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Digital Banking Practices and its Impact on the Competitive Scenario of the Indian Banking Sector

Ms. Bharvi Desai¹, Dr. Archana Fulwari², Dr. Sana Pathan³

¹Assistant Professor (T), Faculty of Commerce, The Maharaja Sayajirao University of Baroda ²Assistant Professor, Department of Business Economics, The Maharaja Sayajirao University of Baroda ³Assistant Professor, School of Business and Law, Navrachana University

Abstract

Advancement in technology and digitalization has altered the way economic activities are carried out, and has paved the way for a faster pace of growth across most sectors of the worldwide economy. The Indian Banking Sector (IBS) is no exception to this transition. The IBS has progressed over the years and digital adoption has played a significant role in financial inclusion. Studies have established that adoption of digital practices have impacted operational efficiency and profitability of banks. Bank characteristics are also found to have impacted digital adoption, and have shaped the competitive structure of the banking sector of the country. Digital technology has also enabled banks to economize of personnel and branches. In this context, this paper sought to examine the extent of digital adoption in the Indian banking sector and inquire into any structural changes it had led to, over a period of time. The study is exploratory in nature and examined the composition of the IBS in terms of banks leading in the overall digital banking practices. As a measure of depth of digitalization, the study also analyzed and compared the value of digital banking transactions in relation to total assets of the banks. The study also inquired into whether bank ownership type had any implications for adoption digital technology in banking practices. Through these gradations of analysis, the purpose was also to look for indications of the future structural composition of the IBS.

Keywords: Indian Banking Sector, Digital Banking Practices, Competitive Structure of Banking Sector

1. Introduction

The world is undergoing rapid digital revolution. Digitalization has transformed various sectors globally, and the banking industry is no exception. In India, the adoption of digital banking practices has seen a significant paradigm shift, revolutionizing the way financial services are delivered and accessed. This evolution has not only streamlined banking operations but has also profoundly impacted customer experience and financial inclusion.

Digital banking practices encompass a range of services, from online account management and fund transfers to digital payments and mobile banking applications. They have facilitated seamless and instantaneous fund transfers between individuals and businesses. The ease and convenience offered by these services have played a pivotal role in their widespread acceptance. Customers can now perform various transactions from the comfort of their homes, reducing the need for physical visits to bank branches.



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One of the key aspects of this digital transformation in the Indian banking sector is the widespread adoption of online banking services. Traditional brick-and-mortar banking is being complemented, if not replaced, by digital channels. This shift is fuelled by factors such as increasing internet penetration, the rise of smartphones, and the government's push towards a digital economy. The demonetization drive in 2016 and the Covid-19 pandemic further accelerated the adoption of digital payments, with people increasingly opting for cashless transactions.

The Indian government's initiatives, such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) and the push towards Direct Benefit Transfer (DBT), have driven financial inclusion. Digital banking has played a crucial role in incorporating the unbanked and underbanked sections of the population into the fold of the formal financial system. Opening a bank account has become simpler, often requiring minimal documentation, and individuals in remote areas can access banking services through mobile devices.

There are factors which operate on both, the demand side as well as the supply side which provide the push to digital adoption in the financial services sector (OECD, 2020). With a favourable demography comprising greater proportion of tech-savvy mobile younger generations, there is a greater acceptability of digitalized financial services. They also impose stronger pressure on the level and ease of services they expect from service providers. With the growing prevalence of e-commerce requiring instantaneous transactions, there is a behavioural reinforcement that puts a high value on convenience, speed and ease of transactions spilling over to other aspects of economic and non-economic life. This makes the younger generation, in particular, to patronize the more contemporary banks offering financial services more effectively and efficiency as against those with traditional banking practices.

The demand forces are further driving banks to become more customer-centric through digital revolution. The latter arms banks with vast data on preferences of customers and their banking behaviour, which when analysed, forms the basis of providing customized financial services. Banks which are increasingly equipped with such data as result of their digital adoption stand to gain and retain more number of customers through the latter's patronage. In the Indian banking sector, traditional banks which have expanded on principles of social outreach for mass banking are being increasingly challenged by the Fintech companies which are offering innovating digital solutions for financial transactions. Banks as a group, in general, and public sector banks, in particular, face greater challenges with their capex-heavy business models. The new private sector banks in India are more aggressive and in a better position to adopt digitalization as they increase their scale of operation. Likewise, foreign banks bring in the legacy of digital banking from their parent organization. These factors compel government owned banks also to adapt to the modern banking practices to hold on their market shares.

The combined effects of the banking sector dynamics have important bearing on the competitive scenario of the Indian banking sector with important implications for the structure of the sector. While banks with extended branch presence may find themselves constrained by huge historical costs, newer banks are in a position to expand their business with technology assisted scale that substitutes for physical presence. The public sector banks may also face the dilemma of continued need for stronger physical presence for the kind of clientele they hold on the one hand, and the compulsions of technology adoption on the other to cater to changing modes of economic activities. How the technology adoption would disrupt the banking practices and how these issues play out in terms of impacting the organization of banking businesses, either through collaborative efforts would also have implications for the banking structure in India.

The digitalization of the banking sector has not only benefited consumers but has also enhanced operational efficiency for financial institutions. Additionally, the adoption of digital channels has led to a



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shift in the cost structure of banks. While there are initial investments in technology infrastructure, digitalization has the potential to streamline operations, reduce manual processes, and lower transaction costs. Banks that can leverage digital platforms to optimize their operational efficiency are better positioned to offer competitive pricing and improve their overall cost-effectiveness.

While digitalization presents unprecedented opportunities for banks to expand their reach, improve efficiency, and enhance customer experience, it also poses challenges that demand strategic agility and innovation. The competitive winners in this digital era will be those institutions that can adeptly navigate these complexities, leverage technology effectively, and meet the evolving demands of a digitized consumer base.

2. Review of Literature

In light of the changes observed in the Indian banking sector, the present paper reviewed literature revolving around the area of digitalization in the banking sector, with particular focus on the impact on banking structure and competitiveness. Study of digitalization of the banking sector forms an interesting area of inquiry. Bank ownership type and bank size appear as the major factors against which studies have examined digitalization of the sector.

Early studies like Cooke (1997) have demonstrated in the context of the banking sector in the US, how its commercial banking structure underwent changes on account of information technology. Those banks that incorporated IT in their operations were found to be enabled to drive financial innovations and harness favourable impacts on their performance. The foreign banks were forthright in IT adoption as it allowed them to build complex networks that facilitated global operations. The study asserts that adoption of IT led to changes in the banking structure in the US, especially on account of the role of foreign banks in fostering competition in the sector. It found that over a period of one decade from 1983 to 1993, foreign banks gained substantial market share of the banking assets from 19 to 47 percent. Important implications of the study are that large banks with higher rates of investment in IT would tend to lead to consolidation in the future in terms of mergers and acquisitions with/of smaller banks, thereby leading to higher industry concentration.

Bansal (2014) has also examined bank ownership wise technology index and its relationship with performance index of the respective banks based on correlation and regression analysis. The study reports positive impact of technology adoption on bank performance.

Singh (2018), apart from analyzing the progress in digital banking in India and their challenges and opportunities, reports that the new private sector banks are much ahead of other bank groups and affirms that banks which are updated in their digital adoption tend to have a competitive edge. The thrust on ownership type of banks having a bearing on digital adoption is also found in Kaur et al. (2021). They find that organizational culture of the banks was an important factor influencing the willingness of bank employees in putting efforts to encourage migration of customers to use of technology in banking. In this respect, they find that the organizational culture of public sector banks was less conducive for customer-centric efforts for digital adoption in banking activities. Their study based on primary data suggests that customers' trust and confidence in digital banking are important factors in the acceptance of digital banking in India. The readiness of customers in huge numbers to migrate from traditional to digital baking in an important requisite as banks invest huge sums of money in digital adoption.

Liu (2021) has explored the factors that could support digital advancement in banks and how it would impact bank competitiveness. The study asserts that banks that fails to adopt technology find it difficult to



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survive in the competition. The analysis shows that as banks seek to adopt digitalization, it could forge alignments among them leading to greater degree of concentration in the banking sector as typically digital adoption is difficult for smaller banks.

Some studies relate to linkages between ICT adoption and bank performance. Batterymarch (2003), Beccalli (2006), Mittal and Dhingra (2007), Casolaro et a. (2007), Shirley and Mallick (2008) and Shaukat (2009) largely find a positive relationship between information technology and bank profitability or efficiency. Malhotra and Singh (2006), and Chandrasekhar and Sonar (2008) report that banks adopting information technology were larger banks and had better operating efficiency and profitability. Beccalli (2006) has investigated into whether IT investments led to improvements in organizational ability of banks in select developed European countries. Casolaro and others (2007) based on micro data at bank level found positive association between costs and profit with ICT and also efficiency gains. Ahmad Mashnour (2009) found that banks that invested in information technology got a competitive advantage. Higher profitability for digitally advanced banks coupled with economies of scale would have implications for the banking structure in terms of concentration and competition. Damana (2015) has discussed the challenges and significance of technological innovation in the Indian banking sector.

More recent evidence in Citi (2019) and Accenture (2019) largely support the finding that bank profitability is positively affected by digitalization. Citi (2019) states that on the one hand, digital adoption helped banks in operating with less number of branches and fewer employees, reducing their operating costs between 30 to 50 percent. However, on the other hand, digital adoption in the banking sector also led to increase in the level of competition and fall in transactions costs, leading to fall in bank revenues by 10 to 30 percent. The fall in the revenue is also attributed to increased transparency offered by digital transactions.

The analysis by Accenture (2019) reveals that banks which were more advanced in digitalization had greater degree of profitability. This was evident in the increase in the return on equity for digitally advanced banks while there was a fall in the return to equity for banks which lagged in digitalization. The findings relate to the period from 2011 to 2017. The study further asserts that the variance in profitability between digitally advanced and digitally lagging banks is likely to increase in the future.

3. Research Objectives and Methodology

Apropos the review of literature, analyzing the extent of digital adoption in the Indian banking sector and identifying the leading banks forms an interesting area of inquiry. In this context, this paper seeks to address these objectives:

- To examine the extent of digital adoption in the IBS
- To explore the competitive structure of the IBS in terms of digital adoption
- To measure the depth of digitalization in banking practices by the top ranking banks
- To undertake a preliminary inquiry into whether bank size and bank ownership type had any implications for adoption of digital technology in banking practices.

Digitalization of the IBS has been traced by examining the data related to the volume and value of digital transactions. These cover transactions through Automated Teller Machine (ATM), mobile banking, internet banking, NEFT, RTGS, debit card and credit card. The average value per digital transaction has also been calculated by taking the ratio of total value of transactions to total volume transactions. It is hypothesized that as digital adoption grows, digital modes of transaction would increase for routine small ticket expenses also.



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The study is exploratory in nature and examines the composition of the IBS in terms of banks leading in the overall digital banking practices. The study has identified the top ranking banks in terms of the digitalization of their banking practices. The banks were identified by finding out their respective shares in the digitalization of the entire banking sector. As a measure of depth of digitalization, the study also analyzed and compared the value of digital banking transactions in relation to total assets of the banks. Attempt has been made to check for the bank-size and bank-ownership type as factors determining the digital adoption, while taking into account three major bank-groups, namely, Public Sector Banks (PSBs), Private Sector Banks (PVBs) and Foreign Banks (FBs). Through these gradations of analysis, the purpose was also to look for indications of the future structural composition of the IBS.

The study covers the period from 2015 to 2023. Since the study period starts prior to the demonetization effected in 2016, it would reflect the transition in the banking industry with regard to digital adoption, if any, emerges. The data is obtained from publications of RBI related to monthly data releases. Simple statistical tools such as graphical presentation, ratios and growth rates have been used to capture the trends in digital adoption in the IBS.

4. Analysis and Interpretation

4.1. Growth in Digital Transactions in the Indian Banking Sector

The roots of digitalization of the IBS initiated in 1988 with the committee under the chairmanship of Dr. C. Rangarajan constituted by the RBI seeking recommendations on introduction of computerization in banking operations. The recommendations of the committee led to the adoption of computerization at a gaining pace with the opening up of the economy in 1991-92. Once the digital network got well penetrated in the country, RBI became the guiding force for commercial banks to introduce MICR based cheque processing, Electronic Funds transfer, Inter-connectivity among bank branches and implementation of ATM. These initiatives helped to construct the base for robust digital infrastructure in India.

It is found that there is substantial increase in digital transactions both in value and volume terms over the study period. As depicted in Fig.1 the total value to digital transactions grew from Rs.1596.84 trillion in the year 2015 to Rs.4753.9 trillion, recording a growth of nearly 15 percent on compound annual basis. The volume of transactions has grown much more at a CAGR of more than 33 percent over the same period indicating wider use of digital modes of payments and claim settlements. Initiatives like Jan Dhan Yojana, imposition of demonetization, Covid-19 pandemic situation are factors that have impacted use of digital transaction. The Covid-19 situation, for instance, led to fall in transactions due to lockdowns resulting into cut on spending. Demonetization imposed faster adoption to digital modes of transactions than would have been the case if it were based purely on behavioural changes which come about only gradually.



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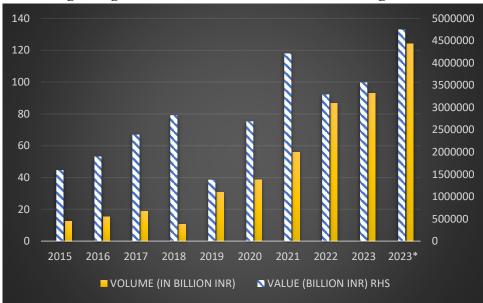


Fig. 1 Digital Transactions of the Indian Banking Sector

Source: Monthly Data Releases of RBI

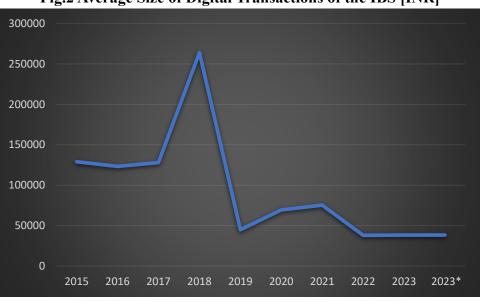


Fig.2 Average Size of Digital Transactions of the IBS [INR]

Source: Researchers' computations

Source: Authors Computation

The ratio of value of digital transactions to their volume has been calculated to examine the trend in average size of digital transactions (Fig. 2). It is found that the average transaction size has reduced substantially from Rs.129027 in the year 2015 to Rs.38326 in the year 2023 which is only 30 percent of the former. The value per transaction has declined at the CAGR of 14 percent. The decline in the average transaction size implies that digital transactions have penetrated into routine transactions of the public indicating wider acceptance of the same.



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4.2. Concentration Ratio in the IBS in terms of Digital Transactions

The present study also attempts to identify the top-ranking banks among PSBs, PVBs and FBs in digital adoption in their banking practices. The digital transactions of individual banks were divided by those of the three bank groups combined. The findings are presented in Table 1a and 1b. The number of banks included in the list are based on the criteria of a concentration ratio (CR) of 70 percent in terms of value of digital transactions. 80 percent concentration ratio involved about four to five banks with very small share in percentage terms and therefore, the present study limits the CR to 70 percent.

Table 1a. Bank-wise Digital Transactions (INR) in the Year 2015

Sr. No.	Bank Name	Share (%) in Digital Transactions
		(INR)
1	HDFC Bank Ltd	20.38
2	State Bank of India	17.68
3	Axis Bank Ltd.	7.52
4	ICICI Bank Ltd.	6.96
5	Citibank N. A.	6.83
6	IDBI Bank Limited	5.25
7	Deutsche Bank A.G.	4.99
Concentration Ratio of 7 Banks (CR ₇)		69.60

Source: Researchers' computations based on data from RBI publications

Table 1b. Bank-wise Digital Transactions (INR) in the Year 2022

Sr. No.	Bank Name	Share (%) in Digital Transactions (INR)
1	HDFC Bank Ltd	20.41
2	State Bank of India	14.91
3	ICICI Bank Ltd	11.73
4	Axis Bank Ltd.	9.06
5	Citibank N.A.	4.26
6	Deutsche Bank A.G.	3.16
7	Kotak Mahindra Bank Ltd	3.00
8	Punjab National Bank	2.66
Concentration Ratio of 8 Banks (CR ₈)		69.18

Source: Researchers' computations based on data from RBI publications

The data reveals that seven banks together held nearly 70 percent of the total banking sector digitalization (Table 1a). Except SBI which is the largest commercial bank in India by size of assets, all other banks were found to be privately held banks, either PVBs or FBs. It is noteworthy that foreign banks, namely, Citibank and Deutsche Bank figure among the top seven banks in terms of the value of digital transactions despite the fact that FBs hold a very small proportion of the total assets of the banking sector in India. This resonates with the findings of Cooke (1997) which stated that IT adoption allowed greater competition from foreign banks, as sophisticated networks facilitated global transactions. Likewise, Indian private banks are front-runners as far as digital adoption is concerned.



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For the year 2022, the concentration ratio of 70 percent is made up by eight banks rather than seven (Table 1b). While most of the banks in the list are the same for both the years, one more PSB has got added and one PVB was replaced by another PVB. Some of the PVBs at the forefront have been able to improve their share while in the case of SBI there is a decline of 15 percent in its share from 17.68 in the year 2015 to 14.91 in the year 2022. ICICI Bank has gained 4.77 greater share in digital transactions, which amounts 68 percent increase over its share. Similarly, the share of Axis Bank increased by 1.54, amounting to an increase of 20.47 percent.

20.38 20.41 30.82 30.4 14.91 17.68 2.66 5.25 11.73 6.83 6.96 9.06 HDFC Bank Ltd ■ State Bank of India HDFC Bank Ltd State Bank of India Axis Bank Ltd. ICICI Bank Ltd. ICICI Bank Ltd Axis Bank Ltd. Citibank N.A. ■ Deutsche Bank A.G. Citibank N.A. ■ IDBI Bank Limited Kotak Mahindra Bank Ltd Punjab National Bank Deutsche Bank A.G. Other banks Other Banks 2a. Year 2015 2b. Year 2022

Fig. 2(a & b) Share of Banks in Total Value of Digital Transactions

Fig. 2a and 2b depict the percentage share of the banks for the year 2015 and 2022 respectively. It may be said that as far as digital adoption is concerned the IBS is highly concentrated. This has implications for the future structure of the IBS as banks with greater digital penetration are expected to attract and retain more customers. This is substantiated by the observation that the top three banks together claimed 45 percent share of digital transactions in 2015 which increased to 47 percent in the year 2022.

4.3. Depth of Digitalization of Banking Practices

To further check with the robustness of the digital penetration of the top-ranking banks, the present study has inquired into the depth of their digital adoption by taking the measure, 'value of digital transactions of the bank as a ratio to its total assets which represents its size. The ratio indicates the digital penetration per rupee worth of bank asset.

Table 2a. Digital Penetration of Top-ranking Banks vis-à-vis Bank Size (Year 2015)

Sr. No.	Bank Name	Digital Transactions to Bank Assets	Share in Total Assets (Rank of Bank)
1	HDFC Bank Ltd	55.10	4.90 (6)
2	State Bank of India	10.83	21.65 (1)
3	Axis Bank Ltd.	25.98	3.83 (8)



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4	ICICI Bank Ltd.	17.20	5.36 (3)
5	Citibank N.A.	78.56	1.15 (22)
6	IDBI Bank Limited	23.52	2.95 (10)
7	Deutsche Bank A.G.	129.28	0.51 (34)
8	Punjab National	0.10	5.01 (5)
	Bank		

Source: STRBI, RBI and Researchers' calculations

Interesting findings are revealed in this analysis. SBI continues to hold number one rank in terms of asset size and there is found to be no change its digital penetration. In the case of HDFC Bank, its rank in terms of size of total assets has jumped from sixth to second between the years 2015 and 2023. On account of the doubling of its size, its digital penetration has reduced from 55.10 to 24.94. A similar comparison for Axis Bank Ltd. reveals that its digital penetration has not kept pace with its size expansion.

Table 2b. Digital Penetration of Top-ranking Banks vis-à-vis Bank Size (Year 2023)

Sr. No.	Dank Name	Digital Transactions to	Share in Total Assets
	Bank Name	Bank Assets	(Rank of Bank)
1	ICICI Bank Ltd.	43.29	6.59 (3)
2	HDFC Bank Ltd	24.94	10.26 (2)
3	State Bank of India	10.39	22.96 (1)
4	Axis Bank Ltd.	20.31	5.48 (7)
5	Citibank N.A.	55.93	0.90 (23)
6	Kotak Mahindra Bank Ltd.	21.70	2.03 (11)
7	Punjab National Bank	6.04	6.08 (4)
8	Deutsche Bank A.G.	63.67	0.54 (27)

Source: STRBI, RBI and Researchers' calculations

Another important observation is in the case ICICI Bank Ltd. While its rank in total bank assets has remained at third position between the two years, its digital penetration has increased from 17.20 to 43.29, exhibiting an increase of 1.5 times over an expansion in its size by 23 percent. This implies that ICICI Bank Ltd. has a robust growth in its digital adoption which is demonstrated in the 6.5 times greater increase in its digitalization compared to the increase in its assets.

For the purpose of comparison, Punjab National Bank has been added in Table 2a although it does not appear in the top seven banks which make up 70 percent concentration ratio for digital banking practices. However, it may be noted that asset size-wise it ranked fifth in the year 2015. It can be observed that in the year 2023, it has moved up to the fourth rank based on its size, but its digital adoption has increased remarkably from 0.10 to 6.04, registering a jump of 60 times over the base year of 2015.

Another such observation emerges in the case of Kotak Mahindra Bank Ltd. While it did not appear in the concentration structure of the IBS in the year 2015, it moved up to the sixth position out of eight banks which together hold 70 percent of banking sector digitalization. Interestingly, Kotak Mahindra Bank Ltd. has been aggressive in its banking business with its share in total bank assets increasing from 0.88 to 2.03



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which amounts an increase of 130 percent. Its rank in terms of asset size has improved from 29th to 11th which substantiates its aggressive approach. Along with expansion it is size, its digital penetration has also increased from 8.20 to 21.70 which is an increase of 164 percent. This reveals that banks with larger asset base have greater potential to deepen its digitalization. This finding can be further tested with more robust analysis.

5. Conclusion

The findings of the present study suggest that bank size is apparently an important factor in digital adoption. This is revealed from the fact that the top seven and eight banks identified in the study are also those which rank roughly among the top ten banks as per their size. In the future with a view to consolidate their position in the banking sector, more banks would aim at expanding their scale of business either through organic or inorganic growth. The Indian banking sector may, therefore, experience mergers and acquisition as larger size facilitates adoption of digitalization in banking practices as also found in the literature. It is expected, therefore, that the structure of IBS would become more concentrated in the future.

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