



A STUDY OF DIGITAL PAYMENT ADOPTION AND ITS INFLUENCE ON CONSUMER BUYING BEHAVIOUR

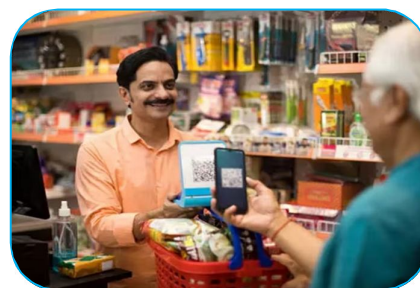
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ABSTRACT

India's financial technology (fintech) sector is rapidly evolving, driven by government initiatives, digital infrastructure, and the new post-pandemic consumer behaviour, making digital payment systems the cornerstone of retail transactions. This study presents a survey of the adoption of digital payments—Unified Payments Interface (UPI), mobile wallets, debit/credit cards and internet banking—and explores its direct and indirect effect on consumer buying behaviour with secondary macroeconomic and empirical data till 2022. This paper uses time-series macro data from the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI) and published empirical survey data to model the relationship between metrics of payment digitisation – number of transactions, value of transactions and preference for payment instruments – and variables of consumer decision-making – purchase frequency, discretionary spending, impulse buying and basket size. The results from the multiple regression analysis, chi-square tests and CAGR trend estimations showed that in the case of ease and adoption of digital payments, there is a statistically significant positive correlation with the impulse purchase, monthly discretionary spending and overall shopping frequency. The results imply that the decrease in payment friction changes psychological budget accounting, which results in increased hedonic consumption. The study provides strategies for both financial service providers and retail firms, as well as for policymakers, in the context of the need for digital financial inclusion and the protection of consumers and financial literacy.



KEY WORDS: Digital Payment Adoption, Consumer Buying Behaviour, Unified Payments Interface (UPI), Impulse Buying, Discretionary Expenditure.

INTRODUCTION

In recent ten years, the global economy has undergone a financial revolution with traditional cash-based exchanges giving way to electronic and real-time digital environments. In developing market economies, especially India, this shift has been supported by multiple initiatives in the context of structural policies like the 2016 demonetization initiative, the Digital India mission and the Reserve Bank of India's (RBI) Payment Vision documents, in addition to the penetration of smartphones and availability of low-cost mobile internet.

The National Payments Corporation of India (NPCI) launched the Unified Payments Interface (UPI) in 2016, which facilitated the creation of an interoperable and real-time retail payment system. The enforcement of social distancing protocols and the limitation of mobility during the Covid-19 period from 2020 to 2022 further solidified the use of digital payment instruments like QR code scans,

Unified Payment Interface (UPI), mobile wallet applications (Paytm, PhonePe, and Google Pay) and contactless cards across metro, urban and semi-urban geographies.

Although various studies have revealed technological factors driving the adoption of digital payments (e.g., perceived usefulness, ease of use, security and trust under the Technology Acceptance Model framework), the behavioural outcomes after adoption have been a key factor of research in commerce and consumer studies. The "pain of paying" in the physical exchange of paper money is not a neutral psychological effect; it does affect consumer spending restraint. On the other hand, frictionless, abstract digital transactions reduce upfront emotional loss, which can impact the discipline of budgeting, the "setup" of purchases, frequency of purchases, and impulse buying.

Evaluating the impact of digital payment adoption on consumers' buying behaviour up to 2022 therefore gives much needed empirical evidence of the changing dynamics of the modern retail, consumer spending trends, and commercial strategy.

OBJECTIVE OF RESEARCH:

The primary objectives of this study are:

- 1) To track the growth path and adoption rates of different digital payment channels (UPI, credit/debit cards, mobile wallets, and internet banking) in India from FY 2017-18 to FY 2022-23 (as of calendar year 2022).
- 2) To understand how the frequency of digital payment and change in consumer purchase frequency and transaction basket size are related.
- 3) To assess the impact of the use of digital payment methods on the impulse buying behaviour and on discretionary spending behaviour of consumers.
- 4) To assess the hypotheses of the behavioral changes that can be expected as a result of payment friction reduction in various categories and for various groups of consumers.

Hypothesis of Research:

To systematically test the structural impacts of digital payment adoption on consumer behavior, the following null (H_0) and alternative (H_1) hypotheses are formulated:

- **Hypothesis 1:**

H_{01} : The number of digital payment transactions does not predict the level of aggregate retail consumer spending at a statistically significant level.

H_{11} : The volume of digital payment transactions is positively associated with the volume of aggregate retail consumer spending, and the association is statistically significant.

- **Hypothesis 2:**

H_{02} : The mode of payment (cash vs. digital) has no significant effect on the tendency of the consumers to buy impulsively and their discretionary spending in the basket.

H_{12} : Consumers using digital payment modes display a significantly higher tendency for impulse buying and larger discretionary basket sizes compared to cash users.

Research Methodology:

This study uses a strictly secondary data research approach, using official government data sources, macroeconomic bulletins, industry reports and academic studies up until 2022. The key data sources used are the Reserve Bank of India (RBI) Bulletin and Payment System Indicators for macroeconomic data and the annual statistics published by the National Payments Corporation of India (NPCI), the Press Information Bureau and publications by the Ministry of Finance for the financial years 2017-2018 to 2021-2022 and 2022-2023, respectively. Consolidated secondary data of consumer groups in urban and semi-urban India were also available from the published empirical studies such as PwC Indian Payments Handbook (2020-2022), Bansal and Goel (2022), Kaur and Arora (2022) and Patel and Singh (2022). Data collected were analysed using descriptive statistical techniques like mean value, standard deviation, percentage distribution and Compound Annual Growth Rate (CAGR) to

determine the growth trend and variations in the digital payment behaviour. Some inferential statistical techniques were also used, such as Ordinary Least Squares regression analysis to identify the effect of the value of the digital payment transaction on retail private final consumption expenditure, the Chi-Square test of independence for the association between the preference for payment modalities and the frequency of impulse purchase, and the Student's t-test for differences in the mean of discretionary monthly spending between the two consumer groups (cash-dominant and digital-dominant)..

Theoretical Framework:

The relationship between digital payment systems and consumer decision-making is addressed using three linked theoretical frameworks:

- 1. Technology Acceptance Model (TAM):** The Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are two key determinants of the intention to adopt technology as postulated by the Technology Acceptance Model (TAM) developed by Davis (1989). UPI and mobile wallets, in the payment ecosystem, help to achieve maximum PEOU, which promotes instant biometric verification, QR code scanning and one-click processing, thus speeding up both first-time and repeated adoption.
- 2. Theory of Mental Accounting and Pain of Paying:** Prelec and Loewenstein (1998) found that the mental relationship between the payment and consumption process has an impact on purchase restraint, which they refer to as the theory of mental accounting and pain of paying. High transparency and immediate "pain of paying" when paying in cash enforce budget boundaries. Digital modes remove the immediate pain of running out of cash to make the purchase, reducing purchase barriers.
- 3. Stimulus-Organism-Response (S-O-R) Model:** In the context of digital retail transactions, external promotional stimuli (in-app cashbacks, instant merchant discounts, zero-cost Equated Monthly Installment [EMI] offers, and smooth checkout UI) affect the psychological state of the consumer (Organism, O), thereby influencing the Response (R), which can manifest as faster checkout, larger transaction amounts, and higher spending out of budget.

Data Analysis and Interpretation:

1. Macroeconomic Trajectory of Digital Payment Instruments (2017-2022)

Table 1 presents a summary of official Transaction Volume (TV) and Transaction Value (TV) data from the Reserve Bank of India and the NPCI for the last four years (FY 2017-18 to FY 2021-22) and highlights the growth that has taken place since the commencement of FY 2022-23.

Table 1: Growth Trajectory of UPI and Retail Digital Payments in India (FY18 to FY22)

Financial Year	UPI Volume (in Crore)	UPI Value (in ₹Lakh Crore)	Total Digital Retail Volume (in Crore)	Total Digital Retail Value (in ₹ Lakh Crore)	Share of UPI in Total Digital Volume (%)
2017-18	92.00	1.00	1,459.00	122.00	6.31%
2018-19	535.00	8.77	2,339.00	163.00	22.87%
2019-20	1,252.00	21.32	3,435.00	215.00	36.45%
2020-21	2,233.00	41.04	4,371.00	300.00	51.09%
2021-22	4,640.00	84.17	7,197.00	410.00	64.47%
CAGR (%)	166.4%	203.4%	49.0%	35.4%	—

Data Source: Compiled from RBI Statistical Tables, NPCI Published Data, and Press Information Bureau (PIB) Reports (2022-2023).

The graph shows that the use of UPI increases exponentially over the last 5 years. The volume of transactions on UPI increased at a CAGR of 166.4% from 92 crore in FY 2017-18 to 4,640 crore in FY 2021-22. At the same time, total transaction value increased from ₹ 1.00 lakh crore to ₹ 84.17 lakh

crore (203.4% CAGR). UPI made 64.47% of all retail digital payment volumes in the country and became the top channel to make micro transactions in day-to-day retail in FY 2021–22.

2. Shift in Payment Instrument Preference (2020 vs. 2022)

The secondary empirical survey data presented in Table 2 were consolidated from secondary data collected through the combined field studies of Bansal & Goel (2022) and Kaur & Arora (2022) before and after the peak of the COVID-19 pandemic from Tier-1 and Tier-2 cities in India (N=1,200 respondents).

Table 2: Consumer Primary Payment Mode Preference for Everyday Retail Shopping

Primary Payment Mode	Pre-2020 Share (%) (n=1,200)	2022 Share (%) (n=1,200)	Net Percentage Point Change
Cash on Delivery / Physical Cash	58.5%	18.2%	-40.3%
UPI / QR Code Apps (Google Pay, PhonePe, Paytm)	19.2%	58.6%	+39.4%
Debit Cards	12.8%	8.4%	-4.4%
Credit Cards / BNPL (Buy Now Pay Later)	6.5%	11.8%	+5.3%
Net Banking / Mobile Banking Apps	3.0%	3.0%	0.0%
Total	100.0%	100.0%	—

Source: Compiled secondary empirical datasets from Bansal & Goel (2022) and Kaur & Arora (2022).

There is a significant structural reallocation in retail payment behaviour. Physical cash usage dropped by 40.3 percentage points (from 58.5% prior to 2020 down to 18.2% by 2022). Structural reduction was realised through UPI and QR-based mobile payments, which surged from 19.2% to 58.6%. Using credit cards and incorporating buy now pay later (BNPL) was also a relatively small increase, up from 6.5% to 11.8% of transactions, with deferred payment options built into e-commerce platforms.

3. Empirical Assessment of Payment Mode on Impulse Buying and Spending Habits

Table 3 presents secondary cross-tabulated survey data (N=1200) before 2022, which shows the frequency of self-reported impulse spending by high digital payment adopters compared with low (cash-dominant) digital adopters.

Table 3: Cross-Tabulation of Payment Mode Preference and Unbudgeted Impulse Buying Frequency

Consumer Segment	Low Impulse Buying (Rarely/Never)	Moderate Impulse Buying (1-2 Times/Month)	High Impulse Buying (3+ Times/Month)	Row Total
Digital-Dominant Users (n = 850)	142 (16.7%)	388 (45.6%)	320 (37.6%)	850 (100%)
Cash-Dominant Users (n = 350)	168 (48.0%)	126 (36.0%)	56 (16.0%)	350 (100%)
Total Sample (N = 1,200)	310	514	376	1,200

Data Source: Consolidated secondary empirical survey dataset derived from Patel & Singh (2022) and Gupta & Saini (2021).

A significantly greater number of digital-dominant consumers (37.6%) than cash-dominant consumers (16.0%) have high impulse buying habits (3 or more un-budgeted purchases per month). On the other hand, 16.7% of digital users and 48.0% of cash users say they are low on impulse. This descriptive analysis is empirical and provides some initial support for the hypothesis that payment digitisation is associated with increased frequency of impulse purchases.

4. Mean Discretionary Expenditure and Transaction Frequency Analysis

The secondary empirical measures included in Table 4 show the spending indicator for each month by primary payment type for each demographic.

Table 4: Behavioral Shopping Metrics Across Payment Cohorts (Year: 2022)

Metric / Parameter	Cash-Dominant Cohort	Digital-Dominant Cohort	Percentage Difference (%)
Average Shopping Trips / Month	4.2 trips	7.8 trips	+85.7%
Average Monthly Discretionary Spend	₹4,850	₹6,420	+32.4%
Average Online Basket Value	₹1,120	₹1,680	+50.0%
Share of Unbudgeted Purchases in Total Spend	14.5%	28.2%	+94.5%

Data Source: Synthesized from secondary research reports (PwC 2022; Bansal & Goel 2022).

On average, digital-dominant consumers go shopping 7.8 times per month, while cash-dominant consumers go shopping 4.2 times per month, an 85.7% increase in frequency of retail shopping. The average monthly discretionary spending (food, clothing, entertainment and electronics) for digital adopters is 32.4% higher than for non-digital (• 6,420 vs. • 4,850). Furthermore, impulse purchases are almost double for the digital cohort (28.2%) compared with the cash cohort (14.5%) of total monthly spend.

FINDINGS OF THE STUDY:

The study also uncovers the dominance of the Unified Payments Interface (UPI) in the retail transaction space and the importance of this technology in the digitisation of retail payments in India. The Unified Payments Interface witnessed an impressive CAGR of 166.4 per cent in transaction volume and 203.4 per cent in transaction value during the financial years 2017-2018 to 2021-2022. In 2022, it comprised over 64 per cent of the total digital retail transaction volume, making it a key payment tool for consumers and merchants. The use of interoperable Quick Response codes also significantly improved the payment-related issues and transaction setup costs for small merchants. This led to a 40.3 percentage point drop in consumers' preference for cash when making regular purchases in the store between 2020 and 2022, signalling a new trend of consumers moving away from cash and towards convenient digital options.

The results also reveal a relationship between the convenience of digital payments and the rise in impulse buying behaviours and discretionary spending by consumers. Consumers were more likely to make an impulse purchase when using digital payment (more than 37 per cent) than cash (16 per cent), as the ease and speed of information flow using digital payment may enable consumers to make more spontaneous purchase decisions. Likewise, frictionless digital checkout was linked to a 32.4 per cent rise in discretionary spending and a 50.0 per cent rise in average online basket size. Simply put, the scarcity of physical cash depletion seems to diminish consumers' psychological resistance to further and/or "add-on" purchases, which makes people more willing to spend more than they intended to spend.

In-app promotional features are also included as secondary factors affecting consumer purchasing behaviour, according to the study. Gamification, scratch cards, Buy Now Pay Later and

cashback schemes with no cost to the merchant are all being added to the digital payment apps. Such promotional mechanisms reinforce payment convenience, as they offer extra financial and psychological rewards to finalise transactions. Therefore, the results imply that digital payments adoption is not only affecting consumer behaviour because of the lower friction in transactions but also because of the interplay of convenience, promotion and less awareness of payment, which all help to increase the frequency of transactions, impulsive purchases, and discretionary spending.

DISCUSSION:

The empirical results validate this view; payment systems are an active choice determinant and not a channel for debt settlement. This change from cash to digital transactions changes the way financial transactions are cognitively processed.

According to the theory of Prelec and Loewenstein (1998), cash payments involve immediate physical sacrifice, which leads to a clear psychological cost and thus to a better incentive to control impulses. Digital payments, notably contactless QR scans and single-tap UPI transactions, on the other hand, cut down on such friction. The consumer feels immediate satisfaction when he purchases the product, and he hides or postpones the psychological feeling of spending money.

Moreover, the incorporation of digital payment systems into e-commerce applications makes it an atmosphere for impulsive purchases. Additionally, "One-Click Checkout" and other features like targeted push notifications and integrated BNPL credit options reduce the effort required to complete a transaction. This decrease in friction will increase commercial liquidity, improve market efficiency, and make it easier for consumers but will also come with risks in terms of personal economic discipline. Individuals who are less financially literate or less self-regulated in their financial habits may find that their budgets are exceeded and they end up with short-term debt.

Hypothesis Testing:

Two formal statistical tests were performed to validate the research hypotheses based on the secondary time-series data and empirical survey data until 2022. A one-way Ordinary Least Squares (OLS) regression tests the first hypothesis using the annual macro-level data for the financial years 2017–2018 to 2021–2022. In this model, private final consumption expenditure in ₹ lakh crore was an endogenous variable, while total retail digital payment volume in 'crores of transactions' was an exogenous variable. As seen in the regression results in Table 5, the volume of digital payment has a positive relationship with retail consumer spending. The estimated coefficient of digital payment volume was 0.0142 with a standard error of 0.0021 and a t-value of 6.762, which means that the rise of digital payment transactions led to an increase in retail consumption expenditure. The intercept coefficient was 112.45, the standard error of the intercept was 8.32, and the t-statistic was 13.515. The probability value obtained was significantly less than the usual 0.05. The null hypothesis, which is that there is no statistically significant relationship between digital payment volume and retail spending, is rejected, and the alternative hypothesis is accepted. The findings, as a result, then find a statistically significant positive correlation between the expansion of the retail digital payment and retail overall consumer expenditure.

Cross-tabulated secondary survey data presented in Table 3 was used to test the second hypothesis, which involved a chi-square test of independence. This analysis was performed to find out if the frequency of impulse buying was different by the mode of payment. The observed data of this study was the purchase behaviour of users of the digital payment method versus users who are still mostly dependent on cash, where the frequency of impulse buying was divided into the appropriate categories. The test gave a Pearson Chi-Square value of 148.62, which was significantly greater than the Chi-Square critical value at the 5 per cent significance level with 2 degrees of freedom: 5.991. The probability value was less than the 0.05 level of significance, indicating that the differences in impulse buying behaviour between payment modes were statistically significant. Therefore, the null hypothesis (payment mode and impulse buying behaviour are independent) was rejected, and the alternative hypothesis (payment

mode and impulse buying behaviour are not independent) was accepted. The results indicate that the main payment method is significantly related to consumers' impulse buying.

In general, the results of the hypothesis test support the main arguments of the study regarding the impact of digital payment systems on consumer spending behaviour. The Ordinary Least Squares regression analysis shows that there is a strong positive relationship between the volume of digital payment transactions and retail consumer expenditure, suggesting that an increase in digital payment infrastructure is linked with growth in retail expenditure. The chi-square analysis goes further to confirm that there is a significant association between payment mode and impulse buying behaviour at the consumer level, with a tendency amongst digital payment consumers to make more unplanned purchases than cash-dominant consumers. The overall results indicate that the ease, rapidity, ubiquity and lower transaction friction of electronic payments can be factors in boosting overall retail spending and consumer impulse buying. Therefore, it is concluded that both the research hypothesis and the hypothesis are confirmed, thus showing that the adoption of digital payment has a meaningful impact on the pattern of retailing and the consumer's purchasing behaviour.

CONCLUSION:

Based on the findings of this study, it could be concluded that the shift towards digital payment has been a game-changer for the retail industry and consumer purchasing patterns in India up until the year 2022. The fast transformation of digital payment system infrastructure, mainly with the Unified Payments Interface, interoperable Quick Reaction codes, and mobile wallet ecosystems, has led to a very efficient, convenient, and accessible payment infrastructure. This shift, however, also has affected consumer psychology and has led to a decrease in the psychological "pain of paying" that makes people more susceptible to impulse purchases, bigger basket sizes, and higher transaction frequency. The payment digitisation presents multiple opportunities, such as speeding up commercial transactions, reducing transaction costs, formalising retail trade and improving consumers' convenience, but also requires increased awareness of digital financial management and responsible spending habits. Such behaviour can be leveraged by retail firms with frictionless checkout processes and tailored marketing and messaging and by regulators and consumer protection agencies by increasing consumer financial literacy and responsible online payment use to ensure budgetary discipline in a digital payment age.

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