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Impact of Determinants of Profitability Ratios among Private, Public and Foreign Banks in India

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Abstract

Purpose: The paper endeavours to examine variables as determinants of profitability margin ratios of private sector bank, public sector bank and foreign sector bank groups in India. The purpose of the study is to explore the association of ROADV, ROI, ROA and ROE with several variables. The paper intends to identify the differential impacts of determinants on exploratory variables of individual group of banks. Methodology: The study has regressed four profitability measures viz., ROADV, ROI, ROA and ROE on selected independent variables that measures Assets-Deposit ratio, Loans-Advances ratio, Income-Assets ratio and Cost of debts. Banking information from year 2005 to 2019 of all scheduled commercial banks in India was retrieved from DBIE of RBI. Panel data analysis, fixed effect model is applied to analyse impact of determinants on profitability margin ratios and fixed effects of bank groups. Multicollinearity and Heteroscadasticity is diagnosed to check the fitness of model. Findings: The fixed effects analysis indicated all models were significant. The variables CAD, PSATA, NIM and COB have significant with ROE. The variables CAD, PSATA, NIM and COB have significant relation with ROA. The study variables CD, TLTA NIM and COD have significant relation with ROI. The variable NIM is significant to all three profitability margin ratios. Out of all fixed effects, ROE had highest value in all the three bank groups and the private bank groups had the highest ROE individual effect.

Keywords: Profitability, ROE, ROI, ROA, ROADV, Bank, India, Panel Data

Introduction

The role of the banking sector in the Indian economy had been viewed as backbone since independence and further empowered after the economic reforms of 1991 to play a catalyst role in the growth process. The Indian banking sector has been receiving the reforms in a phased manner with an objective to improve its efficiency and profitability. The deregulation of the banking sector was with vision prominent mainly for two reasons, firstly, the system acts as a conduit for resource mobilization and secondly, the trend of financial deregulation adopted worldwide in the purview of increasing cases of the financial crisis and and thirdly, reduction of transaction cost due to the advent of information and communication technology (Prasad et al., 2002).

The Indian banking system which was dominated by the nationalised bank till 1990 was liberalised and thrown open for the private sector to commence the business in the banking sector. The nationalised banks were made public through disinvestment. The privatization of national commercial banks brought transparency, operation efficiency and profitability (Mohan, 2005). Apparently, the post reforms period, the Indian banks' financial result indicated the persistent declining trend inefficiency. The post-reform period also failed to witness any significant increase in the number of efficient banks. The inefficiency of most of the banks was attributed to underutilization of valuable resources and scale of operations (Das & Ghosh, 2006).

In terms of efficiency of Indian commercial banks evaluated based on interest margin, non-interest income, investment and credit, State Bank of India group and foreign banks were better than private sector banks and nationalised banks. As against the objectives of banking sector reforms, the steps taken for the betterment of banks had been inefficient in improving the technical efficiency and increasing interest margin, despite banks showing a significant increase in efficiency of non-interest income, investment and credits (Shanmugam & Das, 2004).

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Very popular and widely known framework CAMEL suggested in Basel norms I, for evaluation of financial institutions and banks, was adopted by RBI to assess the performance and efficiency of banks. CAMEL approach is an assessment of five key parameters namely, Capital adequacy, Assets quality, Management competency, Earnings and Liquidity. The Indian private banks when compared with nationalised and SBI group, the performance of later were found trailing in most of the parameters during the 1st decade of 21st century (Dhanabhakyam & Kavitha, 2012), (Kumar et al., 2012). Within the SBI group also, the performance of the associate banks was not very correlated and the banks within the group had varied performance along different parameters.

As the efficiency in the Indian commercial banks differs significantly among public sector banks, private sector banks and foreign sector banks. The public sector banks have also varied efficiency in its subgroups of nationalized banks and State Bank of India. The State Bank of India and its associate's banks not only outperformed the nationalized bank but also their efficiency in terms of operating profits was above average than that of the Indian banking industry. The inefficiency of banks was commonly featured by underutilization and wastage of resources leading to low (ROA) Return on Assets.

The banks being very much associated as the backbone of the Indian economy. But along with the macroeconomic factors, banks' internal factors also significantly affects its efficiency and profitability. The bank's non-performing loans significantly affect the profitability whereas diversification of loan, ownership structure and economic factor viz. Inflation and GDP had insignificant effects (Bapat, 2018a).

The Indian banking industry is one of the most organised sectors and most stable, even when compared with its counterpart economies. Despite the advantage, the Indian banking industry cannot deny the concerns related to its performance and management efficiency. Indian banks concern widely varies across types ownerships, (government, private or foreign) and performance measures. Therefore, the study tries to explore the determinants and its impact on profitability across bank group based on their ownership. The paper further discussed the various previous studies carried on a related topic in the review of literature section, followed by Research Methodology, Data Analysis and Conclusion.

Review of Literature

Profitability is one of the most important as well as studied topics in the literature of banking. The manager and researcher had always tried to identify the factors which act as determinants of banks' profitability. (Turnbull, 2002) used the Return on Assets and Return on Equity as measures of banks performance. (Pi & Timme, 1993) investigated the bank efficiency measured by Return on Assets was significantly impacted by the top management team structure. (Kang & Shivdasani, 1995) examined the mechanism of corporate governance and found the return on assets, excess stock returns, and operating income was significantly related to non-routine turnover. (Al Nimer et al., 2015) studied the impact of liquidity on profitability and found the quick ratio was significantly impacting on return on assets among Jordanian banks.

(Sufian & Habibullah, 2009) studied the performance of the commercial bank in developing countries with specific reference to Bangladesh and found that advances, credit risk and cost impact were positive, the non-interest had negative impact and size of the bank had a different impact on the profitability of bank measured by return on average equity (ROAE), return on average assets (ROAA) and net interest margins (NIM). It was also evident that profitability was more impacted by banks internal characteristics and macroeconomic factors were insignificant, except inflation which had a negative impact on bank performance.

(Staikouras & Wood, 2011) conducted the study on determinants of profitability of European banks and suggested that banks internal as well as external/ macroeconomic factors had a significant impact on the bank. Internal factors equity to assets ratio and gap impacted positively whereas loan to assets had a negative impact. The macroeconomic factors interest rate had a negative impact and GDP growth rate had a positive impact on profitability.

(Obamuyi, 2013) carried study on determinants of profitability of banks in Nigeria and found that banks internal determinants capital adequacy, expenses and external determinant GDP growth rate relationship were positive with profitability and suggested that Nigerian government should encourage the bank to improve their

capital base and income for overall economic growth. The study adopted a panel data fixed effect model to examine the impacts.

(Jeslin Sheeba, 2017) investigated the impact of credit risk on profitability and used return on assets and return on equity as dependent variables. (Kosmidou & Tanna, 2005) studied the profitability of a commercial bank in the UK and concluded that the capital strength measured by equity to assets was the main determinant of bank profitability measured both in return on average assets (ROAA) and net interest margin (NIM). The other variables like the cost to income and bank had significant but negative impact whereas liquidity had an ambiguous impact on profit measures. The study adopted the fixed effect model to measure the relationship between dependent and independent variables.

(Bhullar & Gupta, 2017) analysed the determinants of profitability in Indian banks and found that the effects of bank characteristics on profitability were non-uniform. The results evidenced that deposit ratio had positive whereas other income to total income and interest income total funds had a negative impact on banks profitability. Pooled OLS and fixed effect models were adopted to study the impact of determinants.

(Rakshit, 2019) investigated the profitability and market efficiency of Indian banks and found that 80% of the banks were inefficient in both areas and most large banks were experiencing reducing return to scale as against small banks which adopted best practice for increasing return to scale. The study used a data envelopment method along with input to analyze the top 36 Indian commercial banks over the period of 2015-2016.

(Al-Homaidi et al., 2018) carried out their study on top 37 Indian commercial banks to analyze the profitability of internal and external determinants. They evidenced that internal factors, bank size, quality of assets, liquidity levels, management of assets and net interest margin had a significant impact on profitability measured by return on assets (ROA) and return on equity (ROE). The external factors GDP and inflation also significantly impacted return on assets (ROA) and return on equity (ROE). The analyses were done with the help of pooled, fixed, random panel models and generalized method of moments (GMM).

Objectives of the Study

The paper endeavours to examine several variables as determinants of profitability margin ratios of private sector bank, public sector bank and foreign sector bank groups in India. The purpose of the study is to explore the association of ROADV, ROI, ROA and ROE with several variables of the selected bank groups. The paper intends to identify the differential impacts of determinants on exploratory variables of an individual group of banks.

Research Methodology

The study has regressed four profitability measures viz., Return on advances, return on investments, return on assets, and Return on equity on several independent variables that measures Assets-Deposit ratio, Loans-Advances ratio, Income-Assets ratio and Cost of debts. For this study, we have selected three measures from each category of ratios. Banking information from the year 2005 to 2019 of all scheduled commercial banks in India was retrieved from DBIE of RBI.

The panel data analysis, the fixed-effect model is conducted to analyse the impact of determinants on regressors and fixed effects of bank groups. For data analysis, the data frame is arranged in long-form with both time and types of bank and R Studio software is used.

Since the study is applying the Fixed Effect (FE) model for panel data, the heterogeneity of the data is captured in disturbance terms along with intercept. For the Fixed effect model, we have adopted the within effect model as it uses transformed variables instead of creating dummy variables as in case of Least square with Dummy variables (LSDV). Also, the within model will have more accurate SSE and parameters more accurate than LSDV. The Breusch-Pagan test is applied to diagnose the heteroskedasticity of selected regressors.

Fixed Effect Models

The fixed effect model is formulated with four dependent variables regressing with 12 identified independent variables. The data is collected as the average of selected variables of Public banks, Private banks and Foreign banks in India for a tie period of 15 years.

FE Regression Model for ROE (1)

$$ROEit = \beta_{0i} + \beta_1 CADit + \beta_2 CDit + \beta_3 IDit + \beta_4 PSATAit + \beta_5 TLTAit + \beta_6 SATAit + \beta_7 IITAit + \beta_8 NIMit + \beta_9 NIITAit + \beta_{10} CODit + \beta_{11} COBit + \beta_{12} COFit + Uit$$

FE Regression Model for ROADV (2)

$$ROADVit = \beta_{0i} + \beta_1 CADit + \beta_2 CDit + \beta_3 IDit + \beta_4 PSATAit + \beta_5 TLTAit + \beta_6 SATAit + \beta_7 IITAit + \beta_8 NIMit + \beta_9 NIITAit + \beta_{10} CODit + \beta_{11} COBit + \beta_{12} COFit + Uit$$

FE Regression Model for ROA (3)

$$ROAit = \beta_{0i} + \beta_1 CADit + \beta_2 CDit + \beta_3 IDit + \beta_4 PSATAit + \beta_5 TLTAit + \beta_6 SATAit + \beta_7 IITAit + \beta_8 NIMit + \beta_9 NIITAit + \beta_{10} CODit + \beta_{11} COBit + \beta_{12} COFit + Uit$$

FE Regression Model for ROI (4)

$$ROIit = \beta_{0i} + \beta_1 CADit + \beta_2 CDit + \beta_3 IDit + \beta_4 PSATAit + \beta_5 TLTAit + \beta_6 SATAit + \beta_7 IITAit + \beta_8 NIMit + \beta_9 NIITAit + \beta_{10} CODit + \beta_{11} COBit + \beta_{12} COFit + Uit$$

Where, β_{0i} is the intercept for the bank group i or fixed effects.

'i' takes the different value for Public bank, Private bank and Foreign bank.

't' takes the different value as 1, 2…15 for period 2005 to 2019.

The variables selected for study is described below with hypothesized relation with profitability ratio.

Table 1: Descriptive Variables used in Models

Dependent Variables/Label		*Description*	*Hypothesized Relation*
Profitability Ratio	ROADV	Return on advances	N/A
	ROI	Return on investments	N/A
	ROA	Return on assets	N/A
	ROE	Return on equity	N/A
Independent Variables			
Assets-Deposit Ratio	CAD	Cash - Deposit Ratio	-ve
	CD	Credit - Deposit Ratio	+ve
	ID	Investment - Deposit Ratio	+ve
	PSATA	Priority sector advances to total advances ratio	-ve
Loans-Advances Ratio	TLTA	Term loans to total advances ratio	+ve
	SATA	Secured advances to total advances ratio	+ve
	IITA	Interest income to total assets ratio	+ve
Income -Assets Ratio	NIM	Net interest income to total assets (Net Interest Margin) ratio	+ve
	NIITA	Non-interest income to total assets ratio	-ve
	COD	Cost of deposits	-ve
Cost of Debts	COB	Cost of borrowings	-ve
	COF	Cost of funds	-ve

Results and Findings

Our study on the determinants of profitability of Indian banks has used panel data analysis. We have used a fixed effect model along with the Pearson correlation matrix and Breusch Pagan test for diagnosing multicollinearity and heteroskedasticity of selected variables data. Descriptive statistics of selected dependent and independent variables are depicted in Table 2 below:

Table 2: Descriptive Statistics of Selected Variables

TYPE	VAR	MIN	1ST QU.	MEDIAN	MEAN	3RD QU.
DV1	ROE	14.619	9.029	13.238	10.912	15.389
DV2	ROADV	7.767	8.719	9.52	9.533	10.079
DV3	ROA	0.843	0.9507	1.2634	1.1765	1.6118
DV4	ROI	6.161	6.921	7.263	7.264	7.629
IV1	CAD	4.862	5.666	6.95	7	8.043
IV2	CD	59.46	72.58	77.42	77.81	82.99
IV3	ID	28.59	32.93	41.63	44.78	51.5
IV4	PSATA	25.74	28	29.39	29.86	31.55
IV5	TLTA	36.95	48.14	53.08	54.61	66.54
IV6	SATA	42.36	50.72	79.82	70.97	83
IV7	IITA	5.769	6.709	7.522	7.467	8.124
IV8	NIM	2.075	2.568	3.18	3.115	3.538
IV9	NIITA	0.8725	1.2009	1.6205	1.7027	1.9285
IV10	COD	3.104	4.457	5.011	5.11	6.189
IV11	COB	2.764	4.811	6.358	6.582	7.418
IV12	COF	3.02	4.531	5.268	5.278	6.301

Source: Author calculation with R Studio Software

From the above Table 2, it can be observed that among selected dependent variables of ROE, return on equity; ROADV, return on advances; ROA, return on assets; and ROI, return on investment, the bank groups have ROE is highest average and ROA is the lowest average. This data indicates that banks in India have higher market return to equity holders whereas the lowest return on assets can be inferred as underutilisation of resources.

In Table 3, Pearson's correlation coefficient is represented in matrix form. Before regressing the independent variables of panel data models, it is important to identify the existence of multicollinearity. The calculated value reveals that variables IITA (Interest income to total assets ratio), NIITA (Non-interest income to total assets ratio), and COF (Cost of Funds) have a high correlation (> 0.8) with other independent variables (Bapat, 2018b). This means the variables have collinearity with other independent variables, so these variables are dropped from the fixed effect models.

The final independent variables selected are CAD, Cash - Deposit Ratio; CD, Credit - Deposit Ratio; ID, Investment - Deposit Ratio; PSATA, Priority sector advances to total advances ratio; TLTA, Term loans to total advances ratio; SATA, Secured advances to total advances ratio; NIM, Net interest income to total assets ratio; COD, Cost of deposits; and COB, Cost of borrowings. The total numbers of observations were 145 in each model.

The Table 4, presents the Fixed Effect regression result for four constructed models. The Fixed Effect **r**egression models have ROE, return on equity; ROADV, return on advances; ROA, return on assets; ROI, return on investment as dependent variables.

Table 3: Correlation Matrix

	CAD	CD	ID	PSATA	TLTA	SATA	IITA	NIM	NIITA	COD	COB	COF
CAD	1	0.080314	0.268887	0.148231	-0.0329	-0.34428	-0.17492	0.334328	0.51041	-0.31452	0.127476	-0.23369
CD	0.080314	1	0.144052	-0.52253	0.175273	-0.18971	0.325019	0.51201	0.402815	0.053237	-0.21604	0.065049
ID	0.268887	0.144052	1	-0.09561	-0.62693	-0.87219	-0.61909	0.703518	0.542156	-0.62211	-0.53074	-0.69981
PSATA	0.148231	-0.52253	-0.09561	1	0.006218	0.19897	-0.10684	-0.24714	-0.22149	0.002756	0.23409	-0.01998
TLTA	-0.0329	0.175273	-0.62693	0.006218	1	0.75418	0.687868	-0.36555	-0.15283	0.549555	0.649797	0.681372
SATA	-0.34428	-0.18971	-0.87219	0.19897	0.75418	1	0.660207	-0.76169	-0.6193	0.701747	0.622682	0.769569
IITA	-0.17492	0.325019	-0.61908	-0.10684	0.687868	0.660207	1	-0.24864	-0.21747	0.85602	0.493079	0.90487
NIM	0.334328	0.51201	0.703518	-0.24714	-0.36555	-0.76169	-0.24864	1	0.822939	-0.5963	-0.41826	-0.59117
NIITA	0.51041	0.402814	0.542156	-0.22149	-0.15283	-0.6193	-0.21747	0.822939	1	-0.55626	-0.20899	-0.47169
COD	-0.31452	0.053237	-0.62211	0.002756	0.549555	0.701747	0.85602	-0.5963	-0.55626	1	0.398859	0.968826
COB	0.127476	-0.21604	-0.53074	0.23409	0.649797	0.622682	0.493079	-0.41826	-0.20899	0.398859	1	0.576096
COF	-0.23369	0.065049	-0.69981	-0.01998	0.681372	0.769569	0.90487	-0.59117	-0.47169	0.968826	0.576096	1

Table 4: Panel Data Analysis: Fixed Effect Models

	ROE		*ROADV*		*ROA*		*ROI*	
	Estimate	*Pr(>|t|)*	*Estimate*	*Pr(>|t|)*	*Estimate*	*Pr(>|t|*	*Estimate*	*Pr(>|t|)*
CAD	1.22473	0.0477651*	0.086819	0.1833	0.07538	0.0466980*	-0.06204	0.243017
CD	-0.01334	0.9337007	-0.0388	0.02956*	0.001743	0.8591207	0.026312	0.067895 .
ID	0.14379	0.3185535	0.004825	0.75328	0.008052	0.3610976	-0.00186	0.882024
PSATA	-1.26997	0.0133532*	-0.00053	0.99199	-0.07811	0.0129805*	0.041375	0.337959
TLTA	-0.44551	0.2097681	0.093747	0.01715*	-0.02585	0.2341264	-0.00809	0.792466
SATA	0.029658	0.8842626	0.011482	0.59988	0.005154	0.6798691	0.030427	0.095204 .
NIM	10.28366	0.0001501***	1.331613	1.114e-05***	0.790541	6.088e-06***	0.789943	0.000672***
COD	1.017535	0.3701391	1.260314	4.755e-12***	0.12244	0.0833727	0.242275	0.018885*
COB	2.195609	2.312e-05***	-0.03297	0.49533	0.111038	0.0002788***	0.084126	0.038716*
R-Squared		0.69163		0.83517		0.71204		0.63636
p-value		2.73E-06		1.63E-10		9.69E-07		3.18E-05

Source: Author calculation with R Studio Software
*significant at 10%, **significant at 5%, *** significant at 1%

For FE Regression Model for ROE (1)

$$ROE_{it} = \beta_0 + \beta_1 CAD_{it} + \beta_2 CD_{it} + \beta_3 ID_{it} + \beta_4 PSATA_{it} + \beta_5 TLTA_{it} + \beta_6 SATA_{it} + \beta_7 NIM_{it} + \beta_8 COD_{it} + \beta_9 COB_{it} + U_{it}$$

Out of all the variables, CD and TLTA have negative relationships and other variables have positive relations-hips with ROI. The study variables CAD, PSATA, NIM and COB have significant whereas CD, ID, TLTA, SATA and COD do not have a significant relationship with the ROE. The FE model for ROE is significant at 1% l.o.s with R square at 0.69163.

For FE Regression Model for ROADV (2)

$$ROADV_{it} = \beta_0 + \beta_1 CAD_{it} + \beta_2 CD_{it} + \beta_3 ID_{it} + \beta_4 PSATA_{it} + \beta_5 TLTA_{it} + \beta_6 SATA_{it} + \beta_7 NIM_{it} + \beta_8 COD_{it} + \beta_9 COB_{it} + U_{it}$$

Out of all the variables CD, PSATA, COB has negative relationships and other variables have positive relationships with ROI. The study variables CD, TLTA, NIM and COD have significant whereas CAD, ID, PSATA, SATA and COB do not have a significant relationship with the ROADV. The FE model for ROADV is significant at 1% l.o.s with R square at 0.83517.

For FE Regression Model for ROA (3)

$$ROA_{it} = \beta_0 + \beta_1 CAD_{it} + \beta_2 CD_{it} + \beta_3 ID_{it} + \beta_4 PSATA_{it} + \beta_5 TLTA_{it} + \beta_6 SATA_{it} + \beta_7 NIM_{it} + \beta_8 COD_{it} + \beta_9 COB_{it} + U_{it}$$

Out of all the variables, PSATA and TLTA have negative relationships and other variables have positive relationships with ROA. The study variables CAD, PSATA, NIM and COB have significant whereas CD, ID, TLTA, SATA and COD do not have a significant relationship with the ROA. The FE model for ROA is significant at 1% l.o.s with R square at 0.83517.

For FE Regression Model for ROI (4)

$$ROI_{it} = \beta_0 + \beta_1 CAD_{it} + \beta_2 CD_{it} + \beta_3 ID_{it} + \beta_4 PSATA_{it} + \beta_5 TLTA_{it} + \beta_6 SATA_{it} + \beta_7 NIM_{it} + \beta_8 COD_{it} + \beta_9 COB_{it} + U_{it}$$

Out of all the variables, CAD, ID and TLTA have negative relationships and other variables have positive relationships with ROI. The study variables NIM, COD and COB have significant whereas CAD, CD, ID, PSATA,

TLTA and SATA do not have a significant relationship with the ROI. The FE model for ROI is significant at 1% l.o.s with R square at 0.63636.

Now to test the heteroscedasticity in FE models, the Breusch-Pagan test is applied, Wooldridge (2002). The null hypothesis for the Breusch-Pagan test is that there is no heteroskedasticity, the results obtained is tabulated below

Table 5: Breusch-Pagan Test of Heteroskedasticity

Var	*BP*	*df*	*p-value*	*Result*
ROE	15.63	09	0.07503	No Heteroskedasticity
ROADV	22.90	09	0.006423	Heteroskedasticity
ROA	16.513	09	0.0569	No Heteroskedasticity
ROI	15.888	09	0.06927	No Heteroskedasticity

Source: Author calculation with R Studio Software

If the p-value is > 0.05, infers that there is no heteroskedasticity, and the same is desirable for a good FE model. From the above table, we can infer that the FE models for ROE, ROA and ROI are FE models without heteroscedasticity and FE model of ROADV has heteroscedasticity. Hence, after confirming from the diagnostic test of heteroskedasticity, the FE of banks groups i.e. Private banks, Public banks and Foreign banks are calculated to find which dependent variables are more favoured. Among models for selected dependent variables, ROE has a higher value than other profitability margins of the individual bank groups. The Private Bank has the highest of the three bank groups. The ROI has a negative fixed effect on all bank groups.

Table 6: Fixed Effect of Bank Groups

Bank Group	*Private Bank*	*Public Bank*	*Foreign Bank*
ROE	31.803	22.020	26.682
ROA	1.37279	0.47173	1.33176
ROI	-1.67589	-0.41822	-2.11576

Source: Author calculation with R Studio Software

Thus, from the above table, the estimated individual fixed effects depict that Private banks have very high impact on profitability margin measured by ROE as compared to ROA and ROI. Similarly, the individual effects of public bank and foreign bank have very high impact on profitability margin ROE as against ROE and ROI. Among the bank groups, Private bank has effects is highest towards ROE. Therefore, we can infer that all Indian banks variables suggest that bank management focuses majorly in improving ROE as against ROI and ROA. This also means that banks focus on utilising assets efficiently and cash flow or income generation from investment is not yet areas of concern (Seenaiah et al., 2015). The inferential results are also consistent with the average value of ROE, ROA and ROI in descriptive analysis of individual bank groups.

Conclusion

Our objective was to explore the most preferred profitability margin ratios from ROE, ROADV, ROA and ROI and significant determinants from selected Assets-Deposit ratios, Loans-Advances ratios, Income-Assets ratios and Cost of debts ratios. The determinants were CAD, CD, ID, PSATA, TLTA, SATA, IITA, NIM, NIITA, COD, COB and COF. Using the information of all scheduled commercial banks is grouped as Private Banks, Public banks and Foreign banks from the year 2005 to 2019. For the process of exploring the multicollinearity among determinants of profitability, Pearson correlation coefficients across all selected 12 independent variables were estimated. The calculated value revealed that IITA, NIITA, and COF have high correlation with other selected independent variables. Fixed effect models for selected profitability margin ratios with the remaining 9 independent variables were formulated. The fixed effects analysis indicated all models were significant. But by the application Breusch-Pagan test, the fixed effect model of ROADV was discovered to have heteroscadasticity. The variables CAD, PSATA, NIM and COB have significant with ROE. The variables CAD, PSATA, NIM and COB have significant relation with ROA. The study variables CD, TLTA NIM and COD have significant relation with ROI. The variable NIM is significant to all three profitability margin ratios. To determine the constant term in the model, fixed effects of bank groups were estimated. Out of all fixed effects, ROE had highest value in all the three bank groups and also the intercept of ROE had observable difference then intercept of ROA and ROI. Thus, we can conclude that fixed effect model for ROE will be best to study determinants of profitability of Indian commercial banks. Among selected profitability margins, ROE had higher value than other dependent variables of individual bank groups, and the private bank group

ROE fixed effect was highest than public bank group and foreign bank groups.

Through this study, we can suggest that Indian bank across the group might seem to generate market return to shareholders but return on assets and return on investment, which represents operational profit margin ratios, do not seem to be in focus of management. So Indian bank should use optimally make use of their assets.

Scope of Further Study

The study has used the data by grouping into all Indian banks by their ownership types i.e., private banks, public banks and foreign banks. By analysis banks without groups can produce each banks information breakdown. The current study, however, does not apply other panel models and restrict to fixed effect model. Also, the study did not analyse information on capital adequacy and asset quality, which can create additional analysis and findings for better insights. For further research, the study variables and time period can be extended and advanced methodology can be incorporated.

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