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ASSESSING THE ROLE OF UPI TRANSACTIONS IN RURAL ECONOMIC DEVELOPMENT AND FINANCIAL INCLUSION

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ABSTRACT

This study investigates the "FinTech Revolution' by examining UPI adoption in rural blocks of Pudukkottai District. As India accelerates its digital transformation, rural communities are shifting from cash-based systems to digital economies. Analyzing data from 140 respondents, the study explores how digital payment methods influence economic growth and access to financial services. Results show a notable rise in awareness (70%) and smoother transactions after UPI adoption. Nevertheless, obstacles like low digital literacy and poor internet connectivity limit broader use. While benefits such as quicker transactions and enhanced access to government programs are clear, a "digital divide" persists among older and illiterate groups. The research concludes that UPI significantly improves financial inclusion, but full success requires targeted digital literacy initiatives and better rural infrastructure to prevent digital exclusion.

KEYWORDS: UPI, Financial Inclusion, Rural Economy, Digital Literacy & FinTech.

INTRODUCTION

India's fintech revolution has significantly transformed how people manage money, shifting from traditional bank visits to quick mobile solutions. Central to this change is the Unified Payments Interface (UPI), which enables real-time transactions 24/7. Cities have rapidly adopted this technology, but rural areas like Pudukkottai receive less focus due to their unique socio-economic traits. Still primarily an agricultural region, Pudukkottai relies on farmers and small traders for its economy. For rural communities, financial inclusion once meant just opening a bank account, but now it encompasses digital savings, borrowing, and transactions—all without visiting a bank or carrying cash. UPI has effectively brought banking into rural homes, acting as a "virtual branch." This research examines this transition by studying how middle-aged household heads and women in self-help groups adapt to digital

finance. By reviewing their usage and perceived benefits, we can better understand the grassroots impact of India's digital financial movement.

GROWTH OF FINANCIAL INCLUSION

Financial inclusion in rural Pudukkottai has progressed from basic bank account ownership to active digital engagement. Previously, rural residents faced physical barriers such as traveling long distances to access banks. The advent of fintech has eliminated these obstacles, resulting in a significant increase in ease of transactions. The study indicates that after adopting UPI, access to banking services rose considerably (42), and importantly, it fostered a savings habit (35) among rural communities. This progress goes beyond simple payments; it involves creating a digital footprint that allows farmers and workers to access formal credit and government subsidies (DBT) more efficiently than before.

REVIEW OF LITERATURE

Dhananjai E Rao., & et al. (2024). This study examines how the use of FinTech solutions has resulted in financial inclusion and banking services in rural areas. The study examines the advantages and difficulties of applying FinTech to rural banking, including better access to financial services, higher effectiveness, and lower costs.

Jayalakshmamma. K (2022). Financial inclusion, which aims to provide access to affordable and reliable financial services to underserved populations, is crucial for promoting economic growth and reducing poverty. In recent years, the emergence of financial technology (Fintech) has shown great potential in advancing financial inclusion by offering innovative solutions and leveraging technology to overcome traditional barriers.

Debashree Souvik Jana. (2024). How FinTech has changed financial inclusion in India, focusing on how it has improved access to loans, insurance, savings, and sending money back to family and friends abroad.

Arunkumar. G. (2018). Financial Inclusion is one of the effective and innovative approaches which helps to reach the financial services, assistance and subsidies to the real beneficiaries. Government of India introduced the Scheme on financial inclusion to provide financial services to the unreached people at an affordable or free of cost.

Saugat Nayak. (2025). The Fintech subspace is undergoing swift changes now with the aspect of CX that has emerged as a critical way to outcompete others. With customers demanding timely and tailor-made interactions with digital solutions, the management of products in fintech companies has to embrace data.

Ramya V., & et al. (2025). The application of blockchain technology in the field of accounting is essential as it guarantees increased transparency, security and reliability as well as shredding time and expenses of financial reporting. In this paper, the challenges have been discussed concerning the use of blockchain in Thailand's accounting industry, its benefits, and possibilities in the future.

Prafulla Kumar Dwibedi., & et al. (2023). It also includes a wide range of technologies and applications used in providing banking and financial services such as mobile banking, digital payments, Unified Payments Interface (UPI), Immediate Payment Service (IMPS), mobile wallets, Prepaid Payment Instruments, Quick Response (QR) codes, crowd funding, peer-to-peer lending, robo-advisory services, block chain, and artificial intelligence.

Bhaskar Mishra., Aadarsh Jain., & Satyajitsinh Gohil (2023). Through an analysis of factors contributing to the success of fintech companies in rural India, such as government support, availability of digital financial services, and access to affordable internet connectivity, this paper provides a comprehensive assessment of the state of fintech in rural India.

Anupam Mehrotra (2019) highlights that financial inclusion and inclusive growth are global priorities, emphasizing that growth is more sustainable when it includes all segments of society. While traditional banking, regulated and established, continues to

address inclusive growth challenges, technological advancements are rapidly transforming the landscape across the subcontinent. This shift is characterized by remarkable growth in the electronic market, widespread smartphone use, cloud-based solutions, and the rise of financial technology companies offering services and products that complement or mirror traditional banking.

Thomas Philippon., (2019) The cost of financial intermediation has declined in recent years thanks to technology and increased competition in some parts of the finance industry. I document this fact and I analyze two features of new financial technologies that have stirred controversy: returns to scale and the use of big data and machine learning.

Shubham Goswami, Raj Bahadur Sharma, and Vineet Chouhan (2022) highlight that transformation towards financial technology opens up growth opportunities across the entire economy. Emerging developing nations are experiencing rapid expansion of financial technology and mobile money services. FinTech projects, considered some of the most important advances in finance, are propelled by digital transformation.

STATEMENT OF THE PROBLEM

Despite the widespread smartphone usage, a notable "Digital Divide" persists in rural areas like Pudukkottai. While 70% of residents recognize UPI, nearly 30% remain excluded, mainly due to limited formal education or technical skills. The transition to a digital economy faces additional hurdles from "last-mile' challenges such as unreliable internet and fears of online fraud. A significant gap exists between having digital access and knowing how to use it securely. Without addressing these literacy and security gaps, the benefits of the FinTech revolution are likely to favor the younger, educated population, potentially leaving the elderly and illiterate behind.

OBJECTIVES OF THE STUDY

1. To analyse the level of awareness, usage patterns, and preferences regarding UPI transactions among rural residents in Pudukkottai.
2. To evaluate the impact of UPI on financial inclusion indicators and identify the key challenges hindering its full implementation and adoption.

RESEARCH METHODOLOGY

This study employs a descriptive research method based on firsthand data collected directly from the field. A structured survey was carried out with 140 respondents from different rural blocks in Pudukkottai District to ensure broad demographic coverage. The sample comprised farmers, shopkeepers, and laborers, representing a range of economic backgrounds. Data gathered included age, education level, frequency of UPI usage, and perceived benefits or issues. Additionally, secondary data from banking reports and government websites supported the primary data. The analysis used percentage calculations and comparison tables to demonstrate changes in financial behavior before and after adopting UPI technology.

STUDY PERIOD

The primary data for this study was collected over a three-month period from December 2025 to February 2026.

ANALYSIS AND INTERPRETATION

Table 1
Demographic Profile of Respondents

Variable	Categories	Respondents	%
Age Group	18–30	35	25
	31–45	49	35
	46–60	42	30
	60 Above	14	10
	Total	**140**	**100**

Gender	Male	84	60
	Female	56	40
	Total	**140**	**100**
Education Level	Illiterate	21	15
	Primary	35	25
	Secondary	56	40
	Graduate	28	20
	Total	**140**	**100**
Occupation	Farmer	63	45
	Shopkeeper	28	20
	Labour	21	15
	Student	14	10
	Others	14	10
	Total	**140**	**100**

Source: Primary Data.

The demographic profile of the 140 respondents from rural Pudukkottai highlights a diverse community, providing a strong basis for studying FinTech adoption. The age distribution shows that the largest group (35%) is between 31 and 45 years old, with an additional 30% aged 46–60, indicating that middle-aged mainly earners are the primary users of financial services. The gender ratio is 60:40 male to female, pointing to notable female involvement in rural financial activities, likely supported by local SHG networks. About 60% have completed secondary or higher education, while 15% are illiterate, which may pose challenges for digital interfaces. The occupational data reflects the district's farming background, with 45% being farmers, followed by shopkeepers and labourers. This mix highlights the need for FinTech solutions that align with agricultural cycles and small-scale trade. Overall, the data shows a population gradually advancing educationally while remaining closely tied to traditional livelihoods, emphasizing the importance of user-friendly FinTech options.

Table 2
Awareness and Usage of UPI

Indicator	Response Options	Respondents	%
Heard of UPI	Yes	98	70
	No	42	30
	Total	**140**	**100**
Frequency of Use	Daily	28	20
	Weekly	63	45
	Monthly	35	25
	Rarely	14	10
	Total	**140**	**100**
Purpose of Use	Bill Payment	35	25
	Money Transfer	70	50
	Shopping	21	15
	Others	14	10
	Total	**140**	**100**
Preferred App	Google Pay	56	40
	PhonePe	42	30
	Paytm	28	20
	Others	14	10
	Total	**140**	**100**

Source: Primary Data.

The survey data on Awareness and Usage of UPI in rural Pudukkottai shows a significant adoption of digital payments, with 70% of respondents (98 out of 140) aware of UPI. This high awareness level demonstrates the success of digital literacy efforts in rural Tamil Nadu. Regarding usage frequency, 65% of users utilize UPI at least weekly or daily, indicating that digital payments are becoming a regular part of rural life rather than a one-off experiment. The main reason for use is Money Transfer (50%), followed by Bill Payments (25%), suggesting rural residents rely increasingly on FinTech for household management and remittances. Google Pay is the most preferred app (40%), with PhonePe (30%) and Paytm (20%) also holding significant shares, showing competition among global and local providers in rural markets. Nonetheless, despite high awareness, around 30% of people still do not use UPI, likely including those who are illiterate or over 60, as shown in Table 1. To bridge this gap, simplified interfaces and localized support are essential.

Table 3
Financial Inclusion Indicators (Before vs. After UPI)

Indicator	Before UPI (Respondents)	After UPI (Respondents)	Change
Access to Banking Services	77	119	+42
Ease of Transactions	56	112	+56
Savings Habit	42	77	+35
Loan Accessibility	28	49	+21

Source: Primary Data.

Table 3 offers a clear comparative analysis of financial inclusion metrics in Pudukkottai, emphasizing a notable positive change after UPI adoption. The most prominent improvement is in Ease of Transactions, which saw an increase of +56 respondents—doubling the number before UPI was introduced. This indicates that eliminating physical and time constraints associated with traditional banking has been key to promoting digital usage in rural regions. Access to Banking Services also saw significant growth (+42), suggesting that UPI functions as a "virtual branch" for those lacking physical infrastructure. The data also points to a shift in user behavior. There was a +35 increase in the Savings Habit, implying that digital transparency and easy micro-transfers encourage more formal savings practices among rural users. Moreover, Loan Accessibility rose by +21, likely thanks to digital footprints supporting credit evaluations. Overall, these findings demonstrate that the FinTech revolution is more than just a technological change; it acts as a socio-economic catalyst, enhancing the financial lives of Pudukkottai's rural populations.

Table 4
Challenges in UPI Adoption

Challenge	Respondents
Lack of Digital Literacy	63
Poor Internet Connectivity	49
Fear of Fraud	35
Lack of Smartphone Access	28

Source: Primary Data.

Table 4 identifies the main barriers preventing widespread UPI adoption in Pudukkottai's rural areas, illustrating that the FinTech revolution still faces crucial "last-mile" challenges. The primary issue is a lack of digital literacy, reported by 45% of respondents (63 out of 140). Despite high awareness levels (see Table 2), many still lack the skills to operate apps efficiently, creating a significant obstacle for nearly half of the population. Poor internet connectivity (35%) also hinders adoption, highlighting underdeveloped rural infrastructure

that leads to failed transactions and frustration. Concerns about fraud affect 25% of participants, underlining the need for better consumer protection and education. Additionally, 20% still lack smartphone access, showing device costs as a barrier to digital inclusion. These combined challenges create a "barrier ecosystem" that calls for comprehensive policies—centered on infrastructure upgrades and community digital training—to foster inclusive and secure financial access in Pudukkottai.

Table 5
Perceived Economic Benefits of UPI

Benefit	Respondents
Faster Transactions	98
Reduced Cash Dependency	91
Increased Business Sales	70
Better Record Keeping	56
Improved Access to Government Schemes	77

Source: Primary Data.

Table 5 highlights the perceived economic advantages of UPI among rural residents of Pudukkottai, showing how digital payments are influencing local economic activities. The most commonly acknowledged benefit is Faster Transactions, cited by 70% of respondents (98 out of 140). This is followed by Reduced Cash Dependency (65%), indicating a significant shift toward a less-cash rural economy. These results suggest that the main benefits of FinTech in these areas are convenience and time savings compared to traditional banking. From a development standpoint, 55% of respondents mentioned Improved Access to Government Schemes, emphasizing UPI's vital role in the Direct Benefit Transfer (DBT) system. Additionally, 50% reported Increased Business Sales, especially among farmers and shopkeepers listed in Table 1, as digital payments help avoid lost sales due to lack of change. Finally, 40% acknowledged Better Record Keeping, reflecting growing financial awareness. Overall, these benefits demonstrate how the FinTech revolution promotes both individual convenience and broader economic growth in the district.

TESTING OF HYPOTHESIS

Chi-Square Test

Null Hypothesis (H_0) : There is no significant association between demographic variables (age, gender, education, occupation) and awareness of UPI among respondents.

Alternative Hypothesis (H_1) : There is a significant association between demographic variables (age, gender, education, occupation) and awareness of UPI among respondents.

S. No	Variable	df	Calculated χ^2 Value	Table Value (5%)	p-value	Result
1	Age vs Awareness	3	10.52	7.815	0.015	Significant
2	Gender vs Awareness	1	5.87	3.841	0.015	Significant
3	Education vs Awareness	3	12.34	7.815	0.006	Significant
4	Occupation vs Awareness	4	13.76	9.488	0.008	Significant

The Chi-square test was conducted to examine the association between demographic factors—such as age, gender, education, and occupation—and respondents' awareness of UPI. Results indicated that all variables had Chi-square values exceeding the critical threshold at the 5% significance level, with p-values below 0.05. This leads to the rejection of the null hypothesis and supports the alternative, demonstrating a meaningful relationship between demographic variables and UPI awareness. Thus, factors like age, education, occupation, and

gender play a significant role in respondents' familiarity with UPI. As a result, awareness of digital payment systems differs among various demographic groups.

ANOVA Test

Null Hypothesis (H_0): There is no significant difference in UPI usage among different demographic groups of respondents.

Alternative Hypothesis (H_1) : There is a significant difference in UPI usage among different demographic groups of respondents.

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F Value	p-value	Result
Between Groups	185.40	3	61.80	4.12	0.008	Significant
Within Groups	2039.60	136	15.00			
Total	**2225.00**	**139**				

An ANOVA test was conducted to assess whether there are significant differences in UPI usage across different demographic groups. The results indicate that the calculated F value is higher than the critical table value at the 5% significance level, and the p-value is less than 0.05.

Therefore, the null hypothesis is rejected, and the alternative hypothesis is supported. This indicates that respondents' demographic traits significantly impact UPI usage.

This indicates that variables such as age, education level, gender, and occupation influence how frequently respondents use UPI. Consequently, usage patterns vary among different groups and are not uniform across all respondents.

FINDINGS

The study indicates that the demographic makeup of respondents in rural Pudukkottai is diverse, with most falling into the middle-aged group (31–45 years). Awareness of UPI is relatively high, with 70% of respondents knowledgeable about digital payment methods, and many use them regularly for transfers and bill payments. Google Pay is the most widely used app among users. The results also show that UPI has significantly enhanced financial inclusion by making transactions simpler, increasing access to banking services, supporting savings, and improving loan access. However, challenges such as limited digital literacy, poor internet connectivity, and fear of fraud continue to hinder full adoption. Statistical tests like Chi-square and ANOVA reveal that demographic factors significantly influence both awareness and utilization of UPI. Overall, the findings suggest that UPI has positively influenced financial behavior in rural areas, although disparities persist across different demographic groups.

SUGGESTIONS

To increase the adoption and effective use of UPI in rural areas, targeted initiatives are essential. Community-based digital literacy programs should be conducted, especially for the elderly and less educated, to build their confidence with digital tools. Improving internet infrastructure in these regions is crucial for enabling smooth and reliable transactions. Awareness campaigns on cybersecurity and fraud prevention should be intensified to reduce fears and build trust. Financial institutions and FinTech companies should develop user-friendly apps with simple interfaces, local language options, and voice features to serve diverse users. Additionally, partnering with self-help groups (SHGs) can encourage digital payment usage among women. Offering incentives like cashback or transaction benefits can also motivate more people to adopt these services. These efforts will help bridge the digital divide and support inclusive financial growth.

CONCLUSION

The study reveals that UPI has become a vital tool for promoting financial inclusion and economic growth in rural Pudukkottai. Transitioning from traditional cash-based methods to digital payments has increased transaction efficiency, expanded access to financial services, and positively affected financial behavior among users. However, the benefits are uneven, with demographic factors significantly influencing awareness and usage rates. Challenges such as limited digital literacy, poor infrastructure, and security concerns still impede widespread adoption. The findings demonstrate that technological advances alone are insufficient without proper user education and support. A collaborative effort involving the government, financial institutions, and FinTech companies is essential for building a more inclusive digital ecosystem. With targeted initiatives, UPI can strengthen rural economies and foster sustainable financial inclusion throughout society.

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