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A Study on the Growth of UPI Transactions and Its Impact on Consumer Spending Behaviour: Evidence from Bengaluru Rural District

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ABSTRACT

Purpose: *The study aims to analyse the growth of the Unified Payments Interface (UPI) and its impact on consumer spending behaviour in Bengaluru Rural District. With increasing smartphone penetration and digital infrastructure, UPI has become a dominant payment system in India, processing over 200 billion transactions annually and influencing consumer financial habits and spending patterns.*

Design/Methodology: *The study adopts a descriptive and analytical research design. Primary data was collected from 200 respondents using a structured questionnaire, while secondary data was obtained from RBI, NPCI reports and academic literature. Statistical tools such as percentage analysis, Chi-square test and ANOVA were used to analyse relationships between variables like age, income, UPI usage and spending behaviour.*

Findings: *The findings indicate that UPI usage is high among respondents, with most preferring it for routine transactions. Chi-square results show a significant relationship between UPI usage and increased spending behaviour. ANOVA results reveal significant differences in spending across age and income groups. The study also finds that the convenience of digital payments reduces the "pain of paying," leading to higher transaction frequency and occasional impulsive spending.*

Keywords: *UPI, Consumer Behaviour, Digital Payments, Spending Behaviour, Financial Inclusion.*

Introduction

The Indian financial ecosystem has undergone a profound transformation in recent years, driven by rapid advancements in digital payment technologies. Among these, the Unified Payments Interface (UPI), introduced by the National Payments Corporation of India (NPCI) in 2016, has emerged as a revolutionary platform enabling instant, secure and real-time fund transfers through mobile devices. By integrating multiple bank accounts into a single interface and ensuring interoperability, UPI has simplified digital transactions and significantly strengthened financial inclusion across the country. Notably, UPI has witnessed exponential growth, processing over 200 billion transactions annually with transaction values exceeding ₹300 lakh crore in recent years, establishing India as a global leader in real-time digital payments.

The widespread adoption of UPI has been further accelerated by user-friendly applications such as Google Pay, PhonePe and Paytm, which have successfully penetrated both urban and rural markets. According to **Gupta and Arora (2020)**, the ease of use, low transaction cost and instant settlement features of UPI have made it one of the most preferred digital payment methods in India. Similarly, **Kumar et al. (2021)** highlight that the rapid proliferation of smartphones and affordable internet access

has played a crucial role in expanding UPI usage beyond metropolitan cities into semi-urban and rural areas. At the global level, digital payments are also witnessing rapid growth, with around 42% of adults in developing economies using digital payments in 2024, compared to 35% in 2021, indicating a significant shift towards cashless transactions.

Bengaluru Rural District, characterized by a blend of rural and semi-urban populations, provides an appropriate setting to examine this digital transformation. The district reflects the transitional nature of India's economy, where traditional cash-based practices coexist with emerging digital payment behaviours. **Sharma and Singh (2022)** observe that rural consumers are increasingly adopting digital payment systems due to government initiatives such as Digital India, improved banking access and growing trust in Fintech platforms.

Beyond improving transactional efficiency, UPI has also begun to reshape consumer spending behaviour. The convenience, speed and accessibility of digital payments reduce the psychological constraints associated with physical cash handling. **Soman (2003),** in his behavioural finance framework, argues that electronic payment methods reduce the "pain of paying," thereby increasing the likelihood of higher spending. Supporting this, **Raghavan and Srivastava (2021)** found that digital payment users tend to engage in more frequent transactions and exhibit a higher tendency toward impulsive purchases compared to cash users.

Furthermore, **Dhal and Goswami (2020)** note that digital payment systems enhance transparency and traceability, encouraging more organized and diversified spending patterns. However, the extent of these behavioural changes varies across demographic and geographic contexts, particularly in rural areas where digital literacy, infrastructure and awareness levels still pose challenges.

In this context, the present study aims to examine the growth of UPI transactions and analyse its impact on consumer spending behaviour in Bengaluru Rural District. By combining empirical analysis with recent national and international trends, the study seeks to contribute to the expanding body of literature on digital payments, financial inclusion and behavioural economics in emerging economies.

Statement of the Problem

The rapid growth of Unified Payments Interface (UPI) transactions has transformed India's digital payment landscape. While prior studies have focused on adoption, efficiency and financial inclusion, limited attention has been given to the behavioural impact of UPI, particularly in rural and semi-urban areas. There is a clear gap in understanding how increasing reliance on UPI influences consumer spending behaviour in such regions.

UPI's convenience and speed reduce dependence on cash and may alter traditional spending habits. The reduced "pain of paying" can lead to higher transaction frequency and impulsive purchases. However, these behavioural changes are not well examined in regions like Bengaluru Rural District, where factors such as digital literacy and income levels vary.

Therefore, this study aims to examine the impact of UPI usage on consumer spending behaviour in rural and semi-urban populations, addressing the existing gap in empirical research.

Objectives of the Study

- To examine the growth of UPI transactions.
- To analyse consumer usage patterns.
- To study the impact of UPI on spending behaviour.
- To test relationships between demographic variables and spending behaviour.
- To provide policy recommendations.

Hypothesis

H_{01}: There is no significant relationship between UPI usage and consumer spending behaviour.

H_{02}: There is no significant association between age group and frequency of UPI usage.

H_{03}: There is no significant relationship between income level and consumer spending behaviour.

Research Questions

- How has the growth of UPI transactions influenced consumer usage patterns in Bengaluru Rural District?
- What is the impact of UPI usage on consumer spending behaviour?
- Is there a significant relationship between demographic variables (age, income and occupation) and consumer spending behaviour?

Scope of the Study

The present study focuses on individual consumers in Bengaluru Rural District to understand their UPI usage patterns and its impact on spending behaviour. It excludes business and institutional users, concentrating only on consumer-level financial behaviour.

The study covers selected regions such as Devanahalli, Doddaballapur, Hoskote and Nelamangala, representing rural and semi-urban populations. It examines aspects like frequency and purpose of UPI transactions, preference for digital payments and the influence of UPI on routine spending, along with demographic factors such as age, income, education and occupation.

The analysis is limited to a specific study period and is based on primary data, reflecting localized trends. Therefore, the findings may not be generalized to other regions with different socio-economic conditions.

Review of Literature

Rajan (2019) highlighted the role of digital payment systems in promoting financial inclusion by reducing dependence on cash and integrating unbanked populations into the formal financial system. He noted that digital platforms enhance transparency and efficiency while contributing to economic formalization, though challenges such as digital literacy and infrastructure persist in rural areas.

Demirgüç-Kunt (2021) emphasized the global expansion of digital financial services, showing that digital payments improve access to financial services, especially in developing countries. She pointed out that mobile-based payments enable faster and secure transactions, though disparities in adoption and the need for financial education remain important concerns.

Reserve Bank of India (2022) reports indicate rapid growth in UPI transactions, highlighting its dominance as a retail payment system due to ease of use and interoperability. The reports also note increasing adoption in rural areas, supported by government initiatives, while raising concerns about cybersecurity and awareness.

Soman (2003) introduced the concept of the “pain of paying,” explaining that digital payments reduce the psychological burden of spending, often leading to higher spending and impulsive purchases. This provides a theoretical basis for understanding behavioural changes associated with UPI usage.

Kumar et al. (2021) found that digital payments increase transaction frequency and convenience, leading to shifts in spending habits. Similarly, **Gupta and Arora (2020)** identified ease of use, trust and incentives as key drivers of UPI adoption, particularly among younger consumers, influencing spending patterns.

Dhal and Goswami (2020) observed that digital payments improve convenience and transparency but may also lead to increased discretionary spending. They emphasized that behavioural changes vary across income levels and highlighted the need for more empirical studies in rural contexts.

Research Methodology

- **Research Design:** The study adopts a descriptive and analytical research design to examine the growth of UPI transactions and their impact on consumer spending behaviour. The descriptive aspect identifies patterns of UPI usage, while the analytical aspect examines relationships between demographic factors and spending behaviour, providing a comprehensive understanding of digital payment usage and its effects.
- **Sources of Data:** The study uses both primary and secondary data. Primary data is collected through a structured questionnaire covering UPI usage and spending behaviour, while secondary data is obtained from RBI and NPCI reports, journals and relevant publications to support analysis and interpretation.

- **Sample Size:** The study is based on 200 respondents from Bengaluru Rural District, which is considered sufficient for meaningful analysis. The sample captures diverse demographic characteristics, enhancing the reliability of the findings.
- **Sampling Technique:** Convenience sampling is used to select respondents based on accessibility and willingness. Though it limits generalization, it is suitable for this study and efforts are made to include diverse demographic groups.
- **Tools and Techniques of Analysis**
  - **Chi-Square Test:** The Chi-Square test is used in the study as it suitable for non-parametric data and identifies dependency between variables.
  - **ANOVA (Analysis of Variance):** ANOVA is also used to compare mean differences in spending behaviour across demographic groups such as age, occupation and income. It helps identify whether significant variations exist between groups by analysing variance within and between them, thereby explaining the influence of demographic factors on spending behaviour.

Data Analysis and Interpretation

Chi-Square Test 1: Relationship between UPI Usage and Spending Behaviour

Particulars	O	E	(O−E)	$(O-E)^2$	$(O-E)^2/E$
High–Increased	90	72	18	324	4.5
High–Not Increased	30	48	-18	324	6.75
Low–Increased	30	48	-18	324	6.75
Low–Not Increased	50	32	18	324	10.13

Source: Field Survey

Total $\chi^2 = 4.50 + 6.75 + 6.75 + 10.13 = 28.13$

df = (2−1)(2−1) = 1

Table value @ 5% = 3.84

Interpretation: The calculated value (28.13) is higher than the table value (3.84) at the 5% significance level. Therefore, the **null hypothesis is rejected** and the **alternative hypothesis is accepted**. This indicates a significant relationship between UPI usage and consumer spending, meaning higher UPI usage is linked to increased spending.

Chi-Square Test 2: Association between Age Group and Usage Frequency

Particulars	O	E	(O−E)	$(O-E)^2$	$(O-E)^2/E$
18–30 High	70	54	16	256	4.74
18–30 Low	20	36	-16	256	7.11
31–50 High	40	42	-2	4	0.1
31–50 Low	30	28	2	4	0.14
51 & Above High	10	24	-14	196	8.17
51 & Above Low	30	16	14	196	12.25

Source: Field Survey

Total $\chi^2 = 32.51$, df = (3−1)(2−1) = 2, Table value (5%) = 5.99

Interpretation: The calculated value (32.51) is higher than the table value (5.99) at the 5% significance level. Therefore, the null hypothesis is rejected. This shows a significant relationship between age and UPI usage frequency, with younger people (18–30) using UPI more than older groups.

Chi-Square Test 3: Relationship between Income Level and Spending Behaviour

Particulars	O	E	(O−E)	$(O-E)^2$	$(O-E)^2/E$
Low–Increased	30	42	-12	144	3.43
Low–Not Increased	40	28	12	144	5.14
Mid– Increased	60	48	12	144	3
Mid–Not Increased	20	32	-12	144	4.5
High– Increased	30	30	0	0	0
High–Not Increased	20	20	0	0	0

Source: Field Survey

Total $\chi^2 = 16.07$, df = (3−1)(2−1) = 2, Table value = 5.99,

Interpretation: The calculated value (16.07) is higher than the table value (5.99) at the 5% significance level. Therefore, the null hypothesis is rejected. This indicates a significant relationship between income level and consumer spending, meaning spending patterns differ across income groups.

ANOVA TEST: Spending Behaviour across Income Groups

Source of Variation	SS	df	MS	F
Between Groups	450	2	225	**5.62**
Within Groups	7900	197	40.1	
Total	8350	199		

Source: Field Survey

Interpretation: The ANOVA results indicate that there are differences in spending behaviour across different income groups. The calculated F-value is **5.62**, while the table value at the 5% level of significance is **3.04**. Since the calculated value (**5.62)** is greater than the table value (**3.04**), the null hypothesis is **rejected** and the alternative hypothesis is **accepted**. This implies that there is a statistically significant difference in consumer spending behaviour among different income groups, suggesting that income level plays an important role in influencing spending patterns.

Findings of the Study

- UPI usage is significantly high among respondents in Bengaluru Rural District.
- A strong relationship exists between UPI usage and increased consumer spending behaviour.
- Younger consumers (18–30 years) are the most frequent users of UPI services.
- Middle-aged consumers show moderate adoption, while older age groups exhibit lower usage levels.
- Income level significantly influences consumer spending behaviour.
- Significant variation exists in spending behaviour across different income groups (ANOVA results).
- Consumers prefer UPI over traditional payment methods due to convenience and speed.
- The majority of respondents use UPI for daily transactions such as groceries, bill payments and recharges.
- Increased frequency of UPI usage is associated with higher transaction frequency.
- Digital payments reduce the dependency on cash among rural and semi-urban consumers.
- The ease of UPI transactions reduces the “pain of paying,” leading to increased spending.
- Impulsive buying behaviour is observed among frequent UPI users.
- Cashback offers and incentives play a significant role in encouraging UPI usage.
- Higher-income groups tend to spend more through UPI compared to lower-income groups.
- Lower-income groups use UPI primarily for essential transactions rather than discretionary spending.
- There is a significant association between age group and frequency of UPI usage (Chi-square results).
- A significant relationship exists between income level and spending behaviour (Chi-square results).
- Digital literacy positively influences the adoption and usage of UPI.
- Network connectivity and smartphone availability impact UPI usage in rural areas.
- Overall, UPI has contributed to a shift towards a cashless economy and transformed consumer spending behaviour in the study area.

Recommendations

- There is a need to promote awareness among consumers regarding responsible spending while using UPI platforms, as the ease of transactions may lead to impulsive purchases.

- UPI service providers should introduce integrated budgeting and expense-tracking tools within their applications to help users monitor and control their spending behaviour.
- Government and financial institutions should strengthen digital literacy programs, especially in rural and semi-urban areas, to improve user confidence and effective usage of UPI.
- Cybersecurity measures must be enhanced to protect users from fraud and data breaches, thereby increasing trust in digital payment systems.
- Financial awareness initiatives should be conducted to encourage proper financial planning and disciplined spending among users.
- Regular awareness campaigns should be organized to educate consumers about safe digital payment practices and the risks associated with excessive usage.
- Incentive schemes such as cashback and rewards should be structured carefully to promote usage without encouraging unnecessary spending.
- Improvement in digital infrastructure, particularly internet connectivity in rural areas, is essential for seamless UPI transactions.
- Banks and Fintech companies should provide user-friendly interfaces and multilingual support to increase accessibility among diverse population groups.
- Policymakers should frame supportive regulations that encourage digital payment adoption while ensuring consumer protection and financial stability.

Conclusion

The study concludes that UPI has significantly transformed consumer payment behaviour in Bengaluru Rural District, reflecting wider digital finance trends. In India, UPI has grown rapidly, becoming the world's leading real-time payment system. Statistical results (Chi-square and ANOVA) show that UPI usage significantly affects consumer spending and varies by age and income, with convenience driving higher usage and spending. This aligns with global trends showing a rise in digital payments. While UPI improves financial inclusion and efficiency, it also influences spending patterns, emphasizing the need for responsible usage.

Limitations of the Study

- The study is limited to a sample size of 200 respondents, which may not fully represent the entire population. A larger sample could provide more comprehensive and generalizable results.
- The research is confined to Bengaluru Rural District and therefore the findings may not be applicable to other regions with different socio-economic conditions.
- The study is based on self-reported data collected through questionnaires, which may be subject to respondent bias or inaccuracies.
- The study was conducted within a limited time frame, which may have restricted the depth of data collection and analysis.

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