FinTech-Driven Transformation in Indian Banking: A Comparative Analysis of Public and Private Sector Banks

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Abstract: The Indian banking sector is witnessing a structural shift from conventional branch-oriented banking to technology-enabled and customer-focused financial services.This study examines the influence of Financial Technology (FinTech) on the structure, prformance, and service delivery of Indian banks using secondary data from RBI, NPCI, IBEF, and published bank reports.India has become a global leader in digital payments, with UPI processing over 20 billion transactions per month (NPCI, 2025) **and more than 680 banks integrated by 2025**.Advanced technologies including AI, blockchain, mobile applications, and data analytics have significantly enhanced banking efficiency and expanded financial inclusion.Public sector banks like SBI and Bank of Baroda have strengthened digital services through platforms such as YONO and BoB World, while private banks including HDFC and ICICI Bank lead innovation with AI-powered solutions like EVA and iMobile Pay. The growth of UPI has significantly increased digital transactions and reduced service delivery costs.Despite these advancements, challenges such as cybersecurity risks, regulatory gaps, and limited rural digital access remain. The study concludes that sustained innovation, strong data protection, and collaboration between regulators, banks, and FinTech firms are essential for building an inclusive and resilient digital banking ecosystem.

Keywords: FinTech, Digital Banking, Indian Banking Industry, Financial Inclusion, Artificial Intelligence, Unified Payments Interface (UPI)

I. INTRODUCTION

Banks play a crucial role in the economic system by mobilizing savings and directing financial resources toward productive investment activities that support economic growth (Reserve Bank of India [RBI], 2024). Through their intermediation function, banks facilitate capital formation, ensure liquidity in the financial system, and contribute to overall financial stability (India Brand Equity Foundation [IBEF], 2025). In India, banks have long supported economic growth, monetary stability, and financial inclusion (RBI, 2024). Over time, the sector has transformed from manual, branch-based operations into a modern, technology-driven financial ecosystem shaped by reforms, globalization, and rising demand for efficiency and innovation (ResearchGate, 2014; IBEF, 2025).

1.1 Evolution of the Indian Banking Industry

The formal development of banking in India began during the late 18th century with the establishment of early institutions such as the Bank of Hindustan, followed by the emergence of Presidency Banks during the colonial period (ResearchGate, 2025). In the post-independence era, structural reforms including the nationalization of commercial banks in 1969 and 1980 significantly increased public sector participation in banking with the objective of expanding credit availability to rural and underserved segments (RBI, 2024).Although nationalization improved outreach, public sector banks faced inefficiencies, bureaucratic limitations, and slow technological adoption.

The introduction of private and foreign banks after the 1991 liberalization era marked a major shift, increasing competition and improving service quality and innovation (IBEF, 2012). Regulatory reforms in areas such as capital adequacy, interest rate deregulation, and risk management further aligned Indian banking with global standards (RBI, 2024). Combined with globalization and digitization, these developments paved the way for the modern Indian banking framework.

1.2 Digital Transformation and Technological Advancements

The early 2000s saw the advent of core banking solutions (CBS), ATMs, and online banking, enabling seamless inter-branch transactions (RBI, 2024). Initiatives like Digital India (2015) and demonetization (2016) accelerated the adoption of electronic payments and cashless transactions (Ministry of Finance, 2025).

The introduction of the Unified Payments Interface in 2016 marked a major shift in India's digital payment infrastructure by enabling real-time fund transfers through mobile-based platforms (NPCI, 2025). UPI transformed financial access for small merchants and rural customers and by 2025 it processed more than 14 billion transactions per month, reflecting the scale of adoption across the country (NPCI, 2025).Alongside UPI, the adoption of advanced digital technologies such as artificial intelligence, machine learning, blockchain, and big data analytics has strengthened India's digital banking ecosystem by enhancing fraud detection mechanisms, improving credit assessment processes, and enabling personalized banking services (RBI, 2024).

1.3 Emergence of FinTech in Indian Banking

Financial Technology, commonly known as FinTech, encompasses the application of digital tools and innovative technologies to redesign and streamline the delivery of financial products and services (IMF, 2025). On a global scale, FinTech solutions have reshaped conventional banking models by enabling alternative financial services such as mobile payment platforms, peer-to-peer financing mechanisms, automated investment advisory services, and distributed ledger-based systems (Rai et al., 2021).

In the Indian context, the FinTech ecosystem has expanded rapidly, positioning the country among the leading global markets, supported by over 2,500 active start-ups and a projected market size of approximately USD 150 billion by 2025 (NASSCOM, 2023; IBEF, 2025).Both public and private banks are actively integrating FinTech tools to enhance efficiency and customer experience. Public sector banks like SBI and BoB have launched comprehensive digital platforms such as YONO and BoB World, while private banks such as HDFC Bank and ICICI Bank lead innovation with AI-powered applications like EVA and iMobile Pay (HDFC Bank, 2025; ICICI Bank, 2025). These advancements have expanded access, reduced service delivery costs, and improved convenience—especially for rural populations using UPI and mobile banking.

1.4 Government Initiatives and Policy Support

The Indian government and regulatory bodies have played a key role in fostering digital transformation in banking. Key initiatives include:

- **Digital India Campaign:** Initiated in 2015 to promote digital infrastructure, electronic services, and internet connectivity across the nation.
- **Aadhaar-linked Payments and DBT (Direct Benefit Transfer):** Streamlined welfare payments and reduced corruption by enabling direct credit of government subsidies to beneficiaries' bank accounts.
- **Digital Banking Units (DBUs):** Introduced in 2022 to promote paperless, presence-less, and cashless banking operations across the country.
- **Pradhan Mantri Jan Dhan Yojana (PMJDY):** Introduced in 2014, this initiative aims to expand universal access to formal banking services by facilitating the opening of basic bank accounts, thereby strengthening financial inclusion across the country.

1.5 Challenges in the Digital Banking Ecosystem

The growth of digital banking has brought serious challenges, mainly rising cybersecurity threats such as phishing, data breaches, and online fraud. Many users, especially in rural and semi-urban areas, still lack digital awareness, which increases

their vulnerability. Poor digital infrastructure—like weak internet connectivity and limited smartphone access—also restricts smooth adoption of digital banking services in remote regions.

Regulatory issues add another layer of difficulty. Overlapping rules on data privacy, AI use, and digital payments create confusion for banks and FinTech players. At the same time, rapid technological change requires continuous investment in new systems, security tools, and staff training, which is especially difficult for public sector banks. These combined challenges show the need for stronger digital safety, clearer regulations, and wider digital literacy.

1.5 Significance of the Study

This study is valuable because it highlights how public and private sector banks differ in their FinTech adoption and digital strategies. By comparing their platforms and technology use, the study identifies gaps in innovation, efficiency, and customer experience. These insights can help banks improve their digital performance and support policymakers in strengthening cybersecurity, financial inclusion, and digital governance.

The study also explains how tools like UPI, mobile banking, AI, and data analytics have transformed India's banking system. It shows how digital adoption has improved profitability, reduced NPAs, and made banking faster and more transparent. By presenting both progress and challenges, the study helps build a roadmap for a secure, inclusive, and future-ready digital banking ecosystem.

II. LITERATURE REVIEW

The Indian banking industry has rapidly evolved from a traditional branch-based system to a modern, technology-driven sector. According to ResearchGate (2025), global banking has shifted from manual processes to regulated digital systems, and India has followed the same path. ResearchGate (2014) also highlights that liberalization, privatization, and technological advancement have been key drivers of competitiveness in Indian banks.

As noted by IBEF (2025), the banking sector contributes around 7% to India's GDP and is one of the fastest-growing globally. Reports from IBEF (2012, 2025) and RBI (2024) show that technological and regulatory reforms have strengthened asset quality and capital adequacy. RBI data indicates a 16% rise in bank credit in FY 2024–25 and NPAs falling to historic lows, reflecting improved financial stability.

FinTech has played a major role in this transformation. NPCI (2025) reports UPI growth from ₹2 trillion in 2019 to over ₹17 trillion in 2025, establishing India as a global leader in real-time payments. Technologies like AI, data analytics, and mobile banking have reduced costs, improved decision-making, and enhanced customer experience (IBEF, 2025).

Digital transformation has also strengthened bank performance. Rai et al. (2021) found that digital tools improve profitability and efficiency. Public banks such as SBI and BoB introduced platforms like YONO and BoB World, while private banks like HDFC and ICICI lead AI-driven innovation with EVA and iMobile Pay (HDFC Bank, 2025; ICICI Bank, 2025).

Government initiatives have further supported digital expansion. The Ministry of Finance (2025) and PIB (2025) highlight programs like Digital India, Jan Dhan Yojana, and Aadhaar-enabled services that have increased financial inclusion and promoted cashless transactions.

However, challenges remain. IMF (2025) and KPMG (2023) identify cybersecurity risks, data privacy concerns, and regulatory overlaps as major issues. NSO (2025) and DFS (2025) also note rural infrastructure gaps and low digital literacy, which limit equal access to digital banking.

III. RESEARCH METHODOLOGIES

3.1 Research Design

The present study adopts a descriptive and analytical research design to examine how FinTech adoption is transforming the Indian banking industry. The descriptive component explains the structure, policies, and operational framework of the sector, while the analytical component compares traditional banking practices with technology-enabled models. This approach is

suitable for understanding how digital innovations such as UPI, AI-driven platforms, and mobile banking services have improved efficiency, accessibility, and customer satisfaction across public and private banks.

3.2 Nature of the Study

The study relies entirely on secondary data, drawn from authoritative institutional sources, academic papers, and published financial reports. Since the objective is to evaluate system-level digital transformation rather than individual customer perceptions, secondary data provides both breadth and reliability, enabling analysis of long-term trends in FinTech adoption.

3.3 Objectives of the Study

The major objectives guiding this research are as follows:

- To analyze the evolution and structural development of the Indian banking industry.
- To evaluate the role of FinTech in improving efficiency, customer experience, and financial inclusion.
- To compare the extent and nature of FinTech adoption between public sector and private sector banks in India.
- To evaluate the performance implications of digital banking innovations.

3.4 Data Sources

The study relies primarily on **secondary data** collected from the following reputable sources:

- **RBI**– Reports on *Trend and Progress of Banking in India* and other regulatory publications.
- **India Brand Equity Foundation (IBEF) banking and FinTech statistics**.
- **NPCI's UPI and digital payments datasets (2021–2025)** and annual reports of Banks
- **International Monetary Fund (IMF)** – *Global Financial Stability Reports* for international comparisons.
- **NSO** and **DFS** publications for macroeconomic indicators
- Scholarly journals and research papers from **Research Gate** and other academic databases.

3.5 Sampling Framework

Although based on secondary data, the study adopts a purposive comparative sampling approach by selecting four major banks: SBI, Bank of Baroda, HDFC Bank, and ICICI Bank.This sample is justified because:

- These four banks represent the largest and most influential institutions in India's public and private banking sectors (IBEF; RBI).
- They have the highest levels of FinTech adoption, demonstrated by digital platforms such as YONO, BoB World, EVA, and iMobile Pay.
- They hold a significant share of India's customer base, making them representative of national digital banking trends.

3.6 Data Collection Period

The data used in this study primarily covers the period from **2021 to 2025**, representing the phase of rapid digital transformation in Indian banking.

3.7 Tools and Techniques for Analysis

The collected data were analyzed using **descriptive and comparative analytical methods**.

- **Trend analysis to study digital transactions and performance ratios**
- **Comparative analysis** evaluated the performance of public and private sector banks.
- **Graphical and tabular presentation** was applied to simplify interpretation and highlight major trends.

3.8 Scope of the Study

The scope includes public and private sector banks in India, with emphasis on UPI, digital lending, mobile banking, AI-driven customer service, and overall FinTech-led transformation. The findings aim to support policymakers, regulators, and financial institutions in understanding digital banking in emerging economies.

3.9 Limitations of the Study

While secondary data ensures a broad perspective, it has inherent limitations.

- Dependence on published data, which may not capture the latest developments.
- **Comparative data**across banks may vary in reporting formats and timelines.
- No primary data, limiting direct insights into customer perceptions.

Despite these limitations, the study's analytical depth and cross-verification from multiple sources ensure high validity and relevance.

IV. ANALYSIS

4.1 Analysis of FinTech Transformation in the Indian Banking Industry

This chapter provides a concise analysis of India's digital banking transformation. It begins with a macro-level review of the UPI ecosystem, then shifts to a micro-level evaluation of major digital banking applications. It further compares FinTech adoption in public and private sector banks, presents a strategic SWOT assessment of the industry, and concludes with a quantitative review of key financial indicators to measure the tangible impact of digitalization.

4.2 The Digital Surge: Trend Analysis of the UPI Ecosystem

The Unified Payments Interface (UPI) has evolved from a simple payment tool into a key indicator of India's digital financial growth. Its rapid rise shows a major shift from cash to digital transactions, supported by interoperability, real-time transfers, and low costs. Studying UPI's expansion offers a clear macro-level view of the country's digital adoption.

TABLE I:
MONTHLY UPI TRANSACTION STATISTICS (2020-2025)

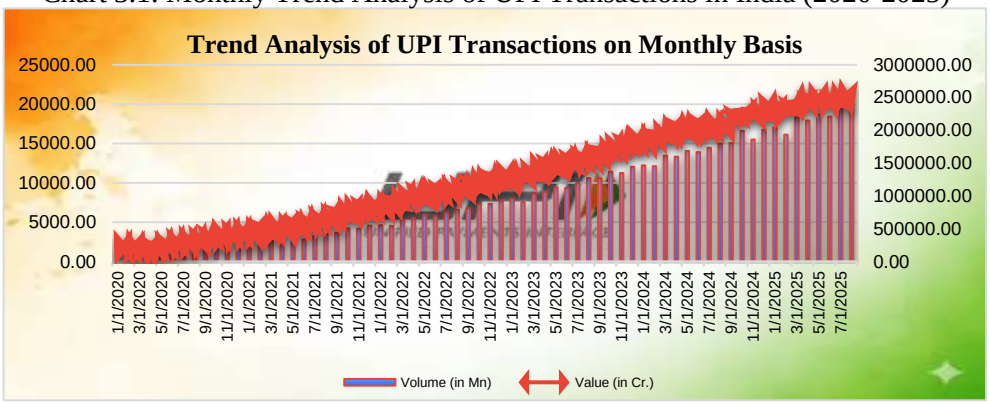
Month	Volume (in Mn)	Value (in Cr.)	No. of Banks live on UPI
01-01-20	1,305.02	216,242.97	144
01-04-20	999.57	151,140.66	153
01-07-20	1,497.36	290,537.86	164
01-10-20	2,071.62	386,106.74	189
01-01-21	2,302.73	431,181.89	207
01-04-21	2,641.06	493,663.68	220
01-07-21	3,247.82	606,281.14	235
01-10-21	4,218.65	771,444.98	261
01-01-22	4,617.15	831,993.11	297
01-04-22	5,583.05	983,302.27	316
01-07-22	6,288.40	1,062,991.76	338
01-10-22	7,305.42	1,211,582.51	365
01-01-23	8,036.89	1,298,726.62	385
01-04-23	8,863.26	1,415,504.71	414
01-07-23	9,964.61	1,533,536.44	473
01-10-23	11,408.79	1,715,768.34	505
01-01-24	12,203.02	1,841,083.97	550
01-04-24	13,303.99	1,964,464.52	583
01-07-24	14,435.55	2,064,292.41	605
01-10-24	16,584.97	2,349,821.46	632
01-01-25	16,996.00	2,348,037.12	647
01-04-25	17,893.42	2,394,925.87	668
01-07-25	19,467.95	2,508,498.09	684
01-08-25	20,008.31	2,485,472.91	688

(Source: Compiled from NPCI - UPI Monthly Transaction Statistics, 2020-2025)

The trend shows key patterns: UPI saw moderate growth in early 2020, followed by rapid expansion from late 2020 to 2022, largely driven by the COVID-19 shift to contactless payments. Seasonal spikes also appear during

the festive months (October–December) and at the financial year-end in March due to higher consumer spending and business transactions.

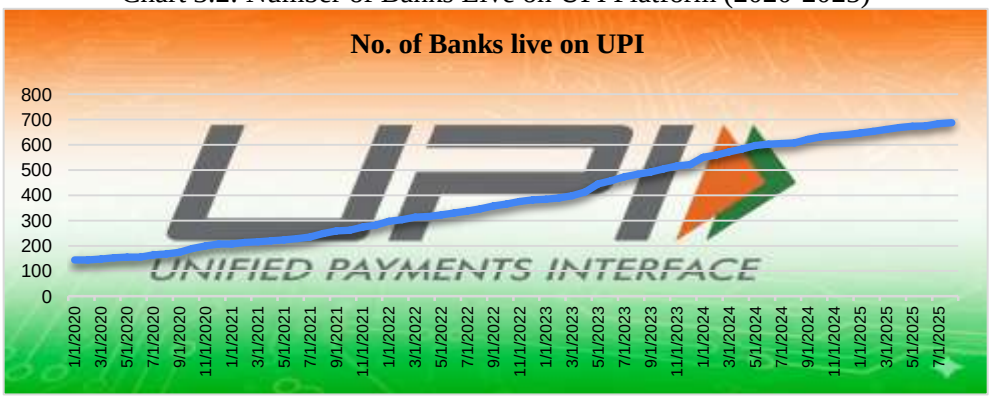
Chart 3.1: Monthly Trend Analysis of UPI Transactions in India (2020-2025)



(Source: Compiled from NPCI - UPI Monthly Transaction Statistics, 2020-2025)

The number of banks on the UPI platform rose from 144 in early 2020 to over 688 by August 2025. Most onboarding occurred between 2021 and 2023 as rural, small finance, and cooperative banks joined due to regulatory support and rising user demand. The slower growth after 2024 indicates that UPI has nearly saturated the formal banking sector.

Chart 3.2: Number of Banks Live on UPI Platform (2020-2025)



(Source: Compiled by researcher from NPCI – UPI Live Banks Data (2020–2025))

This broad adoption has transformed UPI far beyond a payment system. With almost all banks onboard and over 20 billion monthly transactions, UPI now serves as a national digital infrastructure. It generates real-time economic data that supports innovations such as improved credit scoring for individuals without credit history, advanced AI-based fraud detection, and better policymaking through real-time consumption insights. As a result, UPI has evolved from a simple payment rail into a foundational platform enabling the next generation of data-driven financial services, including personalized products and micro-lending.

TABLE II:
COMPARATIVE ANALYSIS OF FINTECH ADOPTION LEVEL BETWEEN PUBLIC AND PRIVATE SECTOR BANKS

Parameter	SBI (Public)	BoB (Public)	HDFC (Private)	ICICI (Private)
Launch Year of App	2017	2021	2015	2014
Name of Chatbot	SIA (GenAI-powered)	ADI (ADITI) 2.0	EVA (GenAI-powered)	iPal (GenAI-powered)
UPI Integration	Yes (YONO, with advanced features)	Yes (with advanced features)	Yes (with credit on UPI)	Yes (Universal UPI for all)
AI/ML Use	Proactive risk alerts, SIA, Hyper-personalization	Predictive analytics, ADI	Advanced credit scoring, EVA, Fraud detection	Proactive financial advice, iPal, Underwriting
Voice / Multilingual Support	English, Hindi + Multiple Regional Languages	English, Hindi + Regional Languages	English, Hindi	English, Hindi + Multiple Regional Languages
Total App Downloads (Google Play Projected)	10Cr+	5Cr.+	5Cr.+	5Cr.+
User Ratings (Google Play, Projected)	4.3	4.4	4.1	4.6
Digital Services Offered	Banking, Loans, Shopping, Travel, Insurance	Banking, Lifestyle, Agri-services	Banking, Investment, Cards, Merchant services	Banking, Payments, Investment, Insurance
Unique Feature	YONO Cash, Integrated Agri-Marketplace	Hyper-personalized lifestyle platform	SmartHub Vyapar for merchants, PayZapp	AI-driven financial wellness tools, Universal App
AI Personalization	High	Moderate-High	Very High (Hyper-personalized)	Very High (Hyper-personalized)
Security Layers	Behavioural Biometrics, MPIN	AI-based Fraud Detection, MPIN	2FA, FaceID, Behavioral Biometrics	2FA, PIN, AI-based Fraud Detection
Target Focus	Financial inclusion, MSMEs	Customer convenience, Rural & Semi-urban	Digital efficiency, Affluent & HNI customers	Omni-channel experience, Gen-Z & Millennials

(Source**:** Compiled by researcher from *NPCI – UPI Live Banks Data (2020–2025)*)

Both public and private sector banks in India are actively adopting digital technologies; however, the nature and strategic direction of their digital initiatives vary significantly. Private banks like HDFC and ICICI were early adopters, launching apps in 2014–15, which helped them build advanced, mature digital ecosystems. Public banks such as SBI and BoB joined later but used their huge customer base to achieve massive scale—SBI's YONO crossing 10 crores+ downloads is the best example.

Private banks focus on innovation and tech-savvy users, offering features like credit on UPI, advanced AI chatbots, merchant platforms, and hyper-personalized services. Public banks focus on financial inclusion, offering multilingual support, rural-friendly services, and features like YONO Krishi to reach underserved areas.AI use also differs: private banks apply AI deeply for credit scoring, underwriting, fraud analytics, and personalized advice, while public banks mainly use AI for chatbots, alerts, and basic support.

4.4 Strategic Posture of the Indian Banking Industry: A SWOT Analysis

A SWOT analysis is used in this study to evaluate the internal strengths and weaknesses of the Indian banking sector, along with external opportunities and threats arising from FinTech-led transformation.

TABLE III:
SWOT ANALYSIS OF THE INDIAN BANKING INDUSTRY

Strengths	Weaknesses
- Strong RBI rules keep banks stable - India leads in digital payments (UPI) - High public trust & wide branch network	- Old NPA (bad loan) problems. - Low digital literacy in rural areas - Increasing cyber fraud risks
Opportunities	**Threats**
- Deeper AI & ML integration in credit, analytics, and fraud detection. - Export of the UPI model globally for cross-border payments. - Huge digital growth possible in villages	- Competition from FinTech, Neobanks, and Big Tech firms. - Rapid technological obsolescence requiring heavy reinvestment. - Regulatory volatility and macroeconomic shocks.

Quantifying the Impact: A Ratio Analysis of Banking Performance (FY2021-FY2025)

To empirically assess the financial impact of FinTech adoption and digital transformation, this section presents a detailed ratio analysis of four major banks—SBI, HDFC Bank, ICICI Bank, and BoB—over the five-year period from FY 2020-21 to FY 2024-25. The analysis covers key indicators of profitability, asset quality, efficiency, and stability, providing quantitative evidence of the trends discussed in the preceding sections.

4.6 Net Profit Margin (NPM)

Net Profit Margin (NPM) serves as an indicator of how effectively a bank converts its overall income into net earnings after accounting for all operational and financial expenses. It is calculated as:

$$\textbf{\textit{Net Profit Margin}}\ (\textbf{\textit{NPM}}) = \left(\frac{\textbf{\textit{Total Income}}}{\textbf{\textit{Net Profit}}}\right) \times \mathbf{100}$$

TABLE IV:
NET PROFIT MARGINS (%)

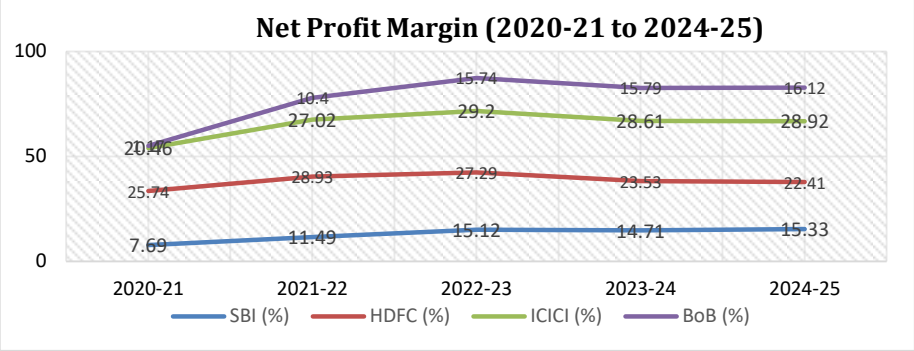
Year	SBI (%)	HDFC (%)	ICICI (%)	BoB (%)
2020-21	7.69	25.74	20.46	1.17
2021-22	11.49	28.93	27.02	10.4
2022-23	15.12	27.29	29.2	15.74
2023-24	14.71	23.53	28.61	15.79
2024-25	15.33	22.41	28.92	16.12

(Source: Money control (https://www.moneycontrol.com/financials/))

The Net Profit Margin (NPM) of these four banks shows how much profit they make after covering all their expenses. Looking at the data from 2020-21 to 2024-25, we can see some interesting trends.

The NPM trend underscores a dramatic improvement in the profitability of public sector banks. BoB's margin soared from a mere 1.17% in FY21 to 16.12% in FY25, while SBI's more than doubled from 7.69% to 15.33%. This remarkable turnaround is directly linked to the operational efficiencies gained through digital platforms like BoB World and YONO, which have lowered transaction costs and expanded fee-based income streams. Private banks, HDFC and ICICI, maintained their consistently high profitability, with NPMs remaining well above 20%, reflecting their mature digital infrastructure and efficient cost structures.

Chart 3.3: Net Profit Margin Trend (2020-21 to 2024-25)



4.7 Return on Assets (ROA)

Return on Assets (ROA) reflects the effectiveness with which an organization converts its assets into profits, indicating the overall efficiency of asset utilization in income generation. The formula is:

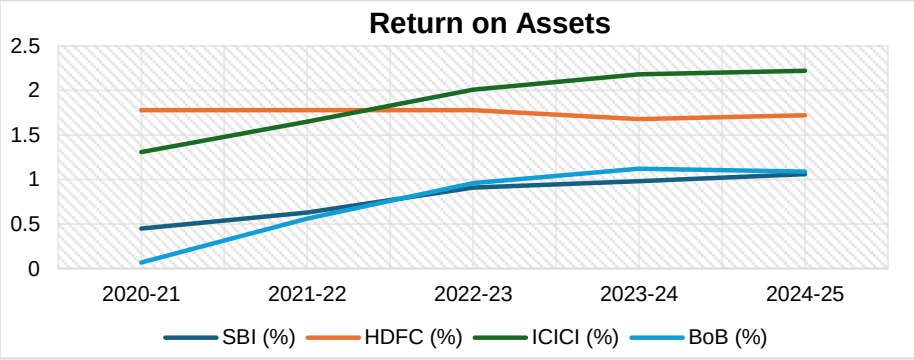
$$ROA = \frac{Net\ Profit}{Average\ Total\ Assets} \times 100$$

TABLE V:
RETURN ON ASSETS (ROA) (%)

Year	SBI (%)	HDFC (%)	ICICI (%)	BoB (%)
2020-21	0.45	1.78	1.31	0.07
2021-22	0.63	1.78	1.65	0.56
2022-23	0.91	1.78	2.01	0.96
2023-24	0.98	1.68	2.18	1.12
2024-25	1.06	1.72	2.22	1.09

(Source: Money control (https://www.moneycontrol.com/financials/))

Chart 3.4: Trend of Return on Assets (ROA)



The ROA data shows a clear trend of convergence. While private banks like ICICI (2.22% in FY25) and HDFC (1.72% in FY25)
continue to lead, the public sector banks have made substantial gains. SBI's ROA more than doubled to 1.06%, and BoB's improved dramatically from 0.07% to 1.09%. This improvement reflects better profit generation from their asset base, driven by digitalization, improved loan recovery, and reduced operational overheads facilitated by FinTech adoption.

4.8 Return on Net Worth (RONW)

Return on Net Worth (RONW) measures the profitability of a firm in relation to its shareholders' equity, indicating how effectively owners' funds are utilized to generate net returns., calculated as:

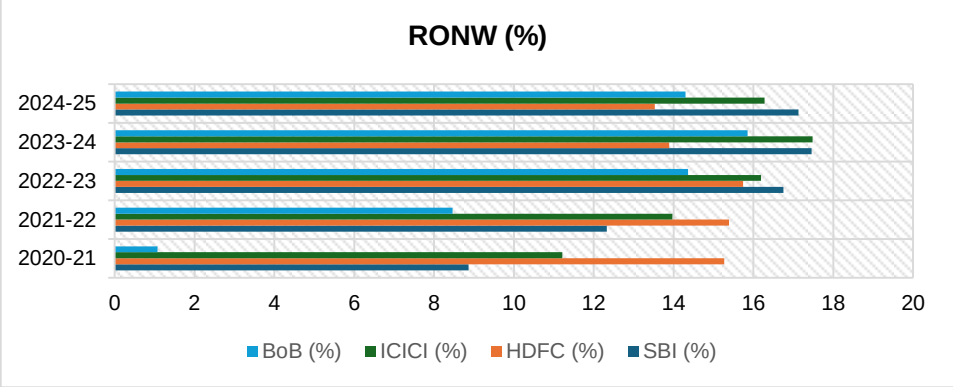
$$RONW = \frac{Net\ Profit}{Shareholders'\ Equity} \times 100$$

TABLE VI:
RETURN ON NET WORTH (RONW) (%)

Year	SBI (%)	HDFC (%)	ICICI (%)	BoB (%)
2020-21	8.86	15.27	11.21	1.07
2021-22	12.33	15.39	13.97	8.46
2022-23	16.75	15.74	16.19	14.36
2023-24	17.46	13.89	17.48	15.85
2024-25	17.13	13.53	16.28	14.3

(Source: Financial data collected from https://www.moneycontrol.com/financials/)

Chart 3.5: Return on Net Worth (%)



The RONW figures further illustrate the performance convergence. SBI and BoB demonstrated explosive growth in shareholder returns, with SBI's RONW rising from 8.86% to 17.13% and BoB's from 1.07% to 14.30%. This indicates a significant improvement in their ability to generate profits from their equity base. This enhancement is closely tied to FinTech-driven efficiencies that have boosted their bottom lines, allowing them to close the performance gap with their private counterparts like ICICI Bank, which also showed strong improvement to 16.28%.

4.9 Net Non-Performing Assets (NNPA)

Net Non-Performing Assets (NNPA) represent the portion of a bank's loan portfolio that remains unrecovered after adjusting for provisions made against non-performing loans.

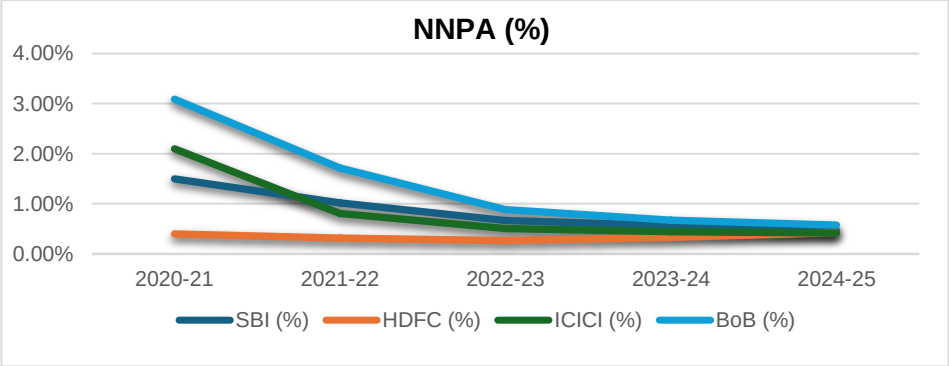
$$NNPA\ Ratio = \left(\frac{Gross\ NPA\ -\ Provisions}{Gross\ Advances\ -\ Provisions}\right) \times 100$$

TABLE VII:
NET NON-PERFORMING ASSETS (NNPA) (%)

Year	SBI (Rs.Cr.)	SBI (%)	HDFC (Rs.Cr.)	HDFC (%)	ICICI (Rs.Cr.)	ICICI (%)	BoB (Rs. Cr)	BoB (%)
2020-21	36809.72	1.5	4,554.82	0.4	9,117.66	2.1	21,800.00	3.09
2021-22	27965.71	1.02	4,407.68	0.32	6,931.04	0.81	13,364.64	1.72
2022-23	21466.64	0.67	4,368.43	0.27	51,500.70	0.51	8,384.00	0.89
2023-24	21051.08	0.57	8,091.74	0.33	5,377.79	0.45	7,213.34	0.68
2024-25	19666.92	0.47	11,320.43	0.43	5,589.00	0.42	6,994.00	0.58

(Source: Financial data collected from https://www.moneycontrol.com/financials/)

Chart 3.7: Trend on Net Non-Performing Assets (%)



The NNPA data shows an even stronger convergence, with all four banks bringing their ratios below 1% by FY23 and further down towards the 0.5% mark by FY25. This indicates not only better loan origination but also more effective provisioning and recovery processes. FinTech tools such as digital repayment reminders, automated collection platforms, and data-driven recovery strategies have significantly improved the efficiency of resolving stressed assets. The convergence to such low levels across both sectors signals a healthier and more resilient banking system overall.

V. FINDING & SUGGESTIONS

5.1 Findings:

Key Findings which we can find from this Article are as follows:

- Banking has become digital-first, with super-apps like YONO and iMobile Pay offering end-to-end financial and lifestyle services.
- UPI is the core of India's digital economy, providing fast, widespread, and real-time digital payments.
- Public sector banks are rapidly catching up, improving profitability and reducing NPAs through digital platforms.
- Private Banks Innovate, Government Banks Scale: Private banks are usually the first to try new technologies. Government banks then adopt these proven technologies and use their massive customer base to bring digital banking to everyone, including people in rural areas.
- AI and analytics have reduced bad loans by improving credit decisions and monitoring.
- Some Key Differences Remain: Even though government banks have improved, private banks still earn more profit from the interest they charge. This is because their core business strategies and target customers are different.
- The Biggest Challenge is Security: As more people start using digital banking, the risk of online fraud and cyber-attacks has increased. Protecting new and less tech-savvy users is the industry's main challenge.
- The Banking System is Financially Strong: All major banks have enough capital to cover potential losses, making the entire banking system safer and more resilient.

5.2 Suggestions:

The Suggestions which we can give are as follows:

For Banks

- Combine Physical and Digital ("Phygital"): Use physical branches for expert advice and complex services, while letting mobile apps handle all routine transactions.
- Use AI for Big Decisions: Go beyond using AI for just customer service. Use it for critical tasks like approving loans, managing risk, and preventing fraud.
- Partner with Tech Companies: Instead of building everything from scratch, banks should team up with FinTech start-ups to quickly offer new and innovative digital services.

For the Government and Regulators:

- Launch a National Digital Safety Program: Start a nationwide campaign to teach people how to use digital banking safely and avoid online scams, especially in rural areas.
- Create Rules for AI in Banking: Establish clear guidelines to ensure that when banks use AI for decisions like loan approvals, the process is fair, transparent, and protects customer data.
- Encourage "Green Banking": Offer incentives for banks to provide more loans to environmentally friendly projects and businesses.

For Investors:

- Look at Digital Strength, Not Just Ownership: When evaluating a bank, focus on how advanced its technology is, rather than just whether it's a public or private bank.
- Judge a Bank by its Digital Ecosystem: The future value of a bank depends on its entire digital world—its app, its partnerships, and the money it makes from digital services. This is a key area to assess.

VI. CONCLUSION

The Indian banking industry has transformed from a branch-centric system into a modern, digital and technology-driven ecosystem. FinTech has been the key driver of this shift, enabling “Banking 4.0,” where innovation, inclusion, and data-driven decisions shape everyday banking. Empirical evidence from 2020–2025 shows that UPI transaction volumes expanded more than 15 times, while public sector banks recorded a two- to three-fold increase in profitability and a sharp decline in asset impairment levels. The convergence of key performance indicators—such as ROA rising above 1% and NNPA falling below 0.5%—indicates that digital platforms, AI-enabled risk management, and data-driven decision-making have significantly strengthened banking efficiency and stability. Despite private banks retaining an edge in innovation intensity and customer analytics, public banks have leveraged scale to accelerate financial inclusion. To sustain this momentum, policymakers and banks must prioritize cybersecurity governance, responsible AI deployment, and nationwide digital literacy. Overall, India’s banking sector demonstrates a successful model of FinTech-led transformation with global relevance.

Overall, India’s banking system has built a strong and inclusive digital foundation and is well-positioned to remain a global leader in modern, secure, and scalable digital banking.

REFERENCES

[1] India Brand Equity Foundation (IBEF). (2025). Indian banking industry analysis and market overview. Ministry of Commerce & Industry,Government of Indiahttps://www.ibef.org/industry/banking-india

[2] Research Gate. (2025). Evolution of banking systems: A comprehensive historical analysis. Retrieved from https://www.researchgate.net/publication/388055630_Evolution_of_banking_systems_A_comprehensive_historical_analysis

[3] Research Gate. (2014). Indian banking industry: Challenges and opportunities. Retrieved from

https://www.researchgate.net/publication/262144765_Indian_Banking_Industry_Challenges_And_Opportunities

[4] Reserve Bank of India (RBI). (Various Years). Report on Trend and Progress of Banking in India. Reserve Bank of India, Mumbai.https://www.rbi.org.in

[5] National Payments Corporation of India (NPCI). (2025). UPI monthly transaction statistics (2020–2025). NPCI, Mumbai.https://www.npci.org.in

[6] Rai, S., Chabot, M., Bertrand, J.-L., & Shaikh, I. (2021). Indian banking industry: New evidence from a profitability perspective. Business: Theory and Practice, 22(2), 349–360.https://doi.org/10.3846/btp.2021.12982

[7] Moneycontrol. (2025). Company financials: Balance sheets and profit & loss statements of Indian banks. Retrieved from https://www.moneycontrol.com

[8] India Brand Equity Foundation (IBEF). (2025). Banking industry presentation. Retrieved from https://www.ibef.org/industry/banking-presentation

[9] International Monetary Fund (IMF). (2025). Global financial stability report. Retrieved from https://www.imf.org/

[10] Press Information Bureau (PIB), Government of India. (2025). Press release. Retrieved from https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2090875

[11] Thakor, A. V. (2020) FinTech and banking: What do we know? Journal of Financial Intermediation, 41, 100833. https://doi.org/10.1016/j.jfi.2019.100833

[12] Vives, X. (2019) Digital disruption in banking. Annual Review of Financial Economics, 11, 243–272. https://doi.org/10.1146/annurev-financial-100719-120854

[13] Frame, W. S., Wall, L. D., & White, L. J. (2019) Technological change and financial innovation in banking. Journal of Banking & Finance, 109, 105402.https://doi.org/10.1016/j.jbankfin.2019.105402

[14] National Statistical Survey (NSS). Official Statistics and Survey Reports. Retrieved from https://www.mospi.gov.in

[15] Navaretti, G. B., Calzolari, G., Mansilla-Fernandez, J. M., &Pozzolo, A. F. (2018). FinTech and banking: Friends or foes? European Economy – Banks, Regulation, and the Real Sector, 2, 9–30.https://doi.org/10.2139/ssrn.3099337

[16] Banna, H., Hassan, M. K., & Rashid, M. (2021).FinTech-based financial inclusion and bank risk-taking.Journal of International Financial Markets,
Institutions & Money, 75, 101447.https://doi.org/10.1016/j.intfin.2021.101447