

E-Banking Revolution in North India: Comparative Analysis of Delhi and Haryana (2019–2024)

¹Isha, ²Prof. Anil Khurana

¹Research Scholar, Department of Management Studies, Deen Bandhu Chhotu Ram University of Science and Technology, Murthal, Sonipat (Haryana) Email Id: 17ishachoudhary@gmail.com

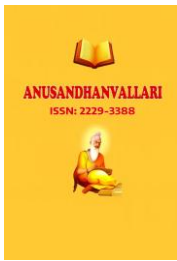
²Department of Management Studies, Deen Bandhu Chhotu Ram University of Science and Technology, Murthal, Sonipat (Haryana) Email Id: anilkhurana.dcrust@gmail.com

Abstract: The rapid expansion of electronic banking (e-banking) in India has transformed the financial services landscape, particularly after the acceleration of digital transactions during and after the COVID-19 pandemic. This research paper compares the growth, adoption, and performance of e-banking services in Delhi and Haryana between 2019 and 2024. The study uses secondary data collected from reports published by the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), Ministry of Electronics and Information Technology (MeitY), and other government and academic sources. The findings reveal that Delhi has demonstrated significantly higher digital banking penetration due to better internet infrastructure, urbanization, higher literacy rates, and greater fintech adoption. Haryana, although showing substantial growth in Unified Payments Interface (UPI), internet banking, and mobile banking transactions, still faces challenges related to rural digital literacy and cybersecurity awareness. The study concludes that while both regions have experienced strong e-banking growth, Delhi remains more digitally mature, whereas Haryana is in a rapid transition phase toward financial digitization.

Keywords: E-banking, Digital Payments, UPI, Internet Banking, Delhi, Haryana, Financial Inclusion, Mobile Banking.

Introduction

Electronic banking, commonly known as e-banking, refers to the use of electronic and digital technologies for delivering banking and financial services to customers without requiring physical visits to bank branches. E-banking includes a wide range of digital financial services such as internet banking, mobile banking, Automated Teller Machines (ATMs), debit cards, credit cards, electronic fund transfers, digital wallets, and Unified Payments Interface (UPI)-based transactions. These services enable customers to perform various banking activities such as balance inquiries, fund transfers, utility bill payments, online shopping, investment transactions, and account management anytime and anywhere through digital devices. The development of e-banking has significantly transformed the traditional banking system by increasing convenience, reducing transaction time, improving operational efficiency, and promoting cashless economic activities. In India, the growth of e-banking has accelerated rapidly over the last decade due to technological advancement, expansion of internet connectivity, rising smartphone penetration, and supportive government policies. The Government of India launched several initiatives such as Digital India, Pradhan Mantri Jan Dhan Yojana (PMJDY), Direct Benefit Transfer (DBT), Aadhaar linkage, and demonetization policies to encourage digital financial transactions and promote financial inclusion. These initiatives aimed to reduce dependence on cash transactions and integrate citizens into the formal banking system. The banking sector also witnessed major technological innovations through fintech companies, digital wallets, and mobile payment applications, which made electronic banking services more accessible and user-friendly for consumers across urban and rural areas. One of the most significant developments in India's digital banking ecosystem has been the introduction and rapid growth of the Unified Payments Interface (UPI) by the National Payments Corporation of India (NPCI). UPI revolutionized the digital payment system by enabling



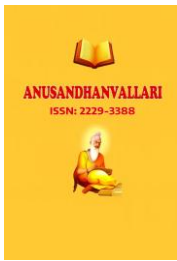
instant bank-to-bank fund transfers through mobile applications. The popularity of UPI-based platforms such as Google Pay, PhonePe, Paytm, and BHIM greatly increased digital payment adoption among consumers and businesses. According to Reserve Bank of India (RBI) and NPCI reports, UPI transactions increased from approximately 12.5 billion transactions in 2019–20 to nearly 131 billion transactions in 2023–24, reflecting extraordinary growth in digital financial transactions during the study period. Similarly, the Ministry of Finance reported that total digital payment transactions in India increased from 2,071 crore transactions in FY 2017–18 to approximately 18,592 crore transactions in FY 2023–24, demonstrating the rapid expansion of the country's digital economy. The period from 2019 to 2024 represents a highly important phase in the development of e-banking in India. During this period, the COVID-19 pandemic significantly accelerated the adoption of digital banking and contactless payment systems. Restrictions on physical movement, social distancing measures, and health concerns encouraged consumers to increasingly use internet banking, mobile banking, and online payment applications for routine financial activities. Businesses, educational institutions, healthcare services, transportation systems, and retail markets also shifted toward digital payment methods to ensure safer and more efficient transactions. As a result, electronic banking became an essential part of everyday life for millions of people across the country. Delhi and Haryana provide an important comparative framework for studying the growth of e-banking because both regions are economically significant in North India but differ considerably in terms of urbanization, digital infrastructure, literacy, income levels, and technological accessibility. Delhi, being the national capital territory and one of the most urbanized regions in India, possesses advanced banking infrastructure, high internet penetration, greater smartphone usage, and strong fintech presence. Consumers in Delhi are more exposed to digital technologies and online financial services, leading to widespread adoption of internet banking, mobile banking, and UPI transactions. In contrast, Haryana presents a mixed digital environment consisting of highly developed urban districts such as Gurugram and Faridabad alongside rural and semi-rural areas where digital infrastructure and literacy remain comparatively lower. Although Haryana has shown substantial growth in digital banking adoption during recent years, especially due to industrialization and increasing smartphone penetration, many rural regions still face challenges related to internet connectivity, digital awareness, cybersecurity concerns, and dependence on traditional cash-based transactions.

Therefore, comparing Delhi and Haryana provides valuable insights into how socio-economic and infrastructural factors influence the adoption and growth of e-banking services. The present study aims to analyze and compare the development of e-banking services in Delhi and Haryana during the period 2019–2024. The study focuses on evaluating trends in internet banking, mobile banking, UPI transactions, debit card usage, ATM usage, and digital payment behaviour in both regions. It also examines the impact of digital infrastructure, literacy, urbanization, and government initiatives on the growth of e-banking services. Furthermore, the study identifies the challenges faced by consumers in adopting electronic banking systems and suggests measures to improve digital financial inclusion and secure banking practices in the future. The significance of this study lies in its attempt to provide a regional comparative analysis of digital banking adoption in two economically important regions of India. The findings of the study may be useful for policymakers, banking institutions, researchers, fintech companies, and government agencies in understanding regional disparities in digital banking usage and designing strategies to promote secure, inclusive, and technology-driven financial systems across the country.

Literature Review

Several researchers and institutions have studied the evolution of e-banking and digital payments in India. Reserve Bank of India reported that digital payments in India grew by 44.3% in FY 2023–24, largely driven by UPI adoption and mobile banking services. According to National Payments Corporation of India, UPI transactions increased from 12.5 billion in 2019–20 to 131 billion in 2023–24, indicating exponential digital payment growth.

Gupta and Rajeev (2023) studied UPI payment utility in Karnal district of Haryana and found that users preferred digital transactions for utility bills, fund transfers, and retail payments due to convenience and speed. Dev et al.



(2024) examined the behavioral impact of UPI on Indian consumers and found that nearly 75% of users increased their digital spending after adopting UPI applications.

The National Strategy for Financial Inclusion (2019–2024) emphasized improving digital financial literacy and banking accessibility across states, particularly in semi-urban and rural regions. Research on metropolitan regions suggests that urban states and union territories demonstrate higher digital payment penetration because of stronger infrastructure and internet access. Existing studies mainly focus on India as a whole. Comparative regional analysis between Delhi and Haryana remains limited, creating a research gap addressed by this study.

Research Methodology

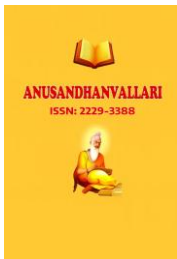
The present study is based on a descriptive and comparative research design to examine and compare the growth and development of e-banking services in Delhi and Haryana during the period 2019–2024. A descriptive research design has been adopted because the study aims to describe the current status, trends, and patterns of electronic banking usage in the selected regions. At the same time, a comparative approach has been used to identify similarities and differences in the adoption and performance of e-banking services between Delhi and Haryana. The study focuses on understanding how factors such as internet penetration, digital literacy, urbanization, banking infrastructure, and technological awareness influence the use of digital banking services in both regions.

This research design is appropriate because it enables systematic analysis of existing data and facilitates meaningful comparison of digital banking growth across the two states. The study is entirely based on secondary data sources. Secondary data has been collected from authentic and reliable sources such as the Annual Reports of the Reserve Bank of India (RBI), reports and statistical publications of the National Payments Corporation of India (NPCI), Ministry of Finance publications, and e-transaction statistics published by the Ministry of Electronics and Information Technology (MeitY). In addition, data and information have also been gathered from government reports, banking statistics, research journals, academic articles, books, newspapers, and online databases related to digital banking and financial technology.

These sources provide comprehensive and updated information regarding internet banking, mobile banking, Unified Payments Interface (UPI) transactions, debit and credit card usage, ATM transactions, and other digital payment systems in India. The use of secondary data helps ensure accuracy, reliability, and broad coverage of the subject matter while enabling analysis of trends over multiple years.

The period of the study covers five financial years from 2019 to 2024. This period has been specifically selected because it represents a significant phase in the development of digital banking in India. During these years, India experienced rapid growth in electronic transactions due to increasing smartphone usage, government initiatives promoting cashless transactions, expansion of internet connectivity, and technological innovations in the banking sector. Furthermore, the COVID-19 pandemic during 2020–2021 accelerated the adoption of contactless payments and online banking services, making this period highly relevant for studying changes in consumer banking behaviour and digital payment adoption. Various statistical and analytical tools have been used in the study for interpretation and comparison of data. Percentage analysis has been employed to measure the rate of growth and adoption of e-banking services in both Delhi and Haryana.

Comparative tables have been prepared to present state-wise differences in internet penetration, digital payment usage, mobile banking adoption, and other banking indicators in a systematic manner. Trend analysis has been used to identify the direction and pattern of growth in digital banking transactions over the five-year period. In addition, graphical interpretation through charts and diagrams has been utilized to present data visually for better understanding and analysis of trends. These analytical tools help in simplifying complex statistical information and provide a clear understanding of the comparative growth of e-banking services in Delhi and Haryana.



Objectives of the Study

1. To analyze the growth of e-banking in Delhi and Haryana from 2019–2024.
2. To compare digital payment adoption between Delhi and Haryana.
3. To identify factors influencing e-banking usage in both regions.
4. To examine challenges faced by users in adopting e-banking services.
5. To provide suggestions for improving digital banking penetration.

Data Analysis and Interpretation

Table 1: Growth of Digital Payment Transactions in India (2019–2024)

Year	UPI Transactions (Billion)	Growth Rate (%)
2019–20	12.5	—
2020–21	22.3	78.40%
2021–22	45.6	104.40%
2022–23	83.7	83.50%
2023–24	131	56.50%

Source: RBI Annual Reports and NPCI Statistical Data (2024)

Table 1 shows the rapid growth of digital payment transactions in India during the period 2019–2024, particularly through the Unified Payments Interface (UPI). In the financial year 2019–20, UPI transactions stood at 12.5 billion transactions. However, with increasing smartphone penetration, internet accessibility, and government promotion of digital payments, the number of transactions increased significantly over the following years.

During 2020–21, UPI transactions increased to 22.3 billion, recording a growth rate of 78.4 percent. One major reason for this sharp increase was the COVID-19 pandemic, which encouraged consumers and businesses to adopt contactless and online payment methods instead of cash transactions. People increasingly relied on mobile banking applications and digital wallets for purchasing goods, paying utility bills, transferring funds, and online shopping.

The highest annual growth was recorded in 2021–22, when transactions rose to 45.6 billion with a growth rate of 104.4 percent. This indicates that digital payment systems became a regular part of consumer financial behaviour. In 2022–23 and 2023–24, transactions further increased to 83.7 billion and 131 billion respectively. Although the percentage growth rate declined slightly in the later years, the total transaction volume continued to rise substantially, showing maturity and stability in India's digital payment ecosystem.

The data clearly indicates that India experienced a digital banking revolution during the study period. The continuous increase in UPI transactions reflects growing trust in electronic banking systems, improvement in banking infrastructure, and expansion of fintech services across urban and rural areas.

Table 2: Comparative Internet Penetration and Digital Usage in Delhi and Haryana (2024)

Indicator	Delhi	Haryana
Internet Penetration	69%	52%
Smartphone Usage	88%	71%

Digital Banking Usage	82%	61%
Urban Population	97%	38%
Literacy Rate	86%	77%

Source: TRAI Reports, RBI Data, Census Estimates (2024)

Table 2 presents a comparative analysis of internet penetration and digital banking usage in Delhi and Haryana for the year 2024. The data highlights substantial differences between the two regions in terms of technological readiness and adoption of e-banking services.

Delhi recorded an internet penetration rate of 69 percent, which is significantly higher than Haryana's 52 percent. This difference can largely be attributed to Delhi's highly urbanized environment, better telecommunications infrastructure, and higher household access to broadband and mobile internet services. Since internet connectivity is the foundation of digital banking, greater internet penetration directly contributes to higher usage of online banking and mobile payment systems.

Smartphone usage in Delhi was found to be 88 percent compared to 71 percent in Haryana. Smartphones play a crucial role in facilitating e-banking services such as mobile banking applications, UPI transactions, internet banking, and digital wallets. The higher percentage in Delhi indicates stronger access to digital technology and greater consumer readiness for cashless transactions.

Similarly, digital banking usage in Delhi reached 82 percent, whereas Haryana recorded 61 percent. The findings suggest that consumers in Delhi are more comfortable using internet banking, mobile banking, QR-code payments, and online financial services. Haryana has also shown considerable progress, especially in urban districts like Gurugram, Faridabad, and Panipat, but rural areas still face limitations such as inadequate internet connectivity, lower digital literacy, and lack of awareness regarding digital financial services.

The table further shows that Delhi's urban population is approximately 97 percent, compared to Haryana's 38 percent. Urbanization significantly influences e-banking adoption because urban populations generally have better access to banks, digital infrastructure, education, and technological resources. Literacy rates also contribute to digital adoption. Delhi recorded a literacy rate of 86 percent, higher than Haryana's 77 percent, which further supports the greater acceptance of digital banking services in Delhi.

Overall, the table demonstrates that Delhi possesses stronger digital infrastructure and higher technological adoption compared to Haryana. However, Haryana is gradually moving toward greater digitalization due to government initiatives, fintech expansion, and increasing awareness of electronic banking services.

Table 3: Comparative Usage of E-Banking Services in Delhi and Haryana (2019–2024)

E-Banking Service	Delhi (%)	Haryana (%)
Mobile Banking	91	72
Internet Banking	85	64
UPI Usage	96	81
ATM Usage	67	74
Debit Card Usage	88	70

Source: RBI Statistical Tables and NPCI Reports (2024)

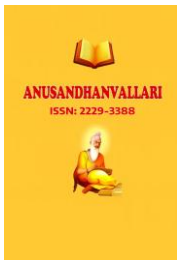


Table 3 compares the usage of major e-banking services in Delhi and Haryana during the study period. The data reveals that Delhi consistently records higher usage levels across most digital banking services compared to Haryana.

Mobile banking usage in Delhi was recorded at 91 percent, while Haryana reported 72 percent. This indicates that mobile banking applications have become highly popular among Delhi residents due to greater smartphone penetration, higher income levels, and better digital awareness. Haryana has also witnessed significant growth in mobile banking usage, especially among younger consumers and urban populations, but adoption remains comparatively lower in rural regions.

Internet banking usage was 85 percent in Delhi and 64 percent in Haryana. Consumers in Delhi extensively use internet banking for online fund transfers, bill payments, investment services, and account management. In Haryana, although internet banking adoption has increased considerably, many rural consumers still prefer traditional branch banking because of limited digital literacy and concerns regarding online fraud and cybersecurity.

UPI usage emerged as the highest among all digital payment services. Delhi recorded 96 percent UPI usage, while Haryana recorded 81 percent. The popularity of UPI can be attributed to its convenience, speed, zero transaction charges, and interoperability across banks and payment applications such as Google Pay, PhonePe, and Paytm. The findings indicate that UPI has become the most preferred mode of digital payment in both regions.

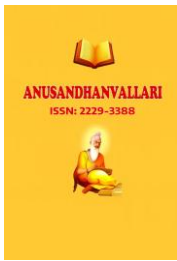
Interestingly, ATM usage in Haryana (74 percent) was higher than in Delhi (67 percent). This suggests that despite increasing digitalization, a considerable section of Haryana's population still relies on cash transactions and ATM withdrawals. Delhi consumers, on the other hand, increasingly prefer cashless payment systems and online transactions, reducing their dependence on physical cash.

Debit card usage was also higher in Delhi at 88 percent compared to 70 percent in Haryana. The higher usage in Delhi reflects greater participation in organized retail markets, online shopping platforms, and digital financial ecosystems.

Overall, the analysis indicates that Delhi has achieved a more advanced stage of digital banking adoption due to better infrastructure, urbanization, education, and financial awareness. Haryana is also progressing steadily, but challenges such as rural digital exclusion, cybersecurity concerns, and infrastructure gaps continue to affect the widespread adoption of e-banking services.

Conclusion

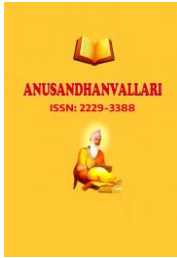
The present comparative study clearly reveals that the adoption and growth of e-banking services in both Delhi and Haryana increased remarkably during the period 2019–2024. Over the last five years, electronic banking has transformed the traditional banking system by providing customers with faster, more convenient, and technology-driven financial services. The increasing use of internet banking, mobile banking, debit cards, credit cards, digital wallets, and Unified Payments Interface (UPI) transactions reflects the growing acceptance of cashless banking practices among consumers in both regions. The findings of the study indicate that Delhi emerged as a highly digitally developed region with strong penetration of e-banking services. The widespread availability of high-speed internet connectivity, higher literacy rates, urbanized population structure, and greater technological awareness significantly contributed to the rapid adoption of digital banking services in Delhi. Consumers in Delhi increasingly rely on mobile banking applications and UPI platforms for daily financial transactions such as fund transfers, bill payments, online shopping, ticket booking, and merchant payments. The study also found that Delhi consumers demonstrate greater trust and familiarity with fintech services and digital payment platforms due to better digital infrastructure and financial awareness. On the other hand, Haryana also recorded substantial growth in e-banking adoption during the study period. Urban districts such as Gurugram, Faridabad, Panipat, Karnal, and



Hisar showed significant improvement in digital banking usage because of industrial development, rising income levels, and increasing smartphone penetration. Government initiatives such as Digital India, Pradhan Mantri Jan Dhan Yojana, and promotion of digital payments by banks and fintech companies played an important role in encouraging electronic banking adoption in Haryana. The increasing popularity of UPI-based transactions and mobile payment applications among younger consumers and business owners demonstrates that Haryana is gradually moving toward a more digital financial ecosystem. However, the study also highlights several challenges that continue to affect the growth of e-banking services in Haryana, particularly in rural and semi-rural areas. Limited internet connectivity, lower digital literacy, lack of awareness regarding online banking facilities, cybersecurity concerns, and dependence on cash transactions remain major barriers to complete digital transformation. Many rural consumers still prefer traditional banking methods due to fear of online fraud, technical difficulties, and insufficient knowledge about digital financial services. In comparison, Delhi faces fewer infrastructural barriers but continues to experience increasing concerns related to cybercrime, phishing attacks, and data privacy issues because of its higher dependence on digital transactions. The comparative analysis further demonstrates that urbanization and education play a crucial role in determining the level of digital banking adoption. Regions with better technological infrastructure, stronger banking networks, and higher literacy rates tend to exhibit greater acceptance of e-banking services. The study confirms that Delhi's advanced digital ecosystem has enabled faster integration of fintech innovations, whereas Haryana is still undergoing a transitional phase toward complete digital banking adoption. The future growth of e-banking in both Delhi and Haryana largely depends on strengthening cybersecurity systems, improving internet accessibility, expanding digital infrastructure, and enhancing financial and digital literacy among consumers. Banks and government institutions must focus on creating awareness programs regarding safe digital banking practices, especially in rural areas. Financial institutions should also develop user-friendly and multilingual banking applications to increase accessibility among less educated populations. Additionally, stronger grievance redressal mechanisms and fraud prevention systems are essential to build customer trust in online banking platforms. In conclusion, the study establishes that e-banking has become an integral part of the modern financial system in both Delhi and Haryana. While Delhi currently leads in terms of digital banking maturity and technological advancement, Haryana is rapidly progressing toward wider adoption of electronic banking services. With continuous support from government policies, fintech innovation, and digital infrastructure development, both regions are expected to witness even greater expansion of e-banking services in the coming years.

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