Ushus-Journal of Business Management
2024, Vol. 23, No. 2, *39-54*
ISSN 0975-3311 | https://doi.org/10.12725/ujbm.67.4

Impact of Technology on the Financial Performance of Indian Commercial Banks

S. Jayalakshmi* and R. Mythili*

Abstract

The banks' freedom to choose their capital structure is restricted by the capital adequacy rules. The implementation of the capital adequacy ratio may have a detrimental effect on the banks' profitability. Since debt repayment imposes restraint on managers' behaviour, It has been argued that when capital ratios are larger, agency costs between managers and shareholders typically increase.. However, the improved monitoring required by the capital adequacy rules and the larger surplus brought about by a positive bank-borrower relationship will have a favourable effect on the banks' profitability. Indian banking. stated that in terms of cost and profit efficiencies, Indian public sector banks were more effective than private and foreign banks. The use of technology enabled banks to create their own websites that their clients may view from the comfort of their homes or offices using web browsers.

Keywords: commercial banks, Information and Communication Technology (ICT), financial performance, Total Bank Automation (TBA).

Introduction

Since banks' assets and loans have a range of maturities, solvency and liquidity are crucial. Banks are inherently exposed to liquidity risk because their primary function is to convert liquid deposit (liabilities)

* Department of Commerce, St Thomas College of Arts & Science, Koyambedu, Chennai; drsjayalakshmi@gmail.com; mythili.rajsekar@gmail.com

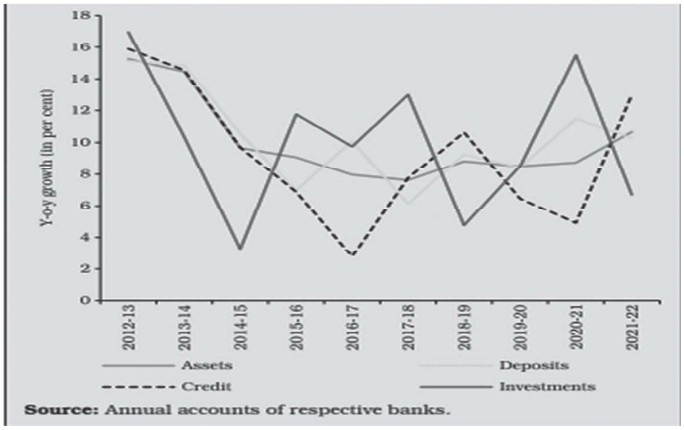
into illiquid assets like loans. Since a lack of liquidity can lead to insolvency and poor financial performance, managing liquidity is a crucial goal for commercial banks. Lack of liquidity is a sign that a banking system is experiencing a liquidity crisis. The bank's ability to handle its short-term liability is made evident through liquidity. In other words, liquidity management demonstrates how effectively a bank handles its short-term requirements and invests the money to increase the organization's profitability. As a result, a bank's optimal level of liquidity ensures that it can pay its short-term debts, and a successful firm can guarantee proper flow management. Furthermore, because the liabilities exceed the assets, illiquidity will result in insolvency and bankruptcy.

In a bank's capital structure, the relationship between owner's money and borrowed funds is represented by "solvency." For the purpose of funding the bank's overall assets, operations, and financial expansion, it consists of debt and common equity. The banks' freedom to choose their capital structure is restricted by the capital adequacy rules. The implementation of the capital adequacy ratio may have a detrimental effect on the banks' profitability. Since debt repayment imposes restraint on managers' behaviour it has been asserted that greater capital ratios tend to increase agency costs between managers and shareholders. However, the improved monitoring required by the capital adequacy rules and the larger surplus brought about by a positive bank-borrower relationship will have a favourable effect on the banks' profitability.

Operations and Performance of Commercial Banks

Balance Sheet Analysis Following a seven-year hiatus, scheduled commercial banks' (SCBs') consolidated balance sheet saw double-digit expansion in 2021–2022. (Chart 1). Deposit expansion reduced from the year prior's COVID-19-related spike in preventive measures. The liabilities side was strengthened by a two-year break in borrowing before a resurgence. The primary development in terms of assets was the year-over-year strengthening of the credit pick-up. Simultaneously, investments decreased.

Chart 1: Select Aggregates of SCBs



Source: Annual accounts of respective banks.

Table 1: Consolidated Balance Sheet of Scheduled Commercial Banks

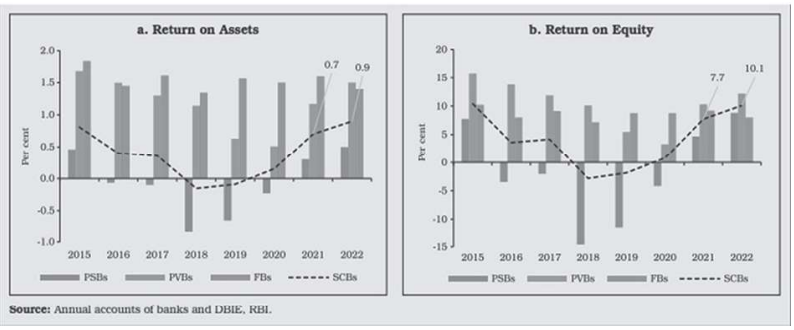
Consolidated Balance Sheet of Scheduled Commercial Banks (Excluding Regional Rural Banks)					
(₹ Crore)					
Year (end-March)	Liabilities				
	Capital	Reserves & Surplus	Deposits	Borrowings	Other Liabilities and Provisions
1	2	3	4	5	6
2010-11	58975	450944	5615874	675527	382077
2011-12	63664	544898	6453549	843774	415006
2012-13	70310	638603	7429677	1010385	440976
2013-14	76067	729832	8533173	1101297	535559
2014-15	81839	822798	9433838	1149939	548578
2015-16	88222	913080	10092651	1448764	586571
2016-17	99292	1010786	11111448	1280708	672372
2017-18	116127	1079770	11794005	1682309	582822
2018-19	154427	1176531	12886643	1709670	673775
2019-20	190802	1282208	13975045	1696120	870250
2020-21	188109	1495289	15590600	1474890	845729

Year (end-March)	Assets						Total Liabilities/ Assets
	Cash and Balances with RBI	Balances with Banks and Money at Call and Short Notice	Invest-ments	Loans and Advances	Fixed Assets	Other Assets	
1	7	8	9	10	11	12	13
2010-11	458783	184082	1923633	4297488	54092	265320	7183398
2011-12	373746	243676	2233903	5073559	56690	339316	8320890
2012-13	375174	334879	2613051	5879773	63120	323956	9589952
2013-14	471728	406304	2883262	6735213	75605	403817	10975929
2014-15	528503	458292	2977592	7388160	80460	603984	12036992
2015-16	563917	524812	3327835	7896467	112059	704199	13129288
2016-17	680542	737427	3652284	8116109	150685	837560	14174606
2017-18	730330	594797	4126237	8745997	141874	915797	15255033
2018-19	698616	663494	4322464	9676183	149137	1091153	16601045
2019-20	765720	787563	4689842	10301897	150775	1318629	18014425
2020-21	897426	1032102	5419866	10820208	152894	1272121	19594617
Source : Reserve Bank of India.							

Financial Performance

Banks were better prepared to handle the pandemic thanks to increased transparency in asset recognition and higher capital and provision buffers. Improved credit monitoring procedures and portfolio diversification supported their balance sheets and helped stop slippages. Consequently, the profitability of SCBs is determined by ROA (return on assets) and ROE (return on equity).

Chart-2: Profitability Ratios
(At end-March)



Source: Annual accounts of banks and DBIE, RBI.

Table 2: 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

Table 3: 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

Return on Asset for the year 2012 and year thereafter will be significantly lower. The table shows that private banks outperform public banks in terms of return on assets. For the duration of the study period, most banks had a Return On Asset of more than one percent. Conversely, a bank's profitability is gauged by its return on equity (ROE), which shows how much money it makes off of the capital that shareholders have invested. For all public banks, the Return On Asset has been declining over the time. Earnings per share, or EPS, is the portion of a bank's profit allocated to each outstanding share of

common stock.. If the bank is losing money, the EPS may be negative. Table 2 makes it evident that during the study period, the majority of public sector banks had negative earnings per share. Non-performing assets, investments in a bank's operations, debt reduction, and subpar earnings are a few possible explanations. Most significantly, commercial banks have the option to reinvest their earnings back into core business assets or into the creation of new products. In this instance, the bank does not appear to be in poor financial standing even if it keeps a portion of its profits. In the future, this reinvestment might result in a greater EPS.

A bank's ability to turn revenues into profits is demonstrated by a high net profit margin. Table 3 makes it evident that most public banks have negative net profit margins and are unable to turn a profit on their sales. These banks' expansion initiatives could be another factor. The net profit margin has drastically decreased, according to the IOB and IDBI.

Technology Trends in Indian Banking Sector

Bank operations around the world have evolved as a result of information and communication technology, or ICT. The 1980s saw the introduction of Advanced Ledger Posting Machines (ALPM), which marked a significant breakthrough. Customers received services devoid of errors as a result of the massive automation at the branch level, which decreased errors. Following the implementation of Total Bank Automation (TBA) for In the late 1980s, automated cheque processing systems employing Magnetic Ink Character Recognition (MICR) technology were invented, allowing for both front-end and back-end operations within the same branch. Reforms in the financial sector and the development of the internet enabled banks to choose low-cost networks by centralising databases across all of their branches. ATMs, phone banking, and internet banking were implemented by new private sector banks and international banks very early on, and were eagerly followed by the public sector banks.

The use of technology enabled banks to create their own websites that their clients may view from the comfort of their homes or offices using web browsers. Online banking was first introduced in 1996, but

usage grew after 1999 as a result of decreased ISP online fees, a rise in PC penetration, and technological stabilisation (Shroff, 2004). Among the most significant electronic delivery methods are ATMs, debit and credit cards, mobile banking, and telebanking, which offers around-the-clock access to financial services. Real Time Gross Settlement (RTGS) was introduced in 1999 as a result of INFINET's establishment. Online banking has thus been made possible by the internet . It led to adherence to the fundamental rules for the Bank of International Settlements' (BIS) systemically critical payment systems. It also cleared the path for risk-free, credit push-based financial transfers that are resolved in real time. Another innovation that efficiently produces the strategic information needed by management for ongoing strategic decision-making, such as branch and product line expansion, market strengthening, credit risk assessment, etc., is data warehousing (Paulraj, 2001).

In 2006–07, the commercial banks in particular, as well as the financial sector as a whole, combined their IT-based initiatives. The construction of data centres, the move towards centralised systems, and the widespread deployment of core banking systems throughout bank branches are this year's main developments. Another piece of legislation passed in December 2007 was the Payment and Settlement Systems Act, 2007 (PSS Act). Since then, the Reserve Bank has granted authorization to companies that manage payment systems for prepaid cards, ATM networks, cross-border inbound money transfers, card schemes, and centralised clearing services. Non-cash payment methods are now more widely accepted and used as a result of the Reserve Bank of India's payment system initiatives.

Research Methodology

Statement of the Problem

Numerous studies on the operations of banks in India and beyond have been conducted. But recent developments and patterns in the Indian banking sector, particularly the bad loans that are stressed on PSUSs, have increased the importance of evaluating banks' performance. Therefore, more research on bank performance is still required as it will highlight emerging tendencies in the way banks operate. The current investigation will close the knowledge gap

regarding the banks' most recent performance. The study will make banks' financial performance transparent. The business's potential, the management's financial interests, and the dependability of current or potential contractors are all determined by the financial performance. As a result, management, shareholders, the general public, and regulators can all benefit from financial performance research and the identification of their strengths and weaknesses utilising financial performance indicators. Moreover, the goal of financial analysis is to evaluate the data in the financial statement in order to assess the banks' potential for future earnings, profitability, and dividend payments.

Objectives of the Study:

i) Determine the profitability performance of Indian public sector banks.

ii) To examine the expansion of Indian public sector banks.

iii) To assess the state of technology adoption in the banking industry in India.

iv) To examine how the banking industry in India performs in relation to the adoption of information technology.

Methodology of the Study

All of the study's foundation comes from secondary data. The Reserve Bank of India website and financial periodicals, among other secondary sources, provided the data that were gathered from. This study examines the profitability status of several public sector banks by taking net profit into account. The Mean and Standard Deviation were the instruments utilised in this study.

Review of Literature

In order to assess the liquidity position of all Indian public sector banks, Dasgupta M. et al. (2018) conducted a study titled "An Empirical Assessment on Liquidity Management of Indian Public Sector Banks". The information was gathered through secondary sources during a 17-year period, from 2000 to 2016, and the sample size included all 23 public sector banks. In this study, various ratios

were employed together with the ANOVA and Jarque Bera tests to determine the banks' liquidity positions. Except for Canara Bank and Corporation Bank, the results indicated that other public sector banks' liquidity positions were unstable during the study period.

The study "Impact of Liquidity Risk on Profitability - A Case Study of Bank of Baroda" was conducted by Muthumoni A. et al. in 2017. The goal was to determine the factors that affect liquidity risk and how they affect Bank of Baroda's profitability. Descriptive statistics and a regression model were employed for the analysis and interpretation of the data, which covered the 10-year period from 2006–07 to 2015–16. The following are regarded as independent variables: size of the bank/total assets, non-interest expenses to total assets, and equity to asset ratio factors, while Return on Assets (ROA) is considered a dependent variable in the study. The conclusion of this paper demonstrates that liquidity risk affects profitability in a statistically significant way.

Diep & Nguyen (2017) investigated "Determinants of Liquidity of Commercial Banks in Vietnam in the period 2009 - 2016" to learn more about these factors and how they affect commercial banks in Vietnam. To accomplish the aforementioned goal, secondary data collected between 2009 and 2016 were analysed using correlation and regression techniques with the ordinary least square approach. According to the study's findings, the liquidity of commercial banks in Vietnam is significantly influenced by factors including the size of the bank, the percentage of capital to assets, and the ratio of total loans to total deposits. One factor, the size of banks, has a positive effect on liquidity, but the ratio of total loans to total deposits and the capital-to-asset ratio are both negative two determinants have negative impact on liquidity.

A study entitled "Liquidity Management and Its Impact on Banks' Profitability: A Perspective of Pakistan" was conducted by Nabeel & Hussain in 2017. The study tries to assess how Pakistani banks' liquidity management has altered their profitability. Ten banks were included in the sample, and data from secondary sources for the 10 years between 2006 and 2016 were gathered. Profitability is indicated by return on assets (ROA), return on equity (ROE), and

earnings per share (EPS) and is reflected by the current ratio, quick ratio, cash, capital adequacy, and interest coverage ratios all comprise the liquidity ratio. To study the nature of the relationship between liquidity and profitability, statistical approaches such descriptive statistics, correlation, and regression analysis were applied.

The conclusion of this article demonstrated a beneficial relationship between bank profitability and liquidity management. In-depth analysis of the results revealed a positive correlation between profitability and liquidity indicators such interest coverage, capital adequacy, and quick ratio, and a negative correlation between profitability and cash and current ratio. examined the factors that affect bank profitability in India and discovered that the profit margins have declined as a result of rising competition and the transformation of Indian banking. stated that in terms of cost and profit efficiencies, Indian public sector banks were more effective than private and foreign banks.

Beccalli (2006) examined the effects of higher information technology investment on the profitability performance of banks in France, Germany, Italy, Spain, and the United Kingdom using data from 737 institutions spanning the years 1993 through 2000. The research employed data from the income statement and balance sheet, resulting in a combined total of 4414 observations. Hardware, software, and service expenses have been utilised as investment variables, and ROA and ROE have been utilised as performance variables. The analysis discovered no connection between increased profitability and total information technology spending. Investigating the same problem in the US banking sector, Carlson (2001) came to the same conclusion by regressing a bank's ROE on a set of controlled factors, which included an explanatory binary variable for the existence or absence of internet banking.

Analysis of the Study

This study gathered the net earnings of all public sector banks and used statistical tools like mean and standard deviation to analyse these institutions' growth.

Table 3: Net profit of public sector Banks in India

	NET PROFIT (Rs.cores)									
NAME OF THE BANK	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
SBI	9,166	2,651	11,707	14,105	10,891	13,102	11589.36	-1382.68	-6547.45	862.23
ALLAHABAD BANK	1,206.30	1,423.10	1,866.80	1,185.20	1,172	621	-743.31	-313.52	-4674.37	-8333.96
ANDHRA BANK	1,045.80	1,267.10	1,344.70	1,289.10	435.6	638	539.84	174.33	-3412.53	-2786.13
BANK OF BARODA	3,058.30	4,241.70	5,007.00	4,480.70	4,541.10	3,398	-5359.54	1383.14	-2431.81	433.52
BANK OF INDIA	1,741.10	2,488.70	2,677.50	2,749.30	2,729.30	1,708.90	-6089.21	-1558.31	-6043.71	-5546.9
BANK OF MAHARASHTRA	440	330.4	430.8	7,595	386	450.7	100.68	-1372.51	-1145.65	-4783.88
CANARA BANK	3,021.40	4,025.90	3,282.70	2,872.10	2,438.20	2,702.60	-2812.82	1121.92	-4222.24	347.02
CENTRAL BANK OF INDIA	1,058.20	1,252.40	533	1,015.00	-1262.8	606.4	-1418.19	-2439.1	-5104.9	-5641.48
CORPORATION BANK	1,170.30	1,413.30	1,506.00	1,434.70	561.7	584	-506.48	561.21	-4053.94	-6332.98
DENA BANK	511.3	611.6	803.1	810.4	551.7	265.5	-935.32	-863.62	-1923.15	-6338.68
INDIAN BANK	1,555.00	1,714.10	1,747.00	1,581.10	1,158.90	1,005.20	711.38	1405.68	1258.99	321.95
INDIAN OVERSEAS BANK	707	10,725	1,050.10	567.2	601.7	-454.3	-2897.33	-3416.74	-6299.49	-3737.88
ORIENTAL BANK OF COMMERCE	1,134.70	1,502.90	1,141.60	1,327.90	1,139.40	497.1	156.08	-1094.07	-5871.74	54.99
PUNJAB & SIND BANK	5,088	526.20	451.3	339.2	300.6	121.3	335.97	201.08	-743.8	-543.48
PUNJAB NATIONAL BANK	3,905.40	4,433.50	4,884.20	4,747.70	3,342.60	3,061.60	-3974.4	1324.8	-12282.8	-9975.49
SYNDICATE BANK	8,133	1,047.90	1.313.4	2,004.40	1,711.50	1,522.90	-1643.49	358.95	-3222.84	-2588.29
UCO BANK	1,012.20	906.5	1,108.70	6,182	1,510.50	1,137.80	-2799.26	-1850.67	-4436.37	-4321.08
UNION BANK OF INDIA	2,074.90	2,081.90	1,787.10	2,158	1,696.20	1,781.60	1351.6	555.21	-5247.37	-2947.45
UNITED BANK OF INDIA	322.4	524	632.5	3,919	-1,213.40	256	-281.96	219.51	-1454.45	-2315.93
VIJAYA BANK	507.3	523.8	581	586	415.9	439.4	381.8	750.49	727.02	-2434.11

Table 4: Mean and Standard Deviation of Net Profit of Public Sector Banks in India

Name of the Bank	Mean (Rs. Crores)	Standard Deviation (Rs. Crores)
SBI	6614	7146.62
ALLAHABAD BANK	-654	3295.47
ANDHRA BANK	54	1714.89
BANK OF BARODA	1875	3435.71
BANK OF INDIA	-514	3922.56
BANK OF MAHARASHTRA	243	3055.51
CANARA BANK	1278	2756.9
CENTRAL BANK OF INDIA	-1140	2556.31
CORPORATION BANK	-366	2669.21
DENA BANK	-651	2200.4
INDIAN BANK	1246	460.54
INDIAN OVERSEAS BANK	-351	4597.67
ORIENTAL BANK OF COMMERCE	-1	2207.56
PUNJAB & SIND BANK	608	1629.53

PUNJAB NATIONAL BANK	-53	6409.64
SYNDICATE BANK	814	3362.77
UCO BANK	-155	3235.96
UNION BANK OF INDIA	529	2540.75
UNITED BANK OF INDIA	61	1674.81
VIJAYA BANK	248	950.24

Information Technology Index

Using the discrete technology factors that were previously examined, a technology index is created to determine the overall technology parameter. Normalised technology variables are obtained by taking these technology parameters and applying a meaningful denominator. The technology index is then calculated using these variables.

Table 5 displays the information technology index by bank group for various years. The information technology index for each bank group has improved over time, as the table generally shows.

Table-5

Information Technology Index (Bank group Wise)

Bank Group	1999-2000	2006-2007	2014-2015	Growth Rate (from 1999-2006) %	Growth Rate (from 2007-2014) %	Pre E-Banking Revolution Period Average (1999-2006)	Pre E-Banking Revolution Period Average (2007-2014)	Average Productivity Gap
NB	0.017	0.150	1.000	785.57	566.73	0.072	0.430	0.358
SBI	0.015	0.097	0.956	546.72	886.81	0.050	0.446	0.396
OPS	0.015	0.119	0.951	701.47	701.85	0.059	0.408	0.349
NPS	0.076	0.237	0.922	211.26	288.39	0.140	0.472	0.332
FB	0.132	0.528	0.945	299.77	78.94	0.321	0.766	0.445

The Technology Index measures how much technology is adopted and used by banks. With an average IT index value of.321, the FB group led the pre-e-banking era. NPS, NB, OPS, and SB groups came next, with average IT index values of.14,.07,.059, and.05, respectively. This ranking, however, was altered to FB, NPS, SB, NB, and OPS following the e-banking period, with average IT index values of.766,.472,.446,.430, and.408, respectively.

Summary of Findings

- The average amount of net profit is highest in case of SBI i.e. Rs 6614crores and next to SBI Bank of Baroda stood second i.e. Rs1875 crores.
- The lowest average amount of net profit is found in Andhra Bank i.e. Rs 54 crores.
- The negative mean is observed in case of Central Bank of India i.e Rs -1140 crores and next to it Allahabad bank showed negative average amount of net profit i.e. Rs - 654 crores More deviation is observed in SBI when compared to other banks i.e 7146.62 crores and next to that Punjab National Bank.
- Lower variation in net profit is found in Indian Bank i.e 460.54 crores.

Conclusion

The study demonstrates that during the course of the sample period, the financial performances of a few private sector and commercial banks were generally superior to those of public sector banks. The analysis and conclusions drawn from it are based on secondary data sources for a short time. Additionally, the current analysis is limited to factors that specifically affect profitability in banks.

The analysis of technological factors leads to the general conclusion that the Indian banking model is characterised by the opening of established private and public sector banks to fierce competition from new private and international banks equipped with cutting edge technology. Public sector and older private sector banks were encouraged to upgrade their technological foundations by this competitive climate, and their size, scope, and distribution offered them an advantage. The adoption of technology in Indian banks, both public and commercial, is a little delayed, but it is resilient and huge in scale. The system is currently implementing technology in a transitory manner.

References

1. Bamadeb Mishra, Dr. Rabindra Kumar Swain,(2020), "Exploring the impact of liquidity management on profitability:evidence from commercial banks of india", Dogo Rangsang Research Journal UGC Care Group I JournalISSN : 2347-7180 Vol-10 Issue-08 No. 03 August 2020.
2. Bodla, B.S. and Verma, R. (2006) Determinants of Profitability of Banks in India: AMultivariate Analysis. Journal of Service Research, 6, 75-89.
3. Calomiris, C.W. and Kahn, C.M. (1991) The Role of Demandable Debt in Structuring Optimal Banking Arrangements. American Economic Review, 81, 497-513.
4. DasGupta, M., & Biswas, P. R. (2018). An Empirical Assessment on Liquidity Management of Indian Public Sector Banks. International Journal of Banking, Risk and Insurance, 6(1), 1.
5. Diep, N. T. N., & Nguyen, T. (2017). Determinants of Liquidity of Commercial Banks in Vietnam in the Period 2009-2016. International Journal of Scientific Study, 5(6), 237-241.
6. Goel, U., Chadha, S. and Sharma, A.K. (2015) Operating Liquidity and Financial Leverage: Evidences from Indian Machinery Industry. Procedia-Social and Behavioral Sciences, 189, 344-350. https://doi.org/10.1016/j.sbspro.2015.03.230
7. Haque, A. (2014) Comparison of Financial Performance of Commercial Banks: A Case Study in the Context of India (2009-2013). Journal of Finance and Bank Management, 2, 1-14.
8. Hirigoyen, G. (1985) Rentabilité et solvabilité. Direction et Gestion, 3, 13-26.
9. Holmstrom, B. and Tirole, J. (1997) Financial Intermediation, Loanable Funds, and the Real Sector. The Quarterly Journal of Economics, 112, 663-691. https://doi.org/10.1162/00335 5397555316.
10. K.V.S.Gayathri , M.Chandraiah, (2020), "A Study On Financial Performance of Indian Commercial Banks", International Journal of Scientific and Research Publications, Volume 10, Issue 2, February 2020 363 ISSN 2250-3153.

11. Maheshwari, N. and Agarwal, N. (2013) Evaluating Financial Performance of SBI through Financial Ratios. Indian Journal of Finance, 7, 34-44.
12. Makkar, A. and Singh, S. (2013) Analysis of the Financial Performance of Indian Commercial Banks: A Comparative Study. Indian Journal of Finance, 7, 41-49.
13. Molyneux, P. and Thornton, J. (1992) Determinants of European Bank Profitability: A Note. Journal of Banking and Finance, 16, 1173-1180. https://doi.org/10.1016/0378-4266(92)90065-8.
14. Muthumoni, D., & Raj, R. (2017). Impact of Liquidity Risk on Profitability–A Case Study of Bank of Baroda. International Journal of Research in Economics and Social Sciences (IJRESS), 7(9).
15. Nabeel, M., & Hussain, S. M. (2017). Liquidity management and its impact on banks profitability: A perspective of Pakistan. International Journal of Business and Management Invention, 6(5), 28-33.
16. Palamalai Srinivasan, John Britto, (2017),” Analysis of Financial Performance of Selected Commercial Banks in India”, Theoretical Economics Letters, 7, 2134-2151 http://www.scirp.org/journal/tel ISSN Online: 2162-2086, ISSN Print: 2162-2078.
17. REPORT ON TREND AND PROGRESS OF BANKING IN INDIA 2021-22 https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/0RTP2021222 5730A6FC708454BB270AC1705CCF178.PDF.
18. Sahota, S. and Dhiman, B. (2017) Relative Performance Analysis of Scheduled Commercial Banks in India: A CAMEL Model Approach. Indian Journal of Finance, 11,40-57. https://doi.org/10.17010/ijf/2017/v11i5/114251.
19. Srinivasan, P. and Saminathan, Y.P. (2016) A Camel Model Analysis of Public, Pri-vate and Foreign Sector Banks in India. Pacific Business Review International, 8, 45-57.
20. Tabak, B.M. and Tecles, P.L. (2010) Estimating a Bayesian Stochastic Frontier forthe Indian Banking System.International Journal of Production Economics, 125, 96-110. https://doi.org/10.1016/j.ijpe.2010.01.008.
21. Tatuskar, S. (2010) A Study of Financial Performance of Select Indian Scheduled Commercial Banks Using CAMELS

Methodology for 2006-2010. International Journal of Research in Commerce and Management, 1, 105-121.

22. Beccalli, E. (2003), "Information Technology and Economic Performance: Some Evidences from the EU Banking Industry", Working Paper, Accounting and Finance Department, London School of Economics.
23. Paulraj, (2001), "Data Warehousing Fundamentals", John Wiley & Sons, Singapore.
24. Dr. Sanjeev Bansal,(2014) "The impact of technology on the performance of indian banking industry: an empirical study", final report macro Research Proposals for the year 2014-15, Indian Institute of Banking & Finance.