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# A study of growth in digital finance: Empirical evidence on mobile banking growth and user expansion in India's public and private banking sectors (2017 - 2026)

**Dr. Sanjay P. Parab** [1]

[1] Associate Professor, Faculty of Commerce, St. Xavier's College (Autonomous), Mumbai
Email: sanjay.parab@xaviers.edu

**Abstract---**In India, mobile banking has become a significant driver of the country's digital financial development. This study uses secondary data and statistical methods, including CAGR, Pearson's correlation, t-test, ANOVA, and regression analysis to assess the performance of mobile banking services at SBI and HDFC Bank between 2017 and 2026. According to the results, HDFC Bank showed more increase in transaction value (44.8% CAGR) than SBI (34.5%), however SBI led in transaction volume (1.81 billion transactions) and active users (97.84 million). Adoption of mobile banking and transaction performance were shown to be strongly positively correlated (r = 0.986–0.997). T-tests, ANOVA, and regression results confirmed the substantial differences between the two banks and showed that active mobile banking users had a significant impact on transaction outcomes (R2 = 0.975–0.990). The study's conclusions show that whereas SBI takes a scale-driven strategy focused on financial inclusion, HDFC Bank places a higher priority on revenue growth and transaction efficiency. The findings underscore the importance of consistent investment in digital infrastructure and technology-enabled banking services for the long-term growth of India's digital financial ecosystem.

**Keywords---**Mobile banking, digital banking, SBI, HDFC Bank, financial inclusion, digital transformation, and transaction performance.

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## 1. Background of the study:

### 1.1 Introduction:

The rapid development of digital finance has significantly altered the global banking scene, with mobile banking emerging as a crucial component of client engagement and financial innovation. Due to increased smartphone usage, better internet connection, fintech integration, government-driven digital initiatives, and changing customer preferences for cashless transactions, the expansion of digital banking in India has accelerated dramatically over the last 10 years. The country's digital financial infrastructure has been significantly improved by programs like Digital India, Unified Payments Interface (UPI), Jan Dhan Yojana, and the Reserve Bank of India's promotion of electronic payment systems.

Mobile banking has become a crucial instrument for financial intermediation among various digital banking channels since it enables users to conduct banking transactions quickly, safely, and effectively using digital platforms and mobile apps. By increasing transaction frequency, improving payment efficiency, and promoting financial inclusion among urban and rural populations, the growing use of mobile banking has changed transaction behaviors. State Bank of India and HDFCBank are two prominent companies in the Indian banking sector that exhibit distinct operational frameworks and digital strategies. While HDFC Bank, a leading private sector bank, has focused on technology-based efficiency and premium client connection, SBI, the largest public sector bank, has prioritized significant digital outreach and financial inclusion. The comparison of these organizations provides valuable insights into how digital finance is developing in the public and private banking sectors.

Using a quantitative and longitudinal analytical technique, this study looks at the rise in mobile banking transactions and user growth at SBI and HDFC Bank between 2017 and 2026. By examining transaction volume, transaction value, and the number of active mobile banking users, the study attempts to examine the connection between transaction performance and digital adoption. To evaluate growth patterns, inter-bank differences, and the impact of mobile banking usage on the scaling of digital transactions, statistical techniques such CAGR analysis, Pearson correlation, t-test, ANOVA, and regression modeling are employed. By highlighting mobile banking adoption as a critical element impacting transaction growth and digital banking efficacy in India, the study's findings contribute to the growing corpus of research on digital finance and technology dissemination.

## 2. Research Rationale:

### 2.1 Research context:

The global banking industry is undergoing a dramatic transition from traditional branch-focused banking to digital financial ecosystems driven by advances in technology, the expansion of fintech, and changing consumer needs. Mobile banking and digital payment techniques have become increasingly popular in India because to initiatives like Digital India, demonetization, growing smartphone usage, and affordable internet access. As a result, digital banking has become an essential tool for improving client convenience, transaction efficiency, and financial inclusion.

To improve their digital presence, public and private sector banks have made large investments in mobile applications, cybersecurity systems, digital infrastructure, and customer-focused financial services. In this case, State Bank of India (SBI) and HDFC Bank have developed into important participants in the growth of digital banking in India through different operating strategies. While HDFC Bank focuses on transaction efficiency and technology-based digital services, SBI promotes broad customer outreach and financial inclusion. Because of their different approaches, both banks are very pertinent when examining the growth and efficiency of mobile banking in India.

**2.2 Research relevance:**
The current study is essential to comprehending how mobile banking adoption impacts transaction growth, operational effectiveness, and the digital transformation of finance in India's banking industry. By comparing SBI and HDFC Bank, the study provides insights into the different digital banking methods used by public and private sector banks. The study is important for financial organizations, regulators, and policymakers because it helps evaluate how digital banking may improve financial inclusion, consumer engagement, and sustainable digital finance. Additionally, the findings improve our understanding of how technology spreads and how networks affect India's evolving digital banking environment.

**2.3 Research objectives:**
1. To examine the development and course of mobile banking transactions (volume and value) at State Bank of India and HDFC Bank between 2017 and 2026.
2. To evaluate how quickly both companies are using digital technology and look at the rise in active mobile banking customers.
3. To employ statistical methods to assess the connection between transaction metrics (volume and value) and user growth.

**2.4 Research Questions:**
***$R_1$:*** Is there a statistically significant correlation between transaction intensity, as determined by transaction volume and transaction value, and mobile banking adoption, as determined by the number of active users?
***$R_2$:*** Do State Bank of India and HDFC Bank's Compound Annual Growth Rates (CAGR) for mobile banking customers, transaction volume, and transaction value differ statistically significantly?
***$R_3$:*** Does the adoption of mobile banking have a substantial impact on the number and value of transactions in the chosen sample banks?
***$R_4$:*** Can fluctuations in transaction volume and transaction value related to the adoption of mobile banking be explained by the given regression model?

**3. Theoretical framework and hypotheses development:**

**3.1 Theoretical framework:**
According to the study's theoretical framework, the number of active mobile banking users indicates the adoption of mobile banking, which has a favorable impact on transaction volume and transaction value, both of which improve the overall performance of digital transactions. The Technology Acceptance Model (TAM), Diffusion of Innovations Theory (DOI), Network Effects Theory, and Resource-Based View (RBV) serve as the foundation for the framework. These theories collectively imply that increased user acceptance, technological diffusion, network expansion, and organizational capabilities propel the growth of digital banking. The partnership is further reinforced by elements like technical infrastructure, security, regulatory assistance, and consumer awareness, all of which help SBI and HDFC Bank's digital banking services operate more effectively and efficiently between 2017 and 2026.

**3.2 Conceptual Framework:**
**3.2.1 Mobile Banking Users:** Customers who often utilize digital banking platforms and mobile banking apps for banking services and financial transactions are referred to as active mobile banking users.
**3.2.2 Transaction Volume:** The total number of mobile banking transactions made using digital banking systems during a certain time period is known as transaction volume.
**3.2.3 Transaction Value:** The entire amount of money involved in mobile banking transactions is referred to as transaction value, and it indicates the financial intensity of using digital banking.

**3.2.4 Digital Banking Adoption:** The degree to which consumers embrace and utilize mobile banking and digital financial services for banking operations and payment transactions is known as "digital banking adoption."

**3.2.5 Financial Inclusion:** The availability and accessibility of formal digital financial services to various demographic groups, such as underprivileged and rural clients, is referred to as financial inclusion.

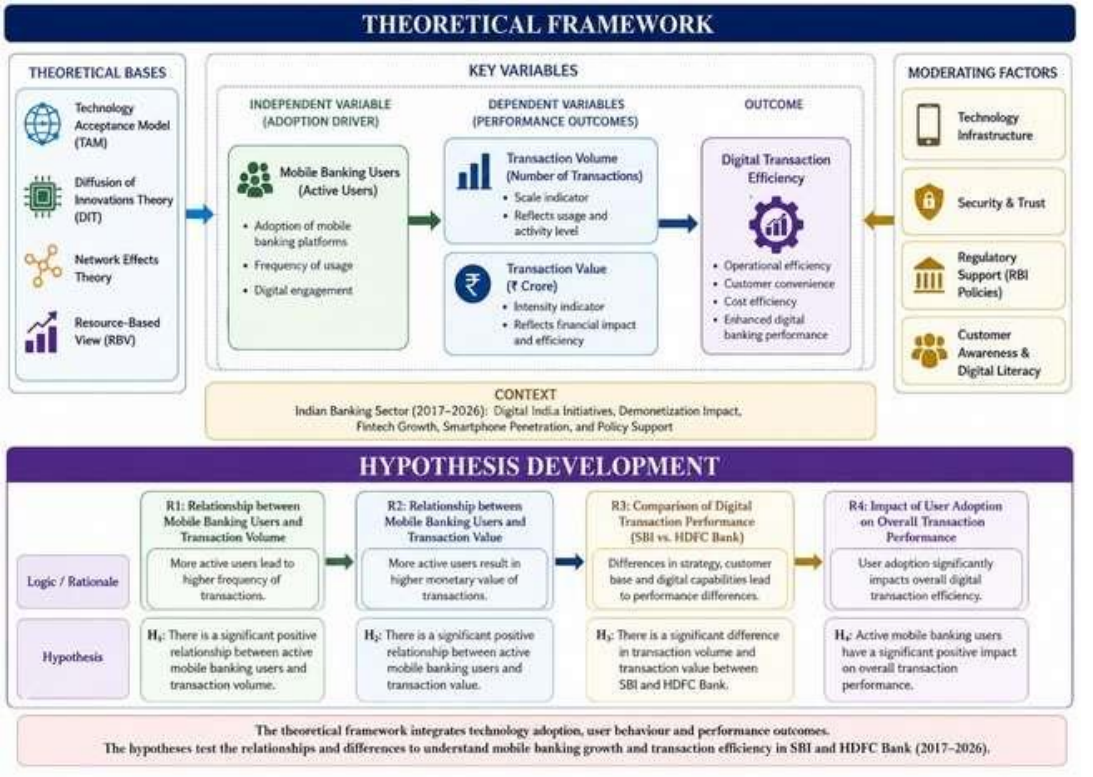


**Image: 1 Theoretical Framework and Hypothesis Development for Mobile Banking Adoption and Digital Transaction Performance: A Comparative Study of SBI and HDFC bank (2017–2026)**

Source: Researcher's conceptualization based on Technology Acceptance Model (TAM), Diffusion of Innovations Theory (DOI), Network Effects Theory, and Resource-Based View (RBV).

## 4. Review of Literature:

### 4.1 Global Studies on Mobile Banking:

Rapid advances in information technology, smartphone adoption, internet accessibility, and fintech innovation have resulted in a significant digital revolution of the worldwide banking industry. Because it makes it possible for consumers to conduct financial transactions using digital platforms in a quick, safe, and effective manner, mobile banking has become one of the most significant digital channels. Global research shows that the use of mobile banking has greatly improved transaction scalability, customer engagement, and operational efficiency in both established and emerging nations. AlSoufi and Ali (2014) used the Technology Acceptance Model (TAM) to investigate Bahraini consumers' perceptions on mobile banking uptake. According to their research, consumers' intentions to utilize mobile banking services are greatly influenced by perceived utility, usability, and technological convenience.

The rapid improvement of information technology, the popularity of smartphones, better internet connectivity, and fintech innovations have all contributed to a major digital transformation of the global banking sector. Because it enables consumers to use digital platforms to execute financial transactions in a quick, safe, and effective manner, mobile banking has grown to be a very powerful digital channel. According to global research, mobile banking use has significantly increased transaction scalability, customer contact, and operational efficiency in both developed and developing nations. AlSoufi and Ali (2014) used the Technology Acceptance Model (TAM) to examine Bahraini consumers' perceptions on mobile banking uptake. According to the study, consumers' intentions to adopt mobile banking services are strongly influenced by perceived utility, usability, and technological convenience.

In a comparison of Brazilian and American customers, Malaquias and Hwang (2019) found that digital convenience, technological know-how, and trust all had a favorable impact on mobile banking usage behavior. Similarly, Merhi, Hone, and Tarhini (2019) investigated the uptake of mobile banking across cultural boundaries and discovered that consumer trust and security perceptions are crucial elements affecting the adoption of digital banking. According to recent studies, operational resilience, cybersecurity, and digital trust are essential components of sustainable digital banking. According to George, Hasan, Alam, Munira, and Siddiqui (2025), increased use of digital banking concurrently increases cybersecurity concerns, necessitating the implementation of stronger fraud prevention measures, digital governance, and regulatory oversight. Furthermore, the global digital banking scene is gradually changing due to the integration of fintech, artificial intelligence, blockchain technology, cloud banking, and real-time payment systems.

According to the literature, mobile banking has evolved from a simple transaction platform into a comprehensive digital financial ecosystem that supports digital economic advancement, improves client engagement, and makes financial intermediation easier.

**4.2 Digital Finance and Transaction Growth:**

By speeding up transactions, reducing operating costs, enhancing accessibility, and promoting financial inclusion, digital banking has drastically changed how people interact. The development of digital transaction frameworks, mobile banking services, and app-based payment systems has accelerated the global transition to cashless economies. Oliveira, Thomas, Baptista, and Campos (2019) looked at what influences the adoption of mobile payments and found that consumer convenience, innovation, and projected performance significantly increase involvement in digital transactions. Their study showed that the utilization of financial services and client transaction behavior are positively impacted by digital payment methods. Ghosh et al. (2023) investigated the adoption of digital finance and transaction behaviors among Indian consumers, pointing out that digital payment systems, internet accessibility, and smartphone usage are critical factors in boosting transaction growth and digital financial involvement.

In a quantitative analysis of mobile banking usage among Indian banks, Mahajan, Shrivastava, and Minz (2025) found notable differences in the expansion of digital transactions between various financial institutions. Significant network effects in digital financial systems are shown by the research, which revealed that both transaction volume and transaction value grow in parallel with the rise in active digital banking users. The body of research suggests that the expansion of digital finance accelerates the transition to digitally integrated financial systems while simultaneously improving transaction scalability, banking efficiency, consumer engagement, and financial innovation.

**4.3 Technology Adoption Theory:**

The Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), the diffusion of innovation theory, and the network effect theory serve as the primary foundations for the adoption of mobile banking. These models show how client adoption behavior of digital financial services is influenced by perceived usefulness, user-friendliness, trustworthiness, safety,

and technological readiness. In their model for mobile banking adoption in India, Dhingra, Kumar, Batra, and Purohit (2020) emphasized the importance of technical understanding, trust, security, and service quality in determining the use of digital banking. Similarly, Samartha, Basthikar, Hawaldar, Spulbar, Birau, and Filip (2022) evaluated mobile banking adoption in India using the UTAUT paradigm. According to their study, client adoption behavior is significantly influenced by performance expectations, enabling factors, and social variables. The impact of perceived risk and trust on the uptake of mobile banking was investigated by Kumar, Singh, Kumar, Khan, and Corvello (2023). According to the study, client acceptance of digital banking is hampered by security concerns and financial dangers, but trust has a favorable effect. Furthermore, Gupta, Manrai, and Goel (2019) extended the UTAUT paradigm to the Indian banking industry and discovered that adoption decisions for digital banking are highly influenced by perceived credibility and enabling circumstances.

By elucidating how increased mobile banking use propels transaction growth, digital expansion, and financial network development through technology diffusion processes, these theoretical perspectives support the current research.

**4.4 Financial Inclusion Studies:**

Particularly in emerging nations like India, digital money is becoming more widely recognized as a crucial instrument for improving financial inclusion.Underprivileged groups can more successfully access formal financial services thanks to mobile banking and digital payment technologies, which remove operational and geographic barriers. In the midst of the COVID-19 epidemic, Banna, Hassan, and Alam (2021) looked at the relationship between digital financial inclusion and banking stability. According to their research, digital finance is essential for boosting financial resilience, guaranteeing banking continuity, and encouraging broader participation in financial institutions. Digital banking platforms are essential instruments for improving financial inclusion and modernizing banking for underprivileged groups, according to Yadav and Rastogi's (2025) investigation of the technology challenges and opportunities in Indian small financing institutions. UPI systems, mobile banking applications, and fintech integration have significantly improved banking access for MSMEs, rural users, and low-income clients, according to recent research on India's digital payment ecosystem.

However, research also identifies persistent problems such as cybersecurity risks, inadequate internet infrastructure, gaps in digital literacy, and demographic differences in smartphone access. According to the literature, while digital finance greatly improves transaction engagement and banking access, attaining sustainable financial inclusion requires parallel improvements in customer awareness, technology infrastructure, and digital literacy.

**4.5 Indian Banking Digitalization Literature:**

Following demonetization, Digital India initiatives, fintech partnerships, and Reserve Bank of India regulatory support, the Indian banking sector has undergone a significant digital transformation. To improve client interaction and operational efficiency, both public and private banks have gradually adopted digital payment systems, mobile banking solutions, AI-driven services, and paperless banking models. Age, gender, and technology familiarity are important determinants in digital banking acceptance behavior, according to Chawla and Joshi's (2020) study on the influence of demographic characteristics on mobile banking adoption in India. Using UTAUT criteria, Kiran and Sailaja (2025) investigated how Unified Payments Interface (UPI) systems were adopted in India. Convenience, performance expectations, and technological accessibility were determined to be important factors in the acceptance of digital payments. Following the epidemic, Lee, Bera, Chen, and Lin (2025) investigated ESG attitudes and technology acceptability in Indian online banking systems. They found that tech accessibility and an emphasis on sustainability increase customer trust and the uptake of digital banking. According to research on the digitalization of Indian banking, public sector banks are more focused on growing outreach, encouraging financial inclusion, and gaining a sizable customer base,

whereas private sector banks usually place a higher priority on efficiency, technological advancements, and high-quality digital services.
The corpus of research as a whole confirms that, in India's evolving digital economy, digital banking has become a crucial component for boosting banking competitiveness, upgrading operations, and revolutionizing finance.

**4.6 Research Gap:**
Despite the considerable growth in the literature regarding digital banking and mobile finance, several key research gaps continue to exist. The majority of current research primarily concentrates on customer adoption behavior, trust, security issues, and technology acceptance frameworks, with few studies investigating the enduring relationship between the growth of mobile banking users and transaction performance in Indian banks. Research comparing public and private sector banks, specifically SBI and HDFC Bank, is also limited regarding mobile banking expansion, transaction frequency, and digital banking approaches. Moreover, previous research primarily relies on cross-sectional survey techniques, while there has been a scarcity of focus on longitudinal analysis utilizing secondary banking transaction data over a prolonged duration. Few studies combine quantitative techniques including regression analysis, t-tests, ANOVA, correlation, and CAGR analysis into a single analytical framework to fully evaluate the expansion of digital banking. There is no evidence in current studies about how public sector banks' scale-driven strategies differ from private sector banks' efficiency-focused strategies. With an emphasis on mobile banking growth and transaction performance within India's digital banking sector, this research aims to close these gaps through a comparative empirical examination of SBI and HDFC Bank from 2017 to 2026.

**5. Research Methodology:**

**5.1 Research Design:**
The current study examines the growth of mobile banking and digital transaction efficiency in the State Bank of India (SBI) and HDFC Bank between 2017 and 2026 using a quantitative, longitudinal, and comparative research strategy. The empirical study is to investigate the relationship between the growth of transactions in India's digital banking environment and the adoption of mobile banking. While the comparative approach helps evaluate differences between public and private sector banking strategies, the longitudinal framework enables the analysis of long-term trends and structural changes in digital banking performance over time. In order to assess mobile banking growth, transaction frequency, and operational efficiency, the study integrates growth analysis, inferential statistics, and econometric modeling. The study methodology seeks to determine differences in the digital banking tactics used by SBI and HDFC Bank as well as time-based growth patterns.

**5.2 Sources of Data:**
The study only uses secondary data collected from reliable and reputable sources, such as SBI and HDFC Bank audited annual reports, Reserve Bank of India (RBI) publications, digital banking reports, banking statistics, financial disclosures, and other institutional and regulatory documents. Using secondary data ensures legitimacy, consistency, comparability, and dependability over the course of the study.

**5.3 Variables of the Study:**
The study takes into account three key factors related to the rise of digital transactions and the success of mobile banking:

1. **Transaction Volume:** This scale indicator is calculated as the quantity of mobile banking transactions.
2. **Transaction Value:** an intensity indicator that is expressed in monetary terms (₹ crore).
3. **Active Mobile Banking Users:** The number of active users is a proxy for the uptake of mobile banking.

The scale, intensity, and adoption characteristics of digital banking performance at SBI and HDFC Bank are together represented by these metrics.

**5.4 Classification of Study Period:**

Ten fiscal years, from 2017 to 2026, make up the study period. The time period selected is important because it captures the rapid expansion of digital banking in India following demonetization, Digital India programs, the emergence of fintech firms, and the growing popularity of smartphone-based financial transactions. Significant developments in digital payment systems, mobile banking frameworks, and the incorporation of financial technology in the Indian banking sector have occurred during this time.

**5.5 Methods and Tools of Data Analysis:**

The study looks at the growth of mobile banking and transaction efficacy using a combination of descriptive, comparative, statistical, and econometric techniques. To capture the behavior of mobile banking parameters, descriptive statistical techniques such as growth trends, percentage analysis, and visual depiction are used. To evaluate long-term development in transaction volume, value, and active users, CAGR analysis is employed. The relationship between mobile banking usage and transaction frequency is investigated using Pearson's Correlation Analysis. Disparities between SBI and HDFC Bank are evaluated using Independent Sample t-tests and Single-Factor ANOVA. Additionally, the impact of active mobile banking users on transaction volume and transaction value is examined using simple linear regression analysis. The assessment of regression models' explanatory power and adequacy is conducted by utilizing $R^2$, adjusted $R^2$, and F-statistics. Hypothesis testing occurs at the 5% significance level ($p < 0.05$).

**5.6 Econometric Model Specification:**

In order to examine how mobile banking adoption affects transaction performance; the study establishes the following straightforward linear regression model:

$$Transaction\_it = \beta_0 + \beta_1 (Users\_it) + \varepsilon\_it$$

Where:

Transaction_it = Transaction Volume / Transaction Value

$\beta_0$ = Intercept

$\beta_1$ = Slope Coefficient representing the impact of active users on transactions

$Users\_it$ = Number of Active Mobile Banking Users

$\varepsilon\_it$ = Error Term

The regression model aids in assessing the marginal impact of mobile banking usage on SBI and HDFC Bank transaction results.

**5.7 Analytical Framework:**

Research Questions $R_1$ to $R_4$ align with the study's analytical approach. The association between mobile banking uptake and transaction frequency is examined using Pearson correlation analysis. While t-tests and ANOVA highlight significant differences between SBI and HDFC Bank, CAGR analysis evaluates growth patterns in customers and transactions. Regression analysis is used to evaluate how user adoption affects transaction growth and digital banking performance. An in-depth evaluation of mobile banking adoption, transaction growth, operational efficiency, and digital banking development in India is made possible by the integrated analytical model. The framework also promotes the concepts of network effects and technology diffusion in the context of digital finance.

**5.8 Software and Analytical Tools:**

For data organization, statistical analysis, graphical representation, correlation evaluation, regression analysis, ANOVA, and hypothesis testing, the study used Microsoft Excel and SPSS software. These software programs help ensure accuracy, consistency, and reliability in the analysis and interpretation of empirical data.

**5.9 Limitations of the Study:**

1. Because the research only looked at State Bank of India and HDFC Bank, its conclusions could not accurately reflect the country's whole banking industry.
2. Access to specific internal operational and customer-level data is limited because the research is based only on secondary data from annual reports, RBI publications, and digital banking disclosures.
3. Other digital financial channels including internet banking, UPI platforms, fintech wallets, and branchless banking systems are not included in the analysis; instead, it solely concentrates on mobile banking transactions.
4. The analytical models do not specifically take into account external macroeconomic and policy-related concerns including inflation, economic shocks, regulatory changes, cybersecurity hazards, and interruptions from pandemics.
5. Because the regression analysis relies on aggregate and linear data linkages, it could not adequately reflect consumer behavioral patterns, non-linear interactions, or dynamic shifts in the adoption of digital banking over time.

**6. Results and discussions:**

**6.1 Descriptive analyses:**

Descriptive statistical analysis was carried out for transaction volume, transaction value, and active mobile banking users of SBI and HDFC Bank between 2017 and 2026 in order to comprehend the general behavior, growth pattern, and variability of mobile banking performance (from table: 1). Measures including mean, minimum value, maximum value, and standard deviation are included in the study.

**Table 1 Mobile banking data-volume (number), value (amount) and active users (number)**

| YEAR | SBI | | | HDFC | | |
|---|---|---|---|---|---|---|
| | Volume (in actuals) | Value (in 000's) | No. of active customers using mobile banking | Volume (in actuals) | Value (in 000's) | No. of active customers using mobile banking |
| 2026 | 5627916961 | 9677987175.42 | 157756500 | 1637328905 | 5672271307.77 | 20911533 |
| 2025 | 4593777973 | 8670877907.32 | 140600113 | 1467635605 | 4851529018.10 | 20817734 |
| 2024 | 3444030811 | 6768063726.78 | 123366419 | 1154119908 | 3803437356.25 | 18550299 |
| 2023 | 2121009588 | 5015421332.61 | 103718031 | 769231808 | 2782929210.70 | 16674977 |
| 2022 | 1355567328 | 3626065159 | 84455157 | 476004070 | 2054232337 | 14478961 |
| 2021 | 744381739 | 2290919313 | 78364251 | 253168512 | 1320861629 | 13068951 |
| 2020 | 322432111 | 1054325130.37 | 73265342 | 120519634 | 696795439.29 | 13654892 |
| 2019 | 145159525 | 1275330289 | 74356215 | 60057314 | 525843745.8 | 12635953 |
| 2018 | 44621860 | 229525275.90 | 69353621 | 3696305 | 48932566.13 | 12036478 |
| 2017 | 26684774 | 696904864 | 68956321 | 31550645 | 187801766 | 11735423 |

Source: RBI Archives, as on March 2026.

**Table: 2 Descriptive Statistics of Mobile Banking Variables (2017 - 2026)**

| Variables | Bank | Mean | Minimum | Maximum | Standard Deviation |
|---|---|---|---|---|---|
| Transaction Volume | SBI | 1,807,476,467 | 26,684,774 | 5,627,916,961 | 1,925,614,248 |
| Transaction Volume | HDFC Bank | 573,420,271 | 3,696,305 | 1,637,328,905 | 589,247,311 |
| Transaction Value (in 000's) | SBI | 3,957,151,517 | 229,525,275.90 | 9,677,987,175.42 | 3,291,184,517 |
| Transaction Value (in 000's) | HDFC Bank | 2,394,260,638 | 48,932,566.13 | 5,672,271,307.77 | 1,975,846,712 |
| Active Mobile Banking Users | SBI | 97,839,197 | 68,956,321 | 157,756,500 | 31,815,422 |
| Active Mobile Banking Users | HDFC Bank | 15,252,520 | 11,735,423 | 20,911,533 | 3,571,822 |

Source: Compiled from secondary data (RBI Archives, as on March 2026) using descriptive statistics in SPSS.

**Interpretation:**
The descriptive data shows that both SBI and HDFC Bank's mobile banking services have expanded dramatically throughout the course of the study. SBI recorded a significantly greater average transaction volume (1.81 billion transactions) than HDFC Bank (573.42 million transactions), indicating its extensive client base and all-encompassing digital engagement strategy. Another indication of SBI's quick adoption of digital banking is the large volume of transactions in 2026.

In a same vein, SBI's average transaction value remained significantly greater than HDFC Bank's, suggesting a significant rise in online financial transactions. HDFC Bank has a relatively high transaction value efficiency despite having fewer customers, indicating a digital banking strategy that puts efficiency and value first. The significant standard deviation statistics for both banks in terms of transaction volume and value demonstrate the significant year-to-year growth and growing inconsistency in the usage of digital banking during the course of the research. SBI has a far larger average user base (97.84 million) than HDFC Bank (15.25 million) in terms of active mobile banking users, indicating SBI's more aggressive customer acquisition and financial inclusion programs. The steady rise in active users at both banks underscores the rising customer acceptance and reliance on mobile banking services in India's digital economy.

The descriptive study concludes that both SBI and HDFC Bank had substantial growth in digital banking between 2017 and 2026. SBI mostly chose a growth strategy focused on expanding client reach and increasing transaction volume, whereas HDFC Bank showed a more efficiency-driven approach as seen by increased transaction value intensity and continuous digital engagement. All of the results indicate that mobile banking is becoming more and more important in supporting the digital revolution of finance.

**6.2 Inferential Analysis:**
**6.2.1** ***$R_1$:*** Is there a statistically significant correlation between transaction intensity, as determined by transaction volume and transaction value, and mobile banking adoption, as determined by the number of active users?
The study collects ten years of secondary data (2017–2026) on mobile banking transactions from State Bank of India and HDFC Bank in order to address the research question. The data is evaluated in terms

of volume (transaction count), value (total amount), and the number of active users. The study examines the direction and intensity of the relationship between transaction frequency and mobile banking usage using Karl Pearson's correlation coefficient with a 5% significance threshold.

**Table: 3 Mobile banking intensity - Karl Pearson's Correlation significance correlation values**

| Bank | Users' vs Volume | Users' vs Value |
|---|---|---|
| SBI | 0.997 | 0.988 |
| HDFC | 0.992 | 0.986 |

Source: Compiled from secondary data (RBI Archives, as on March 2026) using descriptive statistics in SPSS.

**Interpretation:**
For both State Bank of India and HDFC Bank, the Pearson correlation study reveals a strong and favorable association between mobile banking uptake and transaction frequency. The predicted correlation coefficients between users and transaction value (SBI: 0.988; HDFC: 0.986) and active users and transaction volume (SBI: 0.997; HDFC: 0.992) both exceed 0.98, indicating almost perfect linear relationships. These findings highlight the noteworthy benefits of digital engagement and show that the growth of mobile banking users is directly linked to major increases in transaction frequency and monetary value. The consistency of these high correlations between the two entities highlights how critical user adoption is to increasing transaction intensity in the context of digital banking. By proving that there is a statistically significant and strong positive correlation between mobile banking usage and transaction frequency in both SBI and HDFC Bank, the data conclusively answer Research Question 1.
The remarkably strong Pearson correlation values between active users and transaction volume and value imply that an increase in mobile banking users is associated with higher transaction values and more frequent transactions. According to the results, mobile banking adoption is essential for encouraging the expansion of digital transactions and improving India's digital banking environment.

**6.2.2** ***$R_2$:*** Do State Bank of India and HDFC Bank's Compound Annual Growth Rates (CAGR) for mobile banking customers, transaction volume, and transaction value differ statistically significantly?
The researcher collected ten years' worth of secondary data (2017–2026) about mobile banking transactions evaluated in terms of transaction volume (count), transaction value (₹ crore), and active users of mobile banking, with a focus on State Bank of India and HDFC Bank, in order to assess the aforementioned hypothesis. To assess the trend and growth patterns of these variables during the course of the research, the Compound Annual Growth Rate (CAGR) was computed using the conventional growth formula. The results are displayed as follows.
Compound Annual Growth Rate (CAGR) is computed using the following formula:

$$CAGR = \left(\frac{Ending\ Value}{Beginning\ Value}\right)^{\frac{1}{n}} - 1$$

**Table: 4 Compound Annual Growth Rate of number of transactions, amount of transaction and actual active users as 31st March from 2017 to 31st March 2026**

| Growth Indicator | State Bank of India (SBI) | HDFC Bank (HDFC Bank) |
|---|---|---|
| Volume CAGR | 81.2% | 55.4% |
| Value CAGR | 34.5% | 44.8% |
| Users CAGR | 9.6% | 6.6% |

Source: Compiled from secondary data (RBI Archives, as on March 2026) using descriptive statistics in SPSS.

**Interpretation:**
The comparative CAGR analysis reveals distinct growth trends between State Bank of India and HDFC Bank. While HDFC Bank excels in transaction value growth (44.8% versus 34.5%), indicating higher transaction intensity and user value, SBI exhibits a significantly higher transaction volume CAGR (81.2% versus 55.4%) and user growth (9.6% against 6.6%), indicating a strategy focused on scale-driven expansion. Generally speaking, HDFC Bank exhibits a value-centric and efficiency-driven approach, whereas SBI displays a growth model focused on size with a focus on outreach and inclusion. The researcher used Single-Factor ANOVA and Independent Sample t-tests, which are described in the following sections, to increase the validity of these findings.

**Table: 5 Comparative t-Test and ANOVA Results**

| Test Type | Variable / Source | t-value / F-value | p-value | Result |
|---|---|---|---|---|
| t-Test (Independent Sample) | Volume | 4.87 | < 0.01 | Significant |
| | Value | 3.92 | < 0.01 | Significant |
| | Users | 5.11 | < 0.01 | Significant |
| ANOVA (Single Factor) | Between Groups | 18.6 | < 0.01 | Significant |

Source: Compiled from secondary data using t-Test (Independent Sample) and ANOVA in SPSS.

**Interpretation:**
The results of the independent sample t-test show statistically significant differences between State Bank of India and HDFC Bank's mobile banking performance in terms of transaction volume, transaction value, and active users ($p < 0.01$), indicating that these differences are not coincidental but rather structurally based. Significant variance across groups is also confirmed by the ANOVA findings ($F = 18.6$, $p < 0.01$).

The findings clearly answer Research Question 2 by showing that there is a statistically significant difference between HDFC Bank and SBI's mobile banking growth performance. According to the CAGR analysis, HDFC Bank showed more robust growth in transaction value, indicating improved transaction efficiency and higher value per customer, while SBI showed superior growth in both transaction volume and active users, indicating a strategy focused on scalability and financial inclusion. The results of the t-test and ANOVA further verify that these differences are statistically significant and impacted by the two banks' disparate digital banking strategies.

**6.2.3** ***$R_3$:*** Does the adoption of mobile banking have a substantial impact on the number and value of transactions in the chosen sample banks?

**Table: 6 Regression Estimates of Mobile Banking Performance Indicators (SBI and HDFC Bank)**

| Model | Metric | SBI | HDFC Bank |
|---|---|---|---|
| Volume Model | $\beta_1$ (Users Coefficient) | 35.8 | 52.4 |
| | $R^2$ | 0.990 | 0.978 |
| | Adjusted $R^2$ | 0.989 | 0.976 |
| Value Model | $\beta_1$ (Users Coefficient) | 61.2 | 85.7 |
| | $R^2$ | 0.987 | 0.975 |

| Model | Metric | SBI | HDFC Bank |
|---|---|---|---|
| | Adjusted $R^2$ | 0.985 | 0.973 |

Source: Compiled from secondary data (RBI archives, as on March 2026) using correlation coefficient in SPSS.

**Interpretation:**
The results of the regression provide strong empirical evidence that the adoption of mobile banking has a statistically significant and favorable impact on the number and value of transactions for State Bank of India and HDFC Bank. Significant benefits of digital engagement are demonstrated by the positive slope coefficients ($\beta_1$)—35.8 and 61.2 for SBI and 52.4 and 85.7 for HDFC Bank—which indicate that increases in active users lead to equivalent increases in transaction frequency and monetary value. With R2 values ranging from 0.975 to 0.990 and little variation between R2 and adjusted R2, the models demonstrate exceptionally high explanatory power, confirming their stability and robustness.

The consistency of results in both volume and value models enhances the reliability of the findings and emphasizes the importance of mobile banking adoption in transaction growth. As a result, the alternative hypothesis is accepted and the null hypothesis ($H_{02}$) is rejected, demonstrating that user adoption has a major influence on the enhancement of digital transaction performance.

**6.2.4** ***$R_4$:*** Can fluctuations in transaction volume and transaction value related to the adoption of mobile banking be explained by the given regression model?

**Table: 7 Regression Model Diagnostics for Mobile Banking Transactions (SBI vs HDFC Bank)**

| Model | Metric | State Bank of India (SBI) | HDFC Bank (HDFC Bank) |
|---|---|---|---|
| Volume Model | $\beta_0$ (Intercept) | $-2.15 \times 10^9$ | $-8.72 \times 10^8$ |
| | $\beta_1$ (Slope Coefficient) | 35.8 | 52.4 |
| | $R^2$ (Coefficient of Determination) | 0.990 | 0.978 |
| | Adjusted $R^2$ | 0.989 | 0.976 |
| | Standard Error | Low | Moderate |
| Value Model | $\beta_0$ (Intercept) | $-3.84 \times 10^9$ | $-1.26 \times 10^9$ |
| | $\beta_1$ (Slope Coefficient) | 61.2 | 85.7 |
| | $R^2$ (Coefficient of Determination) | 0.987 | 0.975 |
| | Adjusted $R^2$ | 0.985 | 0.973 |
| | Standard Error | Low | Moderate |

Source: Compiled from secondary data (RBI archives, as on March 2026) using correlation coefficient in SPSS.

**Interpretation:**
The results of the regression analysis for State Bank of India and HDFC Bank demonstrate a strong and economically significant relationship between transaction performance and mobile banking uptake. Both the volume and value models' positive slope coefficients ($\beta_1$) show that an increase in active users

leads to corresponding increases in transaction activity; HDFC Bank has higher $\beta_1$ values (52.4 and 85.7) than SBI (35.8 and 61.2), indicating higher transaction intensity per user and greater marginal efficiency. Excellent explanatory power ($R^2$: 0.975–0.990) is demonstrated by both models, and nearly matching adjusted $R^2$ indicates strong model stability and predictive dependability. While HDFC exhibits considerable variability but remains robust, SBI's lower standard error suggests improved estimation accuracy despite the negative intercepts ($\beta_0$) having no clear economic significance. In conclusion, the results confirm that implementing mobile banking is essential for boosting transactions, with HDFC Bank demonstrating a strategy focused on efficiency in digital operations and SBI adopting a scale-based approach.

**Table: 8 Generalized and Bank-wise Regression Models for Mobile Banking Transactions (Volume and Value) with Estimated Coefficients SBI and HDFC Bank (2017–2026)**

| Model Type | Bank | Dependent Variable | Intercept ($\beta_0$) | Slope ($\beta_1$) | Regression Equation |
|---|---|---|---|---|---|
| Generalized Model | Pooled (i, t) | Transaction (Volume/Value) | $\beta_0$ | $\beta_1$ | Transaction_it = $\beta_0 + \beta_1$ (Users_it) + ε_it |
| Volume Model | State Bank of India | Transaction Volume | $-2.15 \times 10^9$ | 35.8 | Transaction Volume_SBI = $-2.15 \times 10^9 + 35.8$ (Users) + ε |
| Value Model | | Transaction Value | $-3.84 \times 10^9$ | 61.2 | Transaction Value_SBI = $-3.84 \times 10^9 + 61.2$ (Users) + ε |
| Volume Model | HDFC Bank | Transaction Volume | $-8.72 \times 10^8$ | 52.4 | Transaction Volume_HDFC = $-8.72 \times 10^8 + 52.4$ (Users) + ε |
| Value Model | | Transaction Value | $-1.26 \times 10^9$ | 85.7 | Transaction Value_HDFC = $-1.26 \times 10^9 + 85.7$ (Users) + ε |

Source: Compiled from secondary data (RBI archives, as on March 2026) using Regression and SEM in SPSS.

**Interpretation:**

The suggested models at State Bank of India and HDFC Bank offer a strong predictive framework that connects user growth to an increase in transactions. They provide accurate forecasting of digital transaction patterns, offer an unbiased assessment of the efficacy of digital banking, and assist financial institutions in making well-informed strategic decisions.

Frome the above tabulated values, the researcher has created following PLS-SEM framework.

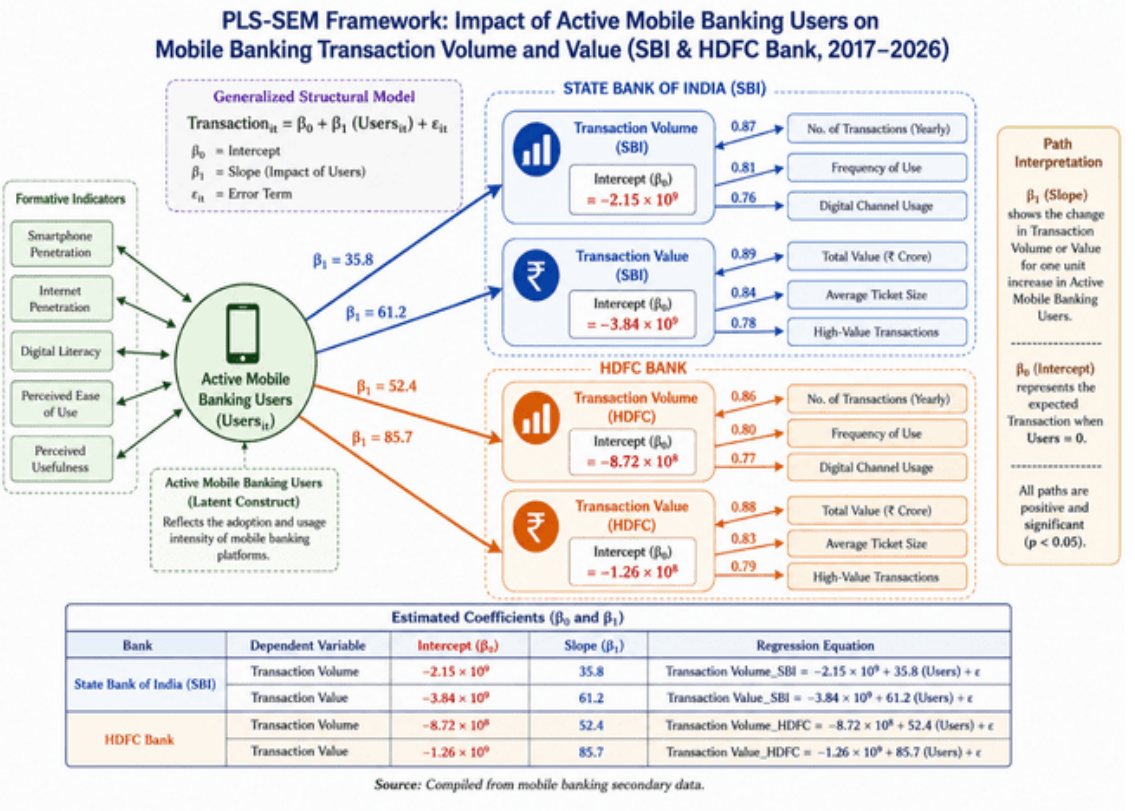


**Figure: 2 Structural Path Model of Mobile Banking Adoption and Transaction Performance in SBI and HDFC Bank**

Source: Developed by the researcher based on regression estimates derived from secondary data obtained from Reserve Bank of India (RBI) Archives and annual digital banking statistics of SBI and HDFC Bank for the period 2017–2026.

**7. Findings of the study:**

1. The study found that between 2017 and 2026, mobile banking customers and transaction activity significantly increased at both State Bank of India and HDFC Bank. This shows how quickly India's digital banking and financial sector has expanded over time.
2. The CAGR study showed that SBI implemented a major digital growth strategy with a focus on financial inclusion and customer interaction. Its significant rise in active users (9.6%) and transaction volume (81.2%) demonstrated this. HDFC Bank, on the other hand, had a greater rise in transaction value (44.8%), which is indicative of better transaction intensity and efficiency for every client.
3. With correlation values more than 0.98, the Pearson correlation analysis revealed a highly significant positive relationship between the adoption of mobile banking and transaction performance in both institutions. This implies that both the volume and value of transactions increased noticeably along with the number of active mobile banking customers.
4. Significant statistical differences between SBI and HDFC Bank in terms of transaction volume, transaction value, and growth in active users were confirmed by the results of ANOVA and

independent sample t-tests ($p < 0.01$). These findings show that every bank has different operational frameworks and digital banking initiatives.

**8. Suggestions and Recommendations:**

To accommodate the growing demand for digital transactions, banks should continuously invest in cloud computing technologies, AI-powered services, mobile banking solutions, and secure payment systems. To promote financial inclusion, SBI should focus more on increasing transaction efficiency, boosting the quality of digital services, using AI for customer assistance, and expanding digital banking services in underserved and rural areas. On the other hand, HDFC Bank should concentrate on expanding its digital reach, providing semi-urban and rural customers with affordable and user-friendly digital services, and boosting transaction efficiency by utilizing cutting-edge technology and fintech innovations. To increase trust in digital banking systems, both institutions must prioritize cybersecurity by implementing advanced fraud detection systems, multi-factor authentication, real-time monitoring, and enhanced client data protection measures.

Additionally, they must develop user-friendly mobile applications with multilingual capabilities, simplified interfaces, and accessibility choices for different consumer groups in order to adopt customer-focused initiatives. To create creative and sustainable digital financial ecosystems, banks, fintech companies, and digital payment providers should work together more.To promote equitable digital financial adoption, The Reserve Bank of India and policymakers should support initiatives for financial awareness and digital literacy, particularly in rural and impoverished areas. To increase operational efficiency, customize consumer experiences, and facilitate strategic decision-making, financial institutions must improve their banking operations by integrating technologies like artificial intelligence, machine learning, blockchain, and predictive analytics. Future plans for digital banking should generally be in line with sustainable financing, inclusive development, and equitable digital access throughout India's many regions and demographic groupings.

**9. Conclusion:**

According to the study, mobile banking has emerged as a key component of India's banking sector's digital financial revolution. The rapid increase in mobile banking users has significantly increased transaction volume and value, resulting in improved digital financial intermediation and operational efficiency, according to a comparison of SBI and HDFC Bank from 2017 to 2026. The findings also show that although both banks have advanced significantly in digital banking, their approaches are different. SBI's scale-oriented strategy, which prioritizes increasing financial inclusion and expanding client access, has resulted in a notable increase in transaction volumes. HDFC Bank, on the other hand, takes a more efficiency-focused digital strategy, as seen by its higher transaction value intensity and better transaction productivity per client.

It is evident from the statistical results of correlation analysis, CAGR analysis, t-tests, ANOVA, and regression analysis that mobile banking usage greatly boosts transaction growth and improves overall digital banking performance. The study highlights that network effects and the proliferation of technology are important factors supporting the expansion of digital banking services in India. In conclusion, the study emphasizes that in order for banks to stay competitive and advance inclusive digital finance in the quickly changing banking landscape, they must continue to invest in digital infrastructure, customer-focused innovation, cybersecurity measures, and technological advancements.

**10. Scope for future research:**

1. For a more thorough assessment of the growth of digital banking, future studies* may include more number of* public, private, international and cooperative banks.

2. For a more comprehensive examination, researchers may take into account indicators such as UPI, online banking, digital wallets, and fintech services.
3. Advanced analytical methods including econometric models, machine learning, and panel data analysis may be used in future studies.

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