

# Digital Payment Trends Across Merchant Categories An Analysis of UPI Transactions

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**Abstract**—Aggregate UPI statistics conceal substantial heterogeneity in how different classes of merchants are absorbing digital payments. This paper examines person-to-merchant UPI activity through Merchant Category Codes (MCCs), comparing the published category-wise classification for January 2026 and June 2026. The study maps the composition of merchant transactions across categories, measures category-wise growth, decomposes the sources of incremental volume, and assesses the internal consistency of the published value data. Twenty-nine reported categories and a residual group are analysed on volume, value, share, growth, average ticket value (ATV) and contribution to incremental volume, using share and growth analysis, the Herfindahl-Hirschman Index, the paired t-test, the Wilcoxon signed-rank test, Spearman's rank correlation and Levene's test. Merchant volume rose from 13,608.10 million to 14,427.88 million transactions, a growth of 6.02 per cent, while reported value rose only 2.40 per cent, reducing system-wide ATV from Rs. 617.89 to Rs. 596.76. Activity is heavily concentrated in everyday provisioning, with groceries and supermarkets accounting for 25.92 per cent of merchant volume and the top five categories for 68.94 per cent. Growth was narrow: groceries and supermarkets alone generated 39.01 per cent of incremental volume, while telecom, food service and online marketplaces declined in absolute terms and medium-transacting categories grew at nearly twice the system rate. A Wilcoxon signed-rank test confirms a significant rise in category volumes ( $p = 0.007$ ), while growth is independent of initial category size ( $\rho = 0.286$ ,  $p = 0.132$ ). The study also reports a methodological finding: category-level value data are highly unstable, with 16 of 29 categories recording ATV changes above 50 per cent (range  $-97.05$  to  $+1,149.31$  per cent) against bounded volume movement of  $-6.19$  to  $+22.63$  per cent — a variance ratio exceeding 1,000:1 that no behavioral account explains. The instability is concentrated in the January value column, and volume-

based indicators are therefore the reliable basis for category-level inference.

**Index Terms**—Average Ticket Value, Data Quality, Digital Payments, Merchant Category Code, Unified Payments Interface.

## I. INTRODUCTION

India's retail payment landscape has been reorganized within a single decade around one piece of digital public infrastructure. The Unified Payments Interface, launched by the National Payments Corporation of India (NPCI) in 2016, allows instant account-to-account transfers from a mobile device with one-click two-factor authentication and, for personal use, no transaction charge. What began as a peer-to-peer remittance convenience has become the default settlement mechanism for everyday commerce, from vegetable vendors and tea stalls to fuel pumps, pharmacies and organized retail chains.

The scale of this shift is well documented in aggregate; its composition is not. Monthly statistics report how many transactions occurred and their total value, but say nothing about where they occurred or what kind of merchant received them. That distinction matters. If growth comes from consumers using UPI more often at the same grocery shop, the implication is habit consolidation; if it comes from newly onboarded categories, the implication is frontier expansion. The two require different interventions.

Merchant Category Codes provide the natural instrument for such enquiry. An MCC is a four-digit code, standardized under ISO 18245 and long used by card networks, identifying a merchant's primary line of business. NPCI has embedded MCCs within UPI

acceptance infrastructure and has recently begun publishing a monthly classification of merchant transactions by category [1], opening a level of granularity previously unavailable outside the payment networks.

This study uses two such disclosures — January 2026 and June 2026 — to examine how digital payment behaviour is distributed across merchant categories and how that distribution is changing. The five-month interval limits claims about long-run structural change, but is also an advantage: over so brief a window genuine consumer behaviour is unlikely to shift dramatically, so extreme movement becomes diagnostically interesting. As the analysis shows, this proves to be the case, and the paper accordingly develops both a substantive account of merchant-category trends and an assessment of the reliability of the disclosures themselves.

## II. REVIEW OF LITERATURE

Research on UPI has developed along three lines: consumer adoption studies grounded in technology acceptance theory, merchant-side adoption studies, and macro-level assessments of digital payment growth. Four studies are reviewed because together they define both the state of knowledge and the gap addressed here.

A. Ligon, Malick, Sheth and Trachtman (2019) — The Merchant-Side Puzzle

Studying small-scale merchants in Jaipur, Ligon and colleagues [2] asked why digital payment technologies were being adopted so slowly despite favorable conditions. Awareness was high but usage low, and the binding constraint was economic and informational rather than technological: merchants overestimated the costs of acceptance, underestimated demand, and were reluctant to make revenues visible for tax purposes. Where adoption did occur, the drivers were customer demand, demonetization and perceived ease of use. The central contribution is the demonstration that merchant adoption is a distinct phenomenon from consumer adoption, governed by a different cost-benefit calculus. Its limitation here is that it is a single-city survey at an early point on the diffusion curve, and cannot speak to how adoption has since differentiated across lines of business.

B. Fahad and Shahid (2022) — Diffusion Theory and the Compatibility Problem

Applying Rogers' diffusion of innovation framework to UPI adoption in India, Fahad and Shahid [3] tested relative advantage, compatibility, complexity, trialability and observability. Their findings largely supported the framework with one exception: compatibility was not a significant predictor. The authors attributed this to UPI's early diffusion phase, the continued dominance of cash in small payments, and UPI's unavailability across every transaction context users encountered. This matters for the present study, because it implies that category coverage was itself an active constraint on adoption. If that constraint has eased, the evidence should appear as broadening across merchant categories rather than merely higher volumes within existing ones. The study, however, rests on consumer survey data at one point in time and observes no transaction records.

C. Sinha and Singh (2023) — Merchant Experience and Continued Use

Sinha and Singh [4] examined merchants' behavioral intention to use mobile payment services, with attention to the moderating and mediating role of perceived experience. Accumulated experience with the payment system was found to condition materially the relationship between standard adoption antecedents and continued usage: a merchant who has used the system and found it reliable responds quite differently to considerations of effort and risk than one who has not. The study thus shifts the question from initial adoption to sustained use, which is the more relevant question once penetration is high. It remains perception-based, establishing that experience matters without observing how sustained use varies across merchant types in transaction data.

D. Padma Kiran and Vedala (2025) — UTAUT, Trust and Promotional Benefits

The most recent of the four applies an extended Unified Theory of Acceptance and Use of Technology model [9] to 416 UPI users using PLS-SEM. Padma Kiran and Vedala [5] found that facilitating conditions, performance expectancy, effort expectancy, social influence, perceived promotional benefits and perceived trust all significantly influenced adoption intention, which in turn drove usage behaviour. Add-on services did not affect

adoption intention, though they affected performance and effort expectancy — interpreted as reflecting limited familiarity with the wider service bundle. Age and occupation moderated some relationships; gender and income did not. The study is rigorous and current, but the authors themselves note that reliance on self-reported data introduces bias, and explicitly recommend that future research integrate objective data such as transaction histories. The present paper responds directly to that recommendation.

#### E. Research Gap

Read together, these studies establish a consistent picture. Adoption determinants on both consumer and merchant sides are well theorized and repeatedly validated. What remains unexamined is the outcome of that adoption as distributed across lines of business. Every study reviewed relies on survey instruments; none observes transaction records disaggregated by merchant type. Where secondary data are used in the wider literature, they are aggregate monthly totals, which cannot distinguish deepening from broadening. The category-wise MCC disclosures now published by NPCI make that distinction possible for the first time, yet have attracted little scholarly attention. A second gap concerns the reliability of these disclosures: derived from merchant tagging performed by acquiring institutions rather than a central registry, their internal consistency has not been independently assessed. This study addresses both.

### III. STATEMENT OF THE PROBLEM

Aggregate UPI statistics are frequently cited as evidence of India's success in digital payments, but are a poor guide to where that success is located. A six per cent rise in total merchant transactions is compatible with several quite different underlying stories — uniform growth across all merchant types, explosive growth in a few categories offset by contraction elsewhere, or the entry of new categories at the margin. Each implies a different assessment of how far adoption has penetrated the merchant economy, and different priorities for policymakers, acquiring banks and payment service providers. Without category-level analysis these possibilities cannot be distinguished. The problem is therefore twofold: to establish what the category-wise distribution of UPI merchant transactions looks like and how it is

changing, and to assess whether the published category-level data are internally consistent enough to support such inference.

### IV. OBJECTIVES OF THE STUDY

1. To examine the composition of UPI person-to-merchant transactions across reported merchant categories in June 2026 and January 2026.
2. To measure category-wise growth in transaction volume and identify categories that are expanding, stagnating or contracting.
3. To determine the contribution of individual merchant categories to the incremental transaction volume generated during the period.
4. To analyse average ticket value across merchant categories and evaluate the internal consistency of the published value data.
5. To offer suggestions for strengthening merchant-category reporting and deepening UPI acceptance in under-penetrated categories.

### V. HYPOTHESES OF THE STUDY

H0<sub>1</sub>: There is no significant difference between category-wise UPI transaction volumes in January 2026 and June 2026.

H0<sub>2</sub>: Category-wise volume growth is independent of the initial size of the category.

H0<sub>3</sub>: The rank ordering of merchant categories by transaction volume is not stable between the two periods.

H0<sub>4</sub>: Category-wise volume growth and change in average ticket value are independent of each other.

### VI. RESEARCH METHODOLOGY

The study is analytical and based entirely on secondary data, comprising the UPI merchant category-wise classification published by NPCI for June 2026 and January 2026 [1]. These report transaction volume in millions and value in rupees crore for twenty-nine individually identified MCCs, grouped into high-transacting, medium-transacting and other categories, with a residual 'Others' line covering all unlisted codes. The reported figures sum exactly to the published monthly totals of 14,427.88 million transactions worth Rs. 8,60,997.14 crore in June 2026 and 13,608.10 million transactions worth

Rs. 8,40,825.83 crore in January 2026, confirming the disclosures are arithmetically complete. The five-month interval is used because merchant-category disclosure is a recent addition to NPCI's public reporting and a longer series is not yet available.

Four derived measures are computed for each category. Category share is volume as a percentage of total monthly merchant volume. Growth rate is the percentage change in volume between the two months. Average ticket value is reported value divided by reported volume in rupees per transaction; since value is stated in crore and volume in millions, ATV equals value multiplied by ten and divided by volume. Contribution to incremental volume expresses the absolute change in a category's volume as a percentage of the total change in system volume.

Percentage, growth, share and contribution analysis are used descriptively, with concentration measured by the Herfindahl-Hirschman Index on volume shares. For hypothesis testing, the paired t-test and Wilcoxon signed-rank test are applied to period-wise volumes, Spearman's rank correlation to associations involving growth and size, and Levene's test to compare dispersion of volume growth against ticket-value growth. Non-parametric procedures are preferred because category volumes are heavily right-skewed, the largest category exceeding the smallest by a factor above fifty. Computation was performed in Python using pandas and SciPy, with significance assessed at five per cent.

The study covers only those categories NPCI reports individually; roughly one-fifth of merchant volume falls within the undifferentiated 'Others' line. The set of twenty-nine categories is itself selected on volume in the reporting month, introducing a mild selection effect. The data are national and admit no state-level or urban-rural disaggregation. Finally, MCC assignment is performed by acquiring institutions at merchant onboarding and is not centrally verified — not a trivial caveat, as Section VII-D shows.

## VII. RESULTS AND DISCUSSION

### A. Aggregate Movement and Composition

Merchant transaction volume grew 6.02 per cent over five months, an annualized pace of roughly fifteen per cent — a considerable deceleration from the doubling rates of UPI's earlier years, consistent with a system

approaching maturity in its core segments. Reported value grew only 2.40 per cent, so system-wide average ticket value fell from Rs. 617.89 to Rs. 596.76, a decline of 3.42 per cent. The aggregate indicators are presented in Table I.

TABLE I: AGGREGATE UPI MERCHANT TRANSACTION INDICATORS

| Indicator                                  | January 2026 | June 2026   | Change     | Growth (%) |
|--------------------------------------------|--------------|-------------|------------|------------|
| Transaction volume (million)               | 13,608.10    | 14,427.88   | +819.78    | +6.02      |
| Transaction value (Rs. crore)              | 8,40,825.83  | 8,60,997.14 | +20,171.31 | +2.40      |
| Average ticket value (Rs.)                 | 617.89       | 596.76      | -21.13     | -3.42      |
| Share of volume in reported categories (%) | 81.78        | 81.35       | -0.43      | —          |

Source: Computed from NPCI UPI merchant category-wise classification, January 2026 and June 2026

The concentration of merchant activity is striking. Groceries and supermarkets alone account for 25.92 per cent of all merchant transactions in June 2026. The top five categories — groceries, fast food, restaurants, telecom and fuel — together account for 68.94 per cent of merchant volume, and the eight food-and-grocery-related codes for 51.73 per cent. The Herfindahl-Hirschman Index on volume shares stands at 1,291.6 in June against 1,271.2 in January, a moderately concentrated distribution becoming marginally more so.

This tells us something important about what UPI has become. It is not primarily an instrument of discretionary or high-value commerce. It is the payment mechanism of daily household provisioning — food, fuel, phone recharge and medicine. Nine of the ten highest-volume categories are recurring-need categories, and the tenth, digital gold, is a small-ticket savings instrument. The category-wise details are presented in Table II, which spans both columns owing to its size.

TABLE II: CATEGORY-WISE UPI MERCHANT TRANSACTIONS, JANUARY 2026 AND JUNE 2026

| MCC  | Merchant Category                          | Jan'26<br>Volume<br>(Mn) | Jun'26<br>Volume<br>(Mn) | Volume<br>Growth<br>(%) | Jun'26<br>Share<br>(%) | Jan'26 ATV<br>(Rs.) | Jun'26 ATV<br>(Rs.) | ATV<br>Change<br>(%) |
|------|--------------------------------------------|--------------------------|--------------------------|-------------------------|------------------------|---------------------|---------------------|----------------------|
| 5411 | Groceries and supermarkets                 | 3,419.81                 | 3,739.59                 | 9.35                    | 25.92                  | 224.67              | 213.14              | -5.1                 |
| 5814 | Fast food restaurants                      | 1,502.57                 | 1,449.10                 | -3.56                   | 10.04                  | 116.36              | 120.20              | 3.3                  |
| 5812 | Eating places and restaurants              | 1,258.98                 | 1,242.19                 | -1.33                   | 8.61                   | 168.27              | 172.96              | 2.8                  |
| 4814 | Telecommunication services                 | 878.66                   | 824.26                   | -6.19                   | 5.71                   | 259.95              | 278.61              | 7.2                  |
| 5541 | Service stations (fuel)                    | 658.84                   | 716.87                   | 8.81                    | 4.97                   | 607.94              | 658.19              | 8.3                  |
| 5993 | Cigar shops and stands                     | 380.86                   | 416.69                   | 9.41                    | 2.89                   | 61.16               | 65.37               | 6.9                  |
| 5462 | Bakeries                                   | 324.06                   | 396.69                   | 22.41                   | 2.75                   | 397.65              | 136.93              | -65.6                |
| 5912 | Drug stores and pharmacies                 | 286.87                   | 294.16                   | 2.54                    | 2.04                   | 153.54              | 422.52              | 175.2                |
| 5451 | Dairies                                    | 219.63                   | 268.25                   | 22.14                   | 1.86                   | 178.78              | 220.89              | 23.6                 |
| 5412 | Purchase of digital gold                   | 189.95                   | 232.94                   | 22.63                   | 1.61                   | 3,178.38            | 109.58              | -96.6                |
| 5921 | Package shops – beer, wine and liquor      | 179.31                   | 216.69                   | 20.85                   | 1.50                   | 270.92              | 422.94              | 56.1                 |
| 7322 | Debt collection agencies                   | 173.10                   | 196.66                   | 13.61                   | 1.36                   | 440.56              | 3,510.25            | 696.8                |
| 5262 | Online marketplaces                        | 161.56                   | 158.01                   | -2.20                   | 1.10                   | 1,224.00            | 572.52              | -53.2                |
| 5441 | Candy, nut and confectionery shops         | 130.09                   | 148.88                   | 14.44                   | 1.03                   | 353.38              | 188.13              | -46.8                |
| 9399 | Government services n.e.c.                 | 122.73                   | 144.57                   | 17.80                   | 1.00                   | 830.50              | 717.35              | -13.6                |
| 4900 | Utilities – electric, gas, water, sanitary | 120.87                   | 143.97                   | 19.11                   | 1.00                   | 205.85              | 1,660.85            | 706.8                |
| 5422 | Freezer and locker meat provisioners       | 119.38                   | 125.67                   | 5.27                    | 0.87                   | 1,106.22            | 343.13              | -69.0                |
| 5691 | Mens and womens clothing shops             | 116.51                   | 119.23                   | 2.33                    | 0.83                   | 601.64              | 989.09              | 64.4                 |
| 5813 | Drinking places (bars, taverns, clubs)     | 87.51                    | 93.11                    | 6.40                    | 0.65                   | 778.07              | 405.89              | -47.8                |
| 5311 | Department stores                          | 87.41                    | 89.24                    | 2.09                    | 0.62                   | 405.29              | 604.45              | 49.1                 |
| 5732 | Electronics shops                          | 86.03                    | 88.14                    | 2.45                    | 0.61                   | 1,269.70            | 1,367.37            | 7.7                  |
| 5331 | Variety stores                             | 85.44                    | 86.90                    | 1.71                    | 0.60                   | 292.89              | 447.15              | 52.7                 |
| 7230 | Beauty and barber shops                    | 80.41                    | 85.96                    | 6.90                    | 0.60                   | 570.66              | 279.57              | -51.0                |
| 7622 | Electronics repair shops                   | 80.40                    | 83.57                    | 3.94                    | 0.58                   | 10,079.54           | 297.55              | -97.0                |
| 5651 | Family clothing shops                      | 78.96                    | 80.35                    | 1.76                    | 0.56                   | 296.58              | 878.63              | 196.3                |
| 4121 | Taxi-cabs and limousines                   | 78.59                    | 77.55                    | -1.32                   | 0.54                   | 1,030.58            | 158.30              | -84.6                |
| 6211 | Securities brokers and dealers             | 76.96                    | 74.22                    | -3.56                   | 0.51                   | 657.28              | 8,211.43            | 1,149.3              |
| 5137 | Uniforms and commercial clothing           | 75.89                    | 73.57                    | -3.06                   | 0.51                   | 173.32              | 945.42              | 445.5                |
| 4112 | Passenger railways                         | 67.82                    | 69.41                    | 2.34                    | 0.48                   | 524.28              | 687.40              | 31.1                 |
| —    | Others (unlisted MCCs)                     | 2,478.90                 | 2,691.44                 | 8.57                    | 18.65                  | 1,528.83            | 1,455.67            | -4.8                 |
|      | Total / all merchants                      | 13,608.10                | 14,427.88                | 6.02                    | 100.00                 | 617.89              | 596.76              | -3.4                 |

Source: Computed from NPCI UPI merchant category-wise classification, January 2026 and June 2026

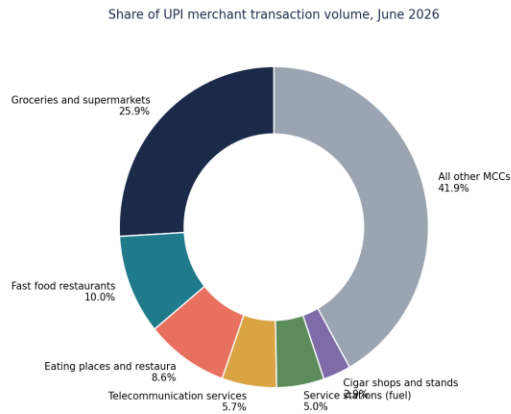


Fig. 1. Share of UPI merchant transaction volume by category, June 2026

#### B. Growth Differentials Across Categories

Behind the headline 6.02 per cent lies considerable variation. Growth rates across the twenty-nine reported categories range from -6.19 to +22.63 per cent, with a median of 3.94 per cent — more than half the reported categories grew more slowly than the system as a whole, meaning growth was carried disproportionately by a minority of categories and by the unlisted residual.

Four categories grew above twenty per cent: digital gold (22.63 per cent), bakeries (22.41 per cent), dairies (22.14 per cent) and liquor retail (20.85 per cent). The first reflects micro-investment in gold through UPI-linked platforms; the other three are small-format neighborhoods retail formats that were among the last to be digitized and are now catching up. Utilities (19.11 per cent) and government services (17.80 per cent) also grew strongly, indicating that institutional payments are migrating to UPI.

Seven categories contracted: telecommunication services (-6.19 per cent), fast food (-3.56 per cent), securities brokers (-3.56 per cent), commercial uniforms (-3.06 per cent), online marketplaces (-2.20 per cent), restaurants (-1.33 per cent) and taxi services (-1.32 per cent). These merit interpretation rather than alarm. Telecom recharge is increasingly handled through auto-pay mandates, which consolidate multiple monthly transactions into fewer scheduled ones. Online marketplaces and taxi aggregators have been migrating to in-app wallet balances and credit-line products, which similarly remove transactions from the UPI merchant count. The food service decline is harder to attribute and may reflect the seasonal

composition of January and June, which occupy quite different points in the Indian consumption calendar. The group-wise performance is presented in Table III.

TABLE III: GROUP-WISE PERFORMANCE OF MERCHANT CATEGORIES

| NPCI Grouping          | No.           | Vol Jan'26 (Mn) | Vol Jun'26 (Mn) | Growth (%) | Share Jun'26 (%) |
|------------------------|---------------|-----------------|-----------------|------------|------------------|
| High transacting       | 10            | 9,120.23        | 9,580.74        | 5.05       | 66.40            |
| Medium transacting     | 10            | 1,298.47        | 1,436.03        | 10.59      | 9.95             |
| All other reported     | 9             | 710.50          | 719.67          | 1.29       | 4.99             |
| Others (unlisted MCCs) | —             | 2,478.90        | 2,691.44        | 8.57       | 18.65            |
| Total                  | 29 + residual | 13,608.10       | 14,427.88       | 6.02       | 100.00           |

Source: Computed from NPCI UPI merchant category-wise classification, January 2026 and June 2026

Medium-transacting categories grew at 10.59 per cent, nearly twice the system rate, while smaller reported categories grew at only 1.29 per cent. The high-transacting block, despite representing two-thirds of volume, grew at 5.05 per cent, below the system average. Growth is therefore occurring in the middle of the distribution — in categories large enough to have established acceptance infrastructure but not yet saturated. The unlisted residual also grew faster than the system, at 8.57 per cent, suggesting genuine broadening into newer categories, though aggregation prevents its identification.

#### C. Contribution to Incremental Volume

Growth rates mislead when categories differ enormously in size; a category doubling from a small base contributes less to national volume than a large category growing modestly. Table IV therefore decomposes the 819.78 million incremental transactions by source.

TABLE IV: TEN LARGEST CONTRIBUTORS TO INCREMENTAL TRANSACTION VOLUME

| MCC  | Merchant Category                          | Absolute Change (Mn) | Contribution to Growth (%) |
|------|--------------------------------------------|----------------------|----------------------------|
| 5411 | Groceries and supermarkets                 | 319.78               | 39.01                      |
| —    | Others (unlisted MCCs)                     | 212.54               | 25.93                      |
| 5462 | Bakeries                                   | 72.63                | 8.86                       |
| 5541 | Service stations (fuel)                    | 58.03                | 7.08                       |
| 5451 | Dairies                                    | 48.62                | 5.93                       |
| 5412 | Purchase of digital gold                   | 42.99                | 5.24                       |
| 5921 | Package shops – beer, wine and liquor      | 37.38                | 4.56                       |
| 5993 | Cigar shops and stands                     | 35.83                | 4.37                       |
| 7322 | Debt collection agencies                   | 23.56                | 2.87                       |
| 4900 | Utilities – electric, gas, water, sanitary | 23.10                | 2.82                       |

Source: Computed from NPCI UPI merchant category-wise classification, January 2026 and June 2026

The result is unambiguous. Groceries and supermarkets alone generated 39.01 per cent of all incremental merchant transactions, and the unlisted residual a further 25.93 per cent — together roughly two-thirds of all growth from one reported category and one aggregated remainder. Bakeries, fuel, dairies and digital gold contributed 26.11 per cent between them. Every other reported category contributed under five per cent individually, and the seven contracting categories together subtracted 16.38 per cent from what growth would otherwise have been. UPI's merchant growth at this stage is therefore not broad-based across the reported categories; it is one very large everyday category continuing to deepen, alongside unobserved activity in codes too small to be individually disclosed.

#### D. Average Ticket Value and the Reliability of Category-Level Value Data

The June ATV figures in Table II, taken alone, are broadly sensible: cigar shops at Rs. 65.37, fast food at

Rs. 120.20, digital gold at Rs. 109.58 and groceries at Rs. 213.14 sit at the low end, as expected of small-ticket everyday purchases; fuel at Rs. 658.19, electronics at Rs. 1,367.37 and securities brokers at Rs. 8,211.43 sit at the high end, again as expected. The problem arises on comparison.

Sixteen of the twenty-nine reported categories record an ATV change exceeding fifty per cent over five months. Electronics repair moves from Rs. 10,079.54 to Rs. 297.55, a fall of 97.05 per cent. Digital gold falls from Rs. 3,178.38 to Rs. 109.58. Securities brokers rise from Rs. 657.28 to Rs. 8,211.43, an increase of 1,149.31 per cent. Utilities rise 706.80 per cent and debt collection 696.79 per cent. Over the identical period and for identical categories, volumes moved within a bounded range of –6.19 to +22.63 per cent, and no category recorded a volume change exceeding twenty-five per cent in either direction.

This asymmetry is the crux. The variance of ticket-value growth exceeds that of volume growth by a factor of 1,062, and Levene's test confirms the difference is significant ( $W = 8.181$ ,  $p = 0.0059$ ). There is no behavioural mechanism by which the number of people transacting at electronics repair shops could rise 3.94 per cent while spending per transaction falls ninety-seven per cent, nor by which securities-broker customers could reduce transaction counts 3.56 per cent while increasing average transaction size twelvefold. Genuine behavioural change moves volume and value together, and moves both gradually.

Examining which of the two figures is economically plausible in each unstable category is instructive. Electronics repair at Rs. 298 per bill is reasonable; Rs. 10,080 is not. Digital gold at Rs. 110 fits micro-purchases; Rs. 3,178 does not. Utilities at Rs. 1,661 matches a household electricity bill; Rs. 206 does not. Debt collection at Rs. 3,510 matches an EMI recovery; Rs. 441 does not. In nearly every unstable category the June figure is the plausible one and the January figure is not. Ordinary merchant re-tagging would scatter such errors across both months; this concentration instead points to a defect specific to the January value column, whether arising from misalignment in transcription or from a subsequent revision that the January extract predates. Both columns sum exactly to the published totals, so this is not missing or erroneous data in the arithmetic sense.

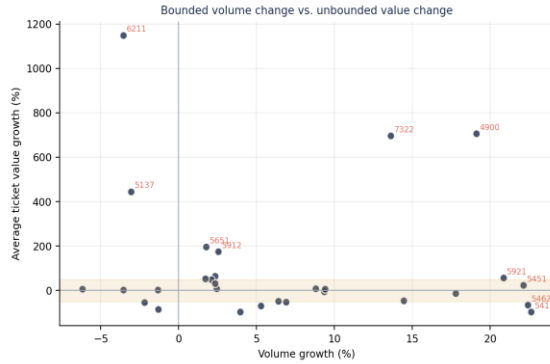


Fig. 2. Volume growth against average ticket value growth by merchant category (the shaded band marks a  $\pm 50$  per cent ATV change)

Fig. 2 makes the pattern visible: observations are compressed into a narrow horizontal band on the volume axis and dispersed across three orders of magnitude on the value axis. Spearman's rank correlation between the two growth measures is  $-0.194$  ( $p = 0.314$ ), confirming they are unrelated — itself the finding, since in a well-behaved dataset one would expect at least a weak positive association between growth in transactions and growth in value. The consequence is that volume-based indicators are presently the reliable basis for category-level inference, while value-based indicators should be treated as provisional pending verification against NPCI's published January release. This is why the analysis in Sections VII-A to VII-C is built on volume.

#### E. Hypothesis Testing

TABLE V: SUMMARY OF HYPOTHESIS TESTING ( $n = 29$  REPORTED CATEGORIES)

| Hypothesis                                            | Test Applied                                       | Statistic                  | p-value         | Decision     |
|-------------------------------------------------------|----------------------------------------------------|----------------------------|-----------------|--------------|
| H0 <sub>1</sub> : No difference in category volumes   | Wilcoxon signed-rank (paired t reported alongside) | $W = 95.0$ ( $t = 1.773$ ) | 0.0069 (0.0872) | Rejected     |
| H0 <sub>2</sub> : Growth independent of category size | Spearman's rank correlation                        | $\rho = 0.286$             | 0.1323          | Not rejected |

| Hypothesis                                                 | Test Applied                | Statistic       | p-value   | Decision     |
|------------------------------------------------------------|-----------------------------|-----------------|-----------|--------------|
| H0 <sub>3</sub> : Rank ordering not stable                 | Spearman's rank correlation | $\rho = 1.000$  | $< 0.001$ | Rejected     |
| H0 <sub>4</sub> : Volume growth and ATV growth independent | Spearman's rank correlation | $\rho = -0.194$ | 0.3143    | Not rejected |

Source: Computed from NPCI UPI merchant category-wise classification, January 2026 and June 2026

Rejection of H0<sub>1</sub> establishes that the increase in category volumes is statistically significant and not attributable to random variation. The paired t-test returns  $p = 0.0872$ , which would not reject at five per cent; the divergence arises because the distribution of category volumes is extremely skewed and the parametric test is dominated by the single largest category. The Wilcoxon result, robust to that skew, is the appropriate basis for decision, and reporting both is preferable to presenting only the convenient one.

Failure to reject H0<sub>2</sub> indicates that large categories are not growing systematically faster or slower than small ones, arguing against simple convergence or a winner-takes-all narrative and pointing to category-specific drivers. Rejection of H0<sub>3</sub> confirms complete rank stability: no category changed position in the volume ordering across five months, underlining how settled the merchant hierarchy has become — though the categories reported are selected on current volume, which reinforces this stability. Failure to reject H0<sub>4</sub> is evidence of the disconnect between the volume and value series rather than a substantive behavioral finding.

#### VIII. MAJOR FINDINGS

1. Merchant transaction volume grew 6.02 per cent between January and June 2026, from 13,608.10 to 14,427.88 million, while reported value grew only 2.40 per cent, reducing system-wide ATV from Rs. 617.89 to Rs. 596.76.
2. Merchant activity is heavily concentrated in everyday consumption: groceries and

supermarkets account for 25.92 per cent of all transactions, the top five categories for 68.94 per cent, and food-and-grocery codes together for 51.73 per cent.

3. Growth is narrow rather than broad. Groceries alone generated 39.01 per cent of incremental volume and the unlisted residual a further 25.93 per cent.
4. The fastest-growing categories are small-format neighborhoods retail and micro-savings: digital gold (22.63 per cent), bakeries (22.41 per cent), dairies (22.14 per cent) and liquor retail (20.85 per cent), indicating the last mile of physical retail is now digitizing.
5. Seven categories contracted, led by telecom (−6.19 per cent), fast food (−3.56 per cent) and online marketplaces (−2.20 per cent), consistent with migration of recurring and in-app payments to auto-pay mandates, wallet balances and embedded credit lines.
6. Medium-transacting categories grew at 10.59 per cent against 5.05 per cent for high-transacting categories: the growth frontier lies in the middle of the size distribution.
7. The merchant hierarchy is completely stable, with identical rank ordering in both months ( $p = 1.000$ ).
8. Category-level value data are unreliable. Sixteen of twenty-nine categories recorded ATV changes above fifty per cent (−97.05 to +1,149.31 per cent) against bounded volume changes of −6.19 to +22.63 per cent, a variance ratio of 1,062:1 (Levene's  $W = 8.181$ ,  $p = 0.0059$ ), with the instability concentrated in the January value column.

## IX. SUGGESTIONS

### A. For NPCI and the Regulator

1. MCC assignment should be subject to periodic audit and a published reclassification log, so that analysts can distinguish reclassification from behavior.
2. Restating prior months alongside each new disclosure would allow genuine period-on-period comparison; at present comparability across editions cannot be assumed.
3. The 'Others' line, at 18.65 per cent of volume, is too large to remain undifferentiated. Disclosing the

next tier of categories, even in banded form, would materially improve analytical value.

4. A consistent and documented treatment of aggregator and biller transactions in the value series would remove the principal source of the instability identified here.

### B. For Banks and Payment Service Providers

1. Acceptance-side effort is best directed at medium-transacting categories, growing at nearly twice the system rate and not yet saturated.
2. Strong growth in bakeries, dairies and small neighborhoods retail suggests soundbox-style confirmation devices and simplified onboarding are working precisely where merchant reluctance was historically highest; this effort should be extended.
3. Declining categories should be examined for payment-channel substitution before being treated as lost business. A telecom recharge moving to auto-pay has not left the ecosystem; it has changed its accounting location.

### C. For Researchers

1. Category-level UPI research should presently be anchored on volume rather than value, and should state this choice explicitly.
2. Where value must be used, month-on-month ATV stability should be reported as a diagnostic before inference is drawn.
3. Combining these disclosures with primary merchant surveys would allow the data-defect hypothesis advanced here to be tested directly.

## X. CONCLUSION

This study set out to look behind the aggregate UPI numbers and ask where, in the merchant economy, digital payment adoption is actually occurring. The answer is more specific than headline figures suggest. UPI's merchant business is overwhelmingly a business of daily household provisioning: groceries, prepared food, fuel, telecom and medicine account for the great majority of transactions, and groceries alone account for a quarter of all merchant activity and nearly two-fifths of all growth. Growth at the top of the distribution has slowed to five per cent over five months, while the middle grows at twice that rate and small-format neighborhoods retail — bakeries, dairies,

liquor shops — grows faster still. Together these patterns describe a payment system that has largely completed its conquest of organized and semi-organized urban retail and is now working through the long tail of small merchants, while its earliest strongholds mature.

The study also reaches a conclusion it did not set out to find. The category-level value data published alongside the volume data are not stable enough to support inference. Sixteen of twenty-nine categories show ticket-value movements no behavioral account can explain, against volume movements that are entirely plausible, and the implausible figures are concentrated in the January column. This does not diminish the value of NPCI's disclosure initiative, which is a genuine advance in payment-system transparency. It does mean the series requires the reporting discipline that mature statistical publications take for granted, and that researchers using it in the interim should build conclusions on the volume series. Fahad and Shahid [3] observed in 2022 that UPI's diffusion was constrained by incomplete compatibility with the contexts in which people actually transact. Four years on, the evidence here suggests that constraint has substantially eased in everyday retail and is now easing at the margins, in the smallest and most informal merchant formats. The frontier of Indian digital payments has moved from whether merchants will accept UPI to which merchants remain outside it — and answering that question well will require the category-level data to become as dependable as the volumes they accompany.

#### XI. LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

Three limitations qualify these findings. A five-month comparison cannot separate seasonal from structural change; January and June occupy different positions in the Indian consumption and festival calendar, and some variation, particularly in food service, may be seasonal. Roughly one-fifth of merchant volume sits in an undifferentiated residual, so statements about completeness of category coverage are necessarily partial. And the data are national, while India's digital payment penetration varies sharply across states and between urban and rural areas.

Three directions follow. A longitudinal series across twenty-four or more months would permit proper

trend decomposition and seasonal adjustment. A merchant-level primary survey within the fastest-growing categories would test whether observed growth reflects new merchant onboarding or higher transaction frequency at existing merchants. And direct verification of the January disclosure against NPCI's published release would establish whether the value instability documented in Section VII-D arises from transcription, revision or reclassification.

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