Tuijin Jishu/Journal of Propulsion Technology
ISSN: 1001-4055
Vol. 44 No. 4 (2023)

Technological Banking Services in Thoothukudi District: A Cross-Sectional Analysis of Customer Perceptions in Public and Private Sector Banks

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Abstract: This research article presents a cross-sectional analysis of customer perceptions regarding technological banking services in Thoothukudi District, focusing on both public and private sector banks. As the banking industry undergoes a transformative shift towards digitalization, understanding customer attitudes and preferences is crucial for banks to enhance service quality and maintain a competitive edge. The study employs a mixed-method approach, combining quantitative surveys and qualitative interviews to gather insights into customer perceptions. A representative sample of customers (386) from various age groups, income levels, and banking habits has surveyed to capture a comprehensive perspective. Key technological banking services, including online and mobile banking, ATM services, and digital customer support, are evaluated. This research contributes to the existing literature on the adoption of technological banking services in a regional context and offers valuable insights to policymakers, bank management, and researchers in the field of banking and finance.
Keywords: Technology, Banking, ATM, Digital Banking, Customer

1. Introduction

The banking sector has undergone a profound transformation in recent years, driven by rapid advancements in technology. This transformation has led to the emergence of innovative banking services and a shift towards a more customer-centric approach. Thoothukudi District, situated in the southern part of Tamil Nadu, India, is no exception to this wave of change. As technology continues to reshape the landscape of financial services, it is imperative to assess the perceptions of customers in both public and private sector banks in Thoothukudi District, in order to gain a comprehensive understanding of their banking experiences and preferences.

Banking has evolved from traditional brick-and-mortar establishments to digital platforms, offering customers an array of technologically-driven services. The integration of technology has not only increased the efficiency and convenience of banking but has also altered the very essence of customer interactions with financial institutions. ATMs, mobile banking apps, internet banking, and contactless payment methods are some of the advancements that have made banking services more accessible and responsive to customer needs. Such advancements have paved the way for an enhanced customer experience and have redefined the way people interact with banks.

Thoothukudi District, known for its bustling port and industrial activities, is home to a diverse and vibrant population. The banking sector in the district plays a pivotal role in facilitating economic activities, savings, and

investments for the residents. Both public and private sector banks have a notable presence in the district, offering a wide range of services to cater to the financial needs of the people. Understanding how customers perceive and engage with these banking services is crucial for the continuous improvement and competitiveness of banks in the region.

2. Statement of the Problem

The significance of this study lies in its comprehensive analysis of customer perceptions in Thoothukudi District, differentiating between public and private sector banks. The perceptions and preferences of customers in these institutions may vary based on factors such as service quality, technology adoption, accessibility, and trust. In an era dominated by technological advancements, understanding the extent to which customers in Thoothukudi District embrace and utilize digital banking services is essential. This study have explore whether customers are comfortable with digital transactions, such as mobile banking, online transfers, and digital wallets, and if there are any discrepancies between public and private sector banks in terms of technology adoption.

The rapid advancement of technology has significantly transformed the landscape of banking services, with a particular emphasis on the adoption of digital and technological innovations. Thoothukudi District, situated in the southern part of Tamil Nadu, India, represents a microcosm of this broader financial evolution. With an array of public sector and private sector banks operating within the district, the manner in which customers perceive and engage with technological banking services has become a critical concern for the financial institutions and policymakers. Therefore, the primary problem to be addressed in this research article is "How do customers in Thoothukudi District perceive and assess the technological banking services provided by public and private sector banks, and what factors influence their perceptions and preferences?"

Over the past few decades, banking services have witnessed a substantial shift towards embracing technology. Services like online banking, mobile banking, ATM facilities, and digital payment methods have become integral to the industry. However, the extent to which these services have been adopted and accepted by customers may vary across different regions, including Thoothukudi District. The success and sustainability of technological banking services are closely tied to customer perceptions. Customer perceptions are influenced by factors such as the reliability, security, ease of use, convenience, and efficiency of these services. Understanding these perceptions is vital for both public and private sector banks to enhance their services and retain and attract customers. Although there is existing literature on technological banking services in India, there is limited research that specifically examines customer perceptions in the context of Thoothukudi District. This research aims to bridge this gap and provide valuable insights into a unique regional perspective.

3. Review of Literature

Choudhury and Bhattacharjee (2015) underscored the significant progress made by the human race in the domains of science, medicine, and technology over the past two centuries. Technological adaptation is ubiquitously observed across various domains, exemplified by the presence of colossal spacecrafts as well as compact handheld smart phones. The aforementioned examples exhibit a spectrum of sizes, varying from substantial to diminutive. The reliance on this technology has progressed to a degree where it is inescapable, and it is presently considered the fourth fundamental necessity for survival, subsequent to air, water, and food. In the contemporary era characterised by swift technological progress, the pervasive influence of information systems has permeated every facet of the business landscape. 26. Iberahim, H. et al. (2016), the inclusion of Self Service Technology (SST) is deemed essential in the retail banking sector, specifically in relation to customer satisfaction with regards to reliability and responsiveness. The significance of the interface enabling interaction between humans and machines has become increasingly prominent in our daily lives due to the rapid progress of technology. The Automated-Teller Machine (ATM) has emerged as a highly effective and widely utilised self-service terminal for providing retail banking services. The objective of this study is to assess the present state of service quality provided by ATMs, which serve as a primary point of service for a Malaysian bank. The aim of this study is to examine the correlation between reliability and responsiveness of ATM services and customer satisfaction, as well as to validate the factors that contribute to enhancing service quality. 40. Neha Yajurvedi (2015), the banking industry utilises both Communication and Business Process Reengineering (BPR) as separate applications of information technology in contemporary times. India is currently ranked among the

top three countries in terms of internet users, with an estimated population of approximately 250 million. However, it is projected that this number will increase to 350 million by the end of the year 2015. The utilisation of electronic banking services, such as mobile banking, online banking, and automated teller machine banking, has experienced a surge in popularity among customers.

4. Methodology

Based on the findings of Glenn D. Israel (1992), a sample size of 400 is deemed adequate for conducting research when the population exceeds 100,000. Thus, the researchers have determined that the appropriate sample size for this study is 386, with a confidence level of 5% and a confidence interval of 5%. In order to mitigate potential biases, an equitable distribution of sample sizes is allocated to each taluk within the district. This approach aims to minimise the impact of respondent unwillingness on the practicality of the data for subsequent analysis. In order get better sample response rate the researcher collect data from 440 respondents in the study area. But after collection 386 question sets are valid for analysis. So, the established sample response rate is 89.09%. The study employed the purposive sampling technique. The researcher employs a scientific approach to design each process within the methodology. The collection of research data involves the acquisition of both primary and secondary data sources. The primary data for this study has collected using a meticulously designed interview schedule. The objectives of the article are to analyse the socio-economic conditions of the sampled respondents in the study area and to analyse customer perceptions towards technology related services offered by banks. The responses obtained are compiled and later analysed data using SPSS (Statistical packages for social sciences) Version 19 and IBM AMOS version 21.

5. Results and Discussion

The table 1 presented here offers a comprehensive overview of the socio-economic and banking profiles of a group of 386 respondents. This data has been collected through primary research, and it sheds light on various crucial aspects of the individuals surveyed. By categorizing the respondents based on gender, age, qualification, occupation, income level, sector of bank account, type of deposit, reasons for maintaining their accounts, and the duration of their banking relationships, this table provides valuable insights into the characteristics and preferences of the participants within the study.

Understanding the socio-economic and banking profiles of individuals is of significant importance, as it helps banks, financial institutions, and policymakers tailor their services and offerings to better serve the diverse needs and preferences of their customers. By analyzing the data in this table, we can gain valuable insights into the distribution and preferences of respondents across various demographic and financial dimensions.

Table 1: Socio-Economic and Banking Profile of the Respondents

S. No.	Gender of the Respondents	No. of Respondents	Percentage
1	Male	232	60.10
2	Female	154	39.90
Total		**386**	**100.00**
S. No.	**Age of the Respondents**	**No. of Respondents**	**Percentage**
1	Less than 25 years	85	22.02
2	26 years to 35 years	107	27.72
3	36 years to 45 years	90	23.32
4	46 years to 55 years	58	15.05
5	Above 55 years	46	11.92
Total		**386**	**100.00**
S. No.	**Qualification**	**No. of Respondents**	**Percentage**
1	Illiterate	13	03.37
2	Primary Level	32	08.29
3	Upto Hr. Sec. Level	71	18.39

4	Under Graduate	169	43.78
5	Post Graduate	61	15.80
6	Professional	40	10.37
Total		**386**	**100.00**
S. No.	**Occupation**	**No. of Respondents**	**Percentage**
1	Entrepreneur	20	05.18
2	Government Employee	83	21.51
3	Private Employee	143	37.05
4	Professional	24	06.22
5	Student	61	15.80
6	Home Maker	37	09.58
7	Farmer	18	04.66
Total		**386**	**100.00**
S. No.	**Income**	**No. of Respondents**	**Percentage**
1	Upto Rs. 15,000	29	07.52
2	Rs. 15,001 to Rs. 20,000	126	32.64
3	Rs. 20,001 to Rs. 25,000	84	21.76
4	Rs. 25,001 to Rs. 30,000	68	17.62
5	Above Rs. 30,000	79	20.46
Total		**386**	**100.00**
S. No.	**Sector of Bank Account**	**No. of Respondents**	**Percentage**
1	Private Sector	193	50.00
2	Public Sector	193	50.00
Total		**386**	**100.00**
S. No.	**Type of Deposit**	**No. of Respondents**	**Percentage**
1	Savings Deposit	277	71.76
2	Current Deposit	54	13.99
3	Fixed Deposit + Savings	18	04.67
4	Recurring Deposit + Savings	37	09.58
Total		**386**	**100.00**
S. No.	**Reasons for maintain**	**No. of Respondents**	**Percentage**
1	Salary	94	24.35
2	Business Transaction	61	15.80
3	Savings	212	54.92
4	Availing Loan	19	04.93
Total		**386**	**100.00**
S. No.	**Duration having account**	**No. of Respondents**	**Percentage**
1	Less than 2 years	87	22.54
2	2 years to 5 years	126	32.64
3	Above 5 years	173	44.82
Total		**386**	**100.00**

Source: Primary Data

The table 1 presents the socio-economic and banking profile of 386 respondents, showing various demographic and banking-related characteristics. Here's the interpretation of the data presented in the table: Gender of the Respondents - 60.10% of the respondents are male, while 39.90% are female. Age of the Respondents, the majority of respondents fall into the age group of 26 to 45 years, with 27.72% aged between 26 and 35 years and 23.32% between 36 and 45 years. There are fewer respondents in the age groups of less than 25 years (22.02%), above 55 years (11.92%), and 46 to 55 years (15.05%). Qualification - A significant portion of

the respondents have completed either undergraduate (43.78%) or up to the higher secondary level (18.39%) education. Only a small percentage of respondents are illiterate (3.37%), indicating that the majority of respondents have at least a basic level of education. Occupation - the largest occupational group is "Private Employees" (37.05%), followed by "Government Employees" (21.51%). Students make up a substantial portion (15.80%) of the respondents, while entrepreneurs comprise the smallest group (5.18%). The income distribution among the respondents varies, with the highest percentage falling in the income range of Rs. 15,001 to Rs. 20,000 (32.64%). A significant portion of respondents also falls in the income ranges of Rs. 20,001 to Rs. 25,000 (21.76%) and above Rs. 30,000 (20.46%).

An equal number of respondents maintain their bank accounts in both private and public sector banks (50% each). This suggests a balanced distribution between the two sectors. Type of Deposit - the majority of respondents use "Savings Deposit" as their primary type of deposit (71.76%). "Current Deposit" is the second most common (13.99%), while "Fixed Deposit + Savings" and "Recurring Deposit + Savings" are less common types. The most common reason for maintaining a bank account is "Savings" (54.92%), followed by "Salary" (24.35%). A smaller percentage maintains accounts for "Business Transactions" (15.80%) or "Availing Loans" (4.93%). A significant number of respondents have held their bank accounts for "Above 5 years" (44.82%), indicating a long-term relationship with their banks. 32.64% have had their accounts for "2 years to 5 years," while 22.54% have had accounts for "Less than 2 years."

Level of Perception towards Online Banking

There are 8 statement have framed by the researcher for the analysis of customer perception towards online banking. In these 8 statements are analysed with the help of Exploratory Factor Analysis. The EFA results are presented in the table 2.

Table 2: EFA Results of Customer Perception towards Online Banking

Analysis	Result Value
KMO and Bartlett's Test of Sphericity	0.887
Total Variance Explained	50.581 %
Pattern Matrix Variables:	
LOP_OB5	.727
LOP_OB7	.721
LOP_OB6	.714
LOP_OB3	.713
LOP_OB2	.709
LOP_OB8	.696
LOP_OB1	.526
LOP_OB4	.523

Source: SPSS output

The table 2 appears to contain the results of an Exploratory Factor Analysis (EFA) for customer perceptions towards online banking. KMO (Kaiser-Meyer-Olkin) is a measure of sampling adequacy for factor analysis. A KMO value of 0.887 is quite high, suggesting that the dataset is suitable for factor analysis. In other words, the data is likely to have sufficient common variance for factor analysis. The total variance explained indicates how much of the total variance in the data is accounted for by the factors extracted in the analysis. In this case, the EFA factors explain 50.581% of the total variance in the dataset. This value is important for understanding how well the selected factors represent the data. A higher percentage suggests that the selected factors capture a substantial portion of the data's variability.

Pattern Matrix Variables lists the loadings of individual variables on the factors extracted during the EFA. Loadings represent the strength and direction of the relationship between each variable and the identified

factors. Higher loadings indicate a stronger relationship between the variable and the factor. LOP_OB5 has the highest loading at 0.727 on one of the factors. LOP_OB7 follows closely with a loading of 0.721 on the same factor. LOP_OB6, LOP_OB3, LOP_OB2, and LOP_OB8 also have relatively high loadings, indicating they are strongly associated with this particular factor. LOP_OB1 and LOP_OB4 have lower loadings on this factor, near to the cut off value.

Level of Perception towards Mobile Banking

There are 10 statement have framed by the researcher for the analysis of customer perception towards mobile banking. In these 10 statements are analysed with the help of Exploratory Factor Analysis. The EFA results are presented in the table 3.

Table 3: EFA Results of Customer Perception towards Mobile Banking

Analysis	Result Value
KMO and Bartlett's Test of Sphericity	0.883
Total Variance Explained	50.299 %
Pattern Matrix Variables:	
LOP_MB8	.716
LOP_MB5	.688
LOP_MB4	.677
LOP_MB6	.663
LOP_MB7	.660
LOP_MB10	.655
LOP_MB9	.646
LOP_MB1	.633
LOP_MB3	.622
LOP_MB2	.553

Source: SPSS output

The table 3 appears to be output from a factor analysis conducted in SPSS, and it includes several key statistics and information. KMO and Bartlett's Test of Sphericity statistic is used to assess the suitability of the data for factor analysis. A KMO value close to 1 indicates that the data is highly suitable for factor analysis. In this case, the KMO value of 0.883 is relatively high, suggesting that the data is suitable for factor analysis. Total Variance Explained value indicates the proportion of total variance in the data that is explained by the extracted factors. In this analysis, the extracted factors account for 50.299% of the total variance in the data. This percentage can help to understand how well the factors capture the variation in these variables.

The factor analysis suggests that there is a factor (or set of factors) that can explain a significant portion of the variance in the data. The variables listed have strong positive relationships with this factor, with "LOP_MB8" having the strongest relationship, followed by the other variables in descending order of factor loading magnitude. The factor structure and the strength of these relationships will be important for interpreting and using the results of factor analysis in research or analysis.

Customer Perceptions on Technology Enabled Banking Services

There are 13 statement have framed by the researcher for the analysis of customer perception on Technology Enabled Banking Services. In these 13 statements are analysed with the help of Exploratory Factor Analysis. The 13 statements are rotated with two factors. The EFA results are presented in the table 4.

Table 4: EFA Results of Customer Perception on Technology Enabled Banking Services

Analysis	Result Value
KMO and Bartlett's Test of Sphericity	0.934
Total Variance Explained	59.064 %
Pattern Matrix Variables:	
PTBS3	.878
PTBS2	.751
PTBS7	.655
PTBS1	.648
PTBS4	.609
PTBS5	.608
PTBS6	.520
PTBS8	.856
PTBS9	.849
PTBS11	.797
PTBS12	.764
PTBS13	.714
PTBS10	.676

Source: SPSS output

The table 4 provided to factor analysis, specifically a factor pattern matrix. KMO (Kaiser-Meyer-Olkin) measures the sampling adequacy for the analysis. A KMO value of 0.934 indicates that the dataset is highly suitable for factor analysis. Generally, a KMO value above 0.7 is considered good. Bartlett's Test of Sphericity assesses whether the correlation matrix is significantly different from an identity matrix (i.e., if there are correlations between variables). The associated p-value should be less than 0.05 for the test to be considered significant. This figure (59.064%) represents the proportion of the total variance in the data that is explained by the extracted factors. In factor analysis, the goal is typically to extract a smaller number of factors that can account for as much of the variance in the original variables as possible. The third section provides the factor loadings for each of the variables (PTBS1, PTBS2, PTBS3, etc.) on the extracted factors. Factor loadings indicate the strength and direction of the relationship between each variable and the factors. In this case, the factor loadings range from 0.520 to 0.878. In this case, it seems that some variables have high positive loadings on the factors (PTBS3, PTBS8, PTBS9), indicating a strong positive relationship, while others have lower loadings (PTBS6), indicating a weaker relationship.

Measurement Models of Customer Perception towards Online Banking, Mobile Banking and Technology Enabled Banking Services

First-order confirmatory factor analysis (CFA) is a statistical technique used in the field of structural equation modeling (SEM) and psychometrics to assess the validity of a theoretical model by confirming the factor structure of a set of observed variables. It is commonly used in fields like psychology, education, and social sciences to test whether a hypothesized measurement model fits the observed data.

The underlying dimension of online banking services, mobile banking services statements and technology enabled banking services are identified through Exploratory Factor Analysis (EFA). Further, these identified factors are validated through first order Confirmatory Factor Analysis (CFA). The measurement models of these services done through AMOS graphics are shown in the following figures 1 to 3 and the results are highlighted in the table 5.

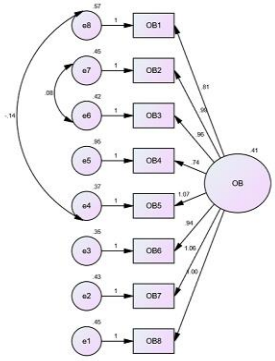

Figure 1 : First order Confirmatory Factor Analysis - Level of Perception towards Online Banking

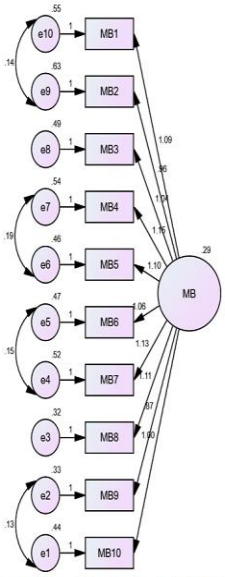

Figure 2 : First order Confirmatory Factor Analysis - Level of Perception towards Mobile Banking

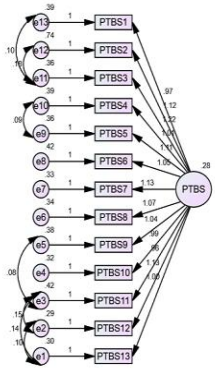

Figure 5.4 : First order Confirmatory Factor Analysis - Perceptions on Technology Enabled Banking Services

Table 5: First order CFA Results

Variables	Name of Index & Values							
	RMSEA <0.08	GFI >0.90	AGFI >0.90	CFI >0.90	TLI >0.90	NFI >0.90	CMIN <3.0	RMR <0.05
Online Banking	0.068	0.969	0.937	0.971	0.955	0.956	2.796	0.030
Mobile Banking	0.071	0.956	0.922	0.960	0.942	0.941	2.965	0.030
Technology Enabled Banking Services	0.057	0.950	0.922	0.971	0.961	0.949	2.270	0.025

Source: AMOS output

The table 5 provided a summary of several model fit indices used in first order confirmatory factor analysis (CFA) to assess the goodness of fit of a statistical model. Each row corresponds to a specific latent variable (Online Banking, Mobile Banking, Technology Enabled Banking Services) and the columns represent different fit indices (RMSEA, GFI, AGFI, CFI, TLI, NFI, CMIN, RMR) along with their respective threshold values. All the latent variables (Online Banking, Mobile Banking, Technology Enabled Banking Services) appears to have RMSEA values below 0.08, indicating a good fit. The GFI, AGFI, CFI, TLI, NFI values for each latent variable are all above 0.90, indicating good fits as well. The CMIN values for each latent variable are below 3.0, which is considered good. The RMR values for each latent variable are less than 0.05, indicating good fits.

6. Conclusion

The cross-sectional analysis of customer perceptions regarding technological banking services in Thoothukudi District has provided valuable insights into the evolving landscape of banking in the digital age. This study, which focused on both public and private sector banks, underscores the significance of understanding customer attitudes and preferences as the banking industry undergoes a transformative shift towards digitalization. The findings of this research reveal that customers in Thoothukudi District have varying levels of comfort and satisfaction with technological banking services. It is evident that digital natives are more inclined to embrace and prefer these services, while older generations show resistance. This generational gap highlights the importance of targeted strategies to promote digital adoption among diverse age groups.

Both public and private sector banks exhibit strengths and weaknesses in the delivery of technological banking services. Public sector banks have a significant presence, but they may need to enhance their technology adoption and customer support to compete effectively with their private sector counterparts. Private sector banks,

on the other hand, may need to focus on addressing security concerns and ensuring that technology does not compromise customer trust.

Factors influencing customer perceptions include security concerns, accessibility, ease of use, and the role of bank personnel. These factors are essential for banks to consider when designing and implementing digital banking services. Security measures must be robust to instill trust, accessibility should cater to all segments of the population, and user-friendly interfaces are crucial for a positive customer experience. The role of bank personnel in assisting customers with digital services should not be underestimated, particularly for customers who are less tech-savvy.

The results of this research provide relevant information for policymakers, bank management, and researchers in the field of banking and finance. Policymakers can use these insights to develop regulations that ensure the security and accessibility of digital banking services. Bank management can tailor their strategies to enhance customer experiences and encourage the adoption of technological banking services. Researchers can build upon this study to further explore the dynamics of digital banking adoption in different regions.

In conclusion, the transformation of the banking industry in Thoothukudi District, driven by technological advancements, is a complex and multifaceted process. Customer perceptions play a pivotal role in shaping the success and sustainability of technological banking services. Recognizing the diverse needs and preferences of customers and addressing their concerns is essential for banks to thrive in this digital era. This research contributes to our understanding of these dynamics and provides a foundation for future research and policy development in the field of banking and technology.

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