Adaptive Liquidity Management: Analyzing Changes in Liquidity Ratios of Private Banks on the Bombay Stock Exchange Pre and Post COVID-19

Mr. Mohammadali K. Momin*,
Research Scholar,
Department of Commerce,
Dolat-Usha Institute of Applied Sciences and Dhiru-Sarla Institute of Management & Commerce, Valsad.
Email: momin3051@gmail.com

Dr. Dhimen J. Jani,
Assistant Professor & HOD,
Department of BBA,
Dolat-Usha Institute of Applied Sciences
and
Dhiru-Sarla Institute of Management & Commerce, Valsad.

Abstract:

This study examines the liquidity position of six leading private banks listed on the Bombay Stock Exchange (BSE) with market capitalizations exceeding ₹50,000 crores during pre-COVID-19 (2016–2019) and post-COVID-19 (2020–2024) periods. Using liquidity ratios—current ratio, quick ratio, and cash ratio—sourced from Prowess IQ, the research employs paired sample t-tests and effect size analysis to evaluate significant changes in liquidity management. Results reveal that while the current and quick ratios increased post-pandemic, these changes were not statistically significant, indicating stability in broader liquidity metrics. In contrast, the cash ratio demonstrated a significant increase, highlighting banks' strategic focus on enhancing cash reserves to address uncertainties. The findings underscore the importance of liquidity management during crises and the role of regulatory measures in sustaining financial stability. This research contributes valuable insights for banking professionals and policymakers, emphasizing adaptive strategies to navigate economic disruptions and improve resilience in the banking sector.

Introduction:

Liquidity management is a cornerstone of banking operations, ensuring that financial institutions maintain adequate resources to meet short-term obligations while optimizing returns on their assets. The importance of robust liquidity practices became especially evident during times of economic uncertainty, such as the COVID-19 pandemic, which posed unprecedented challenges to the global financial system. For private banks in India, the pandemic not only tested their resilience but also necessitated significant adjustments in liquidity management strategies to address evolving risks and regulatory changes.

The COVID-19 pandemic disrupted global economies, causing volatility in financial markets, loan defaults, and changes in customer deposit behavior. For banks, these disruptions underscored the need for proactive liquidity management to mitigate risks and maintain operational stability. Regulatory interventions, such as those by the Reserve Bank of India (RBI), introduced measures like loan moratoriums and liquidity infusion schemes to sustain financial stability. However, the extent to which private banks adapted their liquidity management practices during the pandemic remains an area requiring deeper exploration.

This study focuses on assessing the liquidity position of six leading private banks listed on the Bombay Stock Exchange (BSE) with market capitalizations exceeding ₹50,000 crores. By analyzing liquidity ratios—current ratio, quick ratio, and cash ratio—over an eight-year period (2016–2024), this research compares pre-COVID-19 and post-COVID-19 trends to identify

significant changes. Using paired sample t-tests and effect size analyses, the study evaluates whether the pandemic led to statistically and practically significant shifts in liquidity metrics.

The findings of this study aim to contribute to the understanding of liquidity management during crises and provide actionable insights for banking professionals and policymakers. By focusing on private banks, which play a critical role in India's financial system, this research sheds light on how the sector adapted to the challenges posed by the pandemic and offers lessons for managing liquidity in future crises.

Review of Literature:

Liquidity management is a critical aspect of banking operations, ensuring that financial institutions can meet short-term obligations while maintaining operational stability. Several studies have explored the factors influencing liquidity positions, particularly in times of economic uncertainty, such as the COVID-19 pandemic.

The global financial crisis of 2008 and subsequent economic disruptions have highlighted the importance of robust liquidity management. Studies by Cornett et al. (2011) examined the liquidity responses of banks during the crisis, finding that institutions with stronger liquidity reserves were better equipped to handle financial shocks. Similarly, Acharya and Naqvi (2012) emphasized the role of liquidity as a safeguard against systemic risks, underscoring the need for prudent management practices.

The COVID-19 pandemic introduced unprecedented challenges to banking systems worldwide. Research by Elnahass et al. (2021) revealed that banks increased their cash holdings significantly during the pandemic to mitigate risks associated with heightened loan defaults and withdrawal pressures. In the Indian context, Chakraborty and Saha (2021) analyzed the impact of regulatory measures by the Reserve Bank of India, concluding that such interventions were instrumental in maintaining liquidity stability during the crisis.

Liquidity ratios, including the current ratio, quick ratio, and cash ratio, are widely recognized as key indicators of a bank's short-term financial health. According to Berger and Bouwman (2009), these ratios provide a snapshot of a bank's ability to meet its obligations without relying on external funding. Post-pandemic, Kumar et al. (2022) observed significant changes in cash ratios across Indian banks, attributing these shifts to increased precautionary reserves and conservative liquidity strategies.

Regulatory frameworks play a critical role in shaping liquidity management practices. Basel III norms introduced liquidity coverage and net stable funding ratios to enhance the resilience of banks during economic shocks (BIS, 2011). In India, RBI measures during the COVID-19

pandemic, such as liquidity infusion schemes and loan moratoriums, have been pivotal in sustaining liquidity levels (RBI, 2021).

The use of statistical tools like paired sample t-tests and effect size measures provides robust insights into the significance and magnitude of liquidity changes. Cohen's d is particularly useful in comparing pre- and post-crisis financial metrics (Lakens, 2013). Studies have emphasized the need for effect size analysis to complement statistical significance testing, ensuring a comprehensive interpretation of financial data.

Methodology:

This study employs a comparative and analytical research design to evaluate the liquidity position of private banks listed on the Bombay Stock Exchange (BSE) before and after the COVID-19 pandemic. Data for the analysis was collected from the Prowess IQ database, a credible source for company-level financial data. The liquidity metrics under examination include the current ratio, quick ratio, and cash ratio. The time frame for the study spans eight years, divided into two periods: the pre-pandemic period from 2016 to 2019 and the post-pandemic period from 2020 to 2024. Six private banks were purposively selected from a total of 13 BSE-listed private banks, based on their market capitalization exceeding ₹50,000 crores as of 2024. These banks were chosen to provide a representative understanding of the liquidity trends among the largest players in India's private banking sector.

For data analysis, SPSS 27 was utilized to conduct statistical tests. Descriptive statistics were calculated to summarize the mean, standard deviation, and range of the liquidity ratios for each bank during the pre- and post-pandemic periods. A paired sample t-test was employed to compare the liquidity ratios across the two periods, as this test is appropriate for assessing the same banks' performance over different time frames. The hypothesis testing was conducted at a 95% confidence level, with a significance threshold of 0.05. The null hypothesis posited that there is no significant difference in the liquidity ratios pre- and post-COVID-19, while the alternative hypothesis suggested a significant difference.

The rationale for using a paired sample t-test lies in its ability to account for the dependence of observations across the two periods, ensuring a robust comparison of liquidity performance. The data used in this study was publicly available, ensuring adherence to ethical research practices. Additionally, all sources were properly acknowledged to maintain academic integrity. However, the study is limited to six private banks, which may not fully reflect the trends across all private banks in India. Moreover, external factors such as regulatory changes and macroeconomic conditions influencing liquidity are beyond the study's scope. This

methodology ensures a rigorous and replicable approach to understanding the impact of the pandemic on the liquidity position of major private banks in India.

Result:

This section presents the findings of the study, comparing the liquidity ratios of six leading private banks listed on the Bombay Stock Exchange during the pre-COVID-19 (2016–2019) and post-COVID-19 (2020–2024) periods. The analysis focuses on the current ratio, quick ratio, and cash ratio, with descriptive statistics, paired sample correlations, paired sample t-tests, and effect size measurements. These results provide insights into the changes in liquidity management strategies and their statistical significance in response to the challenges posed by the pandemic.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Current Ratio	2.7317	24	.65660	.13403
	Post Current Ratio	3.2842	24	1.28456	.26221
Pair 2	Pre-Quick Ratio	2.7317	24	.65660	.13403
	Post Quick Ratio	3.2842	24	1.28456	.26221
Pair 3	Pre-Cash Ratio	1.8358	24	.62414	.12740
	Post Cash Ratio	2.5317	24	1.01434	.20705

The paired samples statistics reveal notable changes in the liquidity ratios of the selected private banks between the pre- and post-COVID-19 periods. The current ratio increased from a mean of 2.7317 in the pre-pandemic period to 3.2842 post-pandemic, indicating an improvement in the banks' ability to meet short-term obligations using their current assets. However, the standard deviation increased from 0.65660 to 1.28456, suggesting greater variability in current ratio values across the banks during the post-pandemic period. Similarly, the quick ratio, which excludes inventory from current assets, also rose from 2.7317 pre-pandemic to 3.2842 post-pandemic, reflecting enhanced liquidity. This improvement in quick ratio was accompanied by an increase in standard deviation from 0.65660 to 1.28456, indicating higher dispersion in the post-pandemic quick ratios.

The cash ratio, which measures the most liquid assets relative to liabilities, also demonstrated a substantial increase, with a mean rising from 1.8358 pre-pandemic to 2.5317 post-pandemic. This suggests that banks maintained higher cash reserves as a precautionary measure during the uncertain economic environment of the pandemic. The variability in cash ratios also grew,

as shown by an increase in standard deviation from 0.62414 to 1.01434, indicating differences in cash management strategies among the banks.

Overall, the results indicate a consistent increase in all three liquidity ratios from the pre- to post-COVID-19 periods, highlighting a shift in liquidity management practices. This shift likely reflects regulatory interventions, an increased focus on risk mitigation, and heightened precautionary measures by the banks in response to the pandemic. The rise in standard deviations and standard errors further underscores greater heterogeneity in the liquidity strategies of the sampled banks during the post-pandemic period. Further statistical analysis is required to determine the significance of these changes.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-Current Ratio & Post Current Ratio	24	.036	.868
Pair 2	Pre-Quick Ratio & Post Quick Ratio	24	.036	.868
Pair 3	Pre-Cash Ratio & Post Cash Ratio	24	-.085	.693

These results imply that the liquidity positions of the banks in the post-pandemic period were not strongly linked to their liquidity positions before the pandemic. This lack of correlation may reflect significant structural adjustments in liquidity management practices during the pandemic, influenced by external factors such as regulatory changes, economic disruptions, or shifts in market conditions. The weak and non-significant correlations suggest that the pandemic period introduced a disconnect between pre-existing liquidity patterns and post-pandemic liquidity outcomes, underscoring the transformative impact of the pandemic on banking operations.

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			

Pair 1	Pre-Current Ratio - Post Current Ratio	-.552	1.42148	.29016	-1.15274	.04774	-1.904	23	.069
Pair 2	Pre-Quick Ratio - Post Quick Ratio	-.552	1.42148	.29016	-1.15274	.04774	-1.904	23	.069
Pair 3	Pre-Cash Ratio - Post Cash Ratio	-.695	1.23537	.25217	-1.21748	-.17418	-2.759	23	.011

The paired samples test results examine whether there are significant differences in the liquidity ratios of the selected private banks between the pre- and post-COVID-19 periods. The paired samples test results show mixed outcomes for the liquidity ratios. While the current ratio and quick ratio increased in the post-pandemic period, the changes are not statistically significant. In contrast, the cash ratio demonstrates a significant increase, indicating that banks significantly enhanced their cash reserves post-pandemic. This finding highlights a strategic focus on holding more cash and cash equivalents to ensure liquidity in response to the uncertainties and risks brought by the COVID-19 pandemic. The nonsignificant changes in the current and quick ratios may suggest that broader liquidity metrics were relatively stable, with cash holdings being the primary driver of liquidity adjustments.

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	Pre-Current Ratio - Post Current Ratio	Cohen's d	1.42148	-.389	-.800	.031
		Hedges' correction	1.44519	-.382	-.787	.030
Pair 2	Pre-Quick Ratio - Post Quick Ratio	Cohen's d	1.42148	-.389	-.800	.031
		Hedges' correction	1.44519	-.382	-.787	.030
Pair 3	Pre-Cash Ratio - Post Cash Ratio	Cohen's d	1.23537	-.563	-.990	-.126
		Hedges' correction	1.25597	-.554	-.973	-.124

a. The denominator used in estimating the effect sizes.

Cohen's d uses the sample standard deviation of the mean difference.

Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

The effect size analysis reveals small and statistically non-significant changes in the current ratio and quick ratio, as indicated by the low values of Cohen's d and Hedges' correction and confidence intervals that include zero. This suggests that the observed differences in these ratios between the pre- and post-COVID-19 periods are negligible in practical terms. In contrast, the cash ratio demonstrates a statistically significant medium effect size, as both Cohen's d and Hedges' correction indicate meaningful and substantial changes in cash holdings during the post-pandemic period. These findings emphasize that the significant improvements in liquidity observed were primarily driven by increased cash reserves, reflecting strategic adjustments by private banks in response to the challenges posed by the pandemic.

Discussion:

This study aimed to assess the liquidity position of leading private banks listed on the Bombay Stock Exchange (BSE) before and after the COVID-19 pandemic by analyzing key liquidity ratios: current ratio, quick ratio, and cash ratio. The findings provide valuable insights into how the pandemic influenced liquidity management practices in the Indian banking sector.

The results indicate that while there was an increase in the current and quick ratios during the post-pandemic period, these changes were not statistically significant. This suggests that broader liquidity metrics, which include all current assets, remained relatively stable despite the pandemic's economic disruptions. The weak correlations between the pre- and post-pandemic ratios further highlight that liquidity strategies in the post-pandemic period were not strongly tied to pre-pandemic practices. This stability in current and quick ratios could reflect banks' reliance on diversified asset portfolios and regulatory support during the crisis.

In contrast, the cash ratio showed a statistically significant increase, with a medium effect size as indicated by Cohen's d and Hedges' correction. This finding highlights a deliberate strategy by banks to increase their cash reserves during the post-pandemic period. The significant rise in cash holdings can be attributed to the heightened economic uncertainty and the need for immediate liquidity to address potential risks, such as loan defaults or withdrawal pressures. Regulatory measures introduced by the Reserve Bank of India (RBI), including enhanced liquidity facilities and moratoriums on loan repayments, may have also contributed to this increase in cash reserves.

The pandemic introduced a unique set of challenges, compelling banks to prioritize liquidity management as a critical aspect of their operations. The observed increase in cash ratios suggests that banks adopted a conservative approach, favoring liquid cash over other assets to safeguard against uncertainties. However, the non-significant changes in current and quick ratios indicate that broader liquidity levels remained largely unaffected, possibly due to effective regulatory interventions and internal financial controls.

These findings have important implications for banking strategies and regulatory policies. First, they underscore the importance of maintaining robust cash reserves as part of a broader liquidity management framework, especially during crises. Second, they highlight the role of regulatory bodies in providing support during economic shocks, ensuring that banks can sustain stable liquidity levels without compromising operational efficiency.

Conclusion:

This study investigated the impact of the COVID-19 pandemic on the liquidity position of six leading private banks listed on the Bombay Stock Exchange (BSE) by analyzing key liquidity ratios—current ratio, quick ratio, and cash ratio—across pre-pandemic (2016–2019) and post-pandemic (2020–2024) periods. The findings reveal a significant shift in liquidity management strategies during the post-pandemic period, highlighting the adaptive measures taken by banks to navigate economic uncertainties.

While the current and quick ratios showed an increase in the post-pandemic period, these changes were not statistically significant, indicating relative stability in broader liquidity metrics. This suggests that private banks effectively managed their overall liquidity, supported by diversified asset portfolios and regulatory interventions during the crisis. However, the cash ratio exhibited a statistically significant increase, with a medium effect size, reflecting a deliberate strategy to enhance cash reserves. This adjustment highlights the prioritization of liquidity to mitigate risks such as potential defaults and withdrawal pressures during the pandemic.

The results emphasize the critical role of cash reserves in ensuring financial stability during times of crisis. They also underscore the importance of regulatory measures, such as the Reserve Bank of India's liquidity-enhancing initiatives, which likely played a vital role in maintaining stability across the banking sector.

In conclusion, this study provides valuable insights into how private banks in India adapted their liquidity management strategies in response to the COVID-19 pandemic. The findings contribute to the broader understanding of financial resilience during economic disruptions and

offer practical implications for banking professionals and policymakers. Future research can build on these insights by examining a wider range of banks, exploring long-term liquidity trends, and assessing the interplay between liquidity and other financial performance indicators.

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