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A Study on Digital Banking Services and Their Impact on Financial Inclusion in Sub-Urban Areas of Chennai (2025-2026)

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Abstract

Digital banking has transformed the way financial services are accessed and delivered in India. The proliferation of smartphones, affordable internet services, and government-driven financial inclusion initiatives have accelerated the shift from traditional branch-based banking to digital platforms. This study investigates the awareness, adoption patterns, and impact of digital banking services on financial inclusion among residents of sub-urban areas of Chennai. The survey captured information on demographic characteristics, banking access, and usage of digital banking platforms such as UPI, mobile banking applications, internet banking, and ATMs, along with perceptions regarding security, saving habits, and financial independence. The data was analyzed using statistical tools including percentage analysis, Pearson correlation analysis, multiple regression analysis, one-way ANOVA, independent sample t-tests, chi-square tests, and factor analysis using Microsoft Excel. Key findings indicate that the majority of respondents (96.05%) use digital banking services daily, with UPI and ATM services being the most widely adopted platforms. A significant positive correlation was found between perceived security of digital banking and financial independence ($r = 0.566$). Regression analysis confirmed that security perception is the strongest predictor of financial independence ($\beta = 0.540$, $p < 0.001$). ANOVA results revealed statistically significant differences across age groups, occupations, and income levels in their perception and usage of digital banking services. The study concludes that digital banking has contributed to financial inclusion in sub-urban Chennai by improving access to financial services, reducing cash dependence, and enhancing financial independence. However, challenges related to digital literacy, security concerns, and internet connectivity continue to hinder broader adoption. The study recommends targeted digital literacy programs, stronger cybersecurity infrastructure, and awareness campaigns to further promote financial inclusion through digital banking.

Keywords: Digital Banking, Financial Inclusion, UPI, Sub-Urban Chennai, Mobile Banking, Financial Independence, Digital Literacy.

1.1 Background of the Study

The global banking sector has undergone significant transformation due to advancements in information and communication technology. Traditional branch-based banking has evolved into digital banking systems that allow customers to perform transactions anytime and anywhere.

1.2 Evolution of Banking Services

Banking services in India initially relied on manual branch-based operations where customers had to visit banks for all transactions. The introduction of ATMs, internet banking, and later mobile banking applications significantly improved accessibility and convenience**.**

1.3 Concept of Financial Inclusion

Financial inclusion refers to providing individuals and businesses with affordable and accessible financial services such as savings, credit, insurance, and payment facilities. Digital banking helps promote financial inclusion by reducing geographical barriers and enabling low-cost access to financial services through digital platforms.

1.4 Statement of the Problem

Despite the rapid growth of digital banking in India, disparities still exist in awareness, accessibility, and usage among different population groups. This study examines whether digital banking services have effectively contributed to financial inclusion in sub-urban areas of Chennai.

1.5 Objectives of the Study

- To examine the level of awareness of digital banking services among residents of sub-urban areas of Chennai.
- To analyse the usage patterns and frequency of digital banking services among respondents.
- To identify the key challenges and barriers faced by respondents in adopting and using digital banking services.

1.6 Hypothesis

H1: There is a significant positive relationship between perceived security of digital banking and financial independence among sub-urban residents of Chennai.

H2: There is a significant difference among age groups in their perception of digital banking's ability to improve access to financial services.

H3: There is no significant difference between male and female respondents in their perception of digital banking's impact on financial independence.

1.7 Scope and Limitations of the Study

The study focuses on analysing the impact of digital banking services on financial inclusion among residents of sub-urban areas of Chennai during the academic year 2025–2026. The findings may be limited due to the small sample size, convenience sampling method, and reliance on self-reported responses.

2. REVIEW OF LITERATURE

Several studies have examined the relationship between digital banking services and financial inclusion, particularly in emerging economies such as India. **Ozili (2025)** highlighted that digital banking plays a crucial role in expanding financial inclusion by reducing traditional barriers associated with physical banking infrastructure, such as geographical distance and limited operating hours. The study emphasized that digital financial services provide a scalable and cost-effective mechanism for extending banking access to previously underserved populations, although their effectiveness depends on digital infrastructure and user literacy.

In the Indian context, **Singh (2024)** found that individuals who regularly used digital banking platforms were more likely to participate in formal financial activities such as savings, credit access, and insurance services. The study identified accessibility and convenience as the primary drivers of adoption, while security concerns and lack of technological familiarity were major barriers to usage. Research on digital payment ecosystems has also highlighted the significance of the Unified Payments Interface (UPI) in expanding financial access. **Sahoo (2024)** observed that UPI adoption has spread rapidly beyond metropolitan cities into tier-two and semi-urban regions due to its simplicity, real-time transaction capability, and integration with bank accounts. Similarly, **Haque (2025)** reported that UPI has lowered entry barriers for digital financial participation by providing user-friendly mobile interfaces accessible to individuals with limited formal education.

Studies on mobile banking behaviour further demonstrate its impact on financial management**. Patel (2025)** found that increasing smartphone penetration and affordable

internet connectivity have significantly encouraged mobile banking adoption in semi-urban areas, leading to improved saving habits and financial management practices. Likewise, **Nair (2024)** observed that digital banking enhances financial independence by enabling individuals to manage their finances more confidently. However, several barriers continue to affect digital banking adoption. **Trotta (2025)** and **Verma (2024)** identified factors such as limited digital literacy, inadequate internet infrastructure, and concerns about transaction security as major obstacles to digital financial inclusion. These findings indicate that while digital banking has significant potential to promote financial inclusion, addressing technological, educational, and security challenges remains essential for broader adoption.

3. RESEARCH METHODOLOGY

3.1. Research Design & Analytical Approach:

This study adopts a descriptive and analytical research design to examine the awareness, adoption, and perceived impact of digital banking services on financial inclusion among sub-urban residents of Chennai. The descriptive component profiles respondents' demographics and banking behaviour, while the analytical component tests relationships between variables using inferential statistics. A 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to quantify perceptions.

3.2. Quantitative Approach:

The study is quantitative in nature. Questionnaire responses were coded numerically and analysed using seven statistical tools: Percentage Analysis, Pearson Correlation, Multiple Regression, One-Way ANOVA, Independent Sample T-Test, Chi-Square Test, and Factor Analysis - all computed in Microsoft Excel at a significance level of $\alpha = 0.05$.

3.3. Sources of Data

Primary data was collected via a structured 18-question Google Form questionnaire covering demographics, banking access, digital service awareness, usage patterns, and financial inclusion perceptions. Secondary data was drawn from peer-reviewed journals, RBI and NPCI reports, government publications, and academic databases.

Category	Component	Details
Period of the study	Data collection period	Academic year 2025-2026
Sampling Design	Method	Convenience sampling

	Sample size	76 valid Responses
	Area	Sub-urban areas of Chennai
	Instrument	Structural questionnaire (google form)
Research variables	Dependent Variable	Financial Independence
	Independent Variables	Access to Services, Cash Dependence, Saving Habits, Security Perception
	Demographic Variables	Gender, Age, Education, Occupation, Income

4. ANALYSIS AND INTERPRETATION

Objective 1: To examine the level of awareness of digital banking services among residents of sub-urban areas of Chennai

Digital Banking Service	Number of Respondents Aware	Percentage (%)
ATM Services	75	98.68
UPI	73	96.05
Mobile Banking Apps	67	88.16
Internet Banking	54	71.05
Digital Wallets	33	43.42
AEPS	17	22.37

Objective 2: To analyse the usage patterns and frequency of digital banking services among respondents

Frequency	Number of Respondents	Percentage (%)
Daily	73	96.05
Weekly	1	1.32
Monthly	2	2.63
Total	76	100.00

Objective 3: To identify key challenges and barriers faced by respondents in adopting digital banking services

Education Level	Internet Issues (1)	Security Concerns (2)	Complex Interface (3)	Lack of Trust (4)	No Difficulty (5)	Total
No Formal / Higher Secondary (1–2)	2	2	2	0	1	7 (incl. No Formal Edu.)
Graduate (3)	1	15	16	5	22	59
Postgraduate (4)	0	3	2	2	3	8 (incl. No Formal)
Column Total	3	20	20	7	26	76

Hypothesis 1: There is a significant positive relationship between perceived security of digital banking and financial independence among sub-urban residents of Chennai.

Variable	Security Perception	Financial Independence
Security Perception	1	0.566
Financial Independence	0.566	1

Hypothesis 2: There is a significant difference among age groups in their perception of digital banking's ability to improve access to financial services.

Source of Variation	SS	df	MS	F	p-Value	F Critical
Between Groups	125.29	1	125.29	99.16	0.000	3.904
Within Groups	189.53	150	1.264	-	-	-
Total	314.82	151				

Hypothesis 3: There is no significant difference between male and female respondents in their perception of digital banking's impact on financial independence.

Statistic	Male (n=49)	Female (n=27)
Mean	4.184	4.296
Variance	0.570	0.524
t-Statistic	-0.639	-
p-Value (two-tail)	0.525	0.263
t-Critical (two-tail)	2.003	-

4.1. Combined Table

Objective / Hypothesis	Statistical Tools and Results	Key Finding	Interpretation (Linked to Research Theme)
Objective 1: To examine the level of awareness of digital banking services among residents of sub-urban areas of Chennai	**Percentage Analysis:** ATM (98.68%), UPI (96.05%), Mobile Banking Apps (88.16%), Internet Banking (71.05%), Digital Wallets (43.42%), AEPS (22.37%)	Awareness is extremely high for ATM, UPI, and mobile banking, while awareness is considerably lower for AEPS and digital wallets.	Digital banking awareness is widespread in sub-urban Chennai, especially for commonly used services like UPI and ATMs. However, the low awareness of AEPS indicates that services specifically designed for financial inclusion have not reached their full potential, highlighting the need for targeted awareness programmes.
Objective 2: To analyse the usage patterns and frequency of digital banking services among respondents	**Percentage Analysis:** Daily use – 73 respondents (96.05%), Weekly – 1 (1.32%), Monthly – 2	The vast majority of respondents use digital banking services daily.	Digital banking has become deeply integrated into the everyday financial behaviour of respondents. Frequent usage reflects strong adoption of convenient platforms such

	(2.63%)		as UPI and mobile banking, indicating that digital banking is already playing a major role in expanding financial access.
Objective 3: To identify key challenges and barriers faced by respondents in adopting digital banking services	**Chi-Square Test:** p-value = 0.0508 (>0.05) indicating no significant association between education level and type of difficulty.	Difficulties such as security concerns, interface complexity, internet issues, and trust problems are experienced across all education levels.	Digital banking barriers are not limited to less educated users; even highly educated individuals face similar challenges. This suggests that improving **platform usability, security assurance, and trust mechanisms** is essential to strengthen financial inclusion.
Hypothesis 1: There is a significant positive relationship between perceived security of digital banking and financial independence	**Regression:** Security perception $\beta = 0.540$, $t = 4.785$, $p < 0.001$ (significant). Other variables not significant.	Security perception is the only significant predictor of financial independence.	Perceived security plays a critical role in encouraging users to rely on digital banking for financial activities. When users feel that digital transactions are safe, they are more likely to engage independently in financial management, strengthening financial inclusion outcomes.
Hypothesis 2: Significant difference among age groups in perception of digital banking	**ANOVA:** $F = 99.16$, $p < 0.001$ (significant difference between age groups).	Age significantly influences how individuals perceive digital banking accessibility.	Younger users perceive digital banking as more accessible due to greater familiarity with digital technology, while older users may face usability

improving access to financial services			barriers. This highlights the importance of **age-specific digital literacy initiatives** to expand financial inclusion.
Hypothesis 3: No significant difference between male and female respondents in perception of digital banking's impact on financial independence	**T-Test:** t = -0.639, p = 0.525 (>0.05). Female mean = 4.296, Male mean = 4.184.	No statistically significant gender difference in perceptions of financial independence.	Digital banking appears to provide similar empowerment benefits to both male and female users. The slightly higher female mean suggests that digital banking may support **women's financial autonomy**, aligning with broader financial inclusion goals.

5. CONCLUSION

5.1. Major Findings

This study analysed the role of digital banking in promoting financial inclusion among residents of sub-urban areas of Chennai. The results show very high awareness of commonly used services such as ATM (98.68%) and UPI (96.05%), while awareness of AEPS remains relatively low at 22.37%. Digital banking usage is also highly frequent, with 96.05% of respondents using these services daily.

Regression analysis indicates that perceived security is the only significant predictor of financial independence ($\beta = 0.540$, $p < 0.001$). ANOVA results reveal significant differences among age groups in their perception of digital banking accessibility ($F = 99.16$, $p < 0.001$). The independent sample t-test shows no significant gender difference in perceptions of financial independence ($p = 0.525$), although female respondents reported a slightly higher mean score. The chi-square analysis further indicates that challenges such as security concerns and interface complexity are experienced across all educational levels.

5.2. Suggestions

For the Government: Policymakers should focus on strengthening digital literacy initiatives, particularly for older individuals who may find digital banking platforms less accessible. Greater investment in cybersecurity systems and efficient grievance redressal mechanisms will also help build user trust. Increasing awareness of AEPS in sub-urban areas can further support financial inclusion efforts.

For Financial Institutions: Banks and fintech companies should focus on making digital banking platforms easier to use by simplifying interfaces, providing regional language options, and clearly communicating security measures to users.

5.3 Conclusion

Overall, the findings suggest that digital banking has made a meaningful contribution to improving financial inclusion in sub-urban areas of Chennai. The widespread adoption and frequent use of digital platforms demonstrate that digital financial services are becoming an integral part of everyday life. However, challenges such as security concerns, low awareness of certain platforms like AEPS, and differences in accessibility across age groups still remain. Addressing these issues through improved security, awareness programmes, and user-friendly digital platforms will be essential for ensuring that digital banking contributes to deeper and more inclusive financial participation.

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