreign Banks. For New Private Sector Banks, it increased during 2006-07. During 2010-11, Non-Performing Assets as % to Net Advances declined for Nationalised Banks, Old Private Sector Banks, New Private Sector Banks and Foreign Banks as compared to the year 2006-07 and for State Bank of India in has increased during this period. Data for all bank groups are available from 1996-97 onwards. Performance of the bank group under asset quality group has been evaluated by combining these two indicators with the help of Factor Analysis technique. The Factor loading elements obtained using the first Eigen value and the combined performances during 1996-97, 2000-01, 2005-06 and 2010-11 are presented in Table II.

Table 2: Performance of Bank Group in Asset Quality

Rank	YEAR			
	1996-97	2000-01	2005-06	2010-11
1	New Private Sector Banks	Foreign Banks	Foreign Banks	Foreign Banks
2	Foreign Banks	New Private Sector Banks	New Private Sector Banks	New Private Sector Banks
3	Old Private Sector Banks	State Bank Group	Nationalised Banks	Old Private Sector Banks
4	State Bank Group	Old Private Sector Banks	State Bank Group	Nationalised Banks
5	Nationalised Banks	Nationalised Banks	Old Private Sector Banks	State Bank Group

Low ROA and High NPA during 2010-11 pushed the State Bank Group in the bottom of the group.

3. Profitability

In this present deregulated environment, banks are under pressure to reduce the interest rate both on deposits and advances. To increase the profitability, banks have not only to increase the spread, but also to reduce the burden. Public Sector Banks have improved their performance in terms of Spread as % to Total Assets as compared to Private Banks, but in terms of Burden as % to Total Assets the performance of Public Sector Banks were far below the private banks. The performance of Foreign Banks was above the all bank groups during 1991-92 to 2010- 11. Profitability of a bank not only depends on interest spread, but it also includes the services provided by the bank. Based on value added approach, we

have considered Net Income, which include Spread and Other Income i.e., earning both from the net interest income and the services provided by the bank. Net Income to Total Assets of Public Sector Banks was more than Private Banks but less than Foreign Banks. Spread to Total Assets of Foreign Banks was higher than all other Bank Groups. From the year 2006-07, Spread to Total Assets of Private Banks was more than Public Sector Banks. But the operating expense to net income was higher for Public Sector Banks as compared to other bank groups. The result of combined performance of these five parameters based on Factor Analysis is presented in Table III.

Table 3: Performance of Bank Group in Profitability

Rank	YEAR			
	1996-97	2000-01	2005-06	2010-11
1	Foreign Banks	Foreign Banks	Foreign Banks	Foreign Banks
2	New Private Sector Banks	New Private Sector Banks	State Bank Group	State Bank Group
3	State Bank Group	Old Private Sector Banks	Nationalised Banks	New Private Sector Banks
4	Old Private Sector Banks	State Bank Group	New Private Sector Banks	Nationalised Banks
5	Nationalised Banks	Nationalised Banks	Old Private Sector Banks	Old Private Sector Banks

Foreign Banks & New Private Sector Banks remained at top. State Bank Groups performed over Nationalised Banks during 2010-11. Old Private Banks remained at the bottom.

4. Productivity

Staff Cost to Net Income was significantly high for Public Sector Banks due to huge branch network in rural and semi-urban areas and resistance for computerisation of branches from Trade Union level. Staff Cost to Net Income of all Bank Groups declined during 2000-01 to 2010-11 except Foreign Banks and New Private Sectors Banks. For Public Sector Banks, it declined from 50.06% during 2000-01 to 29.63%. For New Private Sector Banks, it increased from 9.07% to 18.21% and for Foreign Banks it increased from 15.93% to 18.71% during this period. During 2010-11, the Staff cost to Net Income of State Bank Group (29.78%) was marginally higher than that of Nationalised Banks (29.56%) and Old Private Sector Banks (29.52%). For New Private Sector Banks it was low at 18.21% and Foreign Banks it was 18.71%. The total intermediation cost i.e. Operating Expenses to Total Assets of all Bank Groups declined during 2000-01 to 2010-11 except New Private Banks. For Nationalised Banks it declined from 2.76% during 2000-01 to 1.46% during 2010-11. For State Bank Group, it declined from 2.66% to 1.82%, for Old Private Sector Banks it

declined from 1.98% to 1.81% and for Foreign Banks, it declined from 3.05% to 2.55% during this period. For New Private Banks, it increased from 1.75% during 2000-01 to 2.02% during 2010-11. Foreign Bank was highest at 2.55% during 2010-11, followed by Nationalised Banks (2.76%), New Private Banks (2.02%), State Bank Group (1.82%), Old Private Sector Banks (1.81%) and Nationalised Banks (1.46%). Business (Deposits + Advances) per Staff Cost for State Bank Group increased from Rs.59.40 as on 31.3.'01 to Rs.121.24 during 31.3.'11, for Nationalised Banks, it increased from Rs.61.74 to Rs.152.10 and for Old Private Sector Banks it increased from Rs.107.68 to Rs.107.68 to Rs.131.50 during this period, whereas for New Private Sector Banks it declined from Rs.373.74 to Rs.151.82 and for Foreign Banks it also declined from Rs.103.22 to Rs.80.74 during this period. During 2010-11, the business (Deposits + Advances) (in Rs.) per staff cost was highest for Nationalised Banks followed by New Private Banks, Old Private Banks and State Bank Group. The business per staff cost for Foreign Banks was the lowest. The result of the combined performance of the three parameters is presented in Table IV.

Table 4: Performance of Bank Group in Productivity

Rank	YEAR			
	1996-97	2000-01	2005-06	2010-11
1	New Private Sector Banks	New Private Sector Banks	New Private Sector Banks	Nationalised Banks
2	Foreign Banks	Old Private Sector Banks	Foreign Banks	Old Private Sector Banks
3	Old Private Sector Banks	Foreign Banks	Old Private Sector Banks	State Bank Group
4	State Bank Group	State Bank Group	State Bank Group	New Private Sector Banks
5	Nationalised Banks	Nationalised Banks	Nationalised Banks	Foreign Banks

Overall Performance Analysis

The overall performance based on these 11 indicators has

been evaluated based on the Factor Analysis is summarized below

Table 5: Overall Performance

	YEAR			
	1996-97	2000-01	2005-06	2010-11
Indicator	Factor loading value	Factor loading value	Factor loading value	Factor loading value
Capital Adequacy Ratio	0.9560	0.8226	0.9078	0.8739
Return on Assets	0.9785	0.9743	0.9987	0.9679
Net Non-Performing Assets to Net Advances	-0.9728	-0.9104	-0.7094	-0.3918
Spread to Total Assets	0.2285	0.3394	0.6427	0.9296
Burden to Total Assets	-0.9939	-0.8492	-0.9118	-0.8729
Operating Profit to Total Assets	0.8834	0.9200	0.9553	0.9823
Net Income to Total Assets	0.5820	0.6494	0.9528	0.9741
Operating Expenses to Net Income	-0.9902	-0.8660	-0.8984	-0.6494
Staff Cost to Net Income	-0.9934	-0.8891	-0.7032	-0.9125
Operating Expenses to Total Assets	-0.5759	0.0612	0.9338	0.6494
Business (in Rs.)(Deposits + Advances) per Staff Cost	0.8095	0.4075	-0.0392	-0.6607
Percentage of variation explained	63.76%	66.90%	68.56%	73.24%
Rank				
1	New Private Sector Banks	Foreign Banks	Foreign Banks	Foreign Banks
2	Foreign Banks	New Private Sector Banks	New Private Sector Banks	New Private Sector Banks
3	Old Private Sector Banks	Old Private Sector Banks	State Bank Group	Old Private Sector Banks
4	State Bank Group	State Bank Group	Nationalised Banks	State Bank Group
5	Nationalised Banks	Nationalised Banks	Old Private Sector Banks	Nationalised Banks

Conclusion

To conclude, it is observed that performance of Foreign and New Private Sector Banks have far outnumbered the performance of Nationalised Banks. It a matter of severe concern and needs remedial measures. At this era of continuous reorganization as well as reorienting business activities faced by each bank, it is high time that the Nationalised Banks pinpoint and do away with their weaknesses. The best possible way out is to reduce their burden by innovating non-fund based business, actively participating in computerization and improving the overall skills and knowledge. On the other hand, Nationalised Banks with their immense contribution to the country's economic growth have their comparative advantages in the form of their large client base and extended banking service to the rural & semi-urban areas. They should make full use of these comparative advantages to cope up with the changed circumstances and competitive environment. A restructuring plan for the Nationalised Banks is needed to be chalked out

taking into account the deregulation, decapitalisation and organisational structure.

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