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An Analytical Study of Digital Payment Systems and Their Impact on the Indian Economy: A Secondary Data Approach

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Abstract:

While transaction growth is not necessarily economic development, digital payments have the collateral benefits of reducing frictions of exchange and making transactions even more convenient and enabling financial participation. Descriptive secondary data research design is used in this paper to look on the payment transformation in India. Five years of complete financial data of Unified Payments Interface (UPI) is analysed and combined with institutional reports and research regarding interoperability, financial inclusions and consumer behaviour. The UPI volume grew from 45.96 billion to 241.62 billion transactions while the UPI value moved up from INR 84.16 trillion to INR 314.23 trillion between FY2021–22 and FY2025–26. Author estimates show that as transactions are increasing faster than value, average transaction is decreasing. These patterns reflect increases in both the frequency of payments and their size, but the statistics by themselves do not give any insight into the users or the barriers to adoption or the distributional impact. At the merchant level, these may lead to increased turnover, reduced cash-handling costs, enhanced payment record keeping and greater financial services. But some of these benefits may be restricted due to exclusion, fraud, outages, or privacy issues or because excessive expenditure occurs. The evidence thus suggests that digital payments should be regarded as an economic infrastructure and not as an economic contribution as such, measured at gross domestic product. Consumers' access as well as protection and consumer education, and clear accountability for performance, should be the key areas of policy emphasis. Going forward research on household and merchant outcomes should be explored to understand if the rise in payments means sustainable and inclusive and measurable economic gains in India.

Keywords: *Digital payments; UPI; Indian economy; financial inclusion; interoperability; secondary data.*

1 Introduction:

The digital transition in India is about structuring of exchange and not just the replacement of banknotes. Payment is a relationship between buyer and seller, bank and service providers. The ease with which this exchange can occur can alter the nature of the transaction between households and the

ways in which business can arrange sales. But the speedier that transfers do not necessarily indicate more production - the same buy could merely be diverted from cash to electronic channel.

The focus is on UPI as there is a comparable official annual time series. Other such measures like NEFT, RTGS, IMPS, cards and prepaid wallets will continue to play a key role. One shouldn't take the transaction to count details as dominance, as they are not for serving all the payments' needs. It thus examines the implications of the increased UPI activity, the mechanisms cited in the economy and on what cannot be inferred based on secondary evidence at the aggregate level.

The separation of Observation, Interpretation and Policy Recommendation is transparent. Without quantifying an effect on GDP in the absence of support, the paper reports on calculable figures to indicate reproducibly and comments on the implications. Research questions are as follows: have the volume, the value and the average transaction size of UPI increased or decreased? How do digital payments have the potential to influence the economy? Which 'safeguards' do benefits need to provide to reach vulnerable users?

2 Literature and conceptual framework:

By offering flexibility in user choice, interoperability can foster adoption by enabling users to select the application they prefer, with the ability to access a common network. Interoperability can enable a user to access a common network while choosing his or her preferred application, which can help promote adoption. (Copestake et al., 2025) This mechanism is supported by their UPI evidence. The difference is crucial for economic analysis: there is a possibility of competition without the establishment of a separate acceptance network in customer-facing services.

Cornelli et al (2024) name open architecture, convenient interfaces and public-private participation as key characteristics of the payment system in India. They also talk about concentration and operational issues in their institutional analysis. It explains the system design, not a national causal estimate of productivity. These insights are presented in a hypothesis figure – Figure 1 – that depicts the payment infrastructure and potential economic pathways.

Consumer welfare is a category. In a preprint of a survey of 276 respondents and 20 interviews, Dev et al. (2024) found that about 75% of the respondents linked UPI to rising spending. These are self-reported pieces of evidence from a specific sample, and NOT an estimate that is representative of the whole country. It nevertheless calls into question the notion that convenience equals household welfare.

This conceptual framework recognizes infrastructure as an input, usage as an intermediate result and welfare as a separate result that must be demonstrated. A testable implication is that the costs of transactions should be lower and the service should be reliable and meaningful prior to being interpreted as development. This association can differ between households, merchants and regions.

A transaction cost view indicates that previously inconvenient purchases may be possible due

to lower exchange rates. A view from the network perspective is that usefulness is determined by other people's acceptance. These explanations are mutually reinforcing, so that a useful application cannot be of any benefit if there is no means of payment for the recipient. However, with robust networks, dependence on the selected access provider is possible. The analytical question becomes whether as a result of the common infrastructure, meaningful competition remains at the services layer, including a provider change without losing access to customers.

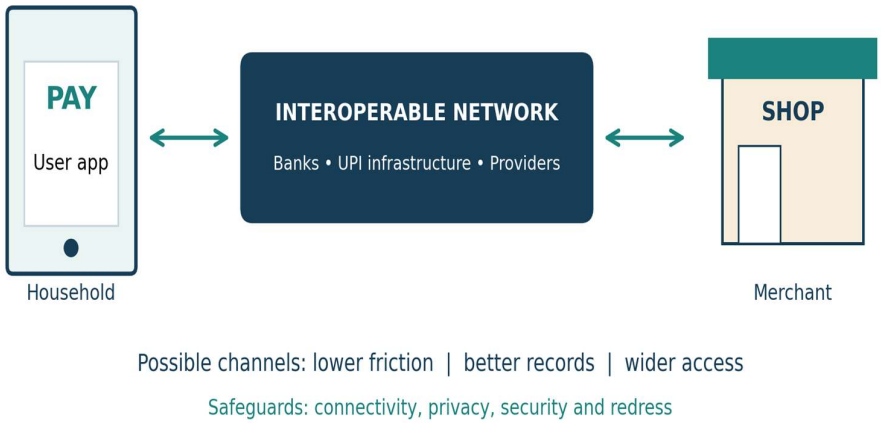

Figure 1. Payment-system illustration and hypothesised economic channels. Original author illustration informed by Cornelli et al. (2024) and Copestake et al. (2025); not a complete technical settlement diagram.

3 Research methodology:

The methods used in this study are descriptive trend analysis and structured documentary synthesis. The quantitative sample area consists of 5 observations at a national financial-year (FY2021–22 – FY2025–26). All the year-on-year data has been sourced from the NPCI data available in the Ministry of Finance's parliamentary response in July 2026 (Ministry of Finance, 2026b). One published vintage prevents silently combining totals from different publications.

Sources were intentionally chosen based on institutional authority, transparent identification and relevance to adoption or an economic mechanism. The documentation involves RBI analysis, a report in a database from the World Bank, IMF research notes and an explicitly labelled preprint. Official administrative counts are not considered to be equivalent to household survey evidence. No one was interviewed, no questionnaires were collected and no individual transaction records were taken for this paper.

Transaction Volume is a measurement of number of transactions, not users. Transaction value is at current value (not inflation adjusted). One crore transaction = 0.01 billion transactions, and 1 lakh crore rupees is equivalent to INR1 trillion. The conversions keep the original observations. The converted series are reported in Table 1, and the authors' measures in Table 2.

The annual growth of an indicator X is 100 times the difference between the value of X in year t and the previous year, divided by the value of X in year t–1. This compound annual growth is 100 × (Xfinal/Xinitial)^(1/4) − 1) as there are 5 observations of X each year, but 4 growth intervals. Average transaction size is defined as the value in INR trillions divided by the number of transactions (in billions). Results from calculations are rounded, calculations are made with unrounded numbers.

There is no attempt to carry out regression, any significance test or casual identification. Five aggregate observations are hardly sufficient to control income, inflation, connectivity, pandemic or policy changes. The review thus separates the observed trends from what seems a plausible mechanism. References and source notes do not imply that all upstream administrative records are independently verified; the calculations are auditable.

There are three levels of validity assessment. It is crucial to differentiate between transactions and users, and between nominal and actual turnover for measurement validity. The financial years must be the same; partial year observations are not comparable. Interpretive validity demands determining if there is direct or merely expected apparent benefit. This allows for smaller but more replicable results rather than more sensational discoveries not warranted by the design in hand. It also provides information about what further evidence would alter the findings.

4 Results:

The annual volume and nominal value increases are uninterrupted in table 1. The five-year time frame aligns with the government's anniversary review (Ministry of Finance, 2026a) for FY2025-26. Figure 2 shows volume in three dimensions visually; the numerical labels and editable table allows for exact comparisons. The depth of the chart is not an extra variable, it's decorative.

Between the endpoints, the volume is increasing by a factor of about 5.26, and the value is increasing by a factor of about 3.73, as shown in calculations by the author in Table 2. The compound annual growth rates for their respective products is 51.4% and 39.0%. Annual volume growth slows down from 82.2 per cent to 30 per cent and annual value growth slows down from 65.3 per cent to 20.6 per cent. This is not a drop in transactions; it is slowing percentage growth on an increasing base. The average transaction size reduces from INR1,831 to INR1,301, down 29.0%. This relationship is shown in Figure 3 without the misleading dual axis. Increasing counts and decreasing average size of payments are indicative of payments being fragmented into smaller transactions. It can't tell the difference between a new user and an old user paying more often, nor can it differentiate between merchant transactions and personal transactions.

Inclusion indicators do not constitute evidence of attribution. According to the Press Information Bureau (2025), the RBI Financial Inclusion Index rose from 64.2 in March 2024 to 67.0 in March 2025. This index is a composite of access, use and quality across financial services and not all the credit to the improvement of this index can be attributed to UPI. The payment series and

inclusion index are also based on different time frames. Therefore, their co-concurrent improvement is not employed to test the cause.

Part of the apparent slowdown is due to an increasing denominator. The final year has an additional 55.75 billion transactions while the first growth interval has an additional 37.76 billion transactions. So, a smaller percentage increase could have a larger overall increase. Absolute additions are significant for infrastructure planning – as in this case capacity needs to be able to cope with real traffic. Percentages can be useful for adoption analysis as they are a measure of change in relation to the current base. These measures are not sufficient to determine market saturation.

Table 1. UPI annual activity in three dimensions

Financial year	Volume Billion	Value INR trillion
2021–22	45.9561	84.16
2022–23	83.7144	139.15
2023–24	131.1295	199.95
2024–25	185.8660	260.56
2025–26	241.6169	314.23

Source: Ministry of Finance (2026b), July 20 series. Converted from crore transactions and lakh crore rupees. Raised header and shadow borders provide visual depth; figures remain editable.

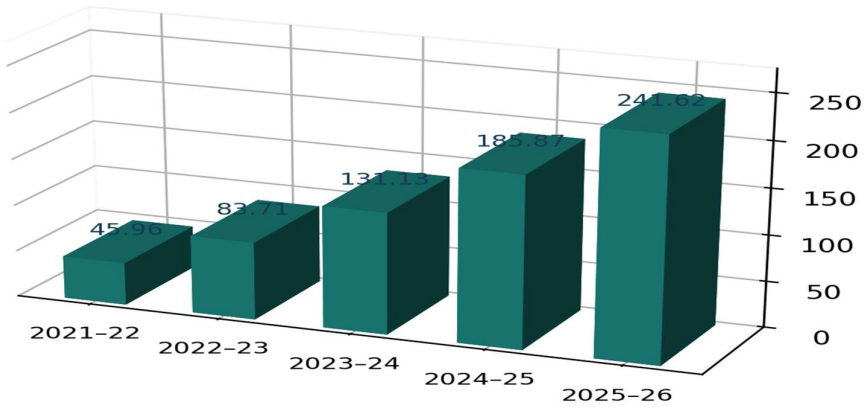

Figure 2. Annual UPI transaction volume. Author plot of Table 1. Three-dimensional depth is decorative; labels and Table 1 retain exact numerical comparisons.

Table 2. Author calculations of growth and ticket size

Financial year	Volume growth Percent	Value growth Percent	Mean payment INR
2021–22	—	—	1,831
2022–23	82.2	65.3	1,662
2023–24	56.6	43.7	1,525
2024–25	41.7	30.3	1,402
2025–26	30.0	20.6	1,301

Note: Growth rates are unrounded by annual observations. Mean payment equals total nominal value divided by transaction count. A dash indicates no preceding year within the sample.

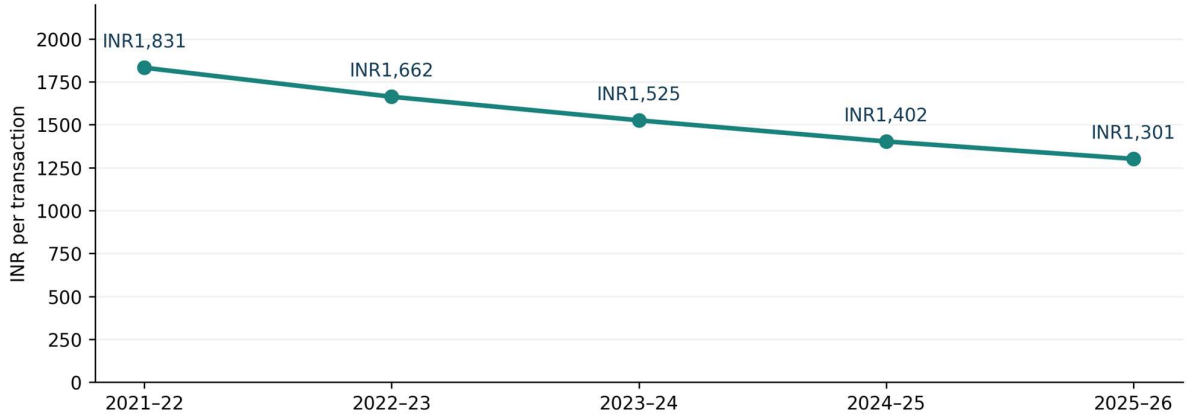

Figure 3. Average nominal UPI transaction size. Author calculation from Table 1. Falling averages do not identify new users or the merchant-payment share.

5 Economic implications:

5.1 Hence, the need to develop interchangeable efficiency and small businesses.

The first likely one is reducing transaction friction. Immediate confirmation can minimize uncertainty at checkout and remote transfers can minimize travel and waiting. The faster a small merchant can receive receipts could help with short-term cash management. The following mechanisms are inferred from the payment design, the current data set does not measure minutes saved, financing costs, or merchant profits. A realistic assessment would evaluate these results of adoption and non-adoption, using appropriate non-adopting businesses to make the comparison.

A second channel for record creation is possible. A transaction history can help with reconciling and give evidence of cash flow. However, payment record is not an invoice, a tax return, or a good indicator of profits. Nor does it automatically make a borrower eligible for affordable credit. Claims

of formalization must accordingly be separated from the availability of records, from compliance and improved financing terms.

5.2 Inclusion and distribution:

Financial access, financial use, financial connectivity and financial digital safety are explicitly separated by the World Bank (2025). Its nationally representative framework emphasizes the importance of (active) autonomous use rather than registration or account ownership. This study is not intended to generate new estimates of households from that database; it is designed to illuminate the constraints of national payment estimates.

An analytical distributional issue then arises: a shared phone can be used to transfer without providing the intended recipient with control. Likewise, if a local store offers digital payments but the connectivity is unreliable, it is unlikely that they will be used routinely. There is a possibility that the growth of aggregates can coexist with their exclusion. Evaluation, therefore, needs to focus on sustained use, self-serving, unsuccessful transactions, and the resolution of complaints by gender, income, and location, not just on enrolment.

5.3 Interpretation of monetary and fiscal statistics:

RBI (2024) explores the relationship of payment digitalization with money demand, ease of access and security concerns. Such relationships are related to payment behavior and monetary behavior and should not be restated as evidence of "national income" resulting from the automaticity of UPI. This paper's nominal series cannot measure changes in velocity of money or the real transmission mechanism.

Personal transfers and multiple transfers of the same balance are examples of payment turnover. GDP reflects value added and adding up transfers or comparing them with GDP would be confusing incompatible measures. Further benefits are also dependent: improved traceability can help with the reconciliation process, but tax revenues rely on the underlying activity, as well as law and enforcement. The paper does not claim any amount of extra tax revenues or leakage savings.

5.4 Consumer and system costs.

Security and operational dependence must be balanced against convenience. The Ministry of Finance (2025) provides a description of device binding, authentication controls, monitoring and public awareness measures. These are a sign of risk response rather than risk avoidance. This paper does not provide an unsupported national loss estimate combining banking-fraud reports, the number of complaints and attempted scams.

Economic cost is assumed to include time spent to resolve failed payments; time spent with liquidity stuck up in the process of the dispute and reduced confidence after the scam. Outage can be disruptive even if good adoption exists in the long run, if there is increased dependence on a shared infrastructure. While it may help users keep track of their spending with budget prompts and clear

transaction histories, the effectiveness of using these tools needs to be evaluated. Provider revenue is a different result and consumer welfare and overall transaction volume are different results.

Another difference is between private and social returns. If a customer finds shopping easier without the merchant's sales being recorded, the merchant can benefit from accepting payments. On the other hand, there could be more transactions processed on a platform without a proportionate social impact if transactions take place between applications. For assessing the economy, a comparison must be made with realistic alternatives to it, such as the existing cash and banking services. It also involves the cost of counting transition costs, training, equipment and time spent on dispute management. These costs should be deducted from the benefits, not gross turnover.

6 Policy recommendations.

The implementation of adoption programmes should focus on successful and independent use first. Complement account opening with local-language support, intuitive interfaces, dependable channels and channels that require assistance. Digital service should be considered, but cash should not be forgotten as a viable alternative where it is not available. Sustained voluntary use is a very useful programme outcome, rather than compulsory channel substitution.

Secondly, consumer protection ought to be quantified. Institutions should provide similar failed-payment rates, resolution times and outcomes of loss to customers, broken down in a non-personalizing way. Defining the clear responsibility between application and banks can ease the burden of the people seeking remedies. Exclusion effects of security improvements should be tested prior to widespread implementation.

Thirdly, the value of infrastructure funding and competition should be analysed side by side. Not having any direct charge at checkout doesn't remove processing, maintenance or fraud-management costs. All funding models should be transparent about who is paying for that and should work to ensure it is not disproportionate to the needs of small merchants or incentives too much data collection. Shared standards should be supportive of provider choice and operational resiliency. These are recommendations and not statements of existing fee rule.

Lastly, economic evaluation shouldn't be limited to counting heads. Typical areas for merchant panels to track include margins, settlement delays and working-capital requirements. Household panels might consider spending control and independent use. District level studies could then be used to compare infrastructure building in stages and see trends prior to. Designs of this kind would offer more robust evidence of impact than a correlation between national payment growth and GDP.

The same applies to the publication standards. Vintages and revisions should be kept on dashboards and make it clear if it is figures recording the initiation of a transaction, the successful transaction, or the settled transaction. Similar transaction size categories for merchants and personal payments would make it easier to understand changes in transaction size. Researchers should provide

details in calculation sheets and make it clear that a distinction is made between real outcomes and nominal transfers. These enhancements would make the system more accountable but would not mandate the public release of any identifiable payment data.

7 Limitations and conclusion:

In addition, the composition problem exists. The average can drop because there are increased numbers of smaller payments or larger transfers move to another channel or both. These explanations are hard to rank without a consistent breakdown by their purpose and ticket size. Future studies should include the categories of transactions over time and determine if the changes are due to the reallocation of funds among instruments or new economic activity.

Five observations per year is a limitation on the evidence, along with nominal values and the lack of individual or regional outcomes. UPI is one of the prominent platforms and not the complete digital payment system. Separation of payment substitution, new commerce, and repeat usage and changing transaction composition is not possible in the analysis. Documentary sources are also used for different purposes: official releases talk about performance, and research studies focus more on the narrower mechanisms.

The findings indicate, however, significant growth in total payments and a shrinking payment size. They do not support an increasing GDP effect; rather, they support an increasing transaction intensity. Reliable service and meaningful choice can enhance exchange and financial access via digital payment infrastructure. Its impact on the Indian economy should be assessed in the end through reduced real costs, enhanced business productivity and increased household welfare. An important first indicator of growth is the increase in payment numbers, but inclusive economic outcomes are what will be tested.

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