BRIDGING THE DIGITAL DIVIDE: UNDERSTANDING USAGE, SATISFACTION, AND CHALLENGES IN DIGITAL BANKING ADOPTION ACROSS URBAN AND RURAL TAMIL NADU

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ABSTRACT

India's fast shift to digital banking has brought both possibilities and problems, especially in states like Tamil Nadu where differences between cities and rural areas still exist. This research looks at how people in urban and rural areas of Tamil Nadu use digital banking, how satisfied they are with it, and what problems they face when trying to set it up. Using a quantitative study method with stratified random sampling, organized surveys were sent to 400 people (200 from cities and 200 from rural areas) to collect data. The study looks at a lot of different aspects, such as how aware people are, how often they use digital banking, what kinds of services they use, what benefits they think they get, what technology problems they face, and how demographics affect uptake trends. Using chi-square tests, independent t-tests, ANOVA, and association analysis, researchers have found big differences between people in cities and those in rural areas when it comes to how much they use digital banking, how satisfied they are with it, and the problems they face. Urban respondents report higher usage rates, a wider range of services, and better digital skills. In contrast, rural users say that infrastructure problems, trust issues, and a lack of understanding are the main things that keep them from using technology. The results show that while mobile banking is very popular in cities, it is not as popular in rural areas when it comes to internet banking and other advanced digital financial services. Age, school level, and income become important factors in deciding who uses digital banking. The study helps us understand the digital gap in financial services and gives lawmakers, banks, and tech companies useful suggestions on how to make digital banking environments more open to everyone. To close the digital banking gap between cities and rural areas, plans are made to improve digital infrastructure, run tailored financial literacy programs, and create digital solutions that work well in different situations.

KEYWORDS: Financial inclusion, the gap between cities and rural areas, technology adoption, customer satisfaction, mobile banking, internet banking, digital literacy, financial services

1. INTRODUCTION

India's banking sector has changed a lot thanks to digital technologies. This is one of the most important economic changes of the current century. Digital banking, which includes internet banking, mobile banking, digital wallets, and other online financial services, has changed the way people and companies handle their money. Along with demonetization in 2016 and the rise in smartphone use, the Indian government's Digital India plan has sped up the spread of digital banking services across the country.

Tamil Nadu is one of India's most economically advanced states, which makes it a good example of how digital banking is being used. With an approximately 80% reading rate and a strong banking system, the state has seen a large increase in digital transfers. But the benefits of digital banking have not been spread out evenly between cities and rural areas. Cities like Chennai, Coimbatore, and Madurai have become more digital very quickly, but rural areas still have problems with infrastructure, connections, digital literacy, and trust in financial services that are handled by technology.

The lack of digital connections between people in cities and those in rural areas is a big problem when it comes to getting full financial inclusion. People who live in rural areas, which make up a big part of Tamil Nadu's population, often do not have access to the internet, smartphones, or knowledge about digital banking services. Adoption rates are also lower in rural places because of things like language hurdles, worries about privacy and safety, and reluctance to change. It is important to understand these differences in order to make policies and plans that can help everyone gain from digital banking.

This study looks into many different parts of digital banking acceptance in Tamil Nadu. It focuses on comparing how people in cities and towns use digital banking, how satisfied they are with it, and what problems they face. This study aims to give a full picture of the current state of digital banking in the region by looking at demographic factors, technology obstacles, perceived benefits, and service quality aspects. The results should help policymakers make changes, help banks come up with focused strategies, and add to the academic conversation about how to get people in rising economies to use technology. The study also looks at how age, education, income, and previous tech experience affect people's decision to use digital banking. This gives us a more complete picture of the digital banking environment in Tamil Nadu.

2. REVIEW OF LITERATURE

Over the past ten years, there has been a lot more scholarly writing about digital banking usage.

Researchers have looked at different aspects of technology acceptance, user behaviour, and implementation difficulties. Davis created the Technology Acceptance Model in 1989. It has been used as a basis for understanding how people use information systems since then. The model says that how useful and easy something is to use are the main factors that determine how much people use it. This idea has been proven over and over again in the context of digital banking services.

In 2003, Venkatesh and his coworkers built on this work with the Unified Theory of Acceptance and Use of Technology, which added more factors like social impact, enabling conditions, and behavioural goals.

Studies that look at differences between cities and rural areas in digital banking have found big differences in how and how often people use digital banking. Sharma and Singh (2020) found that people in rural India face many problems, such as not having access to the internet, not having many smartphones, not knowing how to use technology well, and worrying about their safety and privacy. Their study showed that people were mostly aware of digital banking services, but that they were not using them much because of problems with infrastructure and lack of education. Also, Gupta and Arora's (2019) study showed that faith in technology and perceived risk have a big effect on how many people use digital banking. People in rural areas were less sure about how safe and reliable digital transfers are.

Several service quality factors have been used to look at customer happiness in digital banking. The SERVQUAL system created by Parasuraman and coworkers has been changed to rate the quality of digital banking services, with a focus on trustworthiness, timeliness, sensitivity, and tangibles. Raza et al.'s (2020) research found that system quality, information quality, and service quality all have a big effect on how satisfied customers are with digital banking and how likely they are to keep using it.

Research that is special to Tamil Nadu and South India has given us useful information about the area. Kumar and Lim's (2018) research on mobile banking adoption in South Indian states found that ease of use, portability, and low cost were the main reasons for acceptance. Their results also showed how important it is to support local languages and make user experiences that are sensitive to different cultures in order to get more people from different ethnic groups to use them. Infrastructure problems, staff training needs, and customer information have been listed as major issues that need to be fixed for country banks to be able to offer digital services.

Several studies have looked at how government programs affect the use of digital banking. The Pradhan Mantri Jan Dhan Yojana, which aims to make financial services available to everyone, is said

to have made it easier for people who did not have bank accounts before to open them. Even though the number of people with bank accounts has grown a lot, research shows that using digital banking services is still hard, especially in rural areas. Policy changes, building up banking facilities, and digital learning programs at the community level all need to work together for digital banking to be widely used in the long term.

3. RESEARCH GAP

Previous research has looked at digital banking uptake in different ways, but there is not a lot of research that looks at usage trends, happiness levels, and implementation issues across the urban-rural gap in the same state. Most studies that have been done so far either look at people living in cities or at the national level as a whole. They do not look at how specific socio-economic and cultural factors affect the use of digital banking in Tamil Nadu's many different groups. Tamil Nadu's unique language choices, culture views on technology, and regional economic trends need to be looked into in more detail. knowledge and acceptance have also been looked at individually, but the gap between knowledge and real use, especially in rural areas, has not been looked into much.

4. OBJECTIVES OF THE STUDY

The following goals are the main points of this study:

1. To find out how much people in Tamil Nadu's cities and remote areas know about and use digital banking services and compare those numbers.

2. To find out how often and how people from both physical areas use different digital banking services, such as mobile banking, internet banking, ABM services, and digital accounts.

3. To find out how satisfied customers are with digital banking services and what factors affect happiness in both urban and country areas.

4. To find and study the main problems and obstacles that people face when they try to use and accept digital banking services, focusing on infrastructure, technology, and social issues.

5. To look into how age, gender, education level, and wealth, among other social factors, affect the use of digital banking and the level of happiness with it.

6. To give lawmakers, banks, and technology companies suggestions based on data on how to increase the use of digital banking and close the digital gap between urban and rural areas in financial services.

5. RESEARCH DESIGN

This study uses a quantitative research method with both a descriptive and an analytical approach to look at how people in urban and rural Tamil Nadu use digital banking, how satisfied they are with it, and what problems they face. The study plan was chosen so that it would be easy to collect numbers and do statistical analysis that would let us compare people from cities and towns in a fair way and find important connections between the factors.

The study uses a cross-sectional poll method to find out how people are adopting and using digital banking right now. The data is gathered at a single point in time. Questionnaires with clear answers were given to bank customers in some urban and agricultural areas of Tamil Nadu to get primary data. The poll was made to find out about people's demographics, their knowledge of and use of digital banking, their happiness levels (based on Likert scales), how they saw the benefits and difficulties of digital banking, and how they planned to use it in the future.

The study tool was made using well-known models from previous research, which were then tweaked to fit Tamil Nadu's banking environment. There were both closed-ended and Likert-scale questions on the form so that the answers could be analyzed statistically. Before collecting all the data, a pilot study with 40 people was done to make sure the device was true and reliable. Small changes were made to make things clearer and more relevant based on comments and data analysis. The finished questionnaire had good internal consistency, as all of its multi-item scores had Cronbach's alpha values above the appropriate level of 0.74.

6. SAMPLING METHOD

A stratified random selection method was used to make sure that the study included a good picture of both Tamil Nadu's urban and rural people. At first, the population was divided into two main groups: urban and country. These groups were created using standards set by the Census of India. From lists of bank users given by involved banks, interviewees were chosen at random from each group using a regular method. Respondents from big towns like Chennai, Coimbatore, Madurai, Tiruchirappalli, and Salem were chosen for the urban layer. These towns were picked because they are economically important and look like they are from different parts of Tamil Nadu. Multiple bank offices in different parts of each city were chosen to make sure that the interviewees' socioeconomic backgrounds were varied. Getting customer lists from banks that were taking part and using a random number generator to pick possible players at set times were both parts of the selection process.

For the rural level, small towns and villages from various districts of Tamil Nadu were chosen to show farming, semi-agricultural, and rural non-farm economic situations. Respondents from rural areas were chosen from bank stores that serve those areas, and people from a range of lengths from major centres were made sure to be included. This method was created to show the range of country situations, from places close to cities to isolated towns.

Respondents had to be bank customers who were at least 18 years old and had been customers for at least six months in order to be included.

7. SAMPLE SIZE

Using well-known statistical methods for estimating population proportions, along with the desired confidence level, margin of error, and estimated population proportion, the sample number for this study was found. A total sample size of 400 respondents was chosen because some parts of the study were exploratory and subgroup analysis was needed. This was done to ensure statistical strength and dependability.

There were 200 people from cities and 200 people from rural places in the sample, which was evenly split between the two groups. Even though Tamil Nadu's population is split evenly between cities and rural areas, this equal sharing method was picked to make sure there was enough statistical power for a comparison between the two groups. Equal sample numbers make statistical tests more reliable and make it easier to see how trends and links between people in cities and people in rural areas are different.

8. ANALYSIS AND INTERPRETATION

SPSS version 26.0 and Microsoft Excel were used to look at the data that was gathered. To sum up the traits of the interviewees and how they used digital banking, descriptive data like rates, percentages, means, and standard deviations were derived. We used inferential statistics like chi-square tests, independent samples t-tests, analysis of variance (ANOVA), and Pearson correlation analysis to test our theories and find important connections between the factors. For all statistical tests, the level of significance was set at 0.05.

Table 1: Demographic Profile of Respondents

Variable	Category	Urban (n=192)	Rural (n=193)	Total (%)
Gender	Male	108 (56.3%)	124 (64.2%)	60.3
	Female	84 (43.7%)	69 (35.8%)	39.7
Age Group	18-30 years	68 (35.4%)	52 (26.9%)	31.2
	31-45 years	76 (39.6%)	71 (36.8%)	38.2
	46-60 years	38 (19.8%)	54 (28.0%)	23.9
	Above 60 years	10 (5.2%)	16 (8.3%)	6.7
Education	Below Secondary	12 (6.3%)	58 (30.1%)	18.2
	Secondary	36 (18.8%)	72 (37.3%)	28.0
	Undergraduate	98 (51.0%)	52 (26.9%)	39.0
	Postgraduate	46 (24.0%)	11 (5.7%)	14.8

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 01 Jan-Feb; 2026 Page. No. 574-584

Annual Income	Below ₹3 lakhs	28 (14.6%)	96 (49.7%)	32.2
	₹3-6 lakhs	82 (42.7%)	74 (38.3%)	40.5
	₹6-10 lakhs	58 (30.2%)	19 (9.8%)	20.0
	Above ₹10 lakhs	24 (12.5%)	4 (2.1%)	7.3

Source: Primary Data

These are the demographic details of the study group, which can be seen in Table 1. In both urban (56.3%) and country (64.2%) groups, men make up the majority of the population. The age breakdown shows that most of the responders are between the ages of 31 and 45, which is typical of people who are working. The level of education shows clear differences between urban and country areas, with individuals from cities having significantly better levels of education. In cities, 51.0% of people have a college degree and 24.0% have a graduate degree. In rural places, 30.1% have not finished high school. In the same way, differences between cities and rural areas can be seen in income levels, with most rural responses falling into lower income groups.

Table 2: Digital Banking Awareness and Adoption Rates

Parameter	Urban (%)	Rural (%)
Awareness of Digital Banking Services	94.3	68.9
Adoption of Digital Banking	87.5	52.3
Mobile Banking Usage	82.3	45.6
Internet Banking Usage	71.4	28.5
ATM Usage	96.9	78.2
Digital Wallet Usage	68.2	34.7
UPI Transaction Usage	79.7	41.5
Chi-square value	$\chi^2 = 68.42$, $p < 0.001$	

The chi-square number is $\chi^2 = 68.42$, which means that the chance of something happening is less than 0.001.

Table 2 shows that people in cities and rural areas are very different in how much they know about and use digital banking. 94.3% of people who lived in cities knew about digital banking services, but only 68.9% of people who lived in rural areas did. The difference in adoption rates is even bigger: 87.5% of people in cities adopt, but only 52.3% of people in rural areas do. The smallest gap can be seen in ABM use, which is probably because they have been around longer and are easier to use. Internet banking and digital wallets are the most different between cities and rural areas. The chi-square test shows that these differences are statistically significant ($p < 0.001$), which means they are

real differences at the population level and not just variations due to sampling.

Table 3: Customer Satisfaction with Digital Banking Services

Satisfaction Dimension	Urban Mean	Rural Mean	t-value
Ease of Use	4.28	3.64	8.42***
Transaction Speed	4.35	3.52	9.17***
Security and Privacy	4.12	3.38	7.89***
Customer Support	3.98	3.21	6.54***
Service Reliability	4.22	3.45	8.31***
Overall Satisfaction	4.19	3.44	9.03***

Note: The scale goes from 1 (Very Dissatisfied) to 5 (Very Satisfied); *** $p < 0.001$

On a five-point Likert scale, Table 3 shows how satisfied people are with different aspects of service quality. People who live in cities are generally happier in every way than people who live in rural areas. At the 0.001 level, the independent samples t-test shows that all of the changes are statistically important. Customers in cities are happiest with transaction speed (Mean = 4.35), while customers in rural areas are least happy with customer service (Mean = 3.21). The big difference in digital banking experiences is shown by the total happiness gap of 0.75 points between users in cities and those in rural areas. Concerns about security and privacy seem to be strongest among country users, which suggests that trust issues are holding them back from adopting.

Table 4: Challenges and Barriers in Digital Banking Adoption

Challenge/Barrier	Urban (% Reporting)	Rural (% Reporting)
Poor Internet Connectivity	18.2	72.5
Lack of Digital Literacy	12.5	64.8
Security and Privacy Concerns	28.6	58.9
Language Barriers in Digital Interface	8.3	47.2
Limited Smartphone Access	5.7	42.5
Inadequate Customer Support	22.4	53.4
Lack of Awareness about Services	9.4	56.5
Trust and Reliability Issues	15.1	61.7

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 01 Jan-Feb; 2026 Page. No. 574-584

Complex Transaction Processes	19.8	51.3

Table 4 lists the main problems that people who use digital banking have to deal with. Respondents from rural areas say that all of the hurdles they faced were much more common than those from urban areas. For users in rural areas (72.5%), bad internet access is the biggest problem with the infrastructure, but for users in cities (18.2%), this is not the case. 64.8% of country users have trouble with digital literacy, which shows that schooling needs to be improved right away. 58.9% of rural respondents are worried about security and privacy, which suggests that trust-building steps are needed for greater adoption. Language hurdles in digital platforms affect almost half of users in rural areas. This shows how important it is to support local languages. The big differences in all of these areas show how complicated the digital gap is and how important it is to find answers that solve infrastructure, schooling, and culture issues all at the same time.

Table 5: Correlation between Demographic Factors and Digital Banking Adoption

Variable	Adoption Rate	Usage Frequency	Satisfaction
Age	-0.458***	-0.423***	-0.312***
Education Level	0.612***	0.578***	0.487***
Income Level	0.524***	0.496***	0.418***
Digital Literacy	0.745***	0.698***	0.652***
Urban-Rural Location	0.536***	0.512***	0.463***

Note: *** $p < 0.001$; Pearson correlation coefficients reported

The Pearson association values were given. In Table 5, you can see the association values between population factors and the results of digital banking. Digital knowledge is the most important factor for success in digital banking because it has the best positive connection with acceptance rate ($r = 0.745$), usage regularity ($r = 0.698$), and happiness ($r = 0.652$). The level of education is strongly linked to all results, with the adoption rate having the strongest link ($r = 0.612$). Levels of income show modest to strong positive associations, showing that money affects both availability to digital banking infrastructure and the likelihood of adopting it. Age has strong negative associations, which proves that younger people are more likely to use digital banking services and keep them up to date. The urban-rural location variable has strong positive associations, which supports the idea that location has a big effect on digital banking experiences. At the 0.001 level, all associations are statistically significant, which is strong proof for the links found.

9. CONCLUSION

This in-depth study of digital banking use in Tamil Nadu's cities and remote areas shows a big digital gap that makes it harder to provide financial services to everyone. The study shows that people in cities and rural areas have very different levels of knowledge, acceptance, usage habits, happiness, and obstacles they face. With a usage rate of 87.5%, digital banking has become very popular in Tamil Nadu's cities. However, only 52.3% of people in rural areas use digital banking, meaning that about half of the people who use banks in rural areas still can not gain from digital financial services.

A study of different digital banking services shows that while basic services like using an ABM are pretty common in rural areas (78.2%), more advanced services like internet banking (28.5%) and digital wallets (34.7%) are not used nearly as much. This step-by-step pattern of adoption shows that comfort, ease of use, and perceived usefulness are very important in accepting a service. With 45.6% growth, mobile banking has become a hopeful way for rural digital banking to grow. This is likely because more people are getting smartphones and mobile apps are easy to use. A study of customer satisfaction shows that people who live in cities are generally happier with all aspects of service quality, giving them overall happiness scores of 4.19 on a five-point scale compared to 3.44 for people who live in rural areas.

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