Analysis of Financial Performance of Selected Commercial Banks in India

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Abstract

The present study attempts to evaluate the financial performance of selected Indian commercial banks for the period from 2012/13 to 2016/17. The study comprises 16 commercial banks, 11 representing public sector and 5 from private sector, and the financial performance of these banks are analysed using the financial ratios. The study shows that the financial performance of private sector banks is relatively better than the public sector banks throughout the study period. Besides, the study examines the impact of liquidity, solvency and efficiency on the profitability of the selected Indian commercial banks by employing the panel data estimations, *viz.* the Fixed Effect and Random Effect models. The empirical results from the panel data estimations revealed that the liquidity ratio and solvency ratio, and the turnover ratio and solvency ratio are found to have positive and significant impact on the profitability of selected public sector and private sector banks, respectively, bearing testimony to the fact that profitability is a function of those ratios.

1. Introduction

Solvency and liquidity are very significant for banks since its assets and loans have diverse maturities. Banks have the principal role of converting liquid deposit (liabilities) to illiquid assets such as loans, which makes them intrinsically vulnerable to liquidity risk. Lack of liquidity is an indicator of the liquidity crisis in a banking system and therefore liquidity management is an imperative objective for the commercial banks since illiquidity may results in insolvency and deprived financial performance. Liquidity elucidates the bank's potential to manage its short

duration liability. In other words, the liquidity management shows how efficiently a bank manages its short duration requirement and invests the funds to raise the profitability of the organization. Therefore, the optimum level of liquidity guarantees a bank to meet their short term debts and the proper management of flow can be promised by a profitable business. Besides, the illiquidity will lead to insolvency and bankruptcy as the liabilities surpass its assets. It is impossible for banks to endure without making profits and there exists positive association between liquidity and profitability, which implies that lower liquidity position may result in lower profitability due to greater requirement for loans, and low profitability would not generate sufficient cash flows, thus creating a viscous cycle [1]. Besides, the liquidity is negatively associated with profitability of the banks because of holding liquid assets tend to condense income due to the lower rates of return connected with liquid assets [2].

Solvency represents the association between borrowed funds and owner's funds in the capital structure of a bank. It comprises debt and common equity for financing the bank's total assets, operations and financial growth [3]. The Capital adequacy norms curb the banks in their liberty of capital structure. The enforcement of capital adequacy ratio may have negative impact on the profitability of the banks. It has been stated that agency costs between managers and shareholders tend to increase when capital ratios are higher due to the discipline provided by debt repayment on managers' behaviour [4]. However, the increased surplus engendered as result of healthy bank-borrower relationship and enhanced monitoring laid down by the capital adequacy norms would have positive impact on the banks' profitability [5]. Moreover, the capital adequacy norms target at stability of the banks and thereby reduce the riskiness of the assets in the portfolio of the banks.

Management of liquidity and solvency ratios are vital for the commercial banks as it associated with their performances and reputations, especially with profitability ratios. If the banks have poor liquidity conditions, the regulators will penalize them and therefore it becomes imperative for the banks to keep a sound liquidity arrangement. Healthy financial performance has become a great challenge in the modern times as banks are characterised by the technological advancements, high competition for consumer deposits and altering monetary policy that augments the liquidity, solvency and the profitability of the banks. The present study attempts to evaluate the financial performance of selected Indian commercial banks using the financial ratios, and also examines the impact of liquidity, solvency and efficiency on the profitability of the selected Indian commercial banks by employing the panel data estimations, *viz.* the Fixed Effect and Random Effect models. The study will throw light on financial performance of the commercial banks which will help policy makers, regulator (Reserve Bank of India), Governments and other stakeholders to devise targeted policies and regulations that will dynamically stimulate the growth and sustainability of the commercial banks in the country. The study is of great importance for academics to

compare the performances of various commercial banks and efforts should be made to solve the discrepancies in performances of those banks. Besides, the study is immense help for the management and staff of commercial banks who will gain insight into how their institutions can effectively manage their financial ratios by appropriate practices to increase their profits.

2. Review of Literature

[6] examined the performance of Bahrain's commercial banks with respect to credit (loan), liquidity and profitability positions and found that the commercial banks are relatively less profitable and have less liquid and exposed to risk. [7] found that the operational efficiency, asset management and bank size are positively influenced the financial performance of the Omani commercial banks. [8] used financial ratios for the South Africa and found that banking performance was deteriorated significantly after the global financial crisis of 2007. [9] studied for seven Jordanian commercial banks and found that there is a strong negative correlation between ROA and bank size and with operational efficiency and positive correlation between ROA and asset management ratio. [10] examined the financial performance of five Palestine commercial banks and found that the credit risk, asset management, bank size and operational efficiency have a positive association with bank performance. [11] evaluated the financial performance of foreign and domestic banks in Turkey using financial ratios and found that the management effectiveness, total assets, return on equity and asset quality of domestic banks are better than that of foreign banks. However, foreign banks have higher capital adequacy ratio than domestic banks.

[12] found no significant relationship between the bank's performance and their key explanatory variables in Bangladesh. While [13] analysed for commercial banks in Bangladesh and revealed that the credit risk and bank size are significant and negatively related to ROA. [14] applied CAMEL model and found that profitability of Kenyan banks is significantly related to capital adequacy, asset quality and management efficiency. However, the relationship with ownership is found to be insignificant.

[15] focused on determinants of bank profitability in India and found that the profit margins deteriorated due to increased competition and changing face of the Indian banking. [16] reported that the Indian public sector banks were most efficient than the private and foreign banks in terms of cost and profit efficiencies. [17] examined the financial performance of SBI (State Bank of India) using the investment valuation ratio, profitability ratio, management efficiency ratio, balance sheet ratio, and cash flow indicators. They suggested that SBI's excellent performance can be attributed to the adoption of modern technology, banking reforms, and good recovery mechanisms. [18] has done comparative analysis of the financial performance of Indian commercial banks and disclosed that there is no statistically significant difference in the financial performance of the public and private sector banks in India. [19] found no significant difference in the

profitability of Indian commercial banks in terms of net interest margin and return on assets, but have significant differences in terms of return on equity. Recently, [20] showed significant differences among the financial performance of commercial banks operating in India. Besides, [21] evaluated the financial, operational, and managerial efficiency of the selected largest scheduled commercial banks in India with different ownership structure, such as public (State Bank of India), private (ICICI Bank), and foreign bank (Standard Chartered Bank). The findings revealed that there was no difference statistically among these banks in terms of ratios and performance of sub-parameters namely, debt/equity ratio, gross non-performing assets/total assets, income interest/total assets, and liquid assets to total deposits during the research. However, the study showed that the foreign bank is significantly more efficient than the private and public banks in terms of profitable banking business and converting deposits into higher earning advances.

It is clear from the existing literature that the studies pertaining to the financial performance of commercial banks across the globe, especially in Indian context, are performed based on the ratio analysis and CAMEL ranking method. Besides there have been studies which proved that there has been significant difference in the performance of public and private sector banks in India [18] [20] [22] [23]. However, the analysis has been done on the basis of aggregate financial ratios of public and private sector banks and not on the basis of individual banks. Besides, there exist only few studies in the context of India that associates the liquidity, solvency and efficiency positions of the Indian commercial banks with their profitability ratio. Our study attempts to evaluate the financial performance of selected Indian commercial banks for the period from 2012/13 to 2016/17. The study comprises 16 commercial banks, 11 representing public sector and 5 from private sector, and the financial performance of these banks are analysed using the financial ratios. In addition, the study investigates the impact of liquidity, solvency and efficiency on the profitability of the selected public sector banks and private sector banks, respectively, by employing the panel data estimations.

3. Methodology

To examine the financial performance of selected Indian commercial banks, the financial ratios of respective banks were used, *viz.* the liquidity ratio, represented by the quick ratio, current ratio and loans to deposit ratio, the profitability ratio, measured by the return on asset (ROA), return on equity (ROE), price-earnings ratio (P/E ratio), earnings per share (EPS) and net profit margin, the turnover ratio, measured by the total asset turnover ratio (TATR), the solvency ratio, measured by the interest coverage ratio (ICR), and the capital adequacy ratio (CAR). The detailed description on the measurement of financial ratios is provided in Appendix. Considering data availability, the study comprised 16 commercial banks, 11 representing public sector and 5 from private sector. The list of Indian commercial banks selected for the study is shown in Table 1.

The study covers the annual data for the period from 2012/13 to 2016/17 and

Table 1. List of Indian commercial banks selected for the study.

S. No.	Name of the Selected Public Sector Commercial Banks	S. No.	Name of the Selected Private Sector Commercial Banks
1.	State Bank of India (SBI)	1.	Axis Bank
2.	Canara Bank	2.	ICICI Bank
3.	Indian Bank	3.	Kotak Bank
4.	Indian Overseas Bank (IOB)	4.	Karur Vysya Bank (KVB)
5.	Bank of India	5.	Yes Bank
6.	Bank of Baroda		
7.	Punjab National Bank (PNB)		
8.	Andhra Bank		
9.	Union Bank of India (UBI)		
10.	IDBI Bank		
11.	Vijaya Bank		

the necessary information for this study was obtained from http://www.moneycontrol.com/ website. The One-way ANOVA has been used to determine whether there is any significant difference between the means of financial ratios of public and private sector banks. Besides, the study employed the panel data estimations, *viz.* the Fixed Effect and Random Effect models to examine the impact of liquidity, solvency and efficiency on the profitability of the selected public sector banks and private sector banks, respectively. The fixed effect model takes into the firm specific effect and the random effect model consider the time effect.

The fixed effects model is defined as:

$$\Pi_{it} = \alpha_i + \beta' X_{it} + u_{it}, \ i = 1, \cdots, N; \ t = 1, \cdots, T \tag{1}$$

where, Π_{it} is Return on Asset (ROA) of ith bank of particular banking industry group in t^{th} period; X_{it} is vector of k explanatory variables for i^{th} bank of particular banking industry group in t^{th} period, β' is parameter to be estimated and u_{it} is error term and assumed IN (0, σ^2). $\alpha_i, 1, \cdots, N$ are constant coefficients specific to each bank of respective industry groups. Their presence assumes that differences across the considered banks of respective banking industry groups appear by means of differences in the constant term. These individual coefficients are estimated together with vector of parameters β.

In the random effects case, the model is defined as:

$$\Pi_{it} = \alpha_i + \beta' X_{it} + u_{it}, \ i = 1, \cdots, N; \ t = 1, \cdots, T \tag{2}$$

In the random effects model, the α_i are treated as random variables rather than fixed constants. The α_i are assumed to be independent of the errors u_{it}, *i.e.* $\alpha_i \sim \text{IID}\left(0, \sigma_\alpha^2\right)$ and $u_{it} \sim \text{IID}\left(0, \sigma_u^2\right)$. The Π_{it}, β', X_{it} are defined as earlier. Since α_i are random, the errors now are $v_{it} = \alpha_i + u_{it}$ and the presence of α_i produces a correlation among the errors of the same cross-section unit though the

errors from the different cross-section units are independent. Therefore, the above model is to be estimated by the generalised least squares method [24].

The Hausman specification test is employed to compare the two categories of specifications. A fixed effect model assumes differences in intercepts across groups or time periods, whereas a random effect model explores differences in error variances. The Hausman specification test evaluates the fixed versus random effects under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model [25]. If correlated (H_0 is rejected), a random effect model produces biased estimators, violating one of the Gauss-Markov assumptions; so a fixed effect model is ideal. Under the null hypothesis, the Hausman statistic is asymptotically distributed as chi-square with k degrees of freedom.

The general specification of the parameters of the model is as follows:

$$ROA_{it} = a_i + b_1 QR_{it} + b_2 TATR_{it} + b_3 ICR_{it} + b_4 CAR_{it} + u_{it} \tag{3}$$

where, ROA represents the return on assets of the selected public and private sector banks in India. The explanatory variables, QR, TATR, ICR and CAR denote quick ratio, total asset turnover ratio, interest coverage ratio and capital adequacy ratio, respectively.

4. Empirical Results

Table 2 shows the liquidity ratios of selected commercial banks. Among the public sector banks, majority of them are having consistent current ratio during the study period. The current ratio of IDBI is found to be the highest during the year 2016 (*i.e.* 0.13) which is significantly rose from 0.03 in 2012. The Andhra Bank and the Indian Bank are maintaining a consistent current ratio of 0.03 during the time period. The current ratios of private sector banks are found to be relatively better than the public sector banks. They are able to meet their short term obligations with their current assets. The table results show a leaps and bounds in the quick ratios of public sector banks and private sector banks during the sample period. The liquid assets of the commercial banks keep fluctuating. The ICICI shows an increasing trend, *i.e.* 10.53 to 16.31 during the years 2012 to 2016.

The ideal loans to deposit ratio of the banks should ranges between 80 and 90 percent depending on the bank's business model [26]. Among the public banks, the SBI and IDBI were able to maintain this ideal position of loans to deposit ratio. All the public banks recorded a decreasing trend during the sample period. Under the private sector banks, the Axis Bank and Yes Bank found to have good record in the case of loans to deposit ratio. In nutshell, the private sector banks maintain a better position in the loans to deposit ratio than the public sector banks.

Table 3 and Table 4 reports the profitability ratios of selected commercial banks. The higher return on asset (ROA) implies that the banks are earning more money on less investment. The public sector banks maintained the highest

Table 2. Liquidity ratios of selected commercial banks.

Name of the Banks	Current Ratio					Quick Ratio					Loans to Deposit Ratio				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Public Sector Banks															
SBI	0.04	0.03	0.04	0.07	0.07	12.15	13.88	10.78	10.84	11.94	85.17	86.84	84.47	83.56	80.38
Canara Bank	0.03	0.03	0.03	0.04	0.05	23.76	23.4	22.19	25	25.72	69.51	69.95	70.55	68.66	68.38
Indian Bank	0.03	0.03	0.03	0.03	0.05	19.43	21.67	22.7	25.51	24.1	74.57	74.89	74.83	73.35	71.16
IOB	0.03	0.03	0.02	0.04	0.04	30.65	30.91	33.17	25.98	26.88	79.12	78.18	73.34	70.68	69.13
Bank of India	0.03	0.04	0.03	0.05	0.05	28.08	23.0	29.03	30.9	29.3	76.88	76.86	76.6	72.85	68.91
Bank of Baroda	0.02	0.02	0.02	0.05	0.04	23.9	24.05	20.78	18.27	19.38	71.68	69.54	69.54	68.13	65.24
PNB	0.02	0.02	0.02	0.03	0.03	22.4	25.19	24.23	28.09	28.98	78.13	78.06	76.6	75.19	70.81
Andhra Bank	0.03	0.03	0.02	0.03	0.03	36.56	33.59	28.67	29.21	23.59	79.26	77.55	78.69	77.96	72.38
UBI	0.02	0.02	0.02	0.04	0.04	31.85	30.41	28.83	36.65	35.16	11.45	10.8	10.22	10.56	11.79
IDBI	0.03	0.03	0.03	0.13	0.13	24.82	23.11	22.95	23.35	16.93	86.12	85.12	81.93	80.73	76.13
Vijaya Bank	0.03	0.03	0.03	0.05	0.06	37.98	37.18	33.80	49.9	41.03	70.90	68.35	67.11	69.78	71.01
Private Sector Banks															
Axis Bank	0.03	0.03	0.03	0.07	0.10	20.1	18.57	20.64	25.74	17.1	77.58	80.03	84.71	91.1	92.17
ICICI Bank	0.09	0.09	0.06	0.13	0.12	10.53	11.31	13.81	14.97	16.31	99.25	100.71	104.72	105.08	98.69
Kotak Bank	0.04	0.03	0.02	0.07	0.06	18.95	17.39	14.83	15.61	18.09	97.75	92.18	88.99	86.57	86.04
KVB	0.03	0.03	0.02	0.04	0.02	32.54	32.41	30.34	30.42	32.68	75.5	77.02	79.26	79.34	77.08
Yes Bank	0.07	0.08	0.06	0.08	0.10	10.18	10.4	12.25	14.02	12.08	73.2	72.71	79.33	85.64	90.53

Table 3. Profitability ratios of selected commercial banks.

Name of the Banks	Return on Assets (%)					Return on Equity (%)					Earnings Per Share (Rs.)				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Public Sector Banks															
SBI	0.9	0.61	0.64	0.44	0.39	14.26	9.2	10.2	6.89	6.69	210.06	156.76	17.55	12.98	13.43
Canara Bank	0.7	0.5	0.49	−0.51	0.19	12.57	10.1	10.21	0	3.96	64.83	54.48	58.59	−53.61	20.63
Indian Bank	0.97	0.61	0.52	0.34	0.64	15.14	10.04	8	5.27	9.72	35.8	26.07	21.62	14.81	29.27
IOB	0.23	0.21	−0.15	−1.05	−1.38	−0.55	4.19	0	0	0	6.14	6.05	−3.68	−19.86	−15.78
Bank of India	0.6	0.47	0.27	−0.99	−0.24	11.49	9.12	5.43	0	0	47.79	44.74	26.57	−83.01	−15.72
Bank of Baroda	0.81	0.68	0.47	−0.8	0.19	14.01	12.61	8.53	0	3.43	109	107	16	−23.89	6
PNB	0.99	0.6	0.5	−0.59	0.18	15.19	9.69	8.12	0	3.47	139.52	93.91	16.91	−20.82	6.45
Andhra Bank	9.98	3.04	3.9	3.06	0.96	15.27	4.98	6.34	4.91	1.53	23.04	7.67	10.82	8.6	2.56
UBI	0.69	0.47	0.46	0.33	0.12	13.75	10.03	9.71	6.65	2.36	38.93	27.99	28.05	20.42	8.08
IDBI	0.58	0.34	0.24	−0.97	−1.42	9.66	5.11	3.85	0	0	14.7	8	5.45	−21.77	−25.05
Vijaya Bank	0.52	0.30	0.30	0.26	0.48	14.29	7.37	7.41	5.84	10.25	9.41	7.64	5.11	4.44	7.57
Private Sector Banks															
Axis Bank	1.46	1.02	0.94	0.36	0.3	15.64	16.26	16.46	15.46	6.59	119.67	132.56	31	34.59	15.4
ICICI Bank	1.55	1.64	1.72	1.34	1.26	12.48	13.39	13.89	11.19	10.11	71.93	84.65	19.13	16.65	16.77
Kotak Bank	1.62	1.71	1.76	1.08	1.58	14.37	12.23	13.19	8.72	12.35	18.31	19.62	24.2	11.42	18.57
KVB	1.17	0.83	0.87	0.98	0.98	17.83	12.91	10.93	12.41	12.03	51.35	40.08	39.86	46.59	9.95
Yes Bank	1.31	1.48	1.47	1.53	1.54	22.39	22.71	17.16	18.41	15.09	36.53	44.92	49.34	60.62	78.89

Table 4. Profitability ratios of selected commercial banks.

Name of the Banks	Price Earnings Ratio					Net Profit Margin (%)				
	Public Sector Banks									
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
SBI	9.77	12.18	15.62	15.04	21.47	11.78	7.98	8.59	6.07	5.97
Canara Bank	6.14	5.06	6.54	−3.4	14.74	8.42	6.16	6.17	−6.38	2.71
Indian Bank	4.6	4.45	7.96	6.69	9.21	11.38	7.6	6.34	4.37	8.76
IOB	10.7	8.6	−11.63	−1.51	−1.71	2.74	2.65	−1.89	−12.31	−17.32
Bank of India	6.33	5.21	7.78	−1.21	−8.88	8.61	7.19	3.93	−14.56	−3.96
Bank of Baroda	5.98	7.04	10.65	−6.4	28.08	12.73	11.66	7.91	−12.24	3.27
PNB	5.15	8.03	8.99	−3.91	23.15	11.33	7.73	6.61	−8.38	2.8
Andhra Bank	4.09	8.47	7.47	6.43	22.75	9.98	3.04	3.9	3.06	0.96
UBI	5.66	5.07	5.78	6.14	18.76	8.58	5.77	5.55	4.19	1.69
IDBI	5.54	8.16	13.34	−3.33	−2.99	7.5	4.21	3.1	−13.06	−18.56
Vijaya Bank	5.63	5.19	9.2	7.25	8.91	6.46	3.88	3.58	3.15	6.06
	Private Sector Banks									
Axis Bank	10.85	10.77	18.38	13	31.87	19.05	20.29	20.73	20.06	8.26
ICICI Bank	12.59	13.23	15.37	12.09	14.98	20.77	22.2	22.76	18.44	18.09
Kotak Bank	17.34	19.2	28.15	59.38	47.01	16.91	17.13	19.19	12.75	19.27
KVB	8.74	8.91	13.67	95.33	112.31	12.97	8.39	8.6	10.42	10.77
Yes Bank	11.78	9.42	17.21	14.09	19.72	15.68	16.2	17.32	18.76	20.27

ROA during the year 2012 and thereafter they will be steep decrease in their ROA. It is observed from the table that the private banks have a better ROA than public banks. Their ROA is greater than one percent in the majority of the banks during the sample period.

On the other side, the return on equity (ROE) measures a bank's profitability by revealing how much profit a bank generates with the money shareholders have invested. The ROA have been decreasing over the period for all the public banks. The private banks provided better ROE than the public banks with an average of 14.16 percent.

The earnings per share (EPS) is the portion of a bank's profit allocated to each outstanding share of common stock. EPS can be negative if the bank is losing money. From the Table 3, it is clear that the majority of the public sector banks having negative EPS during the sample period. The reasons may include non-performing assets, reinvestment in a bank's operations, debt reduction and poor earnings. Most importantly, the commercial banks may decide to reinvest its profits in its development of new products or into core business assets. In this case, although it retains some of its earnings, the action does not signal the bank is in weak financial health. This reinvestment may lead to a higher EPS in the future. The private banks have given better EPS to its shareholders during the time period, although

their EPS recorded the decreasing trend. YES Bank is an exception in which it has increased its EPS gradually from 36.53 to 78.89.

A high net profit margin shows that a bank can convert their sales into profits. From Table 4, it is clear that the majority of the public banks show negative net profit margin and they are not able to convert their sales into profits. Another reason might be due to the expansion activities of these banks. The IOB and IDBI have shown a drastic decrease in the Net profit margin. The private banks experienced leaps and bounds in its profit margins. However, they are earning much better than their public counterparts from its sales. The ICICI bank earned 22.76 percent net profit margin in 2014 which was the highest. Generally, the banks with high P/E ratio suggest that investors are expecting higher earnings growth in the future compared to the banks with a lower P/E. The Table 4 shows that majority of the public sector banks has negative P/E ratio due to their negative EPS. Besides, the private banks found to have consistent P/E ratio and they are relatively better than the public sector banks during the study period.

Table 5 shows the turnover ratio of selected commercial banks. The asset turnover ratio can often be used as an indicator of the efficiency with which a bank is deploying its assets in generating revenue. The public banks have maintained a steady asset turnover ratio during the sample period. The private sector banks also had a consistent asset turnover ratio.

Table 5. Turnover ratio of selected commercial banks.

Name of the Banks	Total Assets Turnover Ratio				
	2012	2013	2014	2015	2016
Public Sector Banks					
SBI	0.08	0.08	0.08	0.08	0.07
Canara Bank	0.09	0.09	0.09	0.08	0.07
Indian Bank	0.09	0.09	0.08	0.08	0.08
IOB	0.18	0.11	0.09	0.08	0.08
Bank of India	0.08	0.07	0.07	0.07	0.06
Bank of Baroda	0.07	0.06	0.06	0.06	0.06
PNB	0.09	0.08	0.08	0.07	0.07
Andhra Bank	0.1	0.09	0.09	0.09	0.09
UBI	0.09	0.09	0.09	0.08	0.08
IDBI	0.08	0.08	0.08	0.08	0.08
Vijaya Bank	0.09	0.09	0.09	0.08	0.08
Private Sector Banks					
Axis Bank	0.09	0.08	0.08	0.08	0.08
ICICI Bank	0.08	0.08	0.08	0.08	0.07
Kotak Bank	0.11	0.10	0.10	0.11	0.09
KVB	0.10	0.10	0.10	0.1	0.09
Yes Bank	0.10	0.10	0.09	0.09	0.09

Table 6 depicts the solvency ratio of selected commercial banks. The solvency ratio is represented by the interest coverage ratio. It measures the margin of safety a bank has for paying interest during a given period. The higher ratio indicates the better position of the bank to meet its interest obligations. The Canara Bank, Bank of India, Bank of Baroda, PNB, IOB and IDBI have negative interest coverage ratio which shows that their current earnings are insufficient to service the company's current outstanding debt. The remaining public banks are also in a difficult position as their values are well below one. The private banks have relatively better interest coverage ratio than the public banks, despite the fact that their ratios lie below one.

Table 7 provides the capital adequacy ratio of selected commercial banks. The capital adequacy ratio (CAR) is a measure of a bank's capital. It is expressed as a percentage of a bank's risk weighted credit exposures. Minimum capital adequacy ratios are critical to make sure that banks have enough cushions to absorb a reasonable amount of losses before they become insolvent and consequently lose depositors' funds. The Basel III norms stipulated a capital to risk weighted assets of 8 percent. However, as per RBI norms, Indian scheduled commercial banks are required to maintain a CAR of 9 percent while Indian public sector banks are emphasized to maintain a CAR of 12 percent [27]. It is evident from

Table 6. Solvency ratio of selected commercial banks.

Name of the Banks	Interest Coverage Ratio				
	2012	2013	2014	2015	2016
Public Sector Banks					
SBI	0.26	0.19	0.20	0.13	0.13
Canara Bank	0.14	0.10	0.10	−0.09	0.05
Indian Bank	0.19	0.14	0.13	0.08	0.16
IOB	0.05	0.05	0.01	−0.21	−0.23
Bank of India	0.13	0.13	0.06	−0.26	−0.09
Bank of Baroda	0.20	0.20	0.18	−0.21	0.09
PNB	0.24	0.17	0.13	−0.18	0.06
Andhra Bank	0.19	0.07	0.17	0.08	0.03
UBI	0.17	0.10	0.12	0.07	0.01
IDBI	0.13	0.08	0.06	−0.23	−0.39
Vijaya Bank	0.08	0.05	0.04	0.02	0.10
Private Sector Banks					
Axis Bank	0.38	0.32	0.31	0.12	0.10
ICICI Bank	0.43	0.50	0.52	0.39	0.35
Kotak Bank	0.41	0.45	0.52	0.33	0.54
KVB	0.24	0.10	0.12	0.25	0.25
Yes Bank	0.32	0.32	0.36	0.42	0.47

Table 7. Capital adequacy ratio of selected commercial banks.

Name of the Banks	2012	2013	2014	2015	2016
Public Sector Banks					
SBI	12.92	12.96	12	13.12	13.11
Canara Bank	12.4	10.63	10.56	11.08	12.86
Indian Bank	13.08	13.10	12.86	13.20	13.64
IOB	11.85	10.78	10.11	9.66	10.50
Bank of India	11.02	9.97	10.73	12.01	12.14
Bank of Baroda	13.3	12.28	12.6	13.17	13.17
PNB	12.72	12.11	12.89	11.28	11.66
Andhra Bank	11.76	11.18	10.63	11.58	12.38
UBI	11.85	11.45	10.80	10.22	10.56
IDBI	13.13	11.68	11.76	11.67	10.70
Vijaya Bank	11.32	10.97	11.43	12.58	12.73
Private Sector Banks					
Axis Bank	17	16.07	15.09	15.29	14.95
ICICI Bank	18.74	17.7	17.02	16.64	17.39
Kotak Bank	16.05	18.83	17.17	16.34	16.77
KVB	14.41	12.6	14.62	12.17	12.54
Yes Bank	18.30	14.40	15.60	16.50	17.07

the table that the Indian public sector banks except the SBI, Indian Bank and Bank of Baroda had experienced a poor performance in maintaining the prescribed limit of CAR as per RBI norms. While the private banks show healthy capital adequacy ratios during the sample period.

For determining whether there is any significant mean difference between the financial ratios of selected public sector and private sector banks, we applied one-way ANOVA test and the results are presented in Table 8. It is clear from the table results that the F-statistics for the financial ratios except Capital Adequacy Ratio (CAR) are found to be statistically significant. Hence the null hypothesis of no mean differences in the respective financial ratios of selected private and public sector banks is rejected and alternative hypothesis is accepted. Therefore, the financial performance of public and private bank groups regarding these ratios is different during the study period.

In order to examine the impact of liquidity, solvency and efficiency on the profitability of selected commercial banks, the fixed effect (FE) model and random effect (RE) model were employed. Table 9 presents the fixed effect and random effect estimates for the selected public sector banks. First and foremost, as far as selection of an appropriate model is concerned, the table provides the results of Hausman specification test (FE versus RE) which are applied to specify an appropriate model for our panel data. Under the panel data estimations, the

Table 8. One-way ANOVA results for the financial ratios of the selected commercial banks.

Variables		Sum of Squares	df	Mean Square	F Statistics	Prob. Value
		Liquidity Ratios				
CR	Between Groups	0.009	1	0.009		
	Within Groups	0.051	78	0.001	13.350*	0.000
	Total	0.060	79			
QR	Between Groups	932.034	1	932.034		
	Within Groups	4455.366	78	57.120	16.317*	0.000
	Total	5387.399	79			
LDR	Between Groups	5521.779	1	5521.779		
	Within Groups	22,472.899	78	288.114	19.165*	0.000
	Total	27,994.679	79			
		Profitability Ratios				
ROA	Between Groups	7.875	1	7.875		
	Within Groups	138.854	78	1.780	4.424**	0.039
	Total	146.730	79			
ROE	Between Groups	922.549	1	922.549		
	Within Groups	1595.199	78	20.451	45.110*	0.000
	Total	2517.749	79			
EPS	Between Groups	6694.575	1	6694.575		
	Within Groups	152,652.252	78	1957.080	3.421***	0.068
	Total	159,346.827	79			
PER	Between Groups	5840.041	1	5840.041		
	Within Groups	20,005.479	78	256.481	22.770*	0.000
	Total	25,845.520	79			
NPM	Between Groups	3163.345	1	3163.345		
	Within Groups	3509.930	78	44.999	70.298*	0.000
	Total	6673.275	79			
		Turnover Ratio				
TATR	Between Groups	0.001	1	0.001		
	Within Groups	0.018	78	0.000	5.011**	0.028
	Total	0.019	79			
		Solvency Ratio				
ICR	Between Groups	1.341	1	1.341		
	Within Groups	1.456	78	0.019	71.857*	0.000
	Total	2.797	79			
		Capital Adequacy Ratio				
CAR	Between Groups	69.701	1	69.701		
	Within Groups	20,232.931	78	259.397	0.269	0.606
	Total	20,302.632	79			

Notes: *, ** and ***denote the significance at the one, five and ten per cent level, respectively.

Table 9. Fixed effect and random effect estimates for the selected public sector banks.

	Dependent Variable: ROA					
Variables	Fixed Effect (FE)	t-statistics	Prob. Value	Random Effect (RE)	Z-statistics	Prob. Value
QR	0.1189	2.77*	0.008	0.0856	2.58*	0.010
TATR	12.011	1.10	0.278	8.3932	0.84	0.399
ICR	4.3919	3.74*	0.001	4.7052	4.26*	0.000
CAR	−0.1862	−0.98	0.332	−0.0161	−0.81	0.419
C	−0.4466	−0.14	0.892	−2.3526	−1.91***	0.056
Hausman test		-			8.43* (0.000)	

Notes: * and *** denote the significance at the one and ten per cent level, respectively. ()—values in the brackets indicate probability value.

dependent variable ROA is regressed with independent variables, *viz.* QR, TATR, ICR and CAR. The null hypothesis for Hausman test is that there is no correlation between unique errors and the regressors. It implies that both FE and RE estimates are unbiased, but RE model is more efficient than FE model. So if null fails to be rejected, then RE model would be appropriate. The Hausman test statistics under the RE model found to be statistically significant at one percent level, implying that RE model can be rejected and hence FE model is preferred over RE model. It can be concluded that the FE model is considered better than RE model, and is the best panel data approach for explaining the ROA regression results. The empirical findings from the fixed effect model reveal that the quick ratio (QR) is found to be positive and statistically significant at one percent level, implying that one unit change in quick ratio will leads to 0.118 unit change in return on asset (ROA). Besides, the interest coverage ratio (ICR) is found to be positive and statistically significant at one percent level, implying that one unit change in interest coverage ratio will leads to 4.391 unit change in return on asset (ROA). It can be suggested that the liquidity and solvency, represented by the quick ratio and interest coverage ratio respectively, plays a significant role in determining the profitability of the selected public sector banks.

Table 10 exhibits the fixed effect and random effect estimates for the selected private sector banks. The Hausman test statistics under the RE model found to be statistically insignificant, implying that RE model cannot be rejected and hence RE model is preferred over FE model. The empirical findings from the random effect model reveal that the total asset turnover ratio (TATR) is found to be positive and statistically significant at one percent level, implying that one unit change in quick ratio will leads to 9.056 unit change in return on asset (ROA). Besides, the interest coverage ratio (ICR) is found to be positive and statistically significant at one percent level, implying that one unit change in interest coverage ratio will leads to 2.773 unit change in return on asset (ROA). The results confirmed that the turnover and solvency, represented by the total asset

Table 10. Fixed effect and random effect estimates for the selected private sector banks.

	Dependent Variable: ROA					
Variables	Fixed Effect (FE)	t-Statistics	Prob. Value	Random Effect (RE)	Z-Statistics	Prob. Value
QR	−0.0047	−1.37	0.190	−0.0032	−0.76	0.446
TATR	15.473	3.10*	0.007	9.0567	3.01*	0.003
ICR	2.7737	8.91*	0.000	2.7249	8.47*	0.000
CAR	0.0213	0.86	0.403	0.0046	0.19	0.847
C	−1.3421	−2.41**	0.028	−0.5040	−1.07	0.285
Hausman test		-		1.72 (0.7869)		

Notes: * and **denote the significance at the one and five per cent level, respectively. ()—values in the brackets indicate Probability value.

turnover ratio and interest coverage ratio respectively, plays a significant role in determining the profitability of the selected private sector banks.

5. Conclusions

The present study attempts to evaluate the financial performance of selected Indian commercial banks for the period from 2012/13 to 2016/17. The study comprises 16 commercial banks, 11 representing public sector and 5 from private sector, and the financial performances of these banks are analysed using the financial ratios. The liquidity ratio, represented by the current ratio and loans to deposit ratio, are found to be relatively better in the case of private sector banks. However, the quick ratios of private and public sector banks show leaps and bounds throughout the study period. With respect to profitability ratio, it is observed that the private banks have a better ROA, ROE, P/E ratio and EPS than the public banks. However, the private banks experienced leaps and bounds in its profit margins and the public sector banks have maintained a steady asset turnover ratio throughout the study period. The private banks are found to be relatively better than the public sector banks with respect to solvency ratio and capital adequacy ratio.

The study shows that the financial performances of selected private sector banks are relatively better than the public sector banks throughout the sample period. In addition, the study examines the impact of liquidity, solvency and efficiency on the profitability of the selected Indian commercial banks by employing the panel data estimations, *viz.* the Fixed Effect and Random Effect models. The empirical results from the panel data estimations revealed that the liquidity ratio and solvency ratio, and the turnover ratio and solvency ratio are found to have positive and significant impact on the profitability of selected public sector and private sector banks, respectively, bearing testimony to the fact that profitability is a function of those ratios.

Due to immense competition, the policy changes and the operational environment in which the Indian banking system is presently operating, there has been

an increased focus on liquidity, solvency, operational efficiency and profitability among the selected private sector banks. Most of the selected public sector banks have registered a significant improvement in their asset turnover ratio and profit margins, but the selected private sector banks continue to have still better profitability, liquidity, solvency and healthy capital adequacy ratios.

Most importantly, the increasing level of non-performing assets (NPAs) is the most challenging task faced by the Indian banking system, especially public sector banks, and the same need to be addressed aptly. More Debt Recovery Tribunals (DRTs) should be established and no loan waivers under any circumstances to be undertaken. Besides, the vibrant policy measures have to be implemented to enhance the operational efficiencies of the selected public sector banks to merge the large number of unremunerative or loss making branches. Branches with low productivity and excess staffing and old traditional methods of operations have to be replaced by strategic moves to gain competitive advantage. It is suggested that the public sector banks should take necessary steps to enhance their liquidity and solvency position to amplify their profitability. The private banks should escalate their turnover and solvency position to augment their profits.

6. Limitation of the Study

The analysis and derived conclusions are based on the secondary data sources for the limited period. Besides, the present study is confined to bank-specific determinants of profitability (liquidity ratio, profitability ratio, turnover ratio, solvency ratio and capital adequacy ratio) and the external factors such as gross domestic product, inflation, stock market capitalization, etc. are not taken into consideration. Hence there is scope for further research pertaining to the subject with the inclusion of external factors in the model. Also the study can be extended for non-banking financial companies (NBFCs).

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Appendix

S. No.	Financial Ratio	Description	Formula
1.	Current Ratio	The current ratio is a liquidity ratio that evaluates a bank's capacity to pay short-term and long-term obligations. A ratio below 1 show that bank's liabilities are greater than its assets and suggest that the bank not able to pay off its obligations.	Current Ratio = Current Assets/Current Liabilities
2.	Quick Ratio	The quick ratio is also a liquidity ratio that represents the bank's short-term liquidity. It evaluates the bank's ability to meet its short-term obligations with its most liquid assets.	Quick Ratio = (Cash + accounts receivables + marketable securities)/Total Current Liabilities
3.	Loan to Deposit Ratio	The loan-to-deposit ratio (LTD) is also a commonly used statistic or assessing a bank's liquidity by dividing the bank's total loans by its total deposits.	Loans to Deposit Ratio = Loans/Deposits
4.	Return on Assets	Return on assets (ROA) is a profitability ratio that indicates how profitable a bank is relative to its total assets.	Return on assets = Net Income/Total Assets
5.	Return on Equity	Return on equity is commonly used profitability ratio that measures a bank's profitability by revealing how much profit a bank generates with the money shareholders have invested.	Return on Equity = Net Income/Shareholder's Equity
6.	Earnings Per Share	Earnings Per Share (EPS) measures the fraction of a bank's profit allocated to each outstanding share of common stock. EPS acts as an indicator of a bank's profitability.	Earnings Per Share = (Net Income − Dividends on Preferred Stock)/Average Outstanding Shares
7.	Net Profit Margin	Another measure of profitability ratio is the net profit margin measured by the ratio of net profits to revenues for a bank.	Net Profit Margin = Net Profit/Revenue
8.	Total Asset Turnover Ratio	Asset turnover ratio is the ratio of the value of a bank's sales or revenues generated relative to the value of its assets. The Asset Turnover ratio can often be used as an indicator of the efficiency with which a bank is deploying its assets in generating revenue.	Asset Turnover = Sales or Revenues/Total Assets
9.	Price Earnings Ratio	The price-earnings ratio (P/E ratio) is the ratio for valuing a bank that measures its current share price relative to its per-share earnings. A high P/E suggests that investors are expecting higher earnings growth in the future compared to banks with a lower P/E.	P/E Ratio = Market Value Per Share/Earnings Per Share
10.	Capital Adequacy Ratio	Capital Adequacy Ratio (CAR) is the ratio of a bank's capital in relation to its risk weighted assets and current liabilities. It is determined by RBI to thwart commercial banks from taking surplus leverage and becoming insolvent.	Capital Adequacy Ratio = (Tier I + Tier II + Tier III (Capital funds)/Risk weighted assets The risk weighted assets take into account credit risk, market risk and operational risk. The Basel III norms stipulated a capital to risk weighted assets of 8%. However, as per RBI norms, Indian scheduled commercial banks are required to maintain a CAR of 9% while Indian public sector banks are emphasized to maintain a CAR of 12%.
11.	Interest Coverage Ratio	Interest coverage ratio can be classified as a Solvency Ratio—which helps to understand if the organization is solvent and whether there are any near threats pertaining to bankruptcy. The interest coverage ratio is a measure of the number of times a bank could make the interest payments on its debt with its earnings before interest and taxes, also known as EBIT. The lower the interest coverage ratio implies the higher the bank's debt burden and the greater the chance of bankruptcy or default. The higher the interest coverage ratio represents the less the chance of default.	Interest Coverage Ratio = EBIT/Interest Expenses