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A Comparative Study of the Financial Performance of HDFC Bank During the Pre-COVID-19 and Post-COVID-19 Pandemic Periods

Dr. Md. Moazzam Nazri[1] | M Vasu[2*]

[1]Senior Assistant Professor & HOD, Faculty of Commerce, Karim City College, Jamshedpur.
[2]Research Scholar, University Department of Commerce and Business Management, Kolhan University, Chaibasa, West Singhbhum, Jharkhand.

[*]Corresponding Author: moazzam.nazri @gmail.com

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Abstract

The COVID-19 pandemic created surprising change over in the business environment of Indian banks. Limitations on fiscal activities, changes in stealing models, and uncertainty around financial markets made it needed to re-examine banks' financial function during this period. In this context, the present study highlights HDFC Bank to identify how its financial view progressed between the pre-pandemic and post-pandemic periods. The study is based on five important parameters i.e.; profitability, liquidity, asset quality, capital adequacy, and operational efficiency and eight financial year reports of HDFC Bank i.e.; 2017–18, 2018–19, and 2019–20 (pre-COVID period); 2020–21 and 2021–22 (COVID period); and 2022–23, 2023–24, and 2024–25 (post-COVID period). A comparison of these indicators supports to analyze changes in the bank's financial performance across these timeframes and provides insight into its ability to sustain financial strength during an economic disruption. Selected financial indicators were analysed using averages and coefficients of variation (CV) to assess changes in performance and year-to-year consistency. A paired-samples t-test was also applied to examine whether the differences between the two periods were statistically significant at the 5% level. The findings reveal a mixed but broadly resilient financial performance. Average capital adequacy improved from 16.80% to 19.23%, while the gross and net non-performing asset ratios declined, indicating stronger capitalisation and an improvement in average asset quality.

Keywords: *HDFC Bank, COVID-19 Pandemic, Financial Performance, Profitability, Liquidity, Asset Quality, Capital Adequacy, Paired-Samples t-Test.*

Introduction

The COVID-19 pandemic interrupted economic activities in India, involving businesses, employment, investment, and financial markets. To tackle these difficulties, the Government of India and the Reserve Bank of India established several measures to reinforce borrowers, provide liquidity, and protection the stability of the financial system.

Banks performance an essential role in economic development by gathering savings and supporting credit. The pandemic was a serious issue of financial performance of loan repayments, asset quality, profitability, and liquidity. These solutions made an important part to examine how banks kept their financial position during and after crunch**.**

HDFC Bank, a leading private sector bank in India, provides an appropriate base for such a study. This research correlates its financial performance before and after the COVID-19 pandemic, concentrating on five core parameters: profitability, liquidity, asset quality, capital adequacy, and

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operational efficiency. The study aims to identify variations in these indicators and measure the bank's financial strength during the post-pandemic period.

Against this background the present study titled A Comparative Study of the Financial Performance of HDFC Bank During the Pre-COVID-19 and post-COVID-19 Pandemic Periods aims to examine and compare the financial performance of HDFC Bank. The study focuses on selected financial indicators to identify change in the bank's performance and assess its financial stability and recovery following the pandemic.

Review of Literature

A review of literature is an essential part of a systematic research study. It provides an understanding of previous research, major findings, research methodologies, and gaps in existing knowledge. In the present study, the literature review focuses on the impact of COVID-19 on the financial strength and performance of HDFC Bank.

The review examines previous studies related to the bank's profitability, liquidity, asset quality, capital adequacy, and operational efficiency during the pre-COVID and post-COVID periods. It also helps identify research gaps, select appropriate financial indicators, and develop a suitable methodology for analysing changes in the financial performance of HDFC Bank.

Steps for Conducting the Literature Review

Selection of the Research Problem: Identifying the impact of COVID-19 on the financial strength and performance of HDFC Bank.

- **Search and Collection of Relevant Literature:** Collecting relevant research articles, journals, books, reports, and other credible sources related to COVID-19 and HDFC Bank's financial performance.
- **Synthesis and Analysis of Literature:** Examining previous studies, their methodologies, findings, and conclusions to understand the effects of the pandemic on the bank's financial indicators.
- **Organization and Identification of Research Gaps:** Arranging the reviewed studies systematically and identifying gaps that justify the present study on the pre-COVID and post-COVID financial performance of HDFC Bank.

After screening of 20 relevant studies the following 9 studies were identified as particularly relevant to the present research on the financial performance of HDFC Bank during the pre-COVID and post-COVID periods.

- **Kiruthika and Muthumari (2025)** probed the financial flexibility of Indian public and private sector banks throughout COVID-19 applying instrument panel regression. Their conclusions highlighted the importance of CASA deposits and digital banking. However, further research of individual banks, such as HDFC Bank, remains important.
- **Annu, Kumar, and Tripathi (2021)** compared five private sector banks, including HDFC Bank, using financial ratios. Their findings showed differences in profitability, liquidity, and solvency. Further statistical analysis could provide a clearer knowledge of changes in HDFC Bank's operation.
- **Iqbal and Tanti (2022)** presented through the CAMELS model to measure banking performance during COVID-19. Their study clearly highlights the significance of capital strength, liquidity, digital banking, and risk management in continuing financial strength.
- **Sharma, Prasanna, and Dar (2025)** also carried a study on private sector banks and assessed various financial ratios of CAMELS model and assessed the ratios of CAMEL model. Their results denoted variations in profitability and operational efficiency, accompanying the need for further bank-specific financial analysis.
- **Singh (2024**) has conducted a comparative study of public and private sector banks during COVID-19. He found in his study that the private sector banks exhibited comparatively lower instability and a faster recovery

- **Rani, U., and Singh (2024)** argued that the productivity of private sector banks during COVID-19 using Data Envelopment Analysis (DEA). Their findings suggested that top five private sector banks benefited from their scale and digital capabilities in maintaining operational efficiency.
- **M. Subbiramani, G. Ranjith, and A. Balagurusamy (2018)** observed that the financial performance of Canara Bank and HDFC Bank using the CAMEL model for the period 2012–13 to 2016–17. The study found that HDFC Bank performed favourably in profitability and liquidity, although the results for capital adequacy differed. This study is particularly relevant because it provides evidence of HDFC Bank's financial position before the COVID-19 pandemic.
- **Ratna Sinha (2016)** examined the financial performance of public and private sector banks in India using the CAMEL approach and ANOVA. The study reported that HDFC Bank performed strongly in operating and net profit margins, while differences between public and private sector banksacross CAMEL parameters were not uniformly significant. The study provides a useful background for selecting financial performance indicators for the present research.
- **Dr. Chanduji P. Thako (2020)** studied on Impact of COVID-19 on Banking Sector: An Indian Perspective, the author discussed the financial challenges faced by Indian banks during the pandemic. The study highlighted concerns relating to slower credit growth, rising non-performing assets, and investor uncertainty. It provides the pandemic-related context for examining changes in HDFC Bank's financial performance before and after COVID-19.

Research Gap

The reviewed studies provide useful insights into the financial performance of Indian banks, the effects of COVID-19, and the importance of profitability, liquidity, asset quality, capital adequacy, and operational efficiency. The literature reviewed indicates scope for a focused, systematic comparison of HDFC Bank's financial performance during clearly defined pre-COVID and post-COVID periods. The present study seeks to deal with this gap by analysing certain financial indicators and, where suitable, applying statistical tests to find out whether the observed differences are significant.

Problems of the Study

The central research problem of the study is to examine the extent to which the COVID-19 pandemic affected the financial position and performance of HDFC Bank and to determine whether there was a significant difference between its pre-COVID and post-COVID financial performance.

The study addresses this problem through a comparative analysis of selected financial indicators of HDFC Bank for the pre-COVID and post-COVID periods.

Objectives of the Study

The main objective of the study is to examine the financial performance of HDFC Bank during the pre-COVID and post-COVID periods. The specific objectives are as follows:

- To analyse the financial performance of HDFC Bank during the pre-COVID and post-COVID periods.
- To compare the profitability, liquidity, asset quality, and capital adequacy of HDFC Bank between the two periods.
- To analyse the financial performance of HDFC Bank during the COVID-19 pandemic
- To examine whether the differences in selected financial performance indicators between the pre-COVID and post-COVID periods are statistically significant.

Hypotheses of the Study

To examine whether there is a significant difference in the financial performance of HDFC Bank between the pre-COVID and post-COVID periods, the following null and alternative hypotheses are formulated.

- **Null Hypothesis (H_0):** There is no statistically significant difference in the selected financial performance indicators of HDFC Bank between the pre-COVID and post-COVID periods.
- **Alternative Hypothesis (H_1):** There is a statistically significant difference in the selected financial performance indicators of HDFC Bank between the pre-COVID and post-COVID periods.

Indicator-wise Hypotheses

For a more systematic analysis, the hypotheses may also be formulated separately for each financial indicator.

Table 1: Indicator-wise hypotheses

Sl.No.	Financial Indicator	Null hypothesis (H_0)	Alternative hypothesis (H_1)
1.	Profitability	There is no significant difference in HDFC Bank's profitability between the pre-COVID and post-COVID periods.	There is significant difference in HDFC Bank's profitability between the pre-COVID and post-COVID periods.
2.	Liquidity	There is no significant difference in HDFC Bank's liquidity between the two periods.	There is significant difference in HDFC Bank's liquidity between the two periods.
3.	Asset quality	There is no significant difference in HDFC Bank's asset quality between the two periods.	There is significant difference in HDFC Bank's asset quality between the two periods.
4.	Capital adequacy	There is no significant difference in HDFC Bank's capital adequacy between the two periods.	There is significant difference in HDFC Bank's capital adequacy between the two periods.
5.	Operational efficiency:	There is no significant difference in HDFC Bank's operational efficiency between the two periods.	There is significant difference in HDFC Bank's operational efficiency between the two periods.

Research Methodology

Research Design: The present research study follows a descriptive and analytical research designed to observe the financial performance of HDFC Bank 2017–18, 2018–19, and 2019–20 (pre-COVID period); 2020–21 and 2021–22 (COVID period); and 2022–23, 2023–24, and 2024–25 (post-COVID period). It is based on a comparative analysis of selected financial parmeters to assess changes in profitability, liquidity, asset quality, capital adequacy, and operational efficiency.

- **Study Period:** The study go through the financial years 2017–18 to 2024–25 and is divided into the following three parts.:

Table: 2 Study Period

Period	Financial Years	Purpose
Pre-COVID period	2017–18 to 2019–20	To examine HDFC Bank's financial performance before the pandemic
COVID-19 period	2020–21 to 2021–22	To explain the pandemic and its possible effects on banking operations
Post-COVID period	2022–23 to 2024–25	To examine financial performance after the acute pandemic period

- **Sources of Data:** The study is based on secondary data collected from HDFC Bank's annual reports, published financial statements, official website, and other relevant publications. Data relating to the banking sector and the pandemic may also be obtained from the Reserve Bank of India (RBI) reports and other reliable official sources.
- **Tools and Techniques of Data Analysis:** The following tools and techniques have been applied to analyse data
  - **Mean and Coefficient of Variance (CV%):** This technique applies to examine the average performance and variability of the selected parameters across the pre-COVID and post-COVID periods
  - **Percentage Change Analysis**: Percentage technique measures changes in financial indicators between the two periods.

- **Statistical Hypothesis Testing:** For testing the hypothesis a paired-samples t-test at 5% level of significance is applied to determine whether the differencesbetween the pre-COVID and post-COVID periods in selected financial indicators of HDFC Bank are statistically significant.
- **Hypothesis Testing:** The study tests the following hypotheses.
  - **Null Hypothesis (H_0):** There is no statistically significant difference in the selected financial performance indicators of HDFC Bank between the pre-COVID and post-COVID periods.
  - **Alternative Hypothesis (H_1):** There is a statistically significant difference in the selected financial performance indicators of HDFC Bank between the pre-COVID and post-COVID periods.

Limitations of the Study

Our study is only ***on*** HDFC Bank and focuses on its financial performance during the specified pre-COVID and post-COVID periods and test the selected financial parameters to understand changes in profitability, liquidity, asset quality, capital adequacy, and operational efficiency.

Table 3: Financial Performance of HDFC Bank during the Pre-COVID and Post-COVID Periods

Sl. No.	Financial Indicator	Ratio	Financial Indicator					Post-Covid Periods				
			2017-2018	2018-2019	2019-2020	Average	CV%	2022-2023	2023-2024	2024-2025	Average	CV%
1.	Profitability	Return on Assets (ROA)	1.93	1.9	2.01	1.95	2.38	2.07	1.98	1.91	1.99	3.30
		Return on Equity (ROE)	18.2	16.3	16.8	17.10	4.70	12.4	16.1	14.6	14.37	10.58
		Net Interest Margin Ratio	4.3	4.3	4.3	4.30	0.00	3.6	3.53	3.48	3.54	1.39
2.	Liquidity	Credit Deposit Ratio	83.46	96.51	104.42	94.80	9.12	84.90	110	96	96.97	10.5
		Liquidity Coverage Ratio (LCR)	104.52	117.62	132.23	118.12	9.58	115.51	117.42	123.58	118.84	2.90
		Government Securities to Total Assets	17.70	19.25	21.10	19.35	7.18	17.73	25.97	27.03	23.58	17.63
3.	Assets Quality	Gross Non-Performing Assets (GNPA)	1.3	1.36	1.26	1.31	3.15	1.12	1.24	1.33	1.23	6.99
		Net Non-Performing Assets (NNPA)	0.4	0.39	0.36	0.38	4.43	0.27	0.33	0.43	0.34	19.22
		Provision Coverage Ratio (PCR	69.8	71.4	72	71.07	1.31	75.8	74.04	67.86	72.57	4.69

4.	Capital Adequacy	Capital Adequacy Ratio	14.8	17.1	18.5	16.80	9.08	19.3	18.8	19.6	19.23	1.72
5.	Operational Efficiency	Cost-to-Income Ratio	41	39.7	38.6	39.77	2.47	40.4	40.2	40.5	40.37	0.31
		Business per Employee	15.08	16.87	17.49	16.48	6.02	19.74	21.49	23.62	21.62	7.34
		Profit per Employee	0.2	0.23	0.24	0.22	7.16	0.28	0.31	0.32	0.30	5.60

(Source: Compiled from the Annual Reports of HDFC Bank for 2017–18 to 2019–20 and 2022–23 to 2024–25.)

Table 4: Analysis and interpretation of financial performance

Financial Indicator	Analysis	Interpretation
Profitability	The profitability indicators present a varied picture of HDFC Bank's performance across the two study periods.The data shows that the average Return on Assets (ROA) improved a bit from 1.95% to 1.99% It means the bank maintained its ability to generate earnings from its assets. However, the coefficient of variance increased from 2.38% to 3.30%, representing better relative annual variation in Return on Assets. In comparison to Return on Equity (ROE) declined from 17.10% to 14.37%. Its coefficient of variance also increased from 4.70% to 10.58%. It means that the shareholder returns were lower on average and more variable in the post-COVID period. Net Interest Margin (NIM) is also downward trend, dropping from 4.30% to 3.54% and its coefficient of variance increased from 0.00% to 1.39%. It means some fluctuation in a ratio that had remained constant during the pre-COVID observation window.	Overall, the results indicate that HDFC Bank maintained its return on assets but experienced lower returns on equity and a narrower net interest margin in the post-COVID period.
Liquidity	The average Credit–Deposit Ratio increased from 94.80% to 96.97%, while its CV rose from 9.12% to approximately 10.50%, as reported in the table. This suggests that advances represented a larger proportion of deposits on average, accompanied by greater variation across the post-COVID years. The Liquidity Coverage Ratio (LCR) improved slightly from 118.12% to 118.84%. More importantly, its CV declined from 9.58% to 2.90%, indicating that the ratio was considerably more consistent in the later period. This provides evidence of greater stability in this liquidity indicator. The Government Securities-to-Total Assets ratio increased from 19.35% to 23.58%. However, its CV rose substantially from 7.18% to 17.63%, reflecting greater fluctuations in the proportion of assets held in government securities	The overall liquidity position therefore appears broadly maintained, with improved consistency in the Liquidity Coverage Ratio but greater variation in the other two indicators
Asset Quality	The asset quality indicators show a reduction in non-performing asset ratios, accompanied by changes in their variability. The average Gross Non-Performing Assets (GNPA) ratio declined from 1.31% to 1.23%, while the average Net Non-Performing Assets (NNPA) ratio fell from 0.38% to 0.34%. These reductions suggest an improvement in the bank's reported asset quality. Nevertheless, the CV of GNPA increased from 3.15% to 6.99%,	Overall, the lower GNPA and NNPA ratios and the higher average PCR point towards improved asset quality and provision

	while the CV of NNPA increased from 4.43% to 19.22%. Thus, although the average NPA ratios were lower, their annual values fluctuated more during the post-COVID period, particularly in the case of NNPA. The average Provision Coverage Ratio increased from 71.07% to 72.57%, suggesting a higher average level of provisions relative to non-performing assets. However, its CV increased from 1.31% to 4.69%, indicating greater variation. Taken together, the figures indicate an improvement in average asset quality, although the year-to-year consistency of some asset-quality indicators weakened.	coverage. However, the increased variability indicates that these improvements were not equally consistent throughout the post-COVID period.
Capital Adequacy	The average Capital Adequacy Ratio increased from 16.80% in the pre-COVID period to 19.23% in the post-COVID period. This improvement indicates a stronger average capital buffer relative to risk-weighted assets. The CV declined from 9.08% to 1.72%, showing that the capital adequacy ratio was considerably more stable during the post-COVID period. Based on the figures supplied, capital adequacy was one of the strongest areas of improvement in the bank's financial performance.	The combined increase in the average ratio and reduction in its variability indicate an improvement in both the level and consistency of the bank's capital adequacy position
Operational Efficiency	The operational efficiency parameters reveal upgrading in employee productivity but a minor decline in cost-to-income efficiency. The average Cost-to-Income Ratio minor increased by o.60%. Since a lower ratio generally indicates better cost efficiency. Therefore, the change in operating expenses accounted for a marginally larger proportion of income in the post-COVID period. Though the coefficient of variance declined from 2.47% to 0.31%, representing more consistency in the ratio. Business per Employee increased by an average 5.14%, while Profit per Employee increased by .08%. These increases indicate improved business generation and profitability per employee The coefficient of variance for Business per Employee (BPE) increased by 1.32% indicating notable variation in employee productivity. In contrast, the coefficient of variance for Profit per Employee (PPE) decreased to 5.60%, indicating more consistent profit generation per employee.	Overall, the results suggest that HDFC Bank improved its employee-related business and profit performance, although its average Cost-to-Income Ratio increased slightly

Table 5: Financial Performance of HDFC Bank during the COVID Period

Sl. No	Financial indicator	Ratio	Year		Average	CV (%)
			2020-21	2021-22		
1.	Profitability	Return on Assets (ROA)	1.97	2.03	2.00	1.50
		Return on Equity (ROE)	16.60	16.90	16.75	0.90
		Net Interest Margin (NIM)	4.10	4.00	4.05	1,23
2.	Liquidity	Credit–Deposit Ratio	85,01	87.77	86.39	1.60
		Liquidity Coverage Ratio (LCR)	137.95	112.49	125.22	10.17
		Government Securities to Total Assets	20.10	17.72	18.91	6.29
3.	Asset Quality	Gross Non-Performing Assets (GNPA)	1.32	1.17	1.25	6.02
		Net Non-Performing Assets (NNPA)	0.40	0.32	0.36	11,11
		Provision Coverage Ratio (PCR)	69.80	72.70	71.25	2,04

4.	Capital Adequacy	Capital Adequacy Ratio	18.80	18.90	18.85	0.27
5.	Operational Efficiency	Cost-to-Income Ratio	36.30	36.90	36.60	0.82
		Business per Employee	19.30	20.25	19.78	2.40
		Profit per Employee	0.26	0.28	0.27	3.70

(Source: Compiled from the Annual Reports of HDFC Bank for 2020–21 and 2021–22.)

Analysis and Interpretations

Table 6: Analysis and Interpretations of Financial Performance of HDFC Bank during the COVID Period

Financial Indicator	Analysis	Interpretation
Profitability	During the COVID-19 period, the average Return on Assets (ROA) was 2.00%, while the average Return on Equity (ROE) stood at 16.75%. It is found that during the COVID-19 period, the average Return on Assets (ROA) was 2.00%, while the average Return on Equity (ROE) stood at 16.75%. The respective coefficient of variance of 1.50% and 0.90% indicate that both indicators remained relatively stable over the two years. The average Net Interest Margin (NIM) was 4.05%, with a coefficient of variance of 1.23%. Although Net Interest Margin dropped a little from 4.10% to 4.00%, overall profitability parameter showed limited year-to-year deviation	ROA and ROE remained relatively stable, while NIM declined slightly.
Liquidity	The data of liquidity showed that the average CD (Credit Deposit) Ratio was 86.39%, growing from 85.01% in 2020–21 to 87.77% in 2021–22. Its coefficient of variance of 1.60% denotes comparatively low variation. The average Liquidity Coverage Ratio was 125.22%, but it dropped from 137.95% to 112.49%, causing in a comparatively high coefficient of variance of 10.17%. The Government Securities to Total Assets ratio averaged 18.91% and dropped from 20.10% to 17.72%. Its coefficient of variance of 6.29% shows moderate deviation. In this way, the bank sustained its liquidity parameter (indictors) at positive average levels, but the LC(Liquidity Coverage) Ratio showed the highest variation within this category. 13.	The Credit–Deposit Ratio increased, but the Liquidity Coverage Ratio declined considerably between the two years.
Asset Quality	The average Gross Non-Performing Assets (GNPA) ratio was 1.25%, declining from 1.32% to 1.17%. The average Net Non-Performing Assets (NNPA) ratio was approximately 0.36%, declining from 0.40% to 0.32%. These reductions generally indicate an improvement in asset quality. However, the NNPA ratio had a CV of 11.11%, higher than the GNPA CV of 6.02%, showing greater relative variation in net NPAs. The average Provision Coverage Ratio was 71.25%, increasing from 69.80% to 72.70%. Its CV of 2.04% indicates relatively consistent provisioning during the period. Overall, the figures suggest an improvement in the average NPA position and provision coverage, although the NNPA ratio fluctuated more in relative terms.	Overall, the lower GNPA and NNPA ratios and the higher average PCR point towards improved asset quality and provision coverage. However, the increased variability indicates that these improvements were not equally consistent throughout the post-COVID period.
Capital Adequacy Ratio	The average Capital Adequacy Ratio was 18.85%, increasing marginally from 18.80% to 18.90%. Its CV of only 0.27% indicates a highly stable capital adequacy position over the	CRAR remained highly stable, with an average of 18.85%

	two financial years. This suggests that the bank maintained a consistent capital buffer during the COVID-19 period, based on the figures supplied.	and a CV of 0.27%.
Operational Efficiency	The average Cost-to-Income Ratio was 36.60%, increasing from 36.30% to 36.90%. Since a lower ratio generally indicates better cost efficiency, this movement suggests a small deterioration in cost efficiency. However, the CV of 0.82% indicates that the ratio remained relatively stable. Business per Employee increased from 19.30 to 20.25, giving an average of 19.78. Profit per Employee increased from 0.26 to 0.28, averaging 0.27. These movements suggest improvements in employee-level business generation and profit generation. Their CVs of 2.40% and 3.70%, respectively, indicate relatively limited variation.	Business per Employee and Profit per Employee increased, although the Cost-to-Income Ratio rose slightly.

Results and Discussion

Table 7: Test of Significance of Profitability during the Pre-COVID and Post-COVID Periods

Variables	t - value	df	p-value sig (two tailed)	Decision
Return on Assets (ROA)	0.555	2	0.635	Fail to reject H_o
Return on Equity (ROE)	1.668	2	0.237	Fail to reject Ho
Net Interest Margin Ratio (NIMR)	21.934	2	0.002	Reject Ho

Table 8: Test of Significance of Liquidity during the Pre-COVID and Post-COVID Periods

Variables	t -value	df	p-value sig (two tailed)	Decision
Credit–Deposit Ratio	0.343	2	0.765	Fail to reject Ho
Liquidity Coverage Ratio (LCR)	0.125	2	0.912	Fail to reject Ho
Government Securities to Total Assets	2.003	2	0.183	Fail to reject Ho

Table 9: Test of Significance of Asset quality during the Pre-COVID and Post-COVID Periods

Variables	t -value	df	p-value sig (two tailed)	Decision
Gross Non-Performing Assets (GNPA)	1.017	2	0.416	Fail to reject Ho
Net Non-Performing Assets (NNPA)	0.683	2	0.565	Fail to reject Ho
Provision Coverage Ratio (PCR)	0.503	2	0.665	Fail to reject Ho

Table 10: Test of Significance of Capital Adequacy Ratio during the Pre-COVID and Post-COVID Periods

Variable	t - value	df	p-value sig (two tailed)	Decision
Capital Adequacy Ratio	2.322	2	0.146	Fail to reject Ho

Table 11: Test of Significance ofOperational Efficiency during the Pre-COVID and Post-COVID Periods

Variables	t - value	df	p-value sig (two tailed)	Decision
Cost-to-Income Ratio	0.829	2	0.494	Fail to reject Ho
Business per Employee	10.339	2	0.009	RejectHo

Interpretation of the Results

Out of the 13 variables, Profit per Employee was excluded from hypothesis testing because the standard error of the mean difference was zero, making the paired-samples t-test statistic undefined. Therefore, this variable was excluded from the hypothesis-testing results.

The paired-samples t-test reveals that only two of the twelve financial indicators show statistically significant differences between the pre-COVID and post-COVID periods.

- **Net Interest Margin (NIM):** The p-value is 0.002, which is below 0.05. Therefore, the null hypothesis is rejected. This indicates a statistically significant difference in the bank's Net Interest Margin between the two periods.
- **Business per Employee (BPE):** The p-value is 0.009, which is also below 0.05. Therefore, the null hypothesis is rejected, indicating a statistically significant difference in Business per Employee between the two periods.
- **Other financial indicators:** The p-values for ROE, ROA, CDR, LCR, GSA, GNP, NNP, PCR, CAR and CIR are all greater than 0.05. Consequently, the null hypotheses for these indicators are not rejected. The results do not provide sufficient statistical evidence of differences in these indicators between the two periods.

The results of the paired-samples t-test indicate that the financial performance of HDFC Bank did not exhibit statistically significant differences across all the selected financial indicators during the pre-COVID and post-COVID periods. Out of the twelve indicators examined, Net Interest Margin (NIM) and Business per Employee (BPE) showed statistically significant differences at the 5% level of significance, with p-values of 0.002 and 0.009, respectively. The null hypotheses relating to these two indicators were therefore rejected.

In contrast, the differences observed in Return on Equity, Return on Assets, Credit-Deposit Ratio, Liquidity Coverage Ratio, Government Securities to Total Assets, Gross Non-Performing Assts, Net Non-Performing Assets Provision Coverage Ratio, Capital Adequacy Ratio and Cost-to-Income Ratio were not statistically significant at the 5% level. Accordingly, the null hypotheses for these indicators were not rejected.

Conclusion

The comparative analysis indicates that HDFC Bank sustained a realistically strong financial situation during the post-COVID period, while performance varied across indicators. Capital adequacy improved, average GNPA and NNPA ratios declined, and business and profit per employee increased. However, the decline in ROE and NIM and the slight increase in the Cost-to-Income Ratio indicate certain weaknesses. The CV analysis further reveals improved consistency in capital adequacy and the Liquidity Coverage Ratio, while fluctuations increased in several profitability and asset-quality indicators. Overall, the post-COVID show reflects upgrading in capital strength, chosen asset-quality measures and employee efficiency, besides some burden on profitability.

HDFC Bank demonstrated relative financial stability during the COVID-19 period, as reflected in the low coefficients of variation for most profitability, capital adequacy and operational efficiency indicators. The decline in GNPA and NNPA ratios and the increase in the Provision Coverage Ratio indicate an improvement in average asset quality. However, the substantial decline in the Liquidity Coverage Ratio and the slight increase in the Cost-to-Income Ratio require attention. Overall, the data suggest that HDFC Bank maintained a relatively stable financial position during 2020–21 and 2021–22, despite variations in certain liquidity indicators.

The findings therefore suggest that HDFC Bank's post-COVID financial position was characterized by stronger capital adequacy, lower average non-performing asset ratios, and improved employee productivity, alongside some pressure on profitability and selected measures of operational and liquidity performance. These conclusions describe changes between the two study periods and should not by themselves be interpreted as proof that the pandemic caused those changes.

The paired samples t-test offers a valuable statistical view on these findings of the five selected financial indicators, a combination of thirteen variables, Profit per Employee was excluded because the standard error of the paired differences was zero, making the t-statistic undefined. Among the remaining twelve variables , only Net Interest Margin ($p = 0.002$) and Business per Employee ($p = 0.009$) exhibited statistically significant differences at the 5% level of significance. The null hypotheses for these two indicators were rejected, whereas the null hypotheses for the other ten variables were not rejected. Thus, the observed differences in most indicators did not run sufficient statistical evidence of a difference between the two periods

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