



WHAT DRIVE THE PROFITABILITY OF COMMERCIAL BANK?

(A STUDY OF INDIA, CHINA AND RUSSIA FEDERATION COMMERCIAL BANKS)

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Abstract: *The present study has made to attempt the comparison of profitability of Indian, China and Russia Federation commercial banks and to find the determinants of profitability of commercial banks. For this purpose Fried Man test and Multiple Regressions reveals that the coefficient of net interest income and noninterest income both are positively and significantly associated to the profitability of the selected countries commercial banks during the corresponding period. Operating cost and assets quality both are negatively and significantly associated to the profitability of the selected countries commercial banks. Capital to assets ratio has negatively associated with the Indian and Russia Federation commercial banks, while, it has been positively and significantly associated the China commercial banks.*

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INTRODUCTION

A well-functioning financial sector facilitates efficient intermediation of financial resources. The more efficient a financial system is in resource generation and in its allocation, the greater is its contribution to economic growth (**Mohan, 2005**). An efficient system of financial intermediation also contributes to the risk mitigation process in the economy. For instance, enhanced efficiency in banking can result in greater and more appropriate innovations, improved profitability as well as greater safety and soundness when the improvement in productivity is channelled towards strengthening capital buffers that absorb risk (**Casu, Girardone and Molyneux, 2002**). Moreover, efficiency or productivity measures could act as leading indicators for evolving strengths or weaknesses of the banking system and could enable pre-emptive steps by the regulator when necessary. Therefore, investigation and measurement of efficiency and productivity in the banking sector have always been areas of interest for economic research.

Profitability is a key performance parameter in banking sector, which reflects efficient utilization of all resources in an organization (**Rose: 1974**). Profitability sector has assumed critical importance for a number of valid considerations in the age of globalised world and LPG policies (**Shilpa Baid: 2006**). Bank can also strengthen their financial position through capital accumulation which would again depend on earning performance. In other hand we can say that enhancing the financial strength of the banking institutions clearly requires sufficient banking profitability. In this context, an attempt has been made in this paper to identify and analyze the relationship between profitability (ROA) and certain internal variables of commercial banks.

OBJECTIVES OF THE STUDY

1. To compare the profitability performance (ROA) of India, China and Russia Federation commercial banks.
2. To examine determinates of profitability (ROA) of commercial bank in India, China and Russia Federation commercial banks.

HYPOTHESIS OF THE STUDY

➤ There is no significant difference in the profitability performance (ROA) of India, China and Russia Federation commercial banks during the period under study.



RESEARCH METHODOLOGY

The present study is empirical nature and the fact and figure were obtained from the report on currency and finance published by Reserve Bank of India. The study is concerned with assessing the relationship between commercial banks profitability (ROA) and its internal variables to ascertain the internal factors influenced the profitability of India, China and Russia Federation commercial banks. Dependent variable Return on Assets (ROA) has been taken a proxy of bank profitability and while, Net Interest Margin (as percentage to total assets), Operating Cost (as percentage to total assets) Assets Quality (Impaired Loans/Gross Loans), Capital to Assets Ratio and Non Interest Income (as percentage to total assets) have been taken as an independent variables.

Plan of analysis:

The collected data have transcribed in long sheet and form them, tables have formulated and analyzed using with wide range of appropriate techniques such as; Average, S.D., C.V., Multiple Regressions etc. The study has been covered the 8 years period starting from 1999 to 2006.

The Friedman test

$$\chi^2_r = \frac{12}{bk(k+1)} \sum_{j=1}^k [R_j - \frac{b(k+1)}{2}]^2$$

In which $b(k+1)/2$ is the mean of the R_j under H_0 . Inspection of the formula shows that large discrepancies between the R_j and the mean have the effect of inflating χ^2_r . A sufficiently large value of χ^2_r will cause rejection of H_0 .

The usual computational formula for the test statics is

$$\chi^2_r = \frac{12}{bk(k+1)} \sum_{j=1}^k R_j^2 - 3b(k+1)$$

Alternatively, we may use as our test statistics

$$\frac{k}{J=1} 12 \sum R_j^2 - 3b^2k(k+1)^2$$



$$W = \frac{\chi^2}{b^2 k (k - 1)}$$

Where $W = \chi^2 / b (k-1)$

Decision Rule

When b and k are small, we compare W for significance with appropriate critical value. If the computed W is greater than or equal to the tabulated value of b for b , k and $\chi = p$, we can reject H_0 at the χ level of significance. We compare $\chi^2 r$ for significance with the tabulated value of Chi-Square, with $k-1$ degree of freedom. Reject H_0 at the greater than or equal to the tabulated value of χ^2 for $k-1$ degree of freedom.

MULTIPLE REGRESSIONS MODEL

Multiple regressions represent a logical extension of more than two variables regression analyses. Instead of more than one independent variables and one dependent variable is used to estimate the values of a dependent variable. The multiple regression equation describes the averages relationship between and this relationship is used to predict or control the dependent variables. The formula for calculating multiple regressions as follow:

The general form of the regression equation is

$$Y = a_0 + a_1 X_1 + a_2 X_2 + \dots + a_n X_n + \epsilon$$

Where X_1, X_2 etc are regressor variables, a_1, a_2 and so on are the parameters to be estimated from the data and ϵ is the error term following classical OLS assumptions i.e., The deviations ϵ is assumed to be independent and normally distributed with mean 0 and standard deviation (σ). The empirical model variables, their proxies, and the predicted coefficient sign are summarized in table-1.



Table 1
Empirical Model Variables

Variables	Proxy	Predicated Coefficient Sign
Dependent Variable		
Return on Assets	ROA:	
Independent Variables		
Net Interest Margin (X1)	NIM: Net Interest Income/Total Assets	Positive
Operating Efficiency (X2)	OC/TA: Operating Cost/Total Assets	Negative
Assets Quality (X3)	AQ: Impaired Loans/Gross Loans	Negative
Capital to Assets Ratio (X4)	CAR: Capital/Total Assets	Positive
Non-Interest Income (X5)	NII: Non Interest Income/Total Assets	Positive

EXPLANATION OF THE VARIABLES AND EXPECTED RELATIONSHIP

Bank profitability and performance is measured generally in term of spread, return on assets, return on equity etc (Shilpa Bid: 2006). The independent variables i.e., determinates of bank profitability are divided in into two factors (Internal and external). In this study we have taken following variables: Return on Assets (ROA): Return on assets is an important parameter of profitability of an organization. Return on assets has calculated from net income divided by total assets. Returns on assets indicate that a bank how will be using their assets. In this study ROA has been taken a proxy of profitability of a bank. Net Interest Margin: Net Interest Margin indicate that the intermediation efficiency (fund employment and deployment) of a bank. In this study we have taken NII or Spread (as percentage to total assets) as an independent variable. Operating Efficiency: Operating expenditure is an important component of the cost. In this cost salary is an important component. In this study operation cost (as percentage of total assets) has taken as a proxy of operation efficiency. Assets Quality: Non-Performing Assets (NPA) has been a crucial problem of banking industry. Because, the NPA's not only affect the operation cycle, interest income of a banking institutions it is also affect the financial health of a banking. So, assets quality is an important parameter of bank efficiency and profitability. There assets quality (Impaired



Loans/Gross Loans) has been taken as an individual variable. Capital/Total Assets Ratio: Capital to total assets ratio has taken individual variable also. Capital/Total Assets ratio indicate that the financial health of a banking intuitions'. So, Capital/Total Assets ratio is another important indicator of the profitability of banking institutions. Non-Interest Income: in the age of globalization and technological Enviournment the banking institutions has been providing many types of fee based services like as looker services, insurance services, share transfer services etc. In this era, the fees based income of a banking institutions have been gain more important role in the profitability of a banking institutions. Therefore, non interest income has been taken as an individual determinate of the profitability of banking institutions.

Thus, the empirical model of the study has used:

$$\text{RoA} = C + \text{NIM}\beta_1 + \text{OC/TA}\beta_2 + \text{AQ}\beta_3 + \text{CAR}\beta_4 + \text{NII}\beta_5 + U \dots (1)$$

Here

C is the constant term, NIM: Net Interest Margin, OC/TA: Operating Cost to Total Assets,

AQ: Assets Quality, CAR: Capital to Assets Ratio, NII: Non Interest Income and

U: Error Term

Table-2

Profitability (ROA) of Commercial Banks in India, China and Russia Federation

(In Percentage of Total Assets)

Year	India	China	Russia Federation
	Return on Assets		
1999	0.83	0.17	2
2000	0.54	0.17	3.69
2001	0.72	0.21	2.07
2002	0.98	0.3	1.83
2003	1.2	0.49	2.35
2004	0.91	0.57	2.19
2005	0.9	0.55	2.6
2006	0.85	0.62	2.33
Average	0.86	0.38	2.38
S.D.	0.19	0.19	0.57
C.V.	22.11	49.8	24.3

Source: Report on Currency and Finance (2008)



Table 3

Rank Assign According to ROA

Year	India	China	Russia Federation
	Return on Assets		
1999	2	1	3
2000	2	1	3
2001	2	1	3
2002	2	1	3
2003	2	1	3
2004	2	1	3
2005	2	1	3
2006	2	1	3
Total R	R1=16	R2=8	R3=24

Source: Calculated by Authors

Box-1

Calculation for Comparison of ROA According to Fried Man Test

$$W = \frac{12(16^2 + 8^2 + 24^2) - 3(8)^2 3(3 + 1)^2}{(8)^2 (3) (3^2 - 1)}$$

$$= 10578/1536 = 6.886$$

Since we have one tie, we adjust W,

$$W \text{ (adjusted for ties)} = 10578/1536 - 8(2^3 - 2) = 7.108$$

Table 1 reveals that the trend of Return on Assets in India, China and Russia Federation commercial banks from 1999-2006. The Average ROA of India, China and Russia Federation Commercial bank has been 0.86 percent, 0.38 percent and 2.38 percent respectively, while the coefficient of variation has been 22.11 percent, 49.8 percent and 24.3 percent respectively in India, China and Russia Federation Commercial bank during the period under study. The coefficient of variation indicate that the consistency of the trend. Thus, the ROA has been more fluctuate in case of China commercial banks (49.8 percent) as comparison to India (22.11 percent) and Russia Federation (24.3 Percent) Commercial Banks. What the profitability performance of selected commercial banks are significant differ or not? In first stage the researchers set a null hypothesis: *There is no significant difference in the profitability performance (ROA) of India, China and Russia Federation commercial banks.* After setting the null hypothesis the researchers 'Fried Man- test' (a non-parametric test)



has been applied to proving the null hypothesis. The result of 'Fried Man- test' is shown in table-3 and Box-1.

The calculated value is 6.886 and the chi square value (k-1 degree of freedom [3-1=2]) at 1%, 5% and 10% level of significance levels are 4.00, 5.99 and 9.21. But, the probability of obtaining the value of w is large or other hand H_0 is true when the probability of obtaining value of w is less than 0.001 with k= 3 and b= 8. So, we reject H_0 , i.e., there is no significant difference in the profitability performance (ROA) of India, China and Russia Federation commercial banks and we have accept alternative hypothesis there is significant difference in the profitability performance (ROA) of India, China and Russia Federation commercial banks during the period under study. In conclude, on the base of w, we can say that the India, China and Russia Federation Commercial Banks are significantly differ in profitability performance (ROA) during the period under study and further fund that the Russia Federation commercial bank has been batter perform as comparison of Indian and China commercial banks.

Table 4

Estimate of the Relationship between Return on Assets and Selected Independent Variables of the selected countries commercial Banks

Variables	Indian Commercial Banks	China Commercial Banks	Russia Federation Commercial Banks
Intercept (β_0)	5.370 (1.189)*** [.357]	-.628 (-1.441)*** [.286]	7.621 (.476)*** [.681]
Net Interest Margin (β_1)	4.559 (3.610)* [.069]	.713 (4.637)* [.044]	.175 (.093)*** [.934]
Operating Efficiency(β_2)	-3.442 (-3.39)* [.077]	-.361 (-1.535)** [.265]	-.888 (-.797)*** [.509]
Assets Quality(β_3)	-.075 (-1.28)*** [.329]	-.017 (-4.992)* [.038]**	-.218 (-.282)*** [.804]
Capital to Assets Ratio(β_4)	-.999 (-1.86)*** [.204]	.015 (1.450)*** [.284]	-.207 (-3.378)* [.742]
Non-Interest Income (β_5)	0.29 (.970)*** [.435]	.017 (1.105)*** [.384]	.076 (.875)*** [.474]



Multiple R	.951	.998	.814
R ²	.904	.996	.662
Adjusted R ²	.663	.984	-.182
Standard Error	.11126	.02392	.62964
F-stat	3.748 [.224]	89.705 [.011]	.784 [.643]
D-W stat	2.551	3.082	1.737

Source: Calculated by Authors

Note: *Significant at 1% level, **Significant at 5% level and ***Significant at 10% level

Figure in () t-value, Figure in [] value of probability

Results and Discussion:

Table 4 shows that the estimated relationship between return on assets and selected independent variables i.e., net interest margin as percentage to total assets, operating cost to total assets quality, capital to assets ratio and non interest income as percentage to total assets of the selected countries commercial Banks from 1999-2006. The coefficient of net interest income as percentage to total assets and non interest income as percentage to total assets both, are positively and significantly associated to the profitability of the selected countries commercial banks during the corresponding period. Operating cost to total assets and assets quality (Impaired Loans/Gross Loans) both are negatively and significantly associated to the profitability of the selected countries commercial banks. Capital to assets ratio has negatively associated with the Indian and Russia Federation commercial banks, while, it has been positively and significantly associated the China commercial banks. Multiple R has .951 in case of India, .998 in China and .814 in Russia Commercial banks. The R² of India, China and Russia Federation commercial banks has .904, .996, and .662 respectively. It means 90.4 percent, 99.6 percent and 66.2 percent variation in the profitability of Indian, China and Russia Federation commercial banks is occurring by the following variables i.e., net interest margin as percentage to total assets, operating cost to total assets quality, capital to assets ratio and non interest income as percentage to total assets. The F-value of the Indian China and Russian Commercial banks are 3.748, .784 and 89.705. A high value of probability rejects the null hypothesis that the regression equation is not significant. In our case the *p-values* in all three regression equations are .224, .011 and .643 respectively. So, we conclude that the regression equation is significant. Thus, all variables are significantly describing the commercial bank profitability.



CONCLUSION

Profitability is an important indicator of the operational efficiency of a business entity. In this study we have taken ROA as an dependent variable and as well as a proxy of profitability of the selected country commercial banks and while, Net Interest Margin, Operating Cost, Assets Quality, Capital to Assets Ratio and Non Interest Income have been taken as an independent variables.

Fried Man test has considered for comparison the profitability performance of India, China and Russia Federation commercial banks and Multiple Regression has also employed for the determine the determinates of profitability of commercial banks in selected countries.

Fried Man test has been applied to compare the profitability of India, China and Russian Federation Commercial bank. The result of Fried Man test reveals that there is significant difference in the profitability (ROA) performance of considered countries commercial banks. Russian Federation Commercial bank has been batter performs as compare to India and China commercial bank in term of ROA and followed by India and China in last during the period under consideration.

Multiple Regressions reveals that the coefficient of net interest income and noninterest income both are positively and significantly associated to the profitability of the selected countries commercial banks during the corresponding period. Operating cost and assets quality both are negatively and significantly associated to the profitability of the selected countries commercial banks. Capital to assets ratio has negatively associated with the Indian and Russia Federation commercial banks, while, it has been positively and significantly associated the China commercial banks. Multiple R has .951 in case of India, .998 in China and .814 in Russia Commercial banks. The R^2 of India, China and Russia Federation commercial banks has .904, .996, and .662 respectively. It means 90.4 percent, 99.6 percent and 66.2 percent variation in the profitability of Indian, China and Russia Federation commercial banks is occurring by selected variables.

In sum, we can say that the management of NPA's and the effective management operating cost both could be trust area for enhancing the profitability.

REFERENCES

1. Deposit Mobilized by Broda District Central Co-operative Bank '2002-2007 (Forth coming) November, 2010 Indian Journal of Finance-New Delhi



2. Negi, Puspa et al., (2010) 'Working Capital Management and Firm's Performance: A Study of Indian Manufacturing Companies' *Abhigyan* Volume XXVIII, No. 1
3. Kodan, Anand Singh et al., (2010) "A Comparison of Growth Rate of Labour Productivity of Commercial Bank Operating in India" *Economic Affairs New Delhi*. Vol.55, Issue No.2, April-June, 2010.
4. Kodan, Anand Singh et al., (2010) 'Financial Health of Co-operative Sugar Mills in Tamil Nadu' *Professional Banker, ICFAI University Journal*. Hyderabad February, 2010
5. Kodan, Anand Singh et al., (2010) "Scheduled Commercial Banks: Growth Trend" YOJANA Publication Division of Broadcasting New Delhi. Vol. 54 February 2010
6. Kodan, Anand Singh et al., (2010) "Role of RRB's for agriculturists" *Southern Economist Bangalore* Vol. 48 Issue No.17 January 2010.
7. Kodan, Anand Singh et al., (2009) "Application of Median Test- Net NPA's as percentage of Net Advances of SCB's in India" *Economic Affairs, New Delhi*. Vol 54, Issue No. 3&4. September-December, 2009
8. Kodan, Anand Singh et al., (2009) "Deposit and Advances Mobilized by Public and Private Sector Banks-A Comparative Study" *KAIM Journal of Management and Research, Charkhi Dadri. Haryana* Vol. 2, Issue NO.1. Oct-November, 2009.
9. Kodan, Anand Singh (2008) "Cash Management: A Tool for Short Term Liquidity Management" *Quarterly Economic Report, the Institute of Public Opinion, New Delhi* Vol. LI Issue No.3.July-Sept,2008.
10. Bid Shilpa (2006) 'What Derive the Profitability performance of Indian Commercial Banks?' *Asian Economic Review*, December Issue 2006, Volume 48, No.43
11. John E, Hanke and Dean W, Wichern (2007) 'Business Forecasting' Eight Edition Published by Pearson Prentice Hall New Delh
12. Ramanatam, Ramu (2002) 'Introductory Econometrics with Application' Fifth Edition Published by Thomson Asia Pte Ltd., Singapore
13. Wayne W, Daniel (1990) 'Applied Non-Parametric Statistics' published by PWS-KENT Publishing Company, Boston



Appendix 1

Determinates of Commercial Bank Profitability in Developing Countries

(In Percentage of Total Assets)

Year	India	China	Russia Federation	India	China	Russia Federation	India	China	Russia Federation
	Return on Assets			Net Interest Margin			Operating Cost		
1999	0.83	0.17	2	2.92	2.23	6.18	2.99	1.73	6.54
2000	0.54	0.17	3.69	3.14	2.1	5.72	3.43	1.61	4.6
2001	0.72	0.21	2.07	2.95	2.12	5.98	3.06	1.58	5.15
2002	0.98	0.3	1.83	3.13	2.3	5.05	3.3	1.6	4.8
2003	1.2	0.49	2.35	3.3	2.33	4.85	3.4	1.63	4.44
2004	0.91	0.57	2.19	3.29	2.35	5.07	3.42	1.56	4.7
2005	0.9	0.55	2.6	3.22	2.22	5.04	3.22	1.44	4.61
2006	0.85	0.62	2.33	3	2.3	5.1	2.97	1.43	5.93
Average	0.86	0.38	2.38	3.11	2.24	5.37	3.22	1.57	5.09
S.D.	0.19	0.19	0.57	0.14	0.09	0.5	0.19	0.09	0.75
C.V.	22.11	49.8	24.3	4.7	4.1	9.4	6	6.2	14.7

Source: Report on Currency and Finance (2008)

Appendix 2

Determinates of Commercial Bank Profitability in Developing Countries

(In Percentage of Total Assets)

Year	India	China	Russia Federation	India	China	Russia Federation	India	China	Russia Federation
	Assets Quality			Capital to Assets			Non-Interest Income		
1999	12.8	20.24	3.7	6.94	6.13	11.76	11.47	5.59	30.61
2000	11.4	17.29	1.58	6.77	5.98	12.86	8.98	3.94	23.35
2001	10.4	12.29	1.17	6.86	4.98	14.5	4.3	3.16	21.15
2002	8.8	13.98	1.69	6.9	3.12	15.33	5.85	3.58	20.26
2003	7.2	5.07	2	7.24	3.1	15.6	7.21	4.44	23.76
2004	5.2	4.33	1.4	7.51	5.22	16.72	10.56	5.27	15.54
2005	3.32	3.12	1.82	8.21	5.68	15.95	12.91	5.13	22.79
2006	2.55	2.76	1.84	8.29	6.84	15.91	15.88	3.9	34.88
Average	7.7	9.885	1.9	7.34	5.13	14.82	9.64	4.37	24.04
S.D.	3.7	6.9	0.77	0.61	1.3	1.7	3.8	0.87	6
C.V.	49.1	70	40.7	8.3	26.7	11.4	39.7	20	25.2

Source: Report on Currency and Finance (2008)