Impact of technology on the financial performance of selected nationalized and private sector banks in India

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Abstract

The study assessed the financial performance of banks which found that usage of technology grew with each passing year. As a result of the effective use of technology, banks have been able to manage the increasing transaction volumes that come with a larger customer base in a more accurate and timely manner. The study's major goal was to analyze the impact of technology on the financial performance of a number of Indian banks, both public and private. The data was gathered via secondary sources in order to examine the impact of technology on financial performance. The data were evaluated using descriptive analysis and the t-test, which revealed a substantial difference in the financial performance of selected Indian nationalized and private sector banks. Financial indicators such as cash deposit ratio, the ratio of deposits to total liabilities, ratio of term loans to total advances and ratio of equity showed a significant difference in the financial performance of selected nationalized and private sector banks in the country.

Keywords: Cash Deposit Ratio, Indian Banking Sector, Financial Performance, Nationalized Banks, Private Sector Banks, Ratio of Deposits to Total Liabilities, Ratio of Term Loans to Total Advances and Ratio of Equity

1. Introduction

Nothing is static in the world of banking and business. The most significant change is in the scope of banking operations. Banking, in its most basic form, is concerned with the acceptance of customer

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deposits, the lending of excess deposit money to appropriate customers who wish to borrow, and the conveyance of cash [4].

Aside from typical banking services, banks now offer a wide range of financial and non-financial services to meet the financial and non-financial demands of all types of clients, from the smallest account holder to the largest corporation, and in some circumstances, non-customers. The breadth of services available varies from bank to bank, and is mostly determined by the type and size of the bank, as well as the technology it employs.

One of the most essential factors in humanity's evolution has been technology. Information and communication technology (ICT) are key advancements in the field of technology that are used to electronically access, process, store, and disseminate information. With the usage of technologies such as ATMs, Online Banking, Telephone Banking, and Mobile Banking, India's banking sector is rapidly expanding [2]. One of the financial products that caters to the needs of the retail market is the plastic card. This expansion has been aided by technological advancements, without which it would not have been feasible, as it will affect people's lives.

1.1. Impact of Technology on Banking

Technology has had an impact on many elements of banking, including data storage, processing, and gathering. Several aspects of banking have been significantly influenced or impacted, including: The credit bureau was founded or aided by technological advancements. The system uses mathematics to track client payment records in order to offer data that aids banks in determining the quantity of money they should borrow and who they should lend it to. The available technology has resulted in the development of a scalable and resilient credit bureau infrastructure that allows banks to track client information. Software applications that provide banks with input file preparation tools, validation tools, and data entry tools have been made possible by technological advancements. Credit reporting solutions, such as credit reports, client credit activity monitoring, fraud protection systems, and debtor tracking services, are all made possible by collecting data. Banks can now gather, load, validate, store, and disseminate both positive and negative data, as well as supplemental data, thanks to advances in credit bureau infrastructure technology (e.g. court judgments, legal issues, etc). The Credit Bureau's information technology development and management has offered control over all procedures involving the credit bureau as they pertain to the banking sector. C++, C Sharp, Java, Oracle, and SQL are some of the platforms utilized in the credit bureau. All of these programmes play an important role in the credit bureau's overall operation. The credit bureau's normal cycle and function in relation to banks comprises keeping information such as credit histories, observing fraudulent conduct, past enquires, authenticating data, and many other things [7].

1.2. Payment and Settlement Systems in India

In most cases, a country's central bank is the driving force behind the creation of national payment systems. The Reserve Bank of India, as the country's central bank, has taken many measures to ensure that payment systems in India are safe, secure, sound, efficient, accessible, and computerized [1].

The Reserve Bank of India's Board for Regulation and Supervision of Payment and Settlement Systems (BPSS), a sub-committee of the Central Board, is the country's highest policy-making body on payment systems. The Payment and Settlement Systems Act, 2007 (PSS Act) regulates payment and settlement systems in India. It was enacted in December 2007. The Payment and Settlement System Act of 2008, as well as the Payment and Settlement System Regulations of 2008, took effect on August 12, 2008. No one other than the Reserve Bank of India (RBI) can start or operate a payment system in India unless it is computerized, according to Section 4 of the PSS Act.

Since then, the Reserve Bank has automated pre-paid payment system operators, card schemes, cross-border inbound money transfers, Automated Teller Machine (ATM) networks, and centralised clearing arrangements.

Nawafleh [3] investigates the financial impact of information technology on banks. The information was gathered using two types of questionnaires that were sent to clients and bank employees. For one sample, the SPSS test, Averages and Standard Deviations test, Tree Cluster Analysis, and T-test were used to examine the data. The study discovered that demographic factors influence the barriers to utilizing E-banking, and that commercial banks' capital has a substantial impact on their expansion.

According to Vijay Sarabu [6], India's banking industry is stronger and more capable of withstanding competitive challenges. It withstood the 2008 Global Financial Crisis. Due to technology innovation, financial liberalization with the admission of new private and foreign banks, and regulatory changes in the corporate sector, India's banking sector has been quickly evolving since the 1990s. The Indian banking system is increasingly embracing best practices in accounting, internationally accepted prudential regulations, increased disclosures and openness, corporate governance and risk management, interest rates have been deregulated, and the rigor of directed lending has been increased. Our country today has a fairly developed banking system with many classes of banks – public sector banks, foreign banks, private sector banks – both old and new generation, regional rural banks, and co-operative banks – with the Reserve Bank of India serving as the system's leader. The banking industry has experienced extraordinary growth and diversification, and our institutions are increasingly leveraging cutting-edge technology such as the internet and mobile devices to conduct transactions and engage with the general public. In light of these circumstances, this research aims to examine the country's financial sector.

Vikram and Gayathri [9] examined the impact of information technology on bank profitability to marketing costs. The study reveals that IT spending has a greater impact on a bank's profitability and performance than marketing expenses, based on data from 21 Indian banks from 2011 to 2015. The findings imply that, when compared to marketing expenses, investing in IT can result in increased profitability for banks. As a result, Indian banks must devote more resources to improving their IT infrastructure in order to achieve higher efficiency and enhanced performance.

1.3. Objectives of the Study

1. To analyze the impact of technology on the performance of banks operating in India.

2. To study the relative efficiency and productivity of the public and private sector banking in the post e-Banking.

To study the objectives we have formulated the hypothesis that 'There is no significant difference in the financial performance of nationalized and private sector banks'

1.4. Research Methodology

The Researcher involved banks and the technology used by them within Mysore City. The researcher considered Higher Level Managers and Lower Level Managers. The population of the study consisted of Banks operating in Mysore City. In terms of population, the researcher considered all the Scheduled Commercial banks in Mysore City. The study selected the samples from all the five clusters but not exceeding 50 number from each public bank category and private bank category by using Simple Random Sampling Technique.

1.5. Research Design

NO.	Name of Banks	Nature of Banks	
		National Banks (n=250)	Private Banks (n=250)
1	State Bank of India	50	
2	Punjab National Bank	50	
4	Corporation Bank	50	
4	Indian Overseas Bank	50	
5	Canara Bank	50	
6	ICIC Bank		50
7	HDFC Bank		50
8	Karnataka Bank		50
9	Axis Bank		50
10	IndusInd Bank		50

1.6. Methods of Data Collection

The researcher used secondary sources to collect the data. Secondary data was collected through the website of the Reserve Bank of India (RBI) in order to assess the impact of efficiency and productivity along with the performance of the selected banks. Secondary information related to selected banks about the technology used by banks as well as the performance of the selected bank was collected from Websites, Journals, Books, Magazines, and Reports from the RBI and the Government of India.

1.7. Techniques of Analysis of Data

Collected data was tabulated suitably for the analysis by using appropriate statistical tools like descriptive analysis, percentages and T-test.

2. Comparative Analysis on Performance of Indian Nationalized and Private Sector Banks

2.1. Financial Performance

Cash Deposit Ratio

The Table 1 shows the cash deposit ratio in selected Nationalized and Private Sector Banks from 2005 to 2020. The bank must maintain liquidity to operate and hold an amount of cash to service net withdrawals from customer activities such as drawing from deposit accounts.It was observed that from 2005 to 2010, the cash deposit ratio in State Bank of India was 7.41, Canara Bank was 6.78, and Corporation Bank was 8.39. The cash deposit ratio in Indian Overseas Bank was 7.32 and Punjab National Bank was 10.61 from 2005 to 2010. It was observed that from 2011 to 2015, the cash deposit ratio in State Bank of India was 6.84, Canara Bank was 5.44, and Corporation Bank was 6.26. The cash deposit ratio in Indian Overseas Bank was 4.61 and Punjab National Bank was 4.71 from 2016 to 2020.

It was observed that from 2005 to 2010, the cash deposit ratio in Axis Bank was 7.41, HDFC Bank was 8.91 and ICICI Bank was 9.44. The cash deposit ratio in IndusInd Bank was 6.21 and Karnataka Bank was 6.54 from 2005 to 2010. The cash deposit ratio in IndusInd Bank was 6.02 and Karnataka Bank was 4.97 from 2016 to 2020. The cash deposit ratio was found to be higher in private banks rather than Nationalized Banks.

Table 1:   Cash Deposit Ratio of the Nationalized and Private Sector Banks

Name of Banks	2005-2010	2011-2015	2016-2020
Nationalized Banks			
State Bank of India	7.41	6.84	6.11
Canara Bank	6.78	5.44	4.23
Corporation Bank	8.39	6.26	6.37
Indian Overseas Bank	7.32	5.55	4.61
Punjab National Bank	10.61	5.36	4.71
Private Sector Banks			
Axis Bank	7.41	6.05	8.24
HDFC Bank	8.91	7.21	7.20
ICICI Bank	9.44	7.49	5.84
IndusInd Bank	6.21	6.55	6.02
Karnataka Bank	6.54	5.59	4.97

Source: Various Issues of RBI (2005-2020) and Banking Statistics

The Ratio of Deposits to Total Liabilities

The Table 2 shows the ratio of deposits to total liabilities in selected Nationalized and Private Sector Banks from 2005 to 2020. It was observed that from 2005 to 2010, the ratio of deposits to total liabilities in State Bank of India was 76.31, Canara Bank was 86.56, and Corporation Bank was 82.58. The ratio of deposits to total liabilities in Indian Overseas Bank was 82.83 and Punjab National Bank was 82.48 from 2011 to 2015. It was observed that from 2016 to 2020, the ratio of deposits to total liabilities in State Bank of India was 77.69, Canara Bank was 85.86, and Corporation Bank was 86.97.

It was observed that from 2005 to 2010, the ratio of deposits to total liabilities in Axis Bank was 79.71, HDFC Bank was 75.92 and ICICI Bank was 61.37. It was observed that from 2016 to 2020, the ratio of deposits to total liabilities in Axis Bank was 67.85, HDFC Bank was 74.31 and ICICI Bank was 64.73. The ratio of deposits to total liabilities in IndusInd Bank was 68.06 and Karnataka Bank was 88.01 from 2016 to 2020. The ratio of deposits to total liabilities was found to be increasing in both private and Nationalized Banks indicating total interest rate in the banks was also high.

Table 2: Ratio of Deposits to Total Liabilities of the Nationalized and Private Sector Banks

Name of Banks	2005-2010	2011-2015	2016-2020
Nationalized Banks			
State Bank of India	76.31	77.21	77.69
Canara Bank	86.56	86.61	85.86
Corporation Bank	82.58	85.14	86.97
Indian Overseas Bank	83.74	82.83	85.86
Punjab National Bank	84.23	82.48	85.00
Private Sector Banks			
Axis Bank	79.71	74.46	67.85
HDFC Bank	75.92	74.66	74.31
ICICI Bank	61.37	54.81	64.73
IndusInd Bank	81.38	71.70	68.06
Karnataka Bank	87.97	87.03	88.01

Source: Various Issues of RBI (2005-2020) and Banking Statistics

Ratio of Term Loans to Total Advances

The Table 3 shows the ratio of term loans to total advances in selected Nationalized and Private Sector Banks from 2005 to 2020. It was observed that from 2005 to 2010, the ratio of term loans to total advances in State Bank of India was 52.41, Canara Bank was 48.33 and Corporation Bank was 52.93. The ratio of term loans to total advances in Indian Overseas Bank was 51.62 and Punjab National Bank was 51.45 from 2005 to 2010. The ratio of term loans to total advances in Indian Overseas Bank was 45.12 and Punjab National Bank was 34.24 from 2016 to 2020.

It was observed that from 2005 to 2010, the ratio of term loans to total advances in Axis Bank was 70.32, HDFC Bank was 74.41 and ICICI Bank was 79.47. The ratio of term loans to total advances in IndusInd Bank was 65.71 and Karnataka Bank was 41.97 from 2005 to 2010. The ratio of term loans to total advances in IndusInd Bank was 69.92 and Karnataka Bank was 58.34 from 2016 to 2020. The ratio of term loans to total advances was found to be decreasing relatively during the study period in both private and Nationalized Banks indicating that the advances provided by banks were less.

Table 3: R Ratio of Term Loans to Total Advances of the Nationalized and Private Sector Banks

Name of Banks	2005-2010	2011-2015	2016-2020
Nationalized Banks			
State Bank of India	52.41	48.96	58.94
Canara Bank	48.33	54.26	55.46
Corporation Bank	52.93	50.61	60.99
Indian Overseas Bank	51.62	50.95	45.12
Punjab National Bank	51.45	45.47	34.24
Private Sector Banks			
Axis Bank	70.32	70.14	68.47
HDFC Bank	74.41	59.39	71.02
ICICI Bank	79.47	82.21	71.69
IndusInd Bank	65.71	70.07	69.92
Karnataka Bank	41.97	50.32	58.34

Source: Various Issues of RBI (2005-2020) and Banking Statistics

Ratio of Equity

The Table 4 shows the Return of Equity (ROE) in selected Nationalized and Private Sector Banks from 2005 to 2020. The return on equity (ROE) is a financial performance metric that is determined by dividing net income by shareholders' equity. Because shareholders' equity equals a company's assets less its debt, the return on net assets is referred to as ROE. The return on equity (ROE) is a measure of a company's profitability in relation to its stockholders' equity. It was observed that from 2005 to 2010, the ROE in State Bank of India was 16.21, Canara Bank was 18.46 and Corporation Bank was 17.75. The ROE in Indian Overseas Bank was -33.21 and Punjab National Bank was -11.82 from 2016 to 2020.

It was observed that from 2005 to 2010, the ROE in Axis Bank was 19.02, HDFC Bank was 17.68 and ICICI Bank was 10.98. The ROE was found to be positive for private sector banks during the study period showing that the banks had effectively managed its assets to create profits. The ROE was found to be positive for nationalized banks from 2005 to 2016 but was negative from 2017 to 2020 indicating that assets were not managed effectively to create profits during 2017 to 2020.

Table 4:   Ratio of Equity of the Nationalized and Private Sector Banks

Name of Banks	2005-2010	2011-2015	2016-2020
Nationalized Banks			
State Bank of India	16.21	12.88	3.44
Canara Bank	18.46	13.68	-4.51
Corporation Bank	17.75	13.78	-19.28
Indian Overseas Bank	22.84	5.66	-33.21
Punjab National Bank	19.40	15.20	-11.82
Private Sector Banks			
Axis Bank	19.02	18.67	6.67
HDFC Bank	17.68	19.28	17.39
ICICI Bank	10.98	12.50	7.72
IndusInd Bank	8.95	17.69	14.95
Karnataka Bank	15.66	11.34	8.80

Source: Various Issues of RBI (2005-2020) and Banking Statistics

3. Testing of Hypothesis 1

Research Hypothesis: There is no significant difference in the financial performance of nationalized and private sector banks

Cash Deposit Ratio

$H_{01.1}$: There is no significant difference in the financial performance of different nationalized and private sector banks in cash deposit ratio.

Table 5:   Results of T-Test of Cash Deposit Ratio

Particular	Nationalized banks	Private Sector Banks
Mean	6.295625	6.959375
Variance	1.608772917	2.289792917
Observations	16	16
Pooled Variance	1.949282917	
Hypothesized Mean Difference	0	
df	30	
t Stat	-1.344658772	
P(T<=t) two-tail	0.188814564	
t Critical two-tail	±2.042272456	

To see if there was a significant difference in the financial performance of different nationalized and private sector banks in terms of cash deposit ratio, the t-test was used. The two-tail p-value is found to be p = 0.188, and the two-tail t= -1.344. There is no significant variation in the financial performance of different nationalized and private sector banks in the cash deposit ratio because the specified alpha value is 0.05 and the p-value is higher than 0.05. Furthermore, the fact that T value (-1.34466) is less than T critical value (2.042272456) indicates that there is no substantial difference in the financial performance of nationalized and private sector banks in terms of Cash Deposit Ratio. **Since, p is higher than 0.05, the difference is statistically insignificant. Therefore null hypothesis is accepted and alternative hypothesis is rejected.**

Ratio of Deposits to Total Liabilities

$H_{01.2}$: There is no significant difference in the financial performance of different nationalized and private sector banks in ratio of deposit to total liabilities ratio.

Table 6:   Results of T-Test of Ratio of Deposits to Total Liabilities

Particular	Nationalized banks	Private Sector Banks
Mean	78.65866667	69.22875
Variance	192.5697695	79.392425
Observations	15	16
Pooled Variance	134.0297637	
Hypothesized Mean Difference	0	
df	29	
t Stat	2.26637621	
P(T<=t) two-tail	0.031065799	
t Critical two-tail	±2.045229642	

The t-test was used to see if there was a significant difference in the deposit-to-total-liabilities ratio between nationalized and private sector banks. The two-tail p-value is found to be p = 0.031, and the two-tail t= 2.266. There is a substantial difference in the financial performance of different nationalized and private sector banks in the ratio of deposit to total liabilities ratio since the set alpha value is 0.05 and the p-value is less than 0.05. Furthermore, the fact that T value (2.2664) is higher than T critical value (2.042272456) indicates that there is a considerable disparity in financial performance between nationalized and private sector banks. **Since, p is lesser than 0.05, the difference is statistically significant. Therefore null hypothesis is rejected and alternative hypothesis is accepted.**

Ratio of Term Loans to Total Advances

$H_{01.3}$: There is no significant difference in the financial performance of different nationalized and private sector banks in ratio of term loans to total advances.

Table 7: Results of T-Test of Ratio of Term Loans to Total Advances

Particular	Nationalized banks	Private Sector Banks
Mean	55.5225	68.0725
Variance	56.36875333	5.351446667
Observations	16	16
Pooled Variance	30.8601	
Hypothesized Mean Difference	0	
df	30	
t Stat	-6.389841047	
P(T<=t) two-tail	0.0000005	
t Critical two-tail	±2.042272456	

To see if there was a significant variation in the financial performance of distinct nationalized and private sector banks in terms of term loans to total advances, a t-test was used. The two-tail p-value is found to be p = 0.000, and the two-tail t= -6.389. There is a substantial variation in the financial performance of different nationalized and private sector banks in the ratio of term loans to total advances because the set alpha value is 0.05 and the p-value is less than 0.05. T value (-6.3898) is also larger than T critical value (2.04227), indicating that there is a considerable disparity in financial performance between nationalized and private sector banks in terms of term ratio. **Since, p is lesser than 0.05, the difference is statistically significant. Therefore null hypothesis is rejected and alternative hypothesis is accepted.**

Ratio of Equity

$H_{01.4}$: There is no significant difference in the financial performance of different nationalized and private sector banks in ratio of Return on Equity.

Table 8: Results of T-Test of Ratio of Equity

Particulars	Nationalized banks	Private Sector Banks
Mean	7.95125	12.436875
Variance	127.1847317	13.08478292
Observations	16	16
Pooled Variance	70.13475729	
Hypothesized Mean Difference	0	
df	30	
t Stat	-1.514960494	
P(T<=t) two-tail	0.140248707	
t Critical two-tail	±2.042272456	

The t-test was used to see if the financial performance of different nationalized and private sector banks differed significantly in terms of Return on Equity. The two-tail p-value is 0.140, while the two-tail t is -1.154. There is no significant variation in the financial performance of different nationalized and private sector banks in Return on Equity because the specified alpha value is 0.05 and the p-value is higher than 0.05. Also, because T value (-1.51496) is lower than T critical value (2.042272), there is no substantial difference in financial performance between nationalized and private sector banks in terms of Return on Equity. **Since, p is higher than 0.05, the difference is statistically insignificant. Therefore null hypothesis is accepted and alternative hypothesis is rejected.**

Hence, a significant difference was found in the financial performance of nationalized and private sector banks. Therefore null hypothesis is rejected and alternative hypothesis is accepted.

4. Conclusion

The banking sector is the backbone of the Indian financial system, and it is beset by numerous obstacles. Technology support is critical for the banking sector's successful operation in today's world. Without IT and communication, the banking business cannot succeed, and the banking sector's position in the Indian economy is expanding. There had been an increase in penetration, productivity, and efficiency due to the usage of technology. The main aim of the study was to assess and compare the financial performance of nationalized and private sector banks. Financial indicators such as cash deposit ratio, ratio of deposits to total liabilities, ratio of term loans to total advances and ratio of equity showed a significant difference in the financial performance of selected nationalized and private sector banks in the country.

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