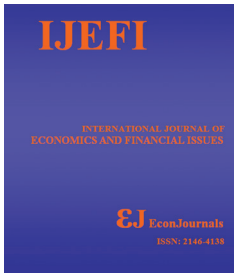

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Determinants of Profitability in Indian Banks in the Changing Scenario

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ABSTRACT

Banking Sector in India plays a crucial role in the development of the country. Being a major constituent of the economy, banks have their own promises and challenges. While banks have the onus of providing funds to the growing economy, they face a daunting task of maintaining profitability in a competitive environment. This study aims at identifying the performance variables responsible in driving the return on asset (ROA) of the banks. We have analyzed bank specific, industry specific and economy specific elements guiding the profitability of 46 Indian banks over a period of 17 years (1999–2015) through panel generalized method of movements estimation. It was found out that ROA has a significant positive association with last year ROA, solvency ratio, capital adequacy ratio whereas 2 and 3 years lag ROA, size, GDP growth, Loan to Deposit Ratio, expense ratio and productivity have significant negative effect.

Keywords: Profitability of Banks, Panel GMM Estimation, Indian Banking Scenario
JEL Classifications: E50, C23, C33

1. INTRODUCTION

The last two decades have been challenging and eventful for the Indian Banking Sector. Indian banks have ample scope to grow in a growing economy with an average growth rate of 7.13% (WDI: World Bank data) in last 15 years. Reserve bank of India (RBI), the regulator of banks along with the government has initiated several reform processes to ease the banking business in the country. To name a few, Statutory Reserve Ratios are reduced, Interest rates are deregulated, Pubic Sector Banks are allowed to raise funds from market, Administrative reforms are initiated providing autonomy to public sector banks; SARFAESI act[1] and debt recovery tribunal are instituted to provide banks more authority for debt recovery; Stricter capital Adequacy Norms, better reporting of non-performing assets (NPA), norms of risk management are introduced to make banks more responsible and accountable.

On the other hand, India, being a welfare economy, Government wants to implement its welfare schemes through the public sector banks, which affects the profitability of those banks with lesser interest charged, higher administrative expenses, bad loans and unprofitable rural branches. Priority sector lending of 40% (RBI notification 2014–15) meant for compulsory financing to specific welfare and non-performing sectors also is rued to be a big deterrent for bank profitability. Besides, Banks in India operate in a dynamic environment with multiplicity of ownership structure (27 Public Sector Banks, 19 Private sector banks and several foreign banks), having different models of operation and a poor credit culture. In recent times bankers are facing a very difficult situation with NPA due to the poor performance of the corporate borrowers. With an average gross NPA level of 6.03%in June 2015 (RBI, government step to help banks end NPA, 2015) and $110billion dollar (Choudhury, 2015,) stressed assets, all is not well with the banking sector. While private sectors banks perform better than the Public Sector Banks, figures also say that there is no uniformity in the profitability of Public Sector Banks (Bandyopadhyay, 2015).

1 The Securitization and reconstruction of financial assets and enforcement of security interest Act, 2002 (SARFAESI) empowers banks/financial institutions to recover their non-performing assets without the intervention of the court.

In this paper, we explore the major performance parameters those are responsible for the profitability of Indian Banks. On the basis of Panel generalized method of movements estimation, we analyze the data of both Public Sector and Private Sector Banks for 17 years (1999–2015) in three categories i.e., company specific, industry specific and economy Specific Parameters. Profitability, for our analysis is considered as return on assets (ROA) and its association is tested against company specific variables like size, solvency ratio, loan to deposit ratio, expense ratio, productivity, capital adequacy ratio (CAR), industry specific dummy variables like bank category (public/private) and pre and post subprime crisis period and Economic variables like GDP growth.

The result of the study indicates that last year ROA, solvency ratio, CAR and lesser non-interest expenses positively guide the profitability of banks whereas 2 and 3 years lag ROA, size, Growth of Economy, loan to deposit ratio, expense ratio and productivity per employee have significant negative association with profitability. Subprime crisis has no impact on the profitability of banks and private banks are more profitable than the public sector banks.

2. LITERATURE REVIEW

There are various literatures across the world analyzing bank profitability in different context, time frame, economies and bank categories.

Global studies: Dietrich and Wanzenried (2014) have undertaken a massive study involving 10165 banks across 118 countries for a period of 15 years (1998–2012). They considered bank specific, industry specific and economy specific factors as the determinants of profitability of banks. They differentiate the countries into three categories i.e., low income, middle income and high income groups. It was uncovered that banks in underdeveloped economies are more profitable due to lack of competition. Capital level of Banks in low income countries is much higher than the other two groups, but the level of capital does not anyway affect the profitability of the banks in lower and middle income countries. Banks with higher capital in high income countries are more profitable. Private owned banks in lower and middle income countries are more profitable whereas it is not true for the higher income countries. GDP growth and Inflation do not explain variation in Profitability of high income group countries. Inflation negatively impact credit demand but lead to higher interest margins in low and middle income countries. They suggest, banks in developing countries should focus on core lending activities whereas in developed economies they must opt for non-fee incomes to increase their profitability. Developing countries should introduce policy measures to improve profitability of the banks.

Shehzad et al. (2013) analyzed 15000 banks across 148 countries during 1988–2010 and found out that growth of banks is not persistent but bank profitability is persistent. Larger banks are more profitable than small banks in OECD Countries. Banks with higher liquidity have stable earnings. In developing countries, size of the banks does not induce their profitability.

European studies: Pasiouras and Kosmidou (2007) had a study of 584 commercial banks operating during the period of 1995–2001 in 15 European Countries. They discussed how financial characteristics and overall banking environment affects profitability of a bank. It was found out that, equity to asset ratio is positively related to return on average asset. Relation between size and profitability was negative signifying diseconomies in larger banks. GDP growth and inflation has significant relationship with profitability but was positive for domestic banks and negative for foreign banks. Cost to income ratio had significant negative relationship for foreign banks indicating the cost of management from a distance is more.

Capraru and Inhatov (2014) in a study in East European Countries have considered average ROA, average return on equity (ROE) and Net Interest Margin as measures of profitability and studied bank size, capital adequacy, credit risk, management efficiency, liquidity risk, Business Mix Indicator, herfindhal-hirschman index (HHI), Inflation and GDP growth rate as the variables of bank profitability. They found out that bigger banks have lesser profit margin. Credit risk and inflation has impact on both ROA and ROE whereas Management Efficiency and capital adequacy influence the bank profitability during the crisis period. As per the authors, the results are consistent with the expected results.

Latin American economies: Albulescue (2015) had a study on the banking sector of emerging six Latin American countries during 2006–2013. The author finds out that bank capitalization, liquidity and interest rate margins positively influence bank's profitability margin whereas NPA and non-interest expenses have negative impact. The author found out either ROA or ROE is robust to measure the profitability of a bank. It was further suggested that banking sector should take care of quality of loans to increase the profitability. A well-capitalized banking sector is eventually a profitable one.

Chinese: A study was made by Alicia et al. (2009) to find out the determinants of profitability in Chinese Banks. A panel data study of 87 banks during 1997–2004 was done to find out determining factors behind Pre provision profit and ROA separately. They uncovered that better capitalized banks are more profitable which confirms the findings of Albulescue (2015). High and volatile interest rate and low income growth leads to high NPA affecting the profitability. As per Ćurak et al. (2012) higher HHI indicates more concentration and higher profitability in Macedonian banking sector whereas in this study of Chinese market less concentrated banking system has higher profitability. It suggests that government intervention in case of large state owned banks deters their profitability. Profits in Chinese banks are quite stable because of a regulated economy. The authors opine that government should allow competition and corporate culture to make the banks more profitable and market oriented.

Korean: Park and Weber (2006) examine the profitability of banks on the basis of efficiency and market share. Their analysis done during 1992–2002 in Korean economy has three phases. During the stable period of 1992–1996 they found market share of bank along with efficiency induce profitability whereas during the crisis

period (1997–1999) and recovery period (2000–2002) market share does not have any role in the profitability, only efficiency works. Greater net interest margin, lower operating cost per employee, less technical inefficiency, higher equity capital ratio and smaller non-performing loan are guiding factors for making a bank profitable.

Indian: In a study involving Foreign, Private and Public Sector Banks in India, Banerjee and Velamuri (2015) explored the profitability and soundness of Indian Banks across 2000–2013 with a sample size of 75. They conclude that banks' profitability in India is deterred due to hesitance to procure funds through commercial lending. Capital Adequacy of Banks is maintained well above the regulated minimum level. Foreign Banks have a lower cost to income ratio because of their better human resource management. There is a negative association between the soundness and profitability of banks. It indicates that Indian Banks prefer to remain sound at the cost of profitability. The discussion leads to the lending environment and regulatory role of RBI. Sharma and Kumar (2013) has analyzed the impact of banking sector reforms on the performance of all bank groups in India in the pre and post reform period. And they have found that there is a significant impact on total income in the post-reform period for all bank groups. Shukla (2016) analyzed the performance of the Indian banking industry on the bases of four financial parameters such as size, growth, profitability and soundness. The author found that there is not much difference in terms of size and growth parameters among public and private sector banks. However, significant differences were found in terms of profitability and soundness of business, indicating robust growth prospects for private sector banks.

Findings from different research papers provide a mixed result and we observe that many of the studies are confirmatory studies in different countries and different time frames. In Indian context, we want to explore and link the major drivers/deterrents to bank profitability in a wider time frame covering different phases of the economy.

3. RESEARCH METHODOLOGY

3.1. Data

Indian Banking sector have several constituents like i.e., Nationalized Banks (25), Government Banks (1), Private Sector Banks (20), Foreign Banks (43), Cooperative Banks (95150) and Regional Rural Banks (68). We have categorized the Nationalized Banks and the single Government Bank under one category as Public Sector Banks. Market share of Public Sector Banks in terms of Loans and Advances is 73.7%, and that of private banks is 18.6%. Share of foreign banks is at 5.2% and Regional Rural Banks and Cooperative banks are 2.5%. Nationalized banks and Public Sector Banks operate in the same kinds of regulatory and economic environment involving 92.3% of the banking business (Foreign banks' share, 2012) Considering the lesser market share, huge numbers and different working environment of Foreign Banks and Cooperative Banks we have not considered them for our analysis. Data has been collected from Centre for monitoring Indian economy (CMIE) data base March 1999-March 2015 annual data and economic variable from world development indicator of world bank database. It has been analyzed through Strata 12.

3.2. Sample Size

Our final data set contains 490 observations for 39 banks with an average data period of 12.56 years after removing the outer layers of data.

3.3. Variables

Three categories of independent variables namely bank specific, industry specific, economic specific variables are considered against the dependent variable of ROA[2]. The details of the variables and their basis of calculation are depicted in Table 1.

HHI considers the impact of monopolistic position of one or few players in the industry. If the score is +1800 it explains the monopolistic position of one or a group of players in the industry. We found out HHI to be insignificant for all the years as explained in Table 2.

Our study does not consider HHI as an independent variable as the index was lesser than 1800 throughout the analysis period. Besides we have also dropped cash reserve ratio and statutory liquidity ratio and inflation from our analysis as these factors had high co linearity with the other independent variables.

3.4. Statistical Tool Adopted

It would be worthy to mention that static panel models do not allow us to analyze the possible dynamism existing in firm profitability. This allows us to evaluate the dynamic panel estimators. Further, these models have greater power to control endogeneity and allow us to determine the level of adjustment of actual factors that affect the profitability of Indian banks.

3.5. Null Hypothesis

- H_{O1}=There is no significant relationship between current year ROA and its 1st year lag
- H_{O2}=There is no significant relationship between current year ROA and its 2nd year lag
- H_{O3}=There is significant relationship between current year ROA and its 3rd year lag
- H_{O4}=There is no significant relationship between size of a bank and ROA
- H_{O5}=There is no significant relationship between solvency of a bank ROA
- H_{O6}=There is no significant relationship between loan to deposit ratio of a Bank and ROA
- H_{O7}=There is no significant relationship between non-interest expenses of a bank and ROA
- H_{O8}=There is no significant relationship between employee productivity of a bank and ROA
- H_{O9}=There is no significant relationship between CAR of a bank and ROA
- H_{O10}=There is no significant relationship between GDP growth of India and ROA

2 ROA explains the overall efficiency of the bank through utilization of assets owned by the bank. The other two profitability indicators generally used are ROE and Net Interest Margin (NIM) whose scope is limited in comparison to ROA

Table 1: Performance variables of bank profitability

Category of variable	Variable	Basis
Dependent variable	ROA	Profit after tax/total assets
Company specific variables	Size	Natural logarithm of average total assets
	Solvency ratio	Net worth/total assets
	Loan to deposit ratio	Loans and advances/(deposit+borrowings)
	Expense ratio	Non-interest expenses/total income
	Productivity	Total Income/number of Employees
	CAR	Tier I and Tier II capital/risk adjusted asset
Industry specific variables	Bank category (public sector/private)	Dummy variable (private banks - 1 and public sector banks - 0)
	Year dummy	Post and pre sub-prime crisis period (pre sub-prime - 0 and post sub-prime 1)
Economic specific variables	GDP growth	From world bank report

Source: Literature reviewed by the authors, ROA: Return on asset, CAR: Capital adequacy ratio

Table 2: HHI of banking sector in India

Year (ending 31st March)	Index
1999	942.39464
2000	887.28944
2001	850.18524
2002	734.04959
2003	727.73904
2004	714.10301
2005	717.98143
2006	729.88375
2007	714.09437
2008	698.37731
2009	707.41791
2010	681.71663
2011	658.22951
2012	641.29759
2013	657.51361
2014	670.85207
2015	662.03498

Sources: Data for this analysis is collected CMIE database. HHI: Herfindhal-hirschman index, CMIE: Centre for monitoring Indian economy

Table 3: Descriptive statistics

Variable	Obs	Mean	SD	Min	Max
ROA	627	0.009	0.005	0.000	0.050
Size	627	13.021	1.405	9.287	16.837
Solvency ratio	627	0.062	0.032	0.013	0.400
Loans to deposit ratio	627	0.600	0.117	0.022	1.314
Expense ratio	627	0.031	0.010	0.007	0.137
Productivity	627	4.491	3.226	0.670	16.970
CAR	627	12.766	2.471	0.000	30.470
GDP growth	627	7.138	2.097	3.804	10.260
Bank category	627	0.354	0.479	0.000	1.000
Year_Dum	627	0.418	0.494	0.000	1.000

Sources: Data for this analysis is collected CMIE database. CMIE: Centre for monitoring Indian economy, CAR: Capital adequacy ratio, ROA: Return on asset, GDP: Gross domestic product, SD: Standard deviation

- H_{O11}=ROA of public sector banks is significantly higher than ROA of private sector banks.
- H_{O12}=ROA of banks during post sub-prime crises period is significantly higher than that in the pre-crises period.

3.6. Model

$$ROA_{it}=\alpha+\beta_1 L1ROA_{i,t-1}+\beta_2 L2ROA_{i,t-2}+\beta_3 L3ROA_{i,t-3}+\beta_4 Size_{it}+\beta_5 Solvency\ Ratio_{it}+\beta_6 Liquidity\ Ratio_{it}+\beta_7 ExpenseRatio_{it}+\beta_8 Productivity_{it}+\beta_9 CAR_{it}+\beta_{10} GDPGrowth_{it}+\beta_{11} BankCategory_{it}+\beta_{12} Year\_dum_{it}+\mu_{it} \quad (1)$$

Where, "I" stands for bank and "t" stands for time.

α=Constant.

μ_{it}=Error term.

$\beta_1, \beta_2 \ldots\ldots\ldots\ldots\ldots\ldots$ $B_{12}$are the coefficients for the independent variable.

4. RESULT AND ANALYSIS

The Table 3 shows the descriptive statistics and the Table 4 shows the pair wise correlation both are satisfactory for the further analysis

4.2. Analysis

Our analysis provides a mixed result against previous research done in this area. The result shown in Tables 5 and 6 shows that last year ROA is having a positive significant association with ROA whereas two and three year lag ROA has a negative association. It indicates that profitability of banks follow a short cyclical pattern of two years. Provisioning of NPA in fixed time interval and cyclical disbursement of loan by the banks may be the reason behind such result Shehzad et al. (2013) also found out persistence in profitability among OECD and Non OECD countries with a significant positive result. But they have not tested it through 2 years and three year lag profitability.

Size of a bank has a negative association with the profitability at five% significance level. It is supported by Pasiouras and Kosmidou (2006) whereas s Alicia et al. (2009); Shehzad et al. (2013) found out that bigger banks have higher profitability. As the studies are made in European Countries, China and OECD countries respectively, the difference in economic condition of those countries mayattribute to different results. Larger banks in India have diseconomies of operation. Smaller banks perform better with less NPA, limited products and higher efficiency.

Our result on solvency ratiois corroboratedby the findings of Dietrich and Wanzenried (2014) and Pasiouras and Kosmidou (2007). A higher solvency ratio leads to higher ROA having a significant positive association. An older and well capitalized Bank is more profitable with lesser cost of fund.

We found out that ROA has a negative and significant coefficient with Loan to Deposit ratio which contradicts the finding of Albulescue (2015). Our advocacy in support of our findings is

Table 4: Pairwise correlation

Variables	ROA	Size	Solvency ratio	Loans to deposit ratio	Expense ratio	Productivity	CAR	GDP growth
ROA	1							
Size	−0.119	1						
Solvency ratio	0.667	−0.113	1					
Loans to deposit ratio	0.074	0.437	0.146	1				
Expense ratio	0.266	−0.360	0.444	−0.414	1			
Productivity	0.071	0.441	0.262	0.434	−0.321	1		
CAR	0.386	0.102	0.290	0.392	−0.211	0.142	1	
GDP growth	0.017	0.086	0.002	0.148	−0.026	−0.004	0.097	1

Source: Data for this analysis is collected CMIE database. CMIE: Centre for monitoring Indian economy, CAR: Capital adequacy ratio, ROA: Return on asset, GDP: Gross domestic product

Table 5: Result of dynamic panel least square analysis

Variables	Coefficient and significance
L1.ROA	0.5101***
L2.ROA	−0.0955***
L3.ROA	−0.1095***
Size	−0.0004**
Solvency ratio	0.0417***
Liquidity ratio	−0.0046**
Expense ratio	−0.0414**
Productivity	−0.0002**
CAR	0.0003***
GDP growth	−0.0001***
Bank category	0.0144*
Year_dum	0.0003
_cons	0.0073
Wald Chi	1892.27***
Sargan test	31.47054
AB test order 1	−4.0333***
AB test order 2	−0.91474
Number of obs	490
Number of groups	39

(1) In this GMM equation ROA is lagged by 1 year. (2) The Wald test has χ^2 distribution and tests the null hypothesis of overall non-significance of the parameters of the explanatory variables, against the alternative hypothesis of overall significance of the parameters of the explanatory variables. (3) The Sargan test has χ^2 distribution and tests the null hypothesis of significance of the validity of the instruments used, against the alternative hypothesis of non-validity of the instruments used. (4) The AB test order 1 test has normal distribution N (0,1) and tests the null hypothesis of absence of first order autocorrelation, against the alternative hypothesis of existence of first order autocorrelation. (5) The AB test order 2 test has normal distribution N (0,1) and tests the null hypothesis of absence of second order autocorrelation against the alternative hypothesis of existence of second order autocorrelation. (6) ***significant at 1% significance; **significant at 5% significance; *significant at 10% significance. Source: Data for this analysis is collected CMIE database. CMIE: Centre for monitoring Indian economy, CAR: Capital adequacy ratio, ROA: Return on asset, GDP: Gross domestic product, GMM: Generalized method of movement

Table 6: Interpretation of result of dynamic panel least square analysis

Hypothesis	Association of ROA with	Hypothesis accepted/rejected
HO1	Previous year ROA	Accept
HO2	2 years lag ROA	Accept
HO3	3 years lag ROA	Accept
HO4	Size of a bank	Accept
HO5	Solvency of a bank	Accept
HO6	Loan to deposit ratio	Accept
HO7	Non-interest expenses	Accept
HO8	Employee productivity	Accept
HO9	CAR	Accept
HO10	GDP growth of India	Accept
H011	Bank category	Accept
H012	Year dummy	Rejected

CAR: Capital adequacy ratio, ROA: Return on asset, GDP: Gross domestic product

that in pursuit of higher utilization of funds banks tend to give bad loans leading to higher NPA and lower ROA. With a loan to deposit ratio of 76.8% (RBI, 2016). India is comparable with other developed countries in terms of its fund utilization. But the amount of stressed asset in Indian banking sector is a matter of concern.

Expense ratio is the proportion of non-interest expense to total revenue which is termed as management efficiency. Our analysis shows a significant negative relationship of ROA against expense ratio. Most of the previous studies highlight the same result as ours. (Albulescue, 2015; Capraru and Inhatov, 2014; Pasiouras and Kosmidou, 2006).

Productivity is having a negative significant impact on the ROA. It leads us to an interesting fact that to earn higher non-fee income, a bank needs relatively more number of employees, thereby reducing the productivity of the bank. On analysis of individual banks, we found out that banks having lesser productivity have high non-fee income and higher ROA. But for a concrete conclusion on the relationship of non-fee income leading to lower productivity of employees, further analysis should be done.

Our findings on CAR having a positive significant relation with ROA and in line with the findings of Capraru and Inhatov (2014). Higher CAR indicates higher amount of reserves and surplus. A profitable and higher tier I and tier II capitalized firm can have better CAR with a slow or moderate growth of deposit.

High growth of GDP is inflationary in nature. During growth phase of economy, banks tend to extend higher amount of loan. If proper vigil is not maintained for appraisal and recoveries of loan, it will lead to more bad loans and affect the ROA of the banks. A negative significant association of growth of GDP with ROA confirms this argument. This indicates that bankers should take more care for credit appraisal and manage their asset liabilities properly to get the benefit of growth in the economy.

Dietrich and Wanzenried (2014); Banerjee and Velamuri (2015) observed that Private sector banks are more profitable than the Public Sector Banks. This is also confirmed by our result on bank category as the dummy variable.

Our study does not show any difference between the ROA of Post and pre subprime crisis period. We understand that subprime crisis had lesser impact on Indian banking sector than the other countries and hence it has not affected their performance. Besides, there

may be various offsetting economic factors which have led to insignificant difference in their ROA during these periods.

5. CONCLUSION

Our study has the similar findings on last year ROA, solvency ratio, expense ratio, CAR and bank category with the previous research done in this area in different countries. Size, Liquidity, productivity, growth of GDP provides a different result which is not in tandem with expected results or findings of other research papers. It leads to the fact that banking environment in India is different from other countries. Indian banks have higher non-fee income; Credit appraisal and Debt recovery system is not proper leading to higher NPA. Banks are not able to reap the benefit of growth in the economy due to these shortcomings. RBI is acting in this area quite sincerely. Bankers many a times advocate for higher liquidity to enhance their business. But our study shows that they should focus more on proper credit appraisal, recovery of loan to bring higher profitability. Higher proportion of non-fee income is not a healthy sign as it may lead to huge amount of off balance sheet liability, which may threaten the existence of the bank in difficult times.

6. LIMITATIONS OF STUDY, RESEARCH IMPLICATIONS, SCOPE FOR FURTHER RESEARCH

6.1. Limitation

We have considered all banks in the public sector and private sector in India for 15 years. We could not find the financial figures of foreign banks' operation in India. So performance of foreign banks against Indian banks could not be compared.

6.2. Research Implication

Our study is a confirmatory study of impact of various factors on ROA of banks in India. It gives a mixed result vis-a-vis the studies done in various countries. It shows that bigger banks have diseconomies of operation; older banks are more profitable; a bank with higher loan to deposit ratio has lower ROA; high GDP growth leads to lesser ROA and public sector and private sector banks are not different in their performance. Although foreign banks were affected by subprime crisis, ROA of Indian Banks was hardly affected by the sub – prime crisis. A negative association of ROA with high loan to deposit ratio and GDP growth reflects lack of proper credit appraisal in Indian banks.

6.3. Scope for Further Research

The study tested 2 and 3-year lags of ROA against ROA and found out a negative association. It may be further discussed, whether there is any association of lag ROA with ROA beyond 3 years? The study found out a negative association of employee productivity with ROA. We ascribe it to higher non fee income with a postulation that non-fee income requires more number of employees leading to lower productivity per employee. A further study on relationship of fee and non-fee income against employee productivity can throw better light on this subject.

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