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A COMPARATIVE ANALYSIS OF UPI ADOPTED AND NON-UPI SMALL MERCHANTS IN CHENNAI

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ABSTRACT

The comparative study of digital payment adoption (Unified Payments Interface (UPI) by Small Merchant Businesses (SMBs) in the area of Alandur, Chennai, explores the socio-economic and operational differences between UPI and Non-UPI adopters. This research relies upon how much digital integration has modified small merchants' daily business practices, customer interactions, and methodology for keeping financial records. The research design is descriptive in nature and utilized primary data collection through structured questionnaire and field surveys having a sample element of 50. The Secondary Data was used scholarly journals, proceedings and web sources for collection of related reviews and to enhance the theoretical framework. Merchants in Alandur can be clearly divided into two homogeneous strata. Stratification ensures fair representation of both groups and improves comparison accuracy. The statistical tools employed are Percentage analysis, Correlation, Regression, ANOVA and using SPSS enables merchants to compare and contrast themselves to either "Digital Adopters," who are taking advantage of the UPI capabilities and using to gain a competitive edge. Traditionalists who remain reliant upon cash due to the structural constraints currently in place. The findings from this study show that merchants in the UPI-adopted cluster experience higher levels of customer throughput and easier reconciliation of sales, in comparison to merchants in the UPI-non-adopted cluster, who express concern over potential technical failures.

Keywords

Unified Payments Interface, Digital Integration, Small Merchant Businesses, Homogeneous Strata and Structural Constraints

1. INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Over the past few years there has been a change from a cash-based economy that included cash deposits and withdrawals into a digital based economy with the development of Unified Payments Interface system (UPI) since its introduction in 2016. Prior to this, most small merchants received physical cash from their customers and as a result many issues arose like inefficiency, security risk & not being able to establish a formal record of business transactions resulted in many merchants being left out of the formal financial system. With UPI being introduced customers can transfer funds to businesses instantly. The introduction of UPI provided opportunities for digital credit trails to be created so now many merchants have found access to formal credit through their digital records and thus have been included in the formal financial system. Although UPI has provided an avenue for small merchants to conduct business there still remains gaps between those accepting UPI and those not, therefore we need to see what has created barriers to small merchants accepting digital payments.

1.2 NEED OF THE STUDY

The purpose of the study is to determine the gap between UPI adopters and non-adopters among small merchants and to determine what barriers exist that are preventing small merchants from adopting digital payments within their business.

1.3 INFLUENCE

The key factors influencing UPI adoption have been demonetisation, COVID-19 and advances in the technology associated with digital payment/Fintech as well as the increasing consumer preference for contactless payments.

1.4 PROBLEM STATEMENT

A sizeable portion of small merchants do not use UPI despite the ramp-up of digitisation. This is contrived through lack of awareness of UPI, fear that they will be victims of online fraud, and uncertainty of hidden costs, which creates a divide by which merchants gain limited digital access and maintain a level of competitiveness among one another.

1.5 THEORETICAL FRAMEWORK

The research on small merchants' use of UPI utilizes concepts from digital financial inclusion, technology adoption models (TAM), and financial intermediation theory. Further, concepts such as interoperability, building trust via sound boxes, and providing flow-based lending via digital credit trails help illuminate ways in which technology diminishes barriers to economic participation.

1.6 SIGNIFICANCE OF THE STUDY

This research presents UPI as a means of financial inclusion which empowers the informal sector merchants by facilitating access to credit, increasing merchant productivity, and supporting resilience in an overall digital economy.

1.7 STUDY OBJECTIVES

- To examine the merchants' socio-economic and business characteristics
- To determine the effects of UPI on merchant efficiencies and performance;
- To determine the barriers of merchant participation, such as trust and fear of fraud.

1.8 SCOPE OF STUDY

This study had a defined scope of attention on small merchants in Alandur, and examined the changing characteristics of payment transactions from cash to digital by evaluating the use of UPI payment methods, benefits of using UPI, evolving challenges associated with UPI adoption, and emerging technology associated with UPI, such as UPI Lite as well as voice operated payment processing.

2. SCHOLARLY REVIEW

The reviewed literature highlights the transformative role of Unified Payments Interface (UPI) in reshaping India's digital payment ecosystem, particularly for small merchants. Studies consistently emphasize that UPI has improved transaction efficiency by enabling direct peer-to-peer and person-to-merchant payments, eliminating intermediaries and reducing transaction costs. This has significantly enhanced accessibility for small vendors and informal businesses, encouraging wider participation in the digital economy (**Verma, 2018; Nair & Singh, 2019**).

A major theme across the literature is financial inclusion. UPI has integrated previously unbanked populations into the formal financial system by simplifying banking access through mobile-based platforms and virtual payment addresses. This has been

especially impactful in semi-urban and urban areas, contributing to economic participation and equality (**NCAER, 2019; Patel & Kumar, 2021**). Empirical studies on small vendors indicate that digital payments increase sales efficiency, reduce dependency on cash handling, and improve income stability (**Rajendran & Sivasubramanian, 2021; Bhatia, 2022**).

Recent studies focusing on vendor behavior reveal that while awareness and usage of UPI are increasing, the gap between adoption and effective utilization remains due to skill deficits and technological challenges (**Velmathi, 2021; Panda, 2022**). Comparative analyses indicate that UPI offers superior convenience, speed, and cost-effectiveness over traditional payment methods, but adoption disparities persist across different merchant segments (**Kumar et al., 2023**).

3. RESEARCH METHODOLOGY

3.1 INTRODUCTION

The research methodology is defined as an explanation of how the research is planned, carried out, and analyzed. In this research, the methodology is structured in such a way that it can compare UPI-adopted and non-UPI small merchants in the city of Chennai.

3.2 RESEARCH DESIGN AND APPROACH

In this research, a descriptive research design with a quantitative approach is used. In this research, data is collected using structured questionnaires and is further analyzed with the help of statistical tools.

3.3 AREA OF THE STUDY

In this research, the area of study is confined to the city of Chennai. Alandur is considered for this research because it has small retail and service businesses.

3.4 SOURCES OF DATA

In this research, both primary and secondary data are used. Primary data is collected through structured questionnaires. On the other hand, secondary data is collected from various sources such as journals, reports, NPCI, etc.

3.5 SAMPLING DESIGN

In this research, cluster sampling is used. In this research, Alandur is considered for this research. A stratified sampling method is used in this research.

3.6 SAMPLE SIZE AND DATA COLLECTION

The sample size is 50. The data was collected by structured questionnaires consisting of multiple-choice questions, Likert scales, and Yes/No questions.

3.7 VARIABLES OF THE STUDY

The independent variables are age, education level, business type, experience, and turnover. The dependent variables are UPI adoption, customer satisfaction, customer preference, ease of business, and challenges.

3.8 TOOLS AND TECHNIQUES OF ANALYSIS

The data was analyzed with the help of SPSS software. The independent 't' test and correlation were used.

3.9 ETHICAL CONSIDERATIONS

The data was collected voluntarily. The data was kept confidential and was used only for academic purposes.

3.10 LIMITATIONS OF THE STUDY

The study was conducted in Alandur in the city of Chennai. The sample size was small. The data collected was subjective and might be biased.

4. ANALYSIS AND INTERPRETATION

TABLE 4.1 OBJECTIVE 1: ANALYSIS FOR OBJECTIVE 1

Anova: Single Factor						
Groups	***Count***	***Sum***	***Average***	***Variance***		
Below SSLC	5	12	2.4	1.8		
SSLC / HSC	14	53	3.7857	2.3351		
Graduate	23	96	4.1739	1.2411		
No formal education	8	19	2.375	2.2678		
ANOVA						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	27.263	3	9.087	5.1778	0.003	2.8068
Within Groups	80.7364	46	1.7551			
Total	108	49				

TABLE 4.2 OBJECTIVE 2: ANALYSIS FOR OBJECTIVE 2

Particular	**No. of customer**	**UPI Exponential**
No. of customer	1	
UPI Exponential	0.3675	1

TABLE 4.3 OBJECTIVE 3: ANALYSIS FOR OBJECTIVE 3

Regression Statistics					
Multiple R	0.64				
R Square	0.417				
Adjusted R^2	0.351				
Standard Error	1.195				
Observations	50				
ANOVA					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	5	45.0695	9.0139	6.302	0.0001
Residual	44	62.930	1.4302		
Total	49	108			
	Coefficients	***Standard Error***	***t Stat***	***P-value***	
Intercept	6.58	1.026	6.41	8.35E-08	
Digital payment security features	-0.8364	0.3040	-2.7505	0.0086	
Scams	-0.4105	0.3739	-1.0979	0.2781	
No. of years	0.1092	0.1748	0.6250	0.5351	
Education	-0.0281	0.206	-0.1365	0.891	
Smartphone with an active plan	-0.65	0.43	1.49	0.14	

TABLE 4.4 COMBINE ANALYSIS OF ALL THREE OBJECTIVES

Objective	**Variables**	**Key Statistical Findings**	**Interpretation**

Socio-economic	Years of business, education, customers, awareness	• Years vs Trust: r = 0.0847 (very weak) - Years vs Awareness: r = 0.0178 (no relation) • Education (ANOVA): p = 0.00363 (significant) • Age (ANOVA): p = 0.0103 (significant)	Financial literacy is not driven by experience but by education and demographic factors, similar to Infosys employees where financial knowledge depends more on formal learning than tenure
Impact of UPI	Customers, UPI usage, business ease, sales	• Customers vs UPI benefit: r= 0.3676 (moderate +) • Customer demand vs ease: r = 0.4139 (moderate +) • UPI absence vs sales loss (t-test): p = 0.0201 (significant) • Regression: $R^2 \approx 41–47\%$	Reflects that financial tools improve outcomes only when effectively used, similar to employees where investments improve wealth but require proper management knowledge
Trust, fraud fear & barriers	Trust, awareness, fraud perception	• Awareness vs Trust: r = –0.5954 (moderate –) • Scam awareness vs Trust: $p < 0.05$ (significant) • Trust vs Ease: r = –0.6508 (negative) • Regression: Trust significant (p = 0.0021)	Higher financial awareness leads to risk-averse behaviour, similar to employees who avoid risky investments despite knowledge due to fear of loss

5. CONCLUSION

The findings of this study indicate that socio-economic factors such as education and age are key determinants in influencing UPI adoption among small merchants. The findings of ANOVA analysis also support this conclusion, with significant differences in education ($p = 0.0036$) and age ($p = 0.0103$) influencing UPI adoption. These findings are in line with Jain & Kumar (2020) and Velmathi (2021), which emphasized the importance of digital literacy in influencing technology adoption. The second conclusion of this study is that UPI adoption is positively correlated with business performance. A moderate positive correlation of 0.3676 between customer volume and UPI adoption, coupled with significant findings of the t-test analysis ($p = 0.0201$), indicate that UPI adoption is positively correlated with customer inflow and sales loss. These findings are in line with those of Rajendran & Sivasubramanian (2021) and Bhatia (2022), which found digital payments to be positively correlated with business performance.

The third conclusion of this study is that trust deficit and fear of digital fraud are key challenges in UPI adoption. A negative correlation of -0.5954 between awareness and trust, coupled with significant findings of regression analysis ($p = 0.0021$), indicate that trust deficit is negatively correlated with awareness. These findings are in line with those of Sharma & Patel (2021) and Singh (2020), which found trust deficit and fear of digital fraud to be key challenges in digital payments. The findings of this study reinforce the conclusion that UPI is positively correlated with business performance, but its adoption is also dependent on knowledge, perception, and behavioural factors.

5.1 SUGGESTIONS TO STAKEHOLDERS

For the digital payment ecosystem to be effectively strengthened, a multi-stakeholder approach is necessary, starting with government intervention. This involves government initiatives aimed at enhancing digital literacy and financial knowledge among small merchants so that they can effectively operate within the digital economy. This is achieved through the strengthening of national cybersecurity infrastructure, thereby ensuring the promotion of high-end features like UPI Lite and offline transactions, which ensure connectivity is never a barrier for commerce.

Financial institutions and fintech organizations act as the link between technology and the user, ensuring the development of secured applications that provide clear information on fraudulent activities. Apart from the application, financial institutions are responsible for ensuring the development of support systems specifically designed for small merchants. This

is further addressed by financial institutions through the provision of insurance products aimed at safeguarding small businesses from the potential financial implications of digital fraud. Lastly, for the digital payment ecosystem to be effectively strengthened, the involvement of small merchants and individual users is necessary. This is achieved through their proactive approach towards enhancing their digital literacy on security features while ensuring the adoption of best practices in digital transactions. This approach by the user acts as the first line of defense against cyber threats. Apart from security features, small merchants can use the data generated by UPI for organized record-keeping, which is essentially important in ensuring the acquisition of credit while expanding their businesses.

5.2 LIMITATIONS OF THE STUDY

The limitation of this study is mainly based on the scope and methodology, starting with geographical and demographical factors. This is mainly because the study was conducted only in the specific area of Alandur, Chennai, and thus the results obtained might not be applicable to other areas. In addition to this, the sample size of only 50 respondents is a challenge to generalize the results obtained to the larger population of small merchants. Another limitation based on methodology is that this study was conducted only with the merchants and not with the consumers and/or the financial regulators, which might have given a wider view of the subject. Another limitation is based on the fact that the data was based only on self-report measures and thus might have been limited by the inherent biases and/or errors of the participants. Finally, the dynamic nature of technological changes is a limitation based on time, and thus the results obtained might not be relevant in the future due to the innovations that might be introduced.

5.3 SUMMARIZATION

The inclusion of the Unified Payment Interface in the small-scale retail market marks a major leap in the development of a formal digital economy. However, its success is inextricably linked with the mitigation of the perceived risk. Despite the unparalleled speed and efficiency of the system, the "trust deficit" still remains the biggest hurdle for micro-entrepreneurs. For a business owner, whose very survival is at stake due to the daily cash cycle, a single fraudulent transaction or a technical glitch in the payment system, which freezes the payment, is not just an inconvenience but a setback for the business.

The way ahead in bridging this gap lies in developing a framework in collaboration with the government, fintech creators, and the end-user themselves. In order to make the

"last-mile" support system more robust, it is imperative to develop a system of grievance redressal mechanisms for the micro-entrepreneurs. It is only when they feel sufficiently secured in terms of robust cybersecurity and insurance mechanisms that they will feel empowered enough to look beyond basic transactions and leverage digital footprints for access to formal credit. Thus, it is not the technology itself but the development of a secure, transparent, and robust digital ecosystem that will ultimately lead to the success of the mission for universal financial inclusion.

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