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ANALYSIS OF PERFORMANCE OF SELECTED INDIAN BANKS DURING THE CORONAVIRUS PANDEMIC

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Abstract
The paper attempts to study the impact of a series of lockdowns on the performance of selected banks in India. These lockdowns were imposed as preventive measures against the coronavirus (covid-19) pandemic. In this paper, the performance and financial health of the banks has been analysed with the help of CAMELS approach that is based on six performance parameters: Capital Adequacy, Asset Quality, Management Efficiency, Earning Capacity and Sensitivity to Risk. The weighted values of these six representative ratios are used to compute the composite ratios of the selected banks. Thereafter, independent sample t-test and paired t-test have been applied on a sample of 29 Indian banks, which consist of 13 public sector and 16 private sector banks, to determine the impact of covid-19 pandemic on the performance of banks in general. The effects of the pandemic have also been examined individually for banks in the public and private sectors. The performance of private and public banks has also been compared in the pre covid and covid year. It has been found that there was no significant negative impact of the pandemic on these selected banks. While sectors like manufacturing, construction, trade, tourism and so on suffered a setback, the results of the study show that neither the public nor private banks have been affected adversely by the measures against the pandemic. However, the private banks have been found to be placed in a better position on CAMELS parameters as compared with the public sector banks.

Keywords: Banks, CAMELS Approach, t Test, Covid-19.

1. Introduction

The World Health Organization (WHO) on March 11, 2020, declared the outbreak of the novel coronavirus (COVID-19) a global pandemic. This was followed by a series of lockdowns imposed by the governments of different countries as preventive measures to control the spread of the deadly virus. There were restrictions on the movement of the public, as a result of which the production and construction activities came to a grinding halt, the offices and factories were shut down and trade, both at national and international level suffered a setback. The economic consequences of such measures were expected and different countries rolled out economic stimulus packages to offset the damage caused by continuous shutdowns.

In order to address the economic distress caused by the coronavirus, Reserve Bank of India (RBI) announced various monetary and regulatory measures in the form of interest rate cuts, reduction in Cash Reserve Ratio (CRR), moratorium on debt servicing and asset classification standstill. These measures were intended to boost liquidity in the financial system and also to provide relief to most vulnerable category of borrowers such as small and medium sized enterprises.[1]

In crises like these, banks play a crucial role in stabilising an economy whether it is by way of providing cash flow support, easier and cheaper lending or assistance in digital banking. There have been conflicting reports/studies about the impact of the pandemic on Indian Banking System. The

[1] Available on https://economictimes.indiatimes.com/mf/mf-news/responding-to-coronavirus-crisis-rbi-slashes-rates/articleshow/74845099.cms Mar 27, 2020

international credit rating agency, Fitch ratings[2] raised concerns with respect to the operating environment and asset quality of the banks. It was predicted by the agency that low consumer and corporate confidence could further suppress banks' prospects for new businesses. However, a research paper by CARE Ratings[3] advocated that the Scheduled Commercial Banks (SCBs) remained risk averse even during the pandemic-led uncertainty. During the ten months (April 2020-January 2021), SCBs were very selective with their credit portfolios due to asset quality concerns. The overall growth in bank credit remained slower throughout the first ten months as compared with the previous year. The deposits registered a growth of 11.3% during pandemic whereas the growth in deposits in three years priors to pandemic period varied between 8% to 11%. Choudhary (2022) found that the growth in bank deposits has been more than normal, thereby partly reflecting the perception of their safe haven status.

The purpose of the paper is to investigate the impact of Covid-19 on the financial performance of banks. The performance and financial health of the banks has been analysed with the help of variables representing the six parameters of the CAMELS approach: **C**apital Adequacy, **A**sset Quality, **M**anagement Efficiency, **E**arning Capacity and **S**ensitivity to Risk (briefly explained in section 3). Apart from this, performance of private and public banks has also been compared for the pre covid and covid year. The data collected has been analysed using the Statistical Program for Social Sciences (SPSS). The major statistical techniques used for data analysis are (1) descriptive statistics - means, medians, standard deviations, skewness and kurtosis (2) correlation analysis (3) t-test (independent sample and paired sample test)

2. Review of Literature

Afroz (2022) investigated the financial strength of banks in Bangladesh and factors affecting the financial strength over the years 2010–2015 on 35 banks. The CAMEL variables were employed to calculate banks' Financial Strength Index (FSI). Thereafter, panel regression was used to find out the determinants of banks' financial strength. It was concluded that the private banks have more financial strength with higher capital strength, asset quality, managerial efficiency and earning ability than public banks. Bank size, loan recovery, salary and banking sector development affect positively whereas the loan-asset affect negatively the bank's financial strength in Bangladesh.

Darjana (2022) investigated the COVID-19 pandemic's impact on the banking sector in Indonesia between 2011 and 2020. The study revealed that credit delivery decreased more during the pandemic than during the non-pandemic period.

Gazi et al (2022) investigated the impact of COVID-19 on the financial performance and profitability of the listed private commercial banks in Bangladesh. The bank's Financial Performance Index (FPI) was computed to compare the performance of each bank before and after the pandemic by the standardized CAMELS rating system. The fixed-effect regression model was applied to a panel data set from the year 2010 to the year 2021 of listed private commercial banks in Bangladesh. It was concluded that the banks that performed better during the pre-pandemic period were placed better during the pandemic period.

Chaudhary (2022) analysed the impact of the measures taken by the government of India and RBI to assist the banks so as to tide over the pandemic crisis. It was found that the deposits with banks grew at a higher pace during the pandemic. It was reported that the banks' credit growth declined during the pandemic and the outstanding Credit Deposit (CD) ratio in Indian banks also declined during this period.

[2]Available on Fitchratings.com/research/banks/india-second-covid-19-wave-heightens-risks-for-indian-banks-09-04-2021
[3] Available on https://www.careratings.com/uploads/newsfiles/23032021115247_SCBs_Gross_NPAs_declined_further_in_Q3FY21.pdf

Kunt et al (2021) examined the impact of financial sector policy announcements on bank stocks around the world during the COVID-19 crisis. It was found that liquidity support, borrower assistance programs and monetary easing moderated the adverse impact of the crisis, but their impact varied considerably across banks and countries.

Perwej (2020) commented in the descriptive research paper that banks were facing multiple challenges. It was suggested that the banks must continue with leverage technology and build flexibility in their infrastructure so as to navigate these challenges.

Singh and Bodla (2020) used secondary sources to collect views expressed by several economists, financial institutions like IMF, World Bank and consulting firms to indicate the impact of lockdown on banks and NBFCs following the pandemic of 2020. The paper emphasized on liquidity issues that banks were likely to face if the lockdown stands extended beyond July, 2020. They further laid stress on continuous measures by the government for smooth functioning of both money and capital markets.

Shahzad et al (2018) empirically examined the bank-specific, financial, and macroeconomic determinants of performance in Islamic and conventional banks of Pakistan. They constructed the Financial Performance Index (FPI) based on CAMELS' ratios using panel data covering the period 2010-2015. The Researchers further used linear regression, fixed and random effects to conclude that capital adequacy, assets quality, deposits, operating efficiency, profitability, market capitalization, market concentration and political stability have an insignificant relationship with dependent variable FPI. However, management quality, earnings, liquidity, sensitivity to risk, overheads, reserves and size were found to be significant variables.

Ghazavi and Bayraktar (2018) analysed the performance and financial credibility of six Turkish banks for the period 2005-2016 by using the CAMELS variables. The average rates of variables for the years 2014, 2015 and 2016 were separately examined and none of the banks was found to be superior to the others with respect to their performance. However, the composite ratios were able to identify the performance of some banks better than that of others. In addition, ANOVA test results revealed that the means of CAMEL'S ratios were significantly different across the years.

Mohanty and Krishnankutty(2018) analysed bank specific, industry specific and economy specific elements guiding the profitability of 46 Indian banks over a period of 17 years (1999–2015) through a panel generalized method of movements estimation. It was found that Return on Assets (ROA) has a significant positive association with last year's ROA, solvency ratio, capital adequacy ratio whereas 2 years and 3 years lag in ROA, size, GDP growth, Loan to Deposit Ratio, expense ratio and productivity have significant negative effect.

Desta (2016) analysed the financial performance of seven African banks for the period 2012 to 2014. The CAMEL composite and component rating was applied. It was found that the banks were rated as strong and satisfactory when rated in terms of capital adequacy ratio and earnings ability. Conversely, they were rated as less satisfactory, deficient and critically deficient when rated in terms of asset quality, management quality and liquidity

Meena (2016) analysed the financial performance of the selected public and private sector banks in India and attempted to determine the factors that predominantly affect the financial performance of the Indian banking sector. Return on assets was taken as the dependent variable and stepwise regression analysis was used on a sample of 20 banks. It was concluded that the four factors**:** profit per employee, debt-

equity ratio, total assets-to-total deposits ratio and net non- performing assets-to-total advances ratio cause an impact on the financial performance of the banks significantly.

Gupta (2014) evaluated the performance of 26 public sector banks in India using the CAMEL approach for a period of five years from 2009-13. The results showed that there is a statistically significant difference between the CAMEL ratios of all the public sector banks in India, thereby, implying that the overall performance of public sector banks is different among themselves.

Okpara (2012) attempted to determine the most distinguishing factors that are responsible for the classification of banks into sound and unsound positions using a method of discriminant analysis. On the basis of the findings, it was recommended that the weight of asset quality factor in the CAMEL rating should be increased from 25 percent to 30 percent as its components were found to dominate the discriminant. It was also suggested that in order to account for the 100 percent score point, the weights assigned to CAMEL rating components other than capital adequacy ratio should be decreased.

Numerous studies, including those by Balaji (2017), Kaur (2010), Rauf (2016), and Shukla (2015), have been conducted to evaluate the financial standing of banks both in India and abroad. These studies have ranked various banks over a range of time periods on the basis of CAMEL framework's five parameters.The results of the majority of these studies indicated that private sector banks performed better than public sector banks. Profitability has been extensively employed in research by Patolya (2020), Solanki and Shukla (2017), Prasad and Ravinder (2011), and Mittal and Dhade (2004) to assess the performance of Indian banks. Although Mittal and Dhade found that public sector banks were more profitable than private and foreign banks, Patolya, Prasad and Ravinder came to the conclusion that private sector banks outperformed public sector banks, notwithstanding Mittal and Dhade's findings that public sector banks were more lucrative than private and international banks.

3. Research methodology

The study aims to document the effects of the pandemic-related lockdowns on the performance of the selected Indian banks. There are 16 private sector banks and 13 public sector banks in the sample. The financial information of the banks for the years 2015-16 to 2020-21 has been obtained from the database of the Centre for Monitoring Indian Economy (CMIE).

Following the CAMELS approach, financial ratios have been utilised to assess the operating soundness and financial performance. The CAMELS rating system, as introduced by U.S. supervisory regulators, consists of different dimensions, which are linked to the financial health of the banks. These dimensions have been briefly discussed in the following paragraphs:

(a). Capital adequacy refers to the sufficiency of capital to absorb unexpected losses, meet the demand of the depositors and increase its asset base through lending. The following ratio has been considered to measure capital adequacy:

Capital Adequacy Ratio (CAR): (Tier 1 Capital + Tier 2 Capital) / Risk Weighted Assets

Tier 1 Capital is the core capital that consists of equity capital and audited reserves of the bank. It is used to absorb losses and does not require a bank to cease operations.

Tier 2 consists of unaudited retained earnings, unaudited reserves and general loss reserves. In the event that the bank is closed or liquidated, this capital will absorb losses.

Risk weighted assets are the adjusted value of assets on the basis of their exposure to risk.

(b). Asset Quality refers to the loan portfolio of the banks. It is concerned with potential loss associated with default in payment by the customers. The following ratio has been used to measure asset quality:

Net Non-Performing Assets (NPA) to Net Advances Ratio: This ratio denotes the proportion of advances, which has turned into NPA after deducting the provisions made by the bank.

(c). Management Efficiency refers to the ability of the management to perform their functions in a way that allows them to generate business and maximize profits. The following ratio has been used to measure the management efficiency

Profit per Employee= Net Profit/Total number of employees

(d). Earning Quality refers to the profitability or the operational efficiency of the banks. The following ratio has been used to measure earning quality:

Return on Assets = Net Profit / Total Assets

(e). Liquidity reflects the ability of the bank to meet its present and future financial obligations. The following ratio has been used to represent liquidity:

Credit Deposit Ratio =Total Advances/Customer Deposit

(f). Sensitivity to Market Risk refers to the response of a bank to market risk, interest rate risk, foreign exchange risk, operations risk and so on. The following ratio has been used to represent sensitivity to market risk:

Interest Spread Ratio = (Interest earned less interest paid) / Working Fund) *100

According to the CAMELS framework, each of these six components is rated on a scale of 1 to 5, with 1 being the best. A composite rating is established on the basis of ratings given to each component. Alternatively, different components may be assigned weights on the basis of the importance of each component in representing the financial health of the banks. Such weights are subject to some degree of subjectivity that creeps in because of the researcher's judgement and expertise.

The abovementioned ratios have been used in the present study to represent different parameters of the CAMELS model. This is in line with the research work of Koley(2019), Ghazavi and Bayraktar(2018),Meena(2016), Shukla(2015), Altan et al(2014), Gupta(2014) and Kumar et al(2012). These parameters have been assigned weights as stated below:

Table 1: Camels Parameters

S.no	CAMELS parameters	Financial ratios	Weight
1	Capital Adequacy	Capital Adequacy Ratio (CAR)	20
2	Asset Quality	Net Non-Performing Advances to Net Advances Ratio (NNPA/NA)	20
3	Management quality	Profit per employee (PPE)	25
4	Earning Capacity	Return on Asset (ROA)	15
5	Liquidity	Credit Deposit Ratio (CDR)	10
6.	Sensitivity	Interest Spread ratio (ISR)	10

The weights used in the above table are similar to the ones used by Ghazavi & Bayratkar(2018) and Okpara(2012) in their respective studies. A composite ratio for each of the banks has been computed as under:

CR =0.20 x CAR - 0.20 x NNPA/NA + 0.25 x PPE + 0.15 x ROA + 0.10 x CDR + 0.10 x ISR

The composite ratio for each of the banks has been estimated for the financial years 2019-20 and 2020-21. The financial year 2019-20 is taken as pre covid year and the financial year 2020-21 is taken as the covid year. Except for the ratio representing the asset quality, higher values of all other ratios have been considered favourable for determining the financial soundness of the banks. Accordingly, for computing the composite ratio, the weighted values of different ratios for each of the banks have been added but the weighted value of Net NPA to Net Advances ratio has been subtracted. In order to meet the objectives of the present study, the following hypotheses have been formulated:

Hypothesis 1(H1): There is no significant difference between the performance of banks in the financial year 2019-2020 and 2020-21.
Hypothesis 2 (H2): There is no significant difference between the performance of public sector banks and private sector banks in the pre covid year 2019-20.
Hypothesis 3 (H3): There is no significant difference between the performance of public sector banks and private sector banks in the covid year 2020-21.
Hypothesis 4 (H4): There is no significant difference between the performance of public sector banks in the pre covid year 2019-2020 and covid year 2020-21
Hypothesis 5 (H5): There is no significant difference between the performance of private sector banks in the pre covid year 2019-2020 and covid year 2020-21.

It is important to determine the distribution of the dataset so that an appropriate statistical method can be chosen. An assessment of the normality of data is a prerequisite for many statistical tests. There are many methods for testing the null hypothesis that a sample comes from a normally distributed population but the Shapiro-Wilk test is considered more useful if the size of the sample is less than 50. If the p value for the Shapiro-Wilk test statistic is less than 0.05, the hypothesis about the normal distribution is rejected. As the distribution of the dataset of the present study did not depart significantly from normality, the five hypotheses have been tested using t-tests (paired sample and independent sample). The paired or dependent sample t-test is a statistical procedure that is used to determine whether two related groups are significantly different from each other on the variable of interest[4] or not. The first, fourth and fifth hypotheses have been tested by applying the paired t-test. On the other hand, an independent sample test is used to determine whether the groups are significantly different from each other with respect to the variable of interest. The second and third hypotheses have been tested by applying an independent sample t-test. The variable of interest is the composite ratio that has been computed by using the parameters of the CAMELS model. The results also include some observations that have been made on the basis of descriptive statistics, charts and correlation analysis of the data.

4. Results and Interpretation

The following paragraphs present and interpret the results obtained with reference to the hypotheses that have been formulated in the study.

H1: There is no significant difference between the performance of banks in the financial year 2019-2020 and 2020-21.

[4] Available on: https://www.spss-tutorials.com/spss-paired-samples-t-test

In the following tables, CR20 and CR21 denote the composite ratios that represent the financial performance of the banks in the pre covid and covid year respectively. The descriptive statistics of the composite ratios of all the 29 banks for the two financial years 2019-20 and 2020-21 are as follows:

Table 2: Descriptive Statistics

Statistic	CR21	Std. Error	CR20	Std Error
Mean	10.7417	.32980	11.1044	.39339
Median	10.1375		11.1030	
Std. Deviation	1.776011		2.11845	
Minimum	8.00		8.077	
Maximum	14.699		18.022	
Range	6.68		9.95	
Skewness	.690	.434	1.101	.434
Kurtosis	-.2722	.845	2.715	.845

Source: SPSS output

The standard deviation of the data for these two years is less than 3. This implies that the data is distributed around the mean value. The datasets for both years are moderately skewed and have reasonable kurtosis levels. The mean value of composite ratios for both the years is approximately the same. However, the range for the year 2019-20 is higher than that of 2020-21. This implies that the dispersion in the dataset of the pre covid year is higher. The p-value of the Shapiro Wilk test statistic has been found to be more than the critical value of .05 (at 95% confidence interval level). This indicates that the data follows normal distribution. Thereafter, the dataset has been investigated statistically by applying the paired t-test to determine the effect of the pandemic on the performance of banks. The results of the paired t-test are as stated below:

Table 3: Result of paired t-test

CR21 & CR20		Paired Differences			95% confidence interval of difference		t	Sig.(2-tailed)
Correlation	Sig	Mean	Std. Deviation	Std. Error Mean	Lower	Upper		
0.859	.000	-0.3628	1.08620	0.20170	-0.77585	0.05049	-1.798	0.083

Source: SPSS output

As shown in Table 3, the composite ratios for the pre covid and covid year are strongly and positively correlated (r=0.859). The results indicate a nonsignificant difference between the performance of banks in the pre-covid year (M=11.1044, S.D=2.11845) and their performance in the covid year (M=10.7417, S.D=1.77601);[t=-1.798), df 28, p=.083)].

The 95% confidence interval of the difference between the means ranged from -0.77585 to 0.05049 and did not indicate a significant difference between the means of the samples. Therefore, the null

hypothesis (H1) stands accepted. This implies that the performance of the banks did not deteriorate due to the pandemic.

H2: There is no significant difference between the performance of public sector banks and private sector banks in the pre covid year 2019-20.
H3: There is no significant difference between the performance of public sector banks and private sector banks in the covid year 2020-21.
The descriptive statistics for 13 public sector and 16 private sector banks for the pre covid and covid year are as follows:

Table 4: Descriptive Statistics

CR21	Public		Private	
Mean	15.8118	0.1656	19.623	0.59317
Median	15.9415		19.3323	
Std Dev	0.59707		2.37267	
Min	14.82		16.1	
Max	16.71		23.54	
Range	1.89		7.44	0.564
Skewness	-0.119	0.616	0.116	1.091
Kurtosis	-1.218	1.191	-0.926	0.63954
CR20				
Mean	15.7232	0.19981	19.5595	
Median	15.761		19.7703	
Std Dev.	0.72043		2.55818	
Min	14.7		15.45	
Max	17.35		24.71	
Range	2.65		9.25	0.564
Skewness	0.717	0.616	0.151	1.091
Kurtosis	0.791	1.191	-0.541	

Source: SPSS output

The mean and standard deviation of the data for private sector banks are higher than those of public sector banks in the pre covid as well as covid year. Also, the range for private sector and public sector banks is higher in the year 2019-20 than in 2020-21. This is in line with results obtained for descriptive statistics of the first null hypothesis. This implies that the dispersion in the dataset is higher in the pre-covid year than in the covid year for both private sector and public sector banks.

The Shapiro Wilk test was performed to test the normality of the dataset for the pre covid and covid year. The results of the test are as stated below:

Pre covid year 2019-20
The p-value of the Shapiro Wilk test statistic of the data of the public sector banks (W=0.950, p= .595) and private sector banks (W=0.952, p=.525) has been found to be more than the critical value of .05 (at 95% confidence interval level). This indicates that the data of the public sector as well as private sector banks in the pre covid year follow normal distribution.

Covid year 2020-21

The p-value of the Shapiro Wilk test statistic of the data of the public sector banks (W=0.957, p= .709) and private sector banks (W=0.973, p=.888) has been found to be more than the critical value of .05 (at 95% confidence interval level). This indicates that the data of the public sector as well as private sector banks in the pre covid year follow normal distribution.

Thereafter, the comparison between the performance of private sector and public sector banks in the pre covid and covid year is done by applying an independent sample t-test. The composite ratio for the banks is taken as a dependent variable. The sector of the banks is taken as the categorical independent variable. The public sector banks are denoted by '0' and private sector banks are denoted by '1'. The results of the independent sample t-test are stated as below:

Table 5: Result of Independent t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CR21	Equal variances assumed	14.972	0.001	-5.631	27	.000	-3.8112	0.67686	-5.2000	-2.4224
	Equal variances not assumed			-6.189	17.298	.000	-3.8112	0.61585	-5.1088	-2.5135
CR20	Equal variances assumed	15.801	0.000	-5.225	27	0.000	-3.8362	0.73421	-5.3427	-2.3298
	Equal variances not assumed			-5.726	17.859	0.000	-3.8362	0.67003	-5.2447	-2.4278

Source: SPSS output

Covid year 2020-21

The results of the independent sample t test indicate significant difference in the composite ratios as the mean composite ratio of the public sector banks (M= 15.8118, S.D=0.59707) was found to be lower than that of the private sector banks(M= 19.623, S.D=2.37267) in the financial year 2020-21:[t=-6.189), df 17.298, p= .000].

The 95% confidence interval of the difference between the means ranged from -5.1088 to -2.5135 and indicated a significant difference between the means of the samples. Therefore, the null hypothesis (H2) stands rejected. This implies that the performance of private sector banks was better than the public sector banks in the covid year 2020-21.

Pre Covid year 2019-20

The results of the independent sample t test indicate significant difference in the composite ratios as mean composite ratio of public sector banks (M= 15.7232, S.D=0.72303) was lower than that of the

private sector banks(M= 19.5595, S.D=2.5581) in the financial year 2019-20; [t=-5.726), df 17.859, p=.000].

The 95% confidence interval of the difference between the means ranged from -5.2447 tond -2.4278 and indicated a significant difference between the means of the samples. Therefore, the null hypothesis (H3) stands rejected. This implies that the performance of private sector banks was better than the public sector banks in the pre-covid year 2019-20.

It is evident from the results that private sector banks performed better than the public sector banks in both the years. These results are further corroborated by following graphs tracing different parameters of the CAMELS model over a period of six years.

Figure1: Capital Adequacy ratio of public sector and private sector banks

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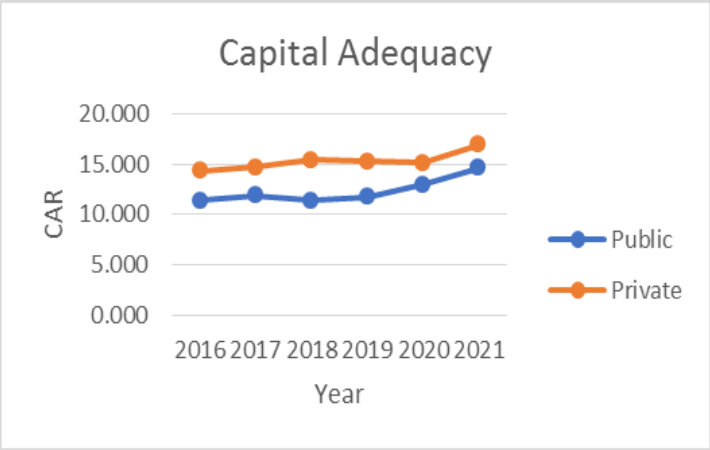


Figure 1 depicts that Capital Adequacy Ratio (CAR) of public sector banks was lower than that of private sector banks between the years 2016 and 2021. It is highest in the covid year (2020-21) for public sector as well as private sector banks..

Figure2: Asset Quality of public sector and private sector banks

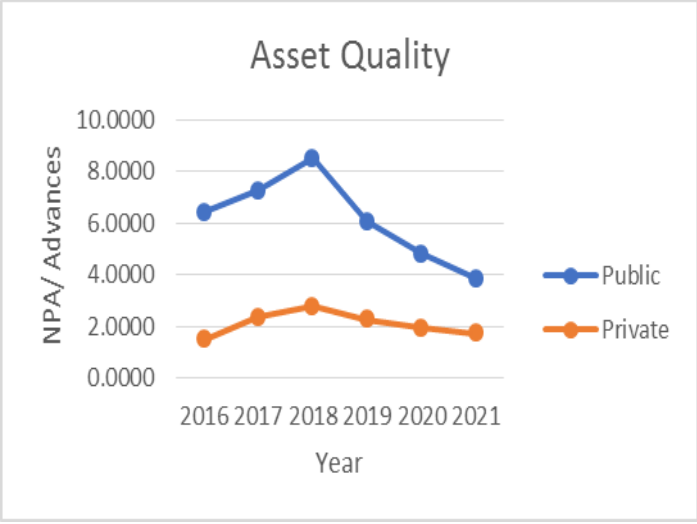


Figure 2 depicts that Net Non-Performing Assets to Net Advances ratio was higher for public sector banks than that of private sector banks between the years 2016 and 2021. It is lowest in the covid year (2020-21) for public sector as well as private sector banks.

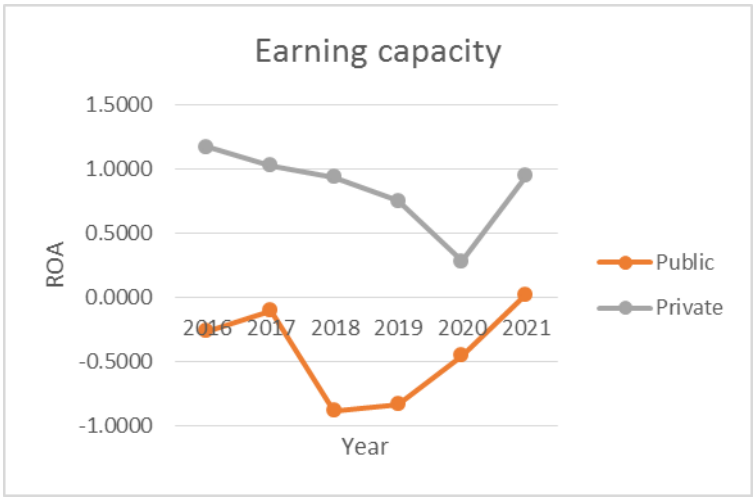
Source: Based on data from CMIE database

Figure 3: Management Quality of public sector and private sector banks

Source: Based on data from CMIE database

Figure 3 depicts that Profit per Employee for the private sector banks was consistent between 2016 and 2021. It was also greater as compared to banks in the public sector during this period. It is further observed that Profit per Employee for public sector banks was negative for majority of the years.

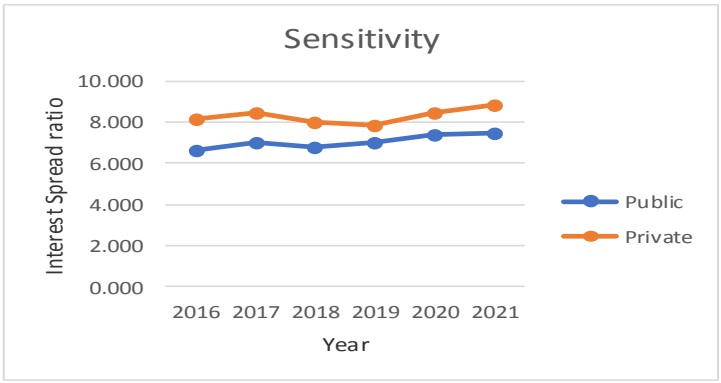
Figure 4: Earning Capacity of public sector and private sector banks



Source: Based on data from CMIE database

Figure 4 depicts that Return on Assets ratio of public sector banks was lower than that of private sector banks between 2016 and 2021. It was negative in majority of the years for public sector banks.

Figure 5: Sensitivity of public sector and private sector banks



Source: Based on data from CMIE database

Figure 5 depicts that Interest Spread ratio of public sector banks was lower than that of private sector banks between 2016 and 2021.

H4: There is no significant difference between the performance of public sector banks in the pre covid year 2019-2020 and covid year 2020-21.

The descriptive statistics for 13 public sector banks for the pre covid and covid year are stated as below:

Table 6: Descriptive Statistics

Public Banks	CR20	Std. Error	CR21	Std error
Mean	15.7232	0.19981	15.8118	0.1656
Median	15.761		15.9415	
Std. Deviation	0.72043		0.59707	
Minimum	14.7		14.82	
Maximum	17.35		16.71	
Range	2.65		1.89	
Skewness	0.717	0.616	-0.119	0.616
Kurtosis	0.791	1.191	-1.218	1.191

Source: SPSS output

The standard deviation of the data for these two years is less than 3. This implies that the data is distributed around the mean value. The mean value of composite ratios for both the years is approximately the same. However, the range for the year 2019-20 is higher than that of 2020-21. This implies that the dispersion in the dataset of the pre covid year was higher. The p-value of the Shapiro Wilk test statistic for the covid year (W= 0.95, p value= .595) as well as the pre-covid year (W= 0.957, p value= .709) has been found to be more than the critical value of .05 (at 95% confidence interval level). This indicates that the data follows normal distribution. Thereafter, the dataset has been investigated statistically by applying the paired t-test to determine the effect of the pandemic on the performance of public sector banks. The results of the paired t-test are stated as below:

Table 7: Result of Paired sample t-test

Public Banks	**Paired Samples Test (**Paired Differences)					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
CR20 - CR21	.08858	.80377	.22292	-.39713	.57429	0.397	12	.698

Source: SPSS output

As shown in Table 7, the results indicate a nonsignificant difference between the performance of banks in the covid year (M= 15.8118, S.D=0.59707 and their performance in the pre-covid year(M=15.7232, S.D=0.72043); [t=0.397),df 12, p=.698)]

The 95% confidence interval of the difference between the means ranged from -0.39713 to 0.0.57429 and did not indicate a significant difference between the means of the samples. Therefore, the fourth hypothesis (H4) stands accepted. This implies that the performance of the public sector banks was not affected by the pandemic.

H5: There is no significant difference between the performance of private sector banks in the pre covid year 2019-2020 and covid year 2020-21

The descriptive statistics for 16 private sector banks for the pre covid and covid year are stated as below:

Table 8: Descriptive Statistics

Private Banks	CR20	Std. error	CR21	Std error
Mean	19.5595	.63954	19.6230	.59317
Median	19.7703		19.3323	
Std. Deviation	2. 55818		2.37267	
Minimum	15.45		16.10	
Maximum	24.71		23.54	
Range	9.25		7.44	
Skewness	.151	.564	.116	.564
Kurtosis	-.541	1.091	-.926	1.091
Shapiro-Wilk	0.973	0.888	0.952	0.525

Source: SPSS output

The standard deviation of the data for these two years is less than 3. This implies that the data is distributed around the mean value. The mean value of composite ratios for both the years is approximately the same. However, the range of the data in the year 2019-20 is higher than that in 2020-21. This implies that the dispersion in the dataset of the pre covid year is higher. The p-value of the Shapiro Wilk test statistic for the covid year (W= 0.9735, p value= .888) as well as the pre-covid year (W= 0.952, p value= .525) has been found to be more than the critical value of .05 (at 95% confidence interval level). This indicates that the data follows normal distribution. Thereafter, the dataset has been investigated statistically by applying the paired t-test to determine the effect of the pandemic on the performance of private sector banks. The results of the paired t-test are as stated below:

Table 9: Result of paired sample t test

Private Banks	Paired Samples Test (Paired Differences)					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
CR20 - CR21	0.06351	1.34692	0.33673	-0.65421	0.78123	0.189	15	0.853

Source: SPSS output

As shown in Table 9, the results indicate a non-significant difference between the performance of banks in the pre-covid year (M= 19.6230, S.D=2.37627) and their performance in the covid year(M= 19.5595, S.D=02.5581) ; [t=0.189), df 15, p=.853)]

The 95% confidence interval of the difference between the means ranged from -0.65421 to 0.781238 and did not indicate a significant difference between the means of the samples. Therefore, the fifth hypothesis (H5) stands accepted. This implies that the performance of private sector banks was not affected by the pandemic.

Conclusion

During the pandemic, the banking system underwent a lot of changes. There was a fall in lending activities as most commercial activities came to a standstill. In response to the need of the hour, the operational functioning was modified to ensure social distancing among the staff and customers. The World Health Organization emphasized the use of digital mode for making payments. While the demonetization drive that was announced in India in the year 2016 encouraged the use of digital platforms, there was exponential growth in such transactions during the pandemic. The retail banks rose to the occasion by moving many parts of their operations online during the pandemic. Falling in line with the new normal, the remote work culture provided all necessary services to the customers through digital channels.

It is true that the economy of India, like other countries, suffered as many sectors such as travel and tourism, real estate and construction, infrastructure, hospitality, automobiles and so on were adversely affected. This had many consequences including reduced profitability for businesses, failure to meet repayment obligations and mass dismissals. From a banking perspective, it meant an increase in non-performing assets and decrease in overall business. The steps taken by the RBI to rescue the economy, such as the three-month lending moratorium and other systematic rate cuts added to the burden on the banking sector. On the positive side, Indian Express[5] reported that Non-Resident Indians (NRIs) brought in more foreign exchange during the lockdown, amid layoffs and falling interest rates all over the world. Deccan Chronicle reported that foreign currency, which accounts for 93 per cent of the forex reserves, grew from $442 billion in April 2020 to $568 billion in July 2021.[6] According to the annual report of the RBI for 2020-21, there was a decline in the number of bank frauds across the country during this pandemic. In the financial year 2019-20, a whopping ₹27,698.38 crores was involved in bank frauds whereas in financial year 2020-21, the amount was less than half to ₹11,583 crore.[7]

The results of the empirical investigations of the present study reveal that there was no significant difference in the performance of the banks during the pandemic for either banks in general or public sector banks and private sector banks in particular. This implies that Indian banks are robust and resilient. None of the parameters-capital adequacy, asset quality, management efficiency, earning ability, liquidity or sensitivity showed any abnormal movement in the covid year. The results that indicated the performance of private sector banks to be better than the public sector banks are in agreement with the earlier literature. However, these findings are based on a small sample with one ratio representing each

[5] Available on https://indianexpress.com/article/business/banking-and-finance/nris-bring-in-more-dollars-during-lockdown-amid-layoffs-falling-interest-rates-world-over-6596265/ September 15, 2020

[6] Available on https://www.deccanchronicle.com/business/in-other-news/030821/forex-reserves-up-by-135-bn-in-pandemic.html/August 3,2021

[7] Available on https://www.timesnownews.com/business-economy/industry/the-pandemic-year-brings-cheer-for-the-banking-sector-frauds-reduced-to-almost-50-article-90319532/March 29,2022

of the six parameters. Also, subjective weights based on earlier studies have been used to compute the composite ratio for representing the financial health of banks. Future research may address the resilience of banks taking longer periods before and after the pandemic with large sample size and different relevant statistical methods.

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