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Digital Finance and Financial Inclusion: An Empirical Analysis

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Abstract

Financial inclusion is the act of ensuring that marginalized groups, such as those with lower financial standing and low incomes, have affordable access to financial services and enough credit when needed. Financial products and services, including bank accounts, insurance, financial counselling, remittance and payment services, etc., must be accessible for financial inclusion to take place. It enables people to set money aside for future financial security. A high level of bank deposits also enables investment, borrowing, and opportunities to increase savings. Today, financial inclusion is a key component of economic progress. These are all accomplished by supporting current financial technology. Many banks have entered the new "Digital finance" landscape for banking consumers, leveraging cutting-edge technologies. Customers may have more control over their own finances through digital finance. Financial inclusion is a win-win outcome made possible by digital finance. This study aims to examine the frequency of customers' use of financial products and services, understand the problems faced by customers using digital financial services, and identify the impact of digital finance on financial inclusion.

Keywords: *Financial Inclusion, Digital Finance, Customers, Banking, Financial Products and Services*

1. Introduction

Digital financial services, including online and mobile banking, enhance user engagement by offering convenience and easy transactions. Internet banking, mobile banking, e-wallets, mobile wallets, and credit and debit cards are accessible through technology, providing consumers with benefits like comfort and simplicity. Nonetheless, cyber-attack risks remain a concern that must be addressed as the economy advances. While cashless transactions become more common, perceptions such as security worries, poor network coverage, merchant reluctance, high transaction costs, and limited user technology knowledge hinder widespread adoption.

Digital financial services have the potential to be more practical and economical than traditional banking services, allowing low-income and underprivileged individuals in developing nations to save and borrow in the financial system while also prospering financially. It is essential to the general public, as it increases the security of their cash and is more practical than keeping cash at home or carrying it when travelling. To deliver digital finance, however, a variety of parties are involved, including banks and other financial institutions, mobile network operators, financial technology suppliers, regulators, agents, retail chains, and customers.

Financial inclusion, the use of a set of acceptable financial services by families and businesses, is crucial for development, as it can improve the lives of poor households while also promoting financial flows. Digital financial services are promoted as important money-related solutions for boosting financial awareness. The transition from cash to digital payments is enabled by financial inclusion. Customers have access to a digital payment system that allows them to quickly and inexpensively send money to friends, family, and colleagues.

2. Literature Review

Garcia et al. (2016) found that financial inclusion and financial security are correlated, and financial stability is a good indicator of banking stability. They also demonstrate the connection between financial inclusion and financial stability by reviewing the body of knowledge. Given that Digitized Financial Inclusion is the most recent iteration of Financial Inclusion, experts believe it is more successful at providing financial stability, which, in turn, supports banking stability.

Klapper et al. (2019) demonstrate that Digital Financial Services enables the registration of

informal business entities as formal entities, making it easier for the government to enforce laws and collect taxes because all records are accessible in the database, and there is no way to avoid paying taxes. The national revenue sector benefits from increased tax collection, which finally stabilizes the economy of the nation. Financial literacy should be the main priority before the Digitized Financial Inclusion is fully launched. Rajasekharan (2018) conducted a study to identify several obstacles to Financial Inclusion and to examine the steps taken by the RBI and GOI to remove these obstacles, which used 69 secondary data sources from government publications, journals, and internet sources. The survey identified a number of obstacles, including distance, a lack of financial literacy, high costs, low and erratic income, and a lack of sufficient documentation, among others. The study also identified government initiatives, such as Aadhaar, Direct Benefit Transfer, financial literacy programmes, and the expansion of ATM networks nationwide, as well as services for farmers and vulnerable groups, such as the Kisan Credit Card and Basic Bank Deposit Accounts. Morgan & Pontines (2014) noted that developing economies increasingly view financial inclusion as a key driver of economic and financial development. The literature explores whether financial inclusion and financial stability act as substitutes or complements, with studies suggesting both positive and negative effects. Existing research indicates that expanded access to finance, particularly increased lending to small and medium-sized enterprises, can enhance financial stability by reducing non-performing loans and lowering default risk. Overall, prior studies suggest that policies promoting financial inclusion also contribute positively to financial system stability.

3. Objectives of the Study

The present study aims to examine the evolving landscape of digital finance and its implications for customers and the broader financial system. Specifically, the objectives of the study are to:

- analyse customers' usage patterns of financial products and services in the context of increasing digitalisation;
- assess the impact of digital finance on enhancing financial inclusion, particularly in terms of access, usage, and affordability of financial services;
- identify and evaluate the challenges and constraints faced by customers in the adoption and use of digital financial services; and
- propose appropriate recommendations, based on empirical findings, to improve the effectiveness of digital financial services and draw meaningful conclusions for policymakers, financial institutions, and other stakeholders.

4. Methodology of the Study

The present study adopts an empirical research design to examine customers' engagement with digital financial services and their implications for financial inclusion. Primary data were collected through a structured survey administered to respondents in Tamil Nadu, one of India's most economically dynamic regions. Tamil Nadu is the tenth largest Indian state by geographical area and the sixth largest by population, and it has been experiencing rapid economic growth, with policy aspirations to achieve a USD 1 trillion economy by 2030. This makes the state a relevant and appropriate setting for examining the adoption and impact of digital finance. A convenience sampling technique was used to collect responses, yielding a final sample of 200 participants. The survey instrument was carefully designed with logically structured questions to capture respondents' usage patterns of digital financial products and services, perceptions of digital finance, and challenges encountered in adopting digital finance. Both primary and secondary data were utilised to enhance the robustness of the analysis. While primary data were obtained directly from respondents through the survey, secondary data were sourced from relevant academic literature, reports, and official publications to support the theoretical framework and contextual understanding of digital finance and financial inclusion. The collected primary data were analysed using statistical tools, including percentage analysis and the Kruskal Wallis Test, to examine variations in responses across different groups. In addition, Structural Equation Modelling (SEM) was employed to assess the relationships among key constructs of the study. The statistical analyses were carried out using SPSS version 22 and AMOS for Windows, ensuring reliability and validity in data interpretation.

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5. Hypothesis

- **H_1:** Usage of Digital Finance by male and female customers is same *(Null hypothesis)*
- **H_2:** There is no significant impact of digital finance on financial inclusion *(Null hypothesis)*

6. Data Analysis

6.1 Demographic Profile of the Respondents

Table 1: Distribution of Demographic Profile of the Respondents

S. No	Demographic Variables		No. of Respondents	Responses in Percentage
1	Gender	Male	116	**58%**
		Female	84	42%
2	Age	25 and below	31	15.5%
		26 – 35	56	28%
		36 – 45	73	**36.5%**
		46 - 55	27	13.5%
		56 and above	13	6.5%
3	Maximum Educational Qualification	HSC	16	8%
		Undergraduate	160	**80%**
		Postgraduate	24	12%
4	Status of Occupation	Student	11	5.5%
		Employed	49	24.5%
		Professional	56	**28%**
		Business	40	20%
		Home Maker	44	22%
5	Location	Rural	84	42%
		Urban	116	**58%**

Source: Computed Data

Table 1 represents the demographic profile of the respondents. It indicates that the majority of respondents are male (58%); 36.5% are in the 36-45 age group; and the majority have completed an undergraduate degree as their highest educational qualification. The majority of respondents (28%) are professionals, and 58% are from urban regions.

6.2 Customer's Usage of Financial Products and Services

To study the customers' usage of financial products and services Mann-Whitney U test is adopted.

Table 2: Results of Mann Whitney U-Test for Customer's Usage of Financial Products and Services

Financial Products and Services	Region	Mean Rank	Sum of Ranks	Mann Whitney U	P Value
Online payments (Net / Mobile banking/ UPIs)	Female	85.05	5899.50	2619.500	.0459
	Male	109.03	5528.50		
Virtual Finance Assistance	Female	23.25	1895.00	533.000	0.003
	Male	178.56	8614.00		
Deposits / Withdrawal of Cash	Female	93.69	4986.50	2845.000	0.000
	Male	97.18	6520.50		
Forex Transaction	Female	19.21	1263.00	624.000	0.000
	Male	182.65	9103.00		
Fixed Deposit Renewal	Female	31.33	2125.50	685.500	0.000
	Male	163.52	8142.50		
EMI Payments	Female	87.33	5942.00	2967.000	0.134
	Male	111.20	5614.00		
Request for Cheque Book / ATM card	Female	62.01	4375.50	942.000	0.000
	Male	145.32	7690.50		
Online Trading	Female	36.25	2365.00	2645.000	0.000
	Male	182.36	8569.00		
RTGS/NEFT Transaction	Female	46.37	3065.00	957.000	0.000
	Male	167.21	8314.00		

Source: Computed Data

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The p-value of Virtual Finance Assistance (0.003), Deposits / Withdrawal of Cash (0.000), Forex Transaction (0.000), Fixed Deposit Renewal (0.000), Request for Cheque Book / ATM card (0.000), Online Trading (0.000) and RTGS/NEFT Transaction (0.000) are lesser than 0.05 the assumed level of significance. This means that the null hypothesis (H1) is rejected. It concludes that the Usage of Digital Finance by female and male customers is not same.

The p-values for online payments (0.459) and EMI payments (0.134) are greater than 0.05, the assumed level of significance. This means that the null hypothesis (H1) is accepted. It concludes that the Usage of Digital Finance by female and male customers is same.

6.3 Impact of Digital Finance on Financial Inclusion

Kruskal Wallis Test is used to study the impact of digital finance on financial inclusion

.Table 3: Impact of Digital Finance on Financial Inclusion

Dimensions	Digital Financial Services	Mean	Critical Value	Level of significance	Result
Accessibility	Debit / Credit Cards	178.5	13.369	.010	S
	ATMs	194			
	UPIs	202.00			
	E-Wallets	144.14			
	POS Terminals	105			
	Internet / Mobile Banking	170.50			
Subjective Norms	Debit / Credit Cards	187.30	3.710	.447	NS
	ATMs	195.32			
	UPIs	219.50			
	E-Wallets	209.23			
	POS Terminals	193.50			
	Internet / Mobile Banking	184.20			
Affordability	Debit / Credit Cards	254.10	70.809	.000	S
	ATMs	145.44			
	UPIs	220.00			
	E-Wallets	243.77			
	POS Terminals	122.10			
	Internet / Mobile Banking	142.50			
Quality	Debit / Credit Cards	244.86	35.105	.000	S
	ATMs	203.41			
	UPIs	141.17			
	E-Wallets	214.73			
	POS Terminals	156.75			
	Internet / Mobile Banking	142.05			
Security	Debit / Credit Cards	168.10	41.997	.000	S
	ATMs	222.62			
	UPIs	225.50			
	E-Wallets	154.32			
	POS Terminals	264.50			
	Internet / Mobile Banking	223.20			
Privacy	Debit / Credit Cards	145.06	31.621	.000	S
	ATMs	196.50			
	UPIs	187.30			
	E-Wallets	137.25			
	POS Terminals	216.50			
	Internet / Mobile Banking	178.60			
Knowledge	Debit / Credit Cards	235.69	15.268	0.013	S
	ATMs	201.93			
	UPIs	241.20			
	E-Wallets	146.55			
	POS Terminals	131.10			
	Internet / Mobile Banking	212.65			

Source: Computed Data

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It is inferred (Table 3) that, with regard to the dimensions of digital financial service "subjective norms" and its impact on financial inclusion, the p-value of 0.447 was greater than 0.05; this indicates that there is no significance at the 5% level in this group. In the overall analysis, the majority of dimensions had significance value of 0.000, which is less than 0.05. Hence, it is concluded that digital finance has a significant impact on financial inclusion.

6.4 Problems Faced by Customers while Using Digital Finance

Table 4: Problems Faced by Customers while Using Digital Finance

Problems Faced	Mean	Standard Deviation
Lack of Technical Knowledge	3.03	1.276
Fear of Financial Security	3.15	1.195
Difficulty in Operation	3.20	1.234
To uphold Password confidentiality	2.66	1.154
Loss of information	3.18	1.187
Data Theft	3.09	1.401
Internet / Server Connectivity	2.78	1.360

Source: Computed Data

Table 4 presents the mean values for seven financial inclusion dimensions, ranging from 2.66 to 3.20. It reveals that the sample respondents have a range of experiences, from favourable to neutral, with digital financial services. Respondents acknowledged that they had major problems with password confidentiality and Internet/server connectivity.

7. Findings of the Study

- The study indicates that the majority of respondents are male (58%); 36.5% are in the 36-45 age group; and the majority have completed an undergraduate degree as their highest educational qualification. The majority of respondents (28%) are professionals, and 58% are from urban regions.
- The p-values of Virtual Finance Assistance (0.003), Deposits / Withdrawal of Cash (0.000), Forex Transaction (0.000), Fixed Deposit Renewal (0.000), Request for Cheque Book / ATM card (0.000), Online Trading (0.000), and RTGS/NEFT Transaction (0.000) are lesser than 0.05, the assumed level of significance. This means that the null hypothesis (H1) is rejected. It concludes that the usage of Digital Finance by female and male customers is not same.
- The p-values for online payments (0.459) and EMI payments (0.134) are greater than 0.05, the assumed level of significance. This means that the null hypothesis (H1) is accepted. It concludes that the usage of Digital Finance by female and male customers is same.
- The mean value of seven financial inclusion dimensions ranging from 2.66 to 3.20. It reveals that the sample respondents have a range of experiences, from favourable to neutral, with digital financial services. Respondents acknowledged that they had major problems with password confidentiality and Internet/server connectivity.
- Regarding the dimensions of digital financial service "subjective norms" and their impact on financial inclusion, the p-value was 0.447, which was greater than 0.05, indicating no significance at the 5% level in this group. In the overall analysis, the majority of dimensions had a significance value of 0.000, which is less than 0.05. Hence, it is concluded that digital finance has a significant impact on financial inclusion.

8. Conclusion

This study confirms that digital financial products or services show a significant impact on financial inclusion. The study found that the majority of customers have experienced problems such as internet/server connectivity issues and difficulties maintaining password confidentiality while using digital finance products and services. Customers' use of Financial Products and Services, such as EMI payments and online transactions via mobile or internet banking and UPIs, is more significant than that of other digital financial services. To boost access and consumption of digital financial services, measures must be taken to improve the quality of digital financial services. The economy will benefit from greater digital financial inclusion. The study

reveals that the impact of digital finance on financial inclusion is satisfactory in the Tamil Nadu region. It is also concluded that customers still lack knowledge of digital finance and fear accessing digital finance services. Hence, actions and policies must be taken with these concerns in mind.

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