

## ADOPTION OF DIGITAL FINANCIAL SERVICES AND THE PERFORMANCE OF COMMERCIAL BANKS IN INDIA: A CAMEL RATING SYSTEM APPROACH

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**ABSTRACT.** This paper is dealing with the adoption of digital financial services on the performance of commercial banks in India. The study used camel rating system to measure pre and post adoption performance of commercial banks. The reports says that Indian banks are widely adopted digital financial services during the year 2012-13. Hence, 2004-05 to 2011-12 considered as pre adoption period and 2012-13 to 2019-20 considered as post adoption period for the data analysis. 44 banks were selected for the study based on the data availability. 15 camel ratios were identified and paired t-test used for analysis. The study found that most of the CAMEL (capital adequacy, assets, management capability, earnings, liquidity) variables are found significant to improve the financial performance of banks. The coefficient of digital financial services variables is found to be significant. This indicates that facilities of digital banking could enhance the financial performance of banks.

### 1. INTRODUCTION

The banking sector in India is going through significant changes due to economic reforms. Gradually, a radical change was observed in banking services compared to conventional physical banking (Pikkarainen et al. 2004). That was just the beginning of the usage of digital payment methods like point of sale (POS), automated teller machine (ATM), Internet banking, online banking, unified payments interface (UPI) payments etc. Since 2010 there has been a revolution in digital financial payment methods (Gupta and Xia 2018). Banks were competing to provide better digital financial services to their customers. Digital banking/financial services are the process of carrying out financial transactions without using physical cash, coins or bills (Beloke and AP 2021). The World Bank defines Digital Financial Services (DFS) as “financial services which rely on digital technologies for their delivery and use by consumers” (Pazarbasioglu et al. 2020). Thus, DFS involves payment through credit cards, debit cards, ATM, mobile banking, internet banking, UPI payments, and point of sale transactions (Hassan and Meraaj 2019).

After 2011, the digital banking wave has been driven mainly by mobile phones. The increasing sale of smartphones, the introduction of high-speed internet services and a considerable number of young tech-savvy users are the combined factors that are a clear indication of the direction in which the digital banking bandwagon is heading (Jain et al. 2020). Almost all banks offer digital banking services to their clients in India as a strategic instrument to survive in the market (Safeena, Kammani, and Date 2014). Indian individuals have been gradually adapting to digital payments, with 77% showing a preference towards digital payments over paper-based

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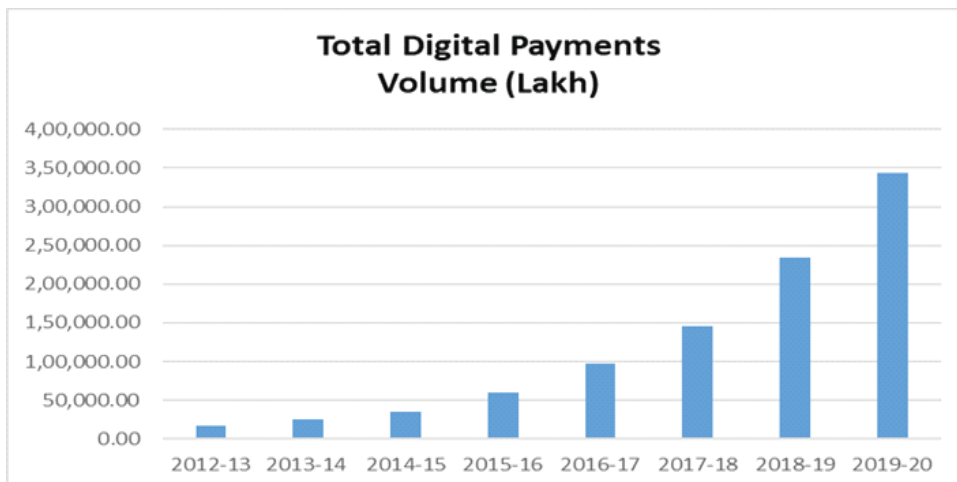
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instruments in the year 2020 (NASSCOM conducted exhaustive pan-India e-surveys from August to November 2020). The portion of digital payments in the total volume of non-cash retail payments increased to 98.5 percent during 2020- 21, up from 97.0 percent in the previous year (RBI Annual Report 2021). The following graph depicts the growth of digital payment methods in India after 2012-13.



Source: National Payment Corporation of India (NPCI) (<https://www.npci.org.in/statistics>)

Since all these processes are done through banks, the banks also have a good role to play in bringing up digital payment. How do these growing digital banking services affect the overall performance of banks? From 2011-12 there was a tremendous increase in digital payment methods. So, this study analyzes how digital financial services affect commercial banks' performance in India.

## 2. REVIEW OF LITERATURE

**2.1. Digital Financial Services.** Digital financial services (DFS) are financial services that rely on digital technologies for their delivery and use by consumers. The term “digital channels” refers to the internet, mobile phones (both smartphones and digital feature phones), ATMs, POS terminals, NFC-enabled devices, chips, electronically enabled cards, biometric devices, tablets, phablets and any other digital system. Banks are using digital financial services because of to reach a more audience of customers untapped by the existing banking infrastructure, increase financial inclusion, increase the efficiency of delivery, improve quality of service, revenue growth or to enhance profitability, cost reduction (operating cost and transactional cost) to companies as well as customers etc. (Kambale 2018). Digital transactions in India increased by 55% last year, compared with 48% in China and 23% in Indonesia, according to a Bank for International Settlements (BIS) report. Digital financial services, digital banking, digitization, digitalization, digital transformation etc., are the frequently used terminologies for technological innovation in the banking sector. Digitization refers to creating a digital representation of physical objects or attributes. Digitalization refers to enabling or improving processes by leveraging digital technologies and digitized data. Digital Transformation is really business transformation enabled by digitalization. But the term digital banking or digital financial services (DFS) are a wide range of innovative technologies mainly used in developing countries to deliver essential financial services to consumers (David-West, Iheanachor, and Kelikume 2018).

**2.2. Bank's Performance.** As the banking sector is considered a vital segment of a modern economy, its performance is vital. In order to ensure a solid financial system and an efficient economy, banks must be carefully evaluated and analyzed. Bank performance means the collective set of indicators that are indicative of the bank's current status and the extent of its ability to achieve the desired objectives (Igyo, Jane, and Omotayo 2016). The performance

of banks cannot be easily measured since many of their products and services are intangible. Bank performance can be measured by using various financial and non-financial factors. Profitability, Customer Satisfaction, Productivity, efficiency and effectiveness, risk exposure etc., are some of the dimensions of bank performance (Boubakri et al. 2005). Measuring bank performance helps to determine their operational result overall financial condition; measure their assets quality, management quality and efficiency, and achievement of their objectives; and (Bititci, Turner, and Begemann 2000) outlines the components of performance measurement as consisting of financial and non-financial measures. The financial measures include profit, ratio analysis and rate of capital employed. Non-financial measures include efficiency, effectiveness, and customer satisfaction, amongst others. Performance measures in the past were mainly financial ones.

Sl. No.	Ramting System	Year and Country	Authors	Description / Area of Analysis
1	PATROL	1993 Italy	(Sarker 2005), (Babar, Zeb, and Lions 2011)	Capital Adequacy, Profitability, Credit Quality, Organization and Liquidity.
2	ORAP	1997 France	(Sahajwala 2000), (Serikbayeva 2015)	Organization and Reinforcement of Preventive Action
3	EAGLES	N/A	(Kumari and Prasad 2017), (AlAli 2019)	Earning Ability, Asset Quality, Growth, Liquidity and Strategy
4	CAMEL	1979 USA	(Dang 2011), (Kengatharan 2018)	Capital Adequacy, Asset Quality, Management Ability, Earnings, And Liquidity
5	PEARLS	2009 Abu Dhabi	(Zaiqing, Lan, and Guoliang 2009), (DEVI 2019)	Protection, Effective Financial Structure, Asset Quality, Rates of Return and Costs, And Liquidity and Signs of Growth.
6	GIRAEF	1999 USA	(Satta 2006), (Gonzalez and Javoy 2011)	Governance and Decision-Making Processes, Information and Management Tools, Risks Analysis and Control Activities and Loan Portfolio Funding: Equity and Liabilities Efficiency and Liability.
7	RAST	1999 Netherlands	(Sahajwala 2000), (Zenchenko 2015)	Risk Analysis Support Tool
8	RATE	1998 UK	(Sahajwala 2000)	Risk Assessment, Tool of Supervision and Evaluation

Source: Compiled from different sources

**2.3. Digital Financial Services and Bank's Performance.** The findings of Evian et al. (2021) suggest that internet banking has a significant positive effect on bank performance, This research employs multiple regression analysis, and the data from 36 banks for a period of five years, from 2015 to 2019. Another study by Bashayreh & Wadi (2021) revealed that the effect of Fintech factors, including automated teller machines services, internet banking services, and phone banking services, on Jordanian banks' performance was positive. The study of Al-Chahadah et al. (2020) showed a statistically significant impact of two financial inclusion indicators, i.e., financial access and enterprise financing and bank financial performance, i.e., bank profitability of Jordanian banks. Rozhkova et al. (2021) found no significant relationship between Internet banking adoption and Russian bank profitability. Mustapha (2018) finds that

bank performance increased after adopting electronic payment technologies in Nigeria. There are many studies conducted by Aduda & Kingoo (2012), Musa et al. (2015), Dinh et al. (2015), Yang et al. (2018), Kahveci & Wolfs (2018), Wadesango & Magaya (2020), Wijayanti et al., (2021) on to analyze the relationship between DFS and bank performance.

**2.4. Different approaches to measure the performance of banks.** There is no optimal system or standard blueprint for the process of regulating and supervising financial institutions, including banks. Over the last few years, regulatory bodies have adopted new approaches and established new systems for ongoing banking supervision. Studies conducted by Sahajwala (2000), Sarker (2005), Babar et al. (2011), and Baltas & Rodean Cozma, (2014) shows that regulatory authorities and central banks of respective countries are adopting different kinds of performance measurement techniques which are listed below:

There are multiple measurement tools to assess banks' performance, but most researchers use the CAMELS Rating system. CAMELS analysis is one of the most frequently used performance measurement methods to evaluate the performance of banks. It is a rating system accepted by the regulatory and supervisory authorities of the USA (Yildirim & Ildokuz, 2020). The CAMELS rating system measures the strength of a bank through six categories. The rating methodology is on a scale of one to five, with one being the top rating and five being the worst. CAMELS model was initially founded in 1979, and CAMEL analyses and rates five areas of bank performance: capital adequacy, Asset quality, Management ability, Earnings, and Liquidity. Later S was added in 1996 to represent the market sensitivity and was and still is the excellent model among supervisory authorities to determine the overall soundness of banks - (AlAli 2019). Reserve Bank of India report says that they also adopted, more or less, the CAMELS approach for regulating Financial Institutions. Many authors used CAMEL and CAMELS framework to assess the overall soundness of banks, especially to measure the pre-event and post-event bank performance.

**2.5. CAMELS and Its Elements.** (Rostami 2015) defines CAMELS as a combination of the six factors used to evaluate banks' performance. These factors are capital adequacy, asset quality, management adequacy, earnings, liquidity and finally, sensitivity to market risk, and their abbreviations are C, A, M, E, L and S, respectively. Initially, there was a 5-factor system (CAMEL). However, since 1997, sensitivity to market risk (S) has also been used to measure the performance of banks:

**C (Capital) Capital adequacy:** Capital adequacy is an effective tool to measure the optimum amount of capital a bank needs in case of unexpected risks and uncertainties (KANDEMİR and ARICI 2013).

**A (Asset) Asset quality:** In addition to off-balance sheet operations, credit risk arising from not only the investment portfolio but also other credit activities, quality of fixed assets and other assets of banks are investigated through the asset quality tool. Moreover, the ability of the management to define, measure, monitor and control credit risk is also assessed through the asset quality tool (Altan, Y. Azari, and Bedük 2014).

**M (Management) Management quality:** The bank management not only defines, measures, monitors and controls the operational risks arising from operations but also ensures bank activities operate effectively following internal and external regulations and legislations (Muhmad and Hashim 2015).

**E (Earnings) Earnings status:** The ability to support current and future banking operations depends on the profile of the earnings as well as profitability (Shar, Shah, and Jamali 2010).

**L (Liquidity) Liquidity status** refers to a bank's ability to meet depositors' withdrawals, maturing liabilities and loan requests without delay (Yeap 2000).

**S (Sensitivity) Sensitivity to market risk:** Sensitivity to market risk measures the risk level that banks are exposed to such as changes in interest rates, exchange rates, and price level of goods and stocks because of operating in that specific market.

<b>Table 2: Measuring Pre and Post-Event Performance Using CAMEL Framework</b>				
Sl. No	Articles	Events and Study Period	Authors	Methodology and Major Findings
1	Evaluating banking productivity and information technology using the translog production function	Pre- ICT Adoption; Post- ICT Adoption (1996-2007)	Stella 2010	Production function and the CAMEL rating were used for the study. The results of this empirical study have focused on ICT contributions to loans and other assets as representative of the bank's output. The results reveal that, generally, a one percent increase in ICT expenses impacted the productivity of Nigerian banks to the tune of 26.8 percent.
2	Electronic banking and bank performance in Nigeria	Pre-adoption period – 1997-2002; Post full adoption period - 2003-2010	Abaenew, Ogbulu, and Ndugbu 2013	The authors used a mean comparison test at a 5 percent significance level for performance. The study discovered that adopting e-banking has positively and significantly enhanced Nigerian banks' returns on equity (ROE). On the other hand, it also revealed that electronic banking has not significantly enhanced Nigerian banks' returns on assets (ROA).
3	Assessment of Key Performance Indicators of Commercial Banks in India - A CAMEL Approach	Full study period (2005-2015); Pre-financial crisis period (2005-2008; Pot-financial crisis period (2009-2015)	Sachdeva and Sivakumar 2017	The study also employs panel data models to analyze the impact of CAMEL variables. The result from the analysis suggests that asset management and earning quality contribute significantly to the banks' performances. On the other hand, capital adequacy and management quality were found to have an insignificant relationship.
4	Financial Stability of Islamic and Conventional Banks of the MENA Region: Post and Pre-Crisis of CAMELS Framework	Pre-Crisis 2005-2006; Subprime Crisis 2007-2008; Post-Crisis 2009-2014	Fadoua and Brahim 2020	To measure bank stability, the CAMELS method was used. The results show that during the subprime crisis, Islamic banks reacted better than conventional banks in terms of capital adequacy, earnings, and management efficiency.
5	Recent tie-up of State Bank of India (SBI) with its Associates: A Probe of Pre and Post-Merger Attainment through the Lens of CAMELS Framework	Pre-tie-up phase - 2014-15 to 2016-17; Post-tie-up phase - 2017-18 to 2019-20	Upadhyay and Kurmi 2020	CAMELS approach and paired samples test were used. It is noticeable that most financial variables under different parameters of CAMELS are not statistically significant. The study's findings show that the State Bank of India has failed to enjoy the benefits of merger as it takes over its associate banks which already have substantial non-performing assets.
Source: Compiled from different sources				

### 3. METHODOLOGY

There are 97 commercial banks operating in India. The samples considered for the study are all the banks providing digital financial services such as Automated Teller Machine (ATM) services, Point of Sale (POS) services, mobile banking and internet banking services from the 2012-13 financial year onwards. Finally, there are 44 banks considered for the study, which includes private banks, public banks and foreign banks from the Indian banking sector. The details of the banks selected for the study are given in table 3. The study used the CAMEL rating system to measure commercial banks' pre and post-adoption performance. The secondary data used for the study are collected from the annual reports published by the selected banks and the various reports published by the Reserve Bank of India (RBI). 15 CAMEL ratios were identified and paired t-tests were used for analysis.

Details	Number of Banks	Total Assets (Rs in Crores)	Total Deposits (Rs in Crores)	Total Advances (Rs in Crores)
Public Sector Banks	18	10783018.05	9048419.78	6158111.98
Private Sector Banks	20	5591220.93	3879537.96	3472929.16
Foreign Banks	6	790209.49	472896.43	272305.80
Total sample considered	44	17164448.46	13400854.17	9903346.95

Source: Author's Calculations from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>

### 4. DATA ANALYSIS

The selection of the time period is an essential factor in this research. Kumar, Mishra, and Saha (2019) say that Indian banks widely adopted digital financial services during the year 2012. In 2012, the Indian banking sector witnessed a structural change in the payment system. During this period, digital payment platforms like mobile banking, M-wallet, debit/credit cards, and net banking have seen exponential growth. While some banks started using digital services as early as 2008, most banks started using digital financial services extensively in 2011-12. Reserve bank of India (RBI) started releasing mobile banking, ATM and POS transaction data from April 2011 onwards. Hence, to compare the performance, 2004-05 to 2011-12 was considered pre adoption period and 2012-13 to 2019-20 considered post-adoption period for the data analysis. The below table shows the pre and post-period CAMEL ratios and their significance at different levels. Based on the articles referred to, Dash, M., & Das, A. (2013), KP, D. V. (2016). Prof. SN Patti, Islam, M. Z. R. M. S. (2018). Gadhia, N. M (2015), the following ratios were identified for each component of the CAMEL Framework. The data from Forty-four commercial banks were considered for the study.

Sl. NO	CAMEL Category	Ratios	Time Period	Mean	SD	t value	Sig. P value
1	Capital Adequacy	Capital Adequacy Ratio	Pre	14.17	3.56	1.408	0.166
			Post	13.47	2.35		
2		Debt Equity	Pre	0.88	0.87	-1.791	0.080*
			Post	1.06	0.65		
3		Total Advance to Total asset	Pre	0.55	0.08	-3.431	0.001***
			Post	0.57	0.09		

Source: Author's Calculations from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>



The Capital Adequacy of selected banks was measured using three ratios: Capital Adequacy ratio, debt-equity ratio and Total Advance to Total asset ratio. The results show that the Capital Adequacy ratio is not significant, and the debt-equity ratio and Total Advance to Total asset ratio are significant. It means that CAR is the same before and after the period that has not significantly improved or changed. The Basel III norms specified that capital to risk weighted assets should be at least 8%. However, as per RBI standards, Indian scheduled commercial banks must maintain a capital to risk-weighted assets ratio of 9%. Basel III guidelines were released in 2010. All the banks were maintained and continued with the minimum required ratio.

In the case of debt-equity ratio, the ratio is significant. The ratio is increased in post period compared to pre-period. The higher ratio indicates less protection for the depositors and creditors and vice-versa. However, a debt-equity ratio of 1.5 or lower is considered favorable, and a ratio higher than two is considered less favorable. Data shows that the majority of banks maintained a debt equity ratio below 1.5 and only very few banks where situation is unfavorable, and their ratio is more than 2.

The total advance to total asset ratio is also considered to measure banks' capital adequacy. This ratio indicates a bank's aggressiveness in lending which ultimately produces better profitability. A higher ratio is preferred. The data analysis shows that the performance of the banks was significant and improved compared to pre-period. The ratio has increased from 55% to 57%. The ratio ranged from 28% to 62% in the pre period and 35% to 67% in the post-period.

Sl. NO	CAMEL Category	Ratios	Time Period	Mean	SD	t value	Sig. P value
1	Asset Quality	Ratio of net NPA to net advances	Pre	1.15	0.6	-6.106	0.000***
			Post	3.33	2.4		
2		Total Investment to Total Assets	Pre	0.3	0	3.297	0.002***
			Post	0.28	0.1		
3		Gross NPA to Gross Advance	Pre	3.09	1.7	-4.735	0.000***
			Post	6.46	4.3		
Source: Author's Calculations from <a href="https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications">https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications</a>							

Asset Quality of banks are efficiently estimated and measured by using three ratios such as, Ratio of net NPA to net advances, Total Investment to Total Assets and Gross NPA to Gross Advance. All these three ratios are significant at all the significant levels. In the case of Net NPA and Gross NPA ratio, it is understood that both these NPA ratios are subsequently increased in the post-period compared to the pre-period. Both ratios show that these are doubled during the entire study period. Reviews prove that the reason for the rise in the NPA of Indian banks is due to some macroeconomic factors like lower exports due to global recession, the decline in commodity price cycles, etc. Further, recently there have been high magnitude frauds and demonetization that have contributed to rising NPAs.

The total Investments to Total Assets Ratio indicates the extent of deployment of assets in investment as against advances. This ratio is used to measure the percentage of total assets locked up in investments. The ratio is significantly improved by decreased from 30% to 28%, which means that the banks can allocate more amount for lending.

Management assessment/efficiency determines whether an organization can react to financial stress appropriately. This rating component is reflected by the management's ability to measure, look after and control risks in the institution's day-to-day activities. This is measured through the ratios of Cost to income ratio, business per employee and profit per employee.

Cost to income ratio and business-per-employee ratios are significantly improved after adopting digital financial services. Profit per employee is not significant during the study period. The management efficiency data analysis results together show that the bank has succeeded in managing their institution.

**Table 6: Management Efficiency Ratios of Selected Banks**

Sl. NO	CAMEL Category	Ratios	Time Period	Mean	SD	t value	Sig. P value
1	Management Efficiency	Cost to Income Ratio	Pre	0.23	0.06	3.238	0.002***
			Post	0.21	0.04		
2		Business per employee (in Rupees Lakh)	Pre	820.58	448.5	-5.758	0.000***
			Post	1784.9	1351.6		
3		Profit per employee (in Rupees Lakh)	Pre	9.87	16.55	-0.52	0.606
			Post	11.45	33.48		

Source: Author's Calculations from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>

The quality of earnings is an essential criterion representing the quality of a bank's profitability and its capability to consistently maintain quality and earn. It primarily determines the bank's profitability and explains its sustainability and growth of future earnings. Earning quality is measured mainly by calculating the Interest Income to Total Income Ratio, the Ratio of net interest income to total assets (Net Interest Margin) and the Ratio of operating profits to total assets. All three ratios are significant, but only Interest Income to Total Income Ratio is improved in the post period. The other two ratios are not improved somewhat, it is decreased. Reviews of literature say that it is mainly because of increasing the net and gross NPA of banks during the post period when Indian banking industry has faced many challenges like demonetization of currency, mergers and acquisition of public banks, a huge amount of fraud, etc.

**Table 7: Earnings Quality Ratios of Selected Banks**

Sl. NO	CAMEL Category	Ratios	Time Period	Mean	SD	t value	Sig. P value
1	Earnings Quality	Interest Income to Total Income Ratio	Pre	0.85	0.1	-2.832	0.007***
			Post	0.87	0.1		
2		Ratio of net interest income to total assets (Net Interest Margin)	Pre	2.99	0.7	3.185	0.003***
			Post	2.72	0.7		
3		Ratio of operating profits to total assets	Pre	2.33	1	2.897	0.006***
			Post	2	0.9		

Source: Author's Calculations from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>

Risk of liquidity can have an effect on the image of bank. Liquidity is a crucial aspect which reflects bank's ability to meet its financial obligations. An adequate liquidity position means a situation, where organization can obtain sufficient liquid funds, either by increasing



their liabilities or by converting its assets quickly into cash. Liquidity performance measured by Government securities to total investment, Liquid Assets to Total Assets and Liquid Asset to Total Deposits. All these ratios are significant. There is a significant improvement in the Government securities to total investment and Liquid Assets to Total Assets and Liquid Asset to Total Deposits are not improved.

**Table 8: Liquidity Ratios of Selected Banks**

Sl. NO	CAMEL Category	Ratios	Time Period	Mean	SD	t value	Sig. P value
1	Liquidity	Government securities to total investment	Pre	0.78	0.09	-3.308	0.002***
			Post	0.81	0.08		
2		Liquid Assets to Total Assets	Pre	0.1	0.04	3.057	0.004***
			Post	0.08	0.04		
3		Liquid Asset to Total Deposits	Pre	0.15	0.14	2.108	0.041**
			Post	0.11	0.06		

Source: Author's Calculations from <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>

## 5. MAJOR FINDINGS

In this paper the authors identified fifteen CAMEL ratios for evaluation of bank performance in each period. Thirteen ratios show significant at various levels and only two ratios are not significant and six ratios were improved in the post period compared to pre period. They are Total Advance to Total asset, Total Investment to Total Assets, Cost to Income Ratio, Business per employee (in Rupees Lakh), Interest Income to Total Income Ratio and Government securities to total investment. Seven ratios are not improved and they are slightly decreased in the post period compared to pre period. They are Debt Equity Ratio, Ratio of net NPA to net advances, Gross NPA to Gross Advance, Ratio of net interest income to total assets (Net Interest Margin), Ratio of operating profits to total assets, Liquid Assets to Total Assets and Liquid Asset to Total Deposits. Two ratios were not significant. They are Capital Adequacy Ratio and Profit per employee (in Rupees Lakh). It was found that Asset Quality and Earnings Quality were not good for all the banking sectors because of rising in Non-Performing Assets. The RBI report 2018 says that the aggregate gross NPAs of SCBs increased primarily as a result of this transparent recognition of stressed assets as NPAs, from Rs 3,23,464 crore, as on March 31, 2015, to Rs 10,35,528 crore, as on March 31, 2018. This is as a result of, In February 2014, the Reserve Bank issued the framework for resolution of stressed assets. The resulting recognition of true asset quality at banks largely explains the spurt in NPAs during the last three years. The important element such as Capital Adequacy, Management Efficiency, Liquidity position were improved in post period compared to pre period.

## 6. CONCLUSION

Evaluation of bank performance become prime focus since it is directly linked with the performance of an economy. The analysis shows that most of the CAMEL variables are found significant to improve the financial performance of banks except the ratios related to asset quality. This indicates that facilities of digital banking could enhance the financial performance of banks. In order to ensure further utilization of digital financial services by the public, with the help of Payment and settlement system, RBI should focus more on providing the electronic services facilities on a larger scale to the public, along with ensuring the security and making the process more cost-effective for the banks. The findings and suggestions from the research can be useful to the various regulatory authorities like Reserve Bank of India (RBI), National

Payment Corporation of India (NPCI) to design the payment and settlement system. This research is also advantageous for the banks to revamp and improve their existing policies.

### Part 1. Author's Contribution

Author 1 conceptualized and designed the study, also collected and conducted data analysis. The author 2 has performed writing part of this paper and organized the study, drafting and revising also performed.

### Part 2. Conflict of Interest

The authors have no conflicts of interest to declared. All authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

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