



## CASH-ON-DELIVERY VS DIGITAL PAYMENTS: CONSUMER AND ENTERPRISE PREFERENCES IN BIHAR

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### **Abstract**

This study analyses consumer and enterprise preferences between Cash-on-Delivery (COD) and digital payments in Bihar, a predominantly rural, lower-income state that has nonetheless witnessed rapid digital infrastructure growth. Using primary data from 850 consumers and 200 enterprises across 15 districts, combined with secondary information from financial institutions, e-commerce platforms and official sources, the research employs descriptive statistics, regression analysis, logistic modelling and qualitative insights. Despite large investments in digital systems, COD still accounts for about 68 percent of e-commerce transactions in Bihar, compared with a national average near 35 percent. Trust, perceived security, digital literacy and access constraints strongly shape payment choices: trust factors alone explain around 74 percent of variance in payment preference, while digital literacy has an odds ratio above 2 for digital adoption. Demographic patterns are stark, with 58 percent of urban consumers preferring digital payments versus only 23 percent in rural areas, and 72 percent adoption among 18–30 year-olds compared with 18 percent among those aged 50 and above. Enterprises, though operationally inclined towards digital receipts, continue to support COD to align with customer preferences, especially in rural markets. The paper concludes that payment behaviour in Bihar reflects a complex interaction of trust, literacy, infrastructure and demographic factors; policy and business strategies must therefore go beyond infrastructure provision to address behavioural and capability gaps.

### **1. Introduction**

India's digital payment ecosystem has expanded rapidly since the launch of the Unified Payments Interface (UPI) and subsequent policy pushes towards a less-cash economy. However, aggregate national progress masks strong regional variation, with some states adopting digital payments far more rapidly than others. Bihar, with over 125 million people and 88 percent rural population, is a prominent example where digital infrastructure has grown quickly but payment behaviour still leans heavily towards COD.

Between 2020 and 2025, internet penetration in Bihar rose from about 28 percent to 67 percent and digital payment transaction volumes increased more than fifteen-fold. Yet COD remains the dominant payment mode in e-commerce, accounting for approximately 68 percent of online transactions, almost double the national share. This mismatch between

infrastructure availability and behavioural outcomes raises questions about the underlying drivers of payment choice in such contexts.

The study pursues three central objectives. First, to quantify the relative preference for COD and digital payments across key demographic and geographic segments. Second, to identify core determinants of payment choice, focusing on trust, perceived security, digital literacy, infrastructure and income. Third, to explore how enterprises in Bihar navigate the trade-off between operational efficiency, which favours digital payments, and customer acquisition, which still requires COD.

The findings add to the literature on digital payment adoption in developing economies by providing a detailed, state-level analysis that simultaneously incorporates consumer and enterprise perspectives in a mixed-methods framework.



## 2. Literature Review

Research on technology adoption, particularly the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), emphasises perceived usefulness, ease of use, social influence and facilitating conditions as key drivers of digital payment uptake. Behavioural economics adds insights on how payment modes affect spending decisions, with cash often inducing more “pain of paying” than digital methods.

In developing economies, mobile money and digital payments have been shown to support financial inclusion and poverty reduction, but adoption depends heavily on agent networks, trust, literacy and regulatory design. In India, demonetisation and UPI accelerated digital use, yet studies highlight significant rural–urban and state-level disparities rooted in infrastructure gaps and trust deficits.

COD has been widely used in emerging-market e-commerce as a response to weak trust in online systems and limited card penetration. Studies show that many consumers use COD as a risk-management tool, especially when concerned about fraud, quality or delivery reliability. At the same time, enterprises incur higher costs and operational complexity when handling COD compared with digital payments. Trust and security consistently appear as the strongest predictors of digital payment adoption. Work on financial inclusion stresses that access, capability and protection must move together: infrastructure alone does not guarantee active or safe use of digital financial services. There remains, however, a gap in region-specific analyses that compare COD and digital preferences simultaneously, particularly in lower-income states like Bihar.

## 3. Methodology

### 3.1 Research design and sampling

The study uses a cross-sectional, mixed-methods design combining consumer and enterprise surveys with secondary transaction and

infrastructure data. A multi-stage stratified random sample of 850 consumers was drawn from 15 districts, ensuring representation across urban, semi-urban and rural areas, as well as income, age, education and gender segments. In parallel, 200 enterprises—e-commerce platforms, retailers and service providers—were surveyed to capture payment policies and perceptions.

### 3.2 Data collection and variables

Primary data were collected between January and June 2024 using face-to-face interviews, telephone surveys and online questionnaires. Consumer instruments covered:

- Demographics: age, gender, income, education, occupation, location.
- Payment behaviour: preferred method for online transactions, frequency of use, transaction value ranges.
- Trust and security: perceptions of payment safety, fraud risk, merchant reliability, data privacy.
- Digital literacy: self-reported skills and tested capabilities across smartphone use, internet navigation, online banking and cybersecurity awareness, scored on a ten-point scale.

Enterprise questionnaires captured business size, sector, geographic focus, payment mix, cost perceptions and reasons for maintaining COD. Secondary data from the Reserve Bank of India, National Payments Corporation of India and major platforms were used to benchmark transaction patterns and infrastructure indicators. The main dependent variable for consumer analysis is payment preference (COD vs digital), while key independent variables include digital literacy, trust and security scores, demographic indicators, banking access and perceived barriers.

### 3.3 Analysis methods

Descriptive statistics were used to profile respondents and summarise payment preferences. Cross-tabulations and chi-square

tests examined associations between demographics and payment choices. Multiple linear regression assessed the influence of trust and security on payment preference scores, while logistic regression modelled the likelihood of preferring digital payments as a function of digital literacy and controls.

Multivariate analysis of variance (MANOVA) captured the combined influence of age, income, education and location, and structural equation modelling (SEM) explored the pathways through which infrastructure and access barriers affect adoption. Qualitative data from open-ended responses and enterprise interviews were coded thematically to interpret quantitative findings.

## 4. Results

### 4.1 Demographic profile

Table 1 summarises the main characteristics of the consumer and enterprise samples.

| Variable       | Category                  | Consumers (%) | Enterprises (%) |
|----------------|---------------------------|---------------|-----------------|
| Age            | 18–30                     | 42            | 35              |
|                | 31–45                     | 38            | 45              |
|                | 46–60                     | 15            | 18              |
|                | 60+                       | 5             | 2               |
| Gender         | Male                      | 58            | 72              |
|                | Female                    | 42            | 28              |
| Education      | Below 12th                | 28            | 5               |
|                | Graduate                  | 52            | 60              |
|                | Postgraduate+             | 20            | 35              |
| Monthly income | < Rs.25,000               | 35            | –               |
|                | Rs.25,000–<br>Rs.50,000   | 42            | 15              |
|                | Rs.50,000–<br>Rs.1,00,000 | 18            | 45              |
|                | > Rs.1,00,000             | 5             | 40              |
|                |                           |               |                 |
| Location       | Urban                     | 38            | 65              |
|                | Semi-urban                | 27            | 25              |
|                | Rural                     | 35            | 10              |

The consumer sample broadly reflects Bihar’s young, lower-middle-income and still relatively low-education structure, while the enterprise sample is skewed towards urban and higher-income segments. This contrast is important for understanding differences between consumer demand and business preferences.

### 4.2 Payment preferences by segment

Aggregate results show that 68 percent of surveyed consumers prefer COD for online purchases, 24 percent favour digital payments and 8 percent report no strong preference. Segment-wise patterns are shown in Table 2.

Table 2. Payment preferences by key demographic segments

| Segment              | COD pref. (%) | Digital pref. (%) |
|----------------------|---------------|-------------------|
| Age 18–30            | 52            | 38                |
| Age 31–45            | 71            | 19                |
| Age 46–60            | 85            | 9                 |
| Age 60+              | 91            | 2                 |
| Male                 | 64            | 28                |
| Female               | 73            | 18                |
| Income < Rs.25,000   | 82            | 12                |
| Income > Rs.1,00,000 | 28            | 65                |
| Urban                | 48            | 42                |
| Rural                | 85            | 8                 |

Younger, urban, higher-income and better-educated respondents are far more likely to use digital payments, while older, rural and lower-income groups overwhelmingly prefer COD. This confirms that digital adoption in Bihar is concentrated in segments already advantaged by location and resources.

#### 4.3 Trust, security and digital literacy

Regression analysis shows that combined trust and perceived security indicators explain about 74 percent of variation in a continuous payment preference score (higher values indicating more digital orientation). Both variables are positive and highly significant, indicating that as trust and perceived security improve, the likelihood of choosing digital payments rises sharply.

Digital literacy has a similarly strong effect. Logistic regression estimates suggest that each one-point increase on the ten-point literacy scale more than doubles the odds of digital payment preference (odds ratio about 2.3,  $p < 0.001$ ), controlling for age, income and location. At very low literacy levels, nearly all respondents choose COD; at very high levels, a majority prefers digital modes.

#### 4.4 Enterprise strategies

From the enterprise side, 67 percent of surveyed businesses state that they operationally prefer digital payments due to faster settlement, lower handling costs and easier reconciliation.

Nevertheless, over 60 percent actively offer both COD and digital options, and many smaller and rural-facing firms “reluctantly” maintain COD because dropping it would reduce customer acquisition. Larger and purely online platforms are more willing to push digital-only or digital-first strategies, especially for urban customers.

#### 5. Discussion

The findings highlight a pronounced “adoption gap” in Bihar: digital infrastructure and platforms are available, but behavioural, capability and trust constraints keep COD dominant for most consumers. For many users, COD is not simply a habit but a risk-management strategy in an environment of perceived fraud, weak recourse and low familiarity with digital tools.

Demographic patterns indicate that digital adoption aligns with broader socio-economic advantages—youth, income, education, urban residence—raising concerns that digitalisation could deepen existing inequalities if left to market forces alone. Meanwhile, enterprises face a dual pressure: they know digital payments are cheaper and more efficient, but they cannot ignore customer mistrust without losing business, particularly in rural and semi-urban markets.



The strong statistical role of trust and literacy suggests that interventions focused only on infrastructure (for example, more terminals or bandwidth) will have limited impact on behaviour unless accompanied by user-centric design, clear consumer protection, and hands-on, local-language training. At the same time, the modest but visible digital preference among young and higher-income consumers indicates that change is underway, and can be accelerated if these early adopters are supported and positive experiences spread.

## 6. Policy and Practice Implications

Several implications emerge for different stakeholders:

- Public policy should prioritise digital financial literacy, especially in rural areas, among women and older adults, using schools, self-help groups and community centres as channels.
- Regulators and payment providers must make consumer protection visible and credible—simple complaint mechanisms, quick redress and clear fraud policies—to bridge the trust gap.
- Infrastructure investments must target last-mile connectivity along with reliable power, as poor connectivity remains a barrier for many rural users despite statewide improvements.
- Banks and fintechs can design simpler, vernacular-language interfaces and hybrid products that blend familiar COD with gradual digital features (for example, assisted digital payments at delivery).
- Enterprises should use nudges such as small discounts or loyalty benefits for digital payments, without abruptly withdrawing COD in markets where trust is still fragile.

## 7. Conclusion

Bihar's payment landscape illustrates how traditional and digital systems can coexist for a

prolonged period, not because digital options are absent, but because key behavioural and structural conditions for trustful adoption are not fully in place. COD remains predominant, especially among older, rural and low-income consumers, while digital payments are gaining ground among younger, urban and higher-income users.

The research shows that trust, perceived security, digital literacy and access constraints are central to understanding this pattern, more so than infrastructure alone. Enterprises recognise the efficiency of digital payments but pragmatically maintain COD to align with customer realities. For Bihar—and similar regions—the path forward lies not in forcing a rapid shift away from COD, but in systematically building the conditions under which digital payments are experienced as safe, easy and beneficial by the broad population.

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(Adapted from your original paper's sources in standard journal style; adjust to APA/MLA/etc. as required.)

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