

# Digital Payments, Tourism and Economic Growth in India: An Empirical Analysis of their Interrelationship

<sup>1</sup>Dr.S.R.Keshava, <sup>2</sup>R. Anusha

<sup>1</sup>Senior Professor of Economics, <sup>2</sup>Research Scholar

<sup>12</sup>Department of Economics

<sup>12</sup>Bangalore University, Bangalore 560056

---

## **Abstract—Purpose:**

Digitalisation has become a crucial aspect of India's economic transformation, with rapid growth in both digital payments and tourism in recent years. However, the relationship among digital payment activities, tourism, and economic growth remains underexplored at the national level. This study aims to examine the connections among UPI transactions, domestic and foreign tourist visits, and India's GDP to understand how these elements have evolved together over the study period.

## **Methods:**

The study utilises annual macro-level data on UPI transaction volume and value, domestic and foreign tourist visits, and GDP. Correlation and regression analysis are employed to assess the strength and statistical significance of the relationships between these variables and economic growth. UPI transaction activity serves as a measurable indicator of the expansion of India's digital payment ecosystem.

## **Results:**

The findings reveal strong positive correlations between UPI activity and GDP. The value of UPI transactions displays the strongest relationship, with an  $R^2$  of 0.998 and a statistically significant p-value of less than 0.001, while transaction volume has an  $R^2$  of 0.994. Domestic tourist visits also show a strong association with GDP ( $R^2 = 0.960$ ;  $p = 0.003$ ). There is a positive and statistically significant relationship with foreign tourist visits, although this association is comparatively weaker ( $R^2 = 0.745$ ;  $p = 0.032$ ). Overall, the results indicate that the growth of digital payments and tourism closely aligns with India's economic growth during the examined period.

## **Conclusion:**

This study suggests that digital payments and tourism are closely intertwined with India's broader economic development. However, the findings should be interpreted as evidence of association rather than causation, as the analysis is based on a limited number of annual observations and the variables exhibit strong upward trends over time. The study emphasises the necessity for continued investment in digital payment infrastructure, cybersecurity, digital literacy, and tourism facilities, particularly in less developed regions. Future research utilising longer and more frequent datasets, along with advanced econometric techniques, would provide a more robust understanding of the direction and persistence of these relationships.

**Index Terms**—Digital payments, UPI, tourism, economic growth, digitalisation, India, financial inclusion

## I. Introduction

The global economy is undergoing a structural transformation driven by rapid advances in digital technology. Digitalisation has moved beyond simple adoption of computers and the internet to become essential for economic activity, governance, financial inclusion, and public service delivery. Governments increasingly use digital systems to connect citizens, businesses, and institutions, reducing transaction costs and improving access to markets. In developing economies, digital infrastructure is vital for overcoming geographical barriers and improving economic participation.

India exemplifies this transformation. Over the past two decades, its digital ecosystem has shifted from basic computerisation and e-governance to the establishment of large-scale, interoperable digital infrastructure. The launch of the Digital India Programme in 2015 marked a significant policy shift, treating digital infrastructure as a key public utility. Platforms such as Aadhaar and the Unified Payments Interface (UPI) have fostered a digital environment where identification, payments, and service delivery can occur through digital channels.

The emergence of Digital Public Infrastructure (DPI) also holds economic significance beyond finance. By lowering transaction costs and enhancing accessibility, digital infrastructure allows small enterprises and informal businesses to participate in formal markets. For example, the growth of digital payments has made transactions faster and more accessible. However, it remains to be seen if these improvements translate into sectoral outcomes and overall economic growth.

Tourism serves as a key sector for exploring this connection. It is vital to employment, entrepreneurship, and income generation, and it impacts various local services and supply chains. Tourist spending generates demand for accommodations, food, and recreation while creating indirect employment in agriculture and handicrafts.

Digital technologies have transformed tourism by changing how services are produced, marketed, and consumed. Tourists can now easily search for information, make reservations, and complete transactions online, while local businesses can reach broader markets. Thus, the relationship between digital infrastructure and tourism is significant for India's development. Improved digital connectivity can boost tourist confidence, streamline access to services, and enhance local enterprise participation in tourism, ultimately contributing to economic growth through job creation and income generation.

## II. Literature Review

The rapid spread of digital technologies has transformed tourism by making destination information more accessible, reducing transaction costs, enhancing communication between tourists and service providers, and enabling businesses to reach wider markets. Consequently, digitalisation is now a crucial aspect of tourism development. The term "digitalisation" encompasses a range of technologies, from mobile connectivity to broader digital ecosystems like digital finance. This variety highlights the need to examine measurable components of digitalisation for assessing their economic significance.

In India, the connection between digital transformation and economic development has gained attention. Keshava S. R. (2024) explores India's economic growth in terms of infrastructure and structural changes, while Keshava (2025) emphasises financial inclusion and the role of digital finance, especially post-2011. Together, these works illustrate how digital financial infrastructure supports economic transformation and inclusion. Furthermore, studies have shown that government support and adequate digital infrastructure can enhance tourism development and improve the tourist experience, as seen in Ratheesh et al. (2024), which focuses on Kerala. However, their primary focus on AI and tourist experience overlooks the relationship between digital financial transactions and macroeconomic performance.

International research also links digitalisation and tourism development. Studies by Xu, Siddik et al. (2024), and Ruan et al. (2025) identify positive relationships between digital technology and economic growth in tourism contexts, while Sanju et al. (2025) highlight the influence of mobile connectivity on tourism demand. Recent studies have addressed the direct impact of digital finance on tourism. Luo, Wang, and Wu (2024) find that digital financial inclusion enhances tourism development in Chinese cities. Similarly, the integration of digital technologies, such as mobile payments, improves tourism efficiency.

Keshava (2010) provides a systematic discussion of fundamental economic concepts that are relevant to understanding the broader dimensions of economic development. The study covers key issues including economic growth, national income, inflation, poverty, unemployment, and public finance, thereby providing a conceptual foundation for analysing economic conditions. It also emphasizes the significance of government policies and economic institutions in addressing developmental challenges and promoting economic stability. The work is therefore useful as a theoretical reference for examining economic issues and understanding their implications within the context of the Indian economy.

The evolving payment landscape in tourism is another area of focus. A systematic review highlights significant shifts in payment practices due to digital systems, notably in India, where UPI has become a vital part of the digital payment ecosystem. Recent research indicates a correlation between digital payment systems and economic growth.

Finally, studies have explored the relationship between tourism and economic growth in India, revealing a long-term connection between tourism-related variables and economic performance, supporting the tourism-led growth hypothesis through investment and government spending.

### III. Research Gap

The literature reviewed highlights a growing body of evidence linking digitalisation with tourism development and economic growth. However, three significant gaps remain, particularly in the Indian context.

- 1) Much of the existing literature treats digitalisation as a broad concept or focuses on specific technologies, such as artificial intelligence, mobile connectivity, online platforms, or digital financial inclusion. Less attention has been given to digital payment activity as a measurable indicator of India's digital transformation. This omission is particularly noteworthy given the rapid expansion of the Unified Payments Interface (UPI) and its increasing use by consumers and businesses.
- 2) Digitalisation, tourism, and economic growth are often examined as separate relationships. While studies have established links between digital technology and tourism, as well as between tourism and economic growth, fewer studies integrate these dimensions within a single empirical framework. This raises a broader question: Is the expansion of India's digital payment ecosystem occurring alongside changes in tourism activity and overall economic output?
- 3) There is limited macro-level evidence that specifically links UPI transactions with domestic tourism, international tourism, and GDP within the Indian economy. Existing studies often rely on cross-country comparisons, regional or city-level datasets, or more generalised measures of digitalisation. A focused examination of these variables at the national level could offer valuable insights, although such an approach cannot alone establish causal relationships.

### IV. Positioning of the Present Study

In this context, the present study uses UPI transaction activity as a proxy for the expansion of India's digital payment ecosystem and examines its relationship with GDP and tourism activity. Domestic and international tourist visits are considered separately to recognise that different forms of tourism may exhibit distinct relationships with economic performance.

The study does not aim to capture every aspect of digitalisation in India; instead, it focuses on a specific, observable component—digital payment activity. It investigates how this expansion has correlated with tourism and economic growth during the study period. The objective is to provide empirical evidence on the association among digital payments, tourism, and economic growth, while acknowledging that the use of annual aggregate data limits the ability to draw causal conclusions.

This positioning also distinguishes the study from research that primarily focuses on technological adoption or the tourist experience. The emphasis here is on the macroeconomic dimensions of digitalisation and tourism, particularly whether the rapid expansion of India's digital payment infrastructure has coincided with changes in tourism activity and GDP.

## V. Objectives of the Study

1. To examine the growth trends in UPI transactions, domestic tourist inflows, international tourist inflows and GDP at constant prices in India during the study period.
2. To examine the relationship between UPI transaction activity and tourist inflows in India, distinguishing between domestic and international tourism.
3. To examine the relationship between UPI transactions, tourist inflows and economic growth, measured by GDP at constant prices.
4. To assess whether digital payment expansion and tourism growth are associated with India's economic performance during the study period.

## VI. Hypotheses of the Study

H01: There is no significant relationship between UPI transaction activity and domestic tourist inflows in India.

H02: There is no significant relationship between UPI transaction activity and international tourist inflows in India.

H03: UPI transaction activity and tourist inflows are not significantly related to GDP at constant prices.

## VII. Methodology

The study employs a quantitative research design to investigate the connections between digital payment activity, tourism, and economic growth in India. It analyses secondary annual data from the Reserve Bank of India, the Ministry of Tourism, and other official databases over a five-year period.

Four main variables are examined: GDP at constant prices (as an indicator of economic growth), UPI transaction volume (as a proxy for digital payments), domestic tourist visits, and international tourist arrivals. The analysis aims to identify growth trends and the relationships among these variables during the study period.

### 7.1 Research Design

The study employs a quantitative empirical research design to analyse the relationships among digital payment activities, tourism, and economic growth in India. The analysis relies solely on secondary annual data gathered over a five-year period.

## 7.2 Variables

| Variable              | Measurement                                | Role                                 |
|-----------------------|--------------------------------------------|--------------------------------------|
| GDP                   | GDP at constant prices (₹/absolute value)  | Economic growth indicator            |
| UPI                   | UPI transaction volume/value, as available | Digital payment infrastructure proxy |
| Domestic Tourism      | Domestic tourist visits/inflows            | Tourism indicator                    |
| International Tourism | International tourist arrivals             | Tourism indicator                    |

## 7.3 Descriptive Analysis

The first stage should examine:

- Absolute values
- Annual growth rates
- Mean
- Minimum and maximum
- Standard deviation
- Percentage change over the study period

Growth rates can be calculated as:

$$Growth\ Rate_t = \frac{X_t - X_{t-1}}{X_{t-1}} \times 100$$

This will allow you to compare the evolution of digital payments, tourism and GDP on a common growth basis.

## 7.4 Correlation Analysis

Pearson's correlation coefficient can be used to examine the direction and strength of association among:

- UPI and GDP
- UPI and domestic tourist inflows
- UPI and international tourist inflows
- Domestic tourism and GDP
- International tourism and GDP

However, with only five observations, correlation coefficients should be interpreted as indicative rather than conclusive evidence.

## 7.5 Regression Analysis

You can estimate simple exploratory relationships such as:

$$GDP_t = \alpha + \beta_1 UPI_t + \epsilon_t$$

and

$$GDP_t = \alpha + \beta_1 DomesticTourism_t + \epsilon_t \quad GDP_t = \alpha + \beta_1 InternationalTourism_t + \epsilon_t$$

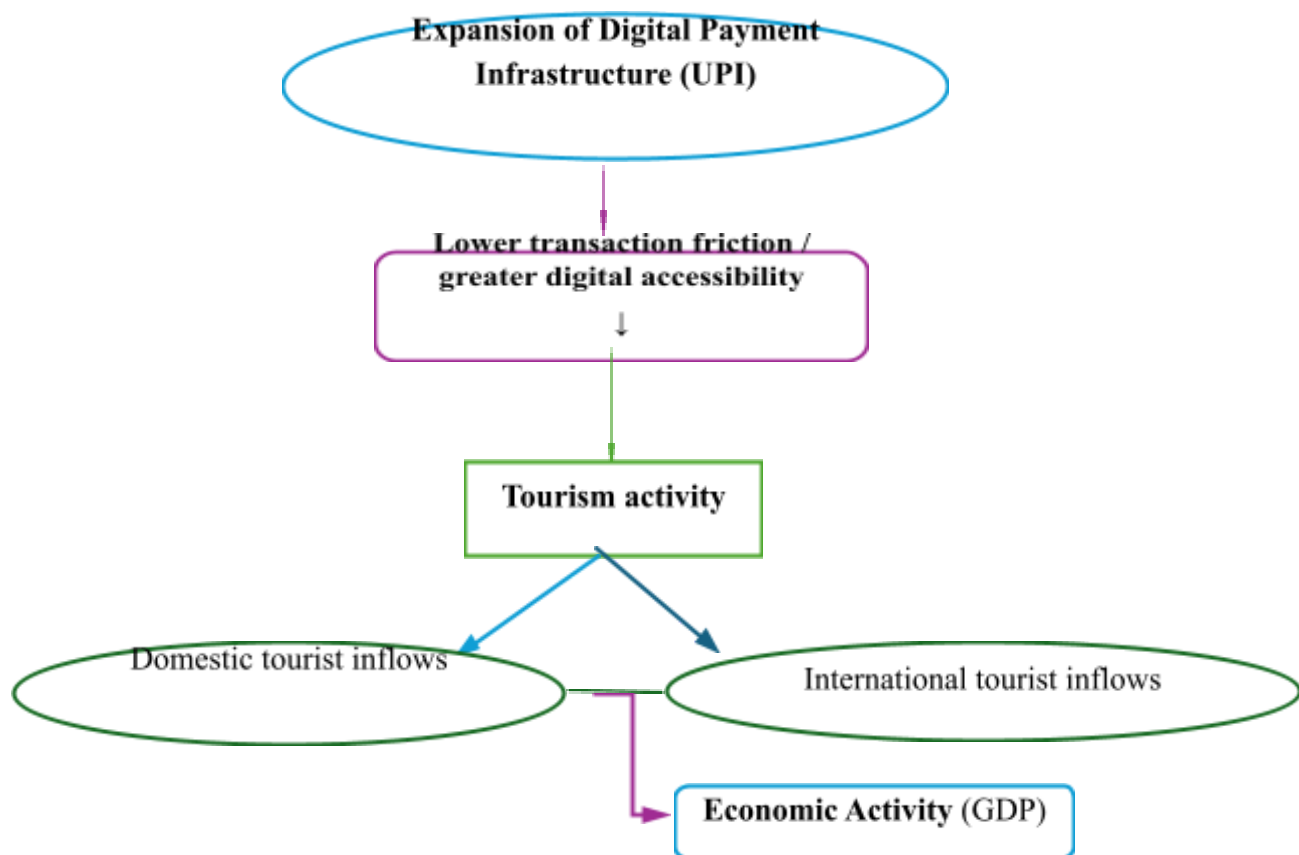
A combined specification could theoretically be:

$$GDP_t = \alpha + \beta_1 UPI_t + \beta_2 DomesticTourism_t + \beta_3 InternationalTourism_t + \epsilon_t$$

## VIII. Methodological caution

Due to the limited five-year observation period, the empirical analysis focuses on descriptive statistics, growth rate analysis, correlation analysis, and simplified regression models. The results are interpreted as indicative associations rather than definitive causal relationships.

### Conceptual framework



## Results and Discussion

### Digital Payments, Tourism and Economic Growth in India

**Table 1: Descriptive Statistics of Digital Payments, Tourism and Economic Growth in India**

| Variables                            | N | Minimum    | Maximum    | Mean          | Std. Deviation |
|--------------------------------------|---|------------|------------|---------------|----------------|
| UPI Transaction Volume (Crore)       | 5 | 4595.61    | 24161.69   | 13665.66      | 7814.89        |
| UPI Transaction Value (₹ Lakh Crore) | 5 | 84.16      | 314.23     | 199.61        | 94.18          |
| Domestic Tourist Visits(Million)     | 5 | 610.22     | 2,948.19   | 1,861.12      | 1,005.89       |
| Foreign Tourist Visits (Million)     | 5 | 1.05       | 20.94      | 10.74         | 8.03           |
| GDP at Constant Prices (₹ crore)     | 5 | 15,021,846 | 20,189,919 | 17,564,844.80 | 2,042,000      |

The descriptive statistics indicate significant growth in digital payment activity, tourism, and economic output during the study period. The volume of UPI transactions ranged from 4,595.61 crore to 24,161.69 crore, with a mean of 13,665.66 crore and a standard deviation of 7,814.89 crore. This suggests considerable growth and variation in the usage of digital payments. Similarly, the total value of UPI transactions ranged from ₹84.16 lakh crore to ₹314.23 lakh crore, with an average of ₹199.61 lakh crore.

Domestic tourist visits also fluctuated significantly, ranging from 610.22 million to 2,948.19 million, with a mean of 1,861.12 million. The relatively high standard deviation of 1,005.89 million reflects substantial changes in domestic tourism during the study period, particularly the sharp decline during the pandemic followed by a recovery. Foreign tourist visits ranged from 1.05 million to 20.94 million, with a mean of 10.74 million, showing similar variability.

GDP at constant prices increased from ₹15,021,846 crore to ₹20,189,919 crore, with an average of ₹17,564,844.80 crore. Overall, the descriptive results clearly demonstrate an upward trend in UPI activity and GDP, along with a robust recovery in tourism. These patterns provide a foundation for further examination of the relationship among digital payments, tourism, and economic growth through correlation and econometric analyses.

**Table 2: Pearson Correlation Analysis of UPI Transactions, Tourism and Economic Growth in India**

| Variables               | UPI Transactions Volume | Domestic Tourist Visits | Foreign Tourist Visits | GDP at Constant Prices |
|-------------------------|-------------------------|-------------------------|------------------------|------------------------|
| UPI Transactions Volume | 1.000                   | .973**                  | .884*                  | .997**                 |
| Domestic Tourist Visits | .973**                  | 1.000                   | .931*                  | .974**                 |
| Foreign Tourist Visits  | .884*                   | .931*                   | 1.000                  | .886*                  |
| GDP at Constant Prices  | .997**                  | .974**                  | .882*                  | 1.000                  |

**Note:** Pearson correlation coefficient; N = 5.

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

The Pearson correlation analysis reveals a very strong positive relationship between UPI transaction volume and GDP at constant prices ( $r = 0.997$ ), which is statistically significant at the 1% level. This indicates that increases in digital payment activity are closely linked to increases in economic output during the study period. Additionally, UPI transaction volume shows a strong positive correlation with domestic tourist visits ( $r = 0.973$ ,  $p < 0.01$ ) and with foreign tourist visits ( $r = 0.884$ ,  $p < 0.05$ ).

Domestic tourist visits also demonstrate a strong positive correlation with GDP ( $r = 0.974$ ,  $p < 0.01$ ), suggesting that higher levels of domestic tourism are associated with greater economic output. Furthermore, domestic and foreign tourist visits are positively correlated ( $r = 0.931$ ,  $p < 0.05$ ), indicating that both forms of tourism tended to move in the same direction during the study period.

Foreign tourist visits exhibit a strong positive relationship with GDP ( $r = 0.886$ ,  $p < 0.05$ ). Overall, the findings suggest that digital payments, domestic tourism, foreign tourism, and economic growth are positively associated with one another. These results provide preliminary support for the interrelationships proposed in the study.

## 8.2 Regression Analysis

This study analyses the relationships among digital payments, tourism, and economic growth in India using a single exploratory multiple regression model. The dependent variable is the Gross Domestic Product (GDP) at constant prices, while the independent variables include the volumes of Unified Payments Interface (UPI) transactions, domestic tourist visits, and foreign tourist visits. The model is specified as follows:

$$GDP_t = \beta_0 + \beta_1 UPI_t + \beta_2 DTV_t + \beta_3 FTV_t + \varepsilon_t$$

Where:

- $GDP_t$  = GDP at constant prices in year t, representing economic growth
- $UPI_t$  = UPI transaction volume (crore), representing digital payment activity
- $UPI_{ti}$  = UPI transaction value (crore), representing digital payment activity
- $DTV_t$  = Domestic tourist visits
- $FTV_t$  = Foreign tourist visits
- $\beta_0$  = Constant term
- $\beta_1, \beta_2, \beta_3$  = Regression coefficients
- $\varepsilon_t$  = Error term

This study examines the relationship between digital payment activity, tourism, and fluctuations in India's economic output during the specified period. The analysis will report estimated coefficients,  $R^2$ , adjusted  $R^2$ , t-statistics, p-values, and F-statistic to evaluate the model's explanatory power and statistical significance.

| Model | Independent Variable | R | R <sup>2</sup> | Adjusted R <sup>2</sup> | Std. Error | F | Sig. | Constant (B <sub>0</sub> ) | Coefficient (B <sub>1</sub> ) | Beta | t | Sig. |
|-------|----------------------|---|----------------|-------------------------|------------|---|------|----------------------------|-------------------------------|------|---|------|
|       |                      |   |                |                         |            |   |      |                            |                               |      |   |      |

|   |                           |       |       |       |       |       |        |        |          |       |       |        |
|---|---------------------------|-------|-------|-------|-------|-------|--------|--------|----------|-------|-------|--------|
| 1 | UPI Transactions (Volume) | 0.997 | 0.994 | 0.992 | 0.234 | 515.0 | <0.001 | 13.966 | 0.000261 | 0.997 | 22.70 | <0.001 |
| 2 | UPI Transaction (Value)   | 0.999 | 0.998 | 0.997 | 0.184 | 1,500 | <0.001 | 12.950 | 0.0231   | 0.999 | 39.00 | <0.001 |
| 3 | Domestic Tourist Visits   | 0.980 | 0.960 | 0.947 | 0.615 | 72.0  | 0.003  | 14.330 | 1.910    | 0.980 | 8.49  | 0.003  |
| 4 | Foreign Tourist Visits    | 0.863 | 0.745 | 0.660 | 1.490 | 14.5  | 0.032  | 15.170 | 0.210    | 0.863 | 3.81  | 0.032  |

### Regression equation:

$$\text{GDP} = 13.966 + 0.000261(\text{UPI Transactions}) \quad \text{GDP} = 13.966 + 0.000261(\text{UPI Transactions})$$

The regression analysis investigates the relationship between India's GDP at constant prices and selected indicators of digital payment activity and tourism. The results consistently show a positive and statistically significant association between GDP and each of the four explanatory variables, when analysed separately.

### Result

| Independent Variable      | R      | R <sup>2</sup> | Relationship with GDP | Significance |
|---------------------------|--------|----------------|-----------------------|--------------|
| UPI Transactions (Volume) | ~0.997 | ~0.994         | Very strong positive  | < 0.001      |
| UPI Transaction (Value)   | ~0.999 | ~0.998         | Very strong positive  | < 0.001      |
| Domestic Tourist Visits   | ~0.980 | ~0.960         | Very strong positive  | 0.003        |
| Foreign Tourist Visits    | ~0.863 | ~0.745         | Strong positive       | 0.032        |

Among the digital payment indicators, UPI transaction volume exhibits an exceptionally strong relationship with GDP, with an R value of 0.997 and an R<sup>2</sup> of 0.994. This indicates that approximately 99.4% of the variation in GDP can be explained by changes in UPI transaction volume within the study period. The positive regression coefficient of 0.000261 is statistically significant ( $t = 22.7$ ,  $p < 0.001$ ), suggesting that higher UPI transaction volumes are associated with higher GDP. The overall regression model is also statistically significant ( $F = 515.0$ ,  $p < 0.001$ ), indicating a very strong linear association between UPI transaction volume and economic output.

UPI transaction value demonstrates an even stronger association with GDP. The model yields an R value of approximately 0.999 and an R<sup>2</sup> of 0.998, indicating that about 99.8% of the variation in GDP is explained by changes in UPI transaction value. The positive regression coefficient ( $B = 0.0231$ ) is statistically significant ( $t = 39$ ,  $p < 0.001$ ), indicating a strong positive relationship between digital payments and GDP. The high F-statistic and significance level ( $p < 0.001$ ) further indicate that the regression relationship is statistically significant. These findings suggest that the expansion and increasing monetary value of digital payment transactions have closely followed India's economic growth during the study period.

Domestic tourist visits also show a very strong positive relationship with GDP. The correlation coefficient is 0.980, and the R<sup>2</sup> value of 0.960 indicates that approximately 96.0% of the variation in GDP is explained by domestic tourist visits in the estimated bivariate model. The positive regression coefficient ( $B = 1.91$ ) is statistically significant ( $t = 8.49$ ,  $p = 0.003$ ). ANOVA results further confirm that the model is statistically significant ( $F = 72.0$ ,  $p = 0.003$ ). This indicates that higher levels of domestic tourism activity are strongly

associated with higher economic output, potentially reflecting domestic tourism's contributions to expenditure, transportation, hospitality, employment, and related economic activities.

Foreign tourist visits also exhibit a positive and statistically significant relationship with GDP; however, the strength of this relationship is weaker than that observed for UPI activity and domestic tourism. The model shows an R value of 0.863 and an  $R^2$  of 0.745, meaning that approximately 74.5% of the variation in GDP is explained by foreign tourist visits in the estimated model. The coefficient for foreign tourist visits is positive ( $B = 0.210$ ) and statistically significant ( $t = 3.81$ ,  $p = 0.032$ ), with an overall regression significance ( $F = 14.5$ ,  $p = 0.032$ ). Thus, an increase in foreign tourist arrivals is associated with an increase in GDP, although this relationship is comparatively weaker than that of domestic tourism and digital payment indicators.

Overall, the regression results reveal that both digital payment activity and tourism are strongly and positively associated with India's economic output during the study period. UPI transaction value shows the strongest explanatory relationship with GDP ( $R^2 \approx 0.998$ ), followed by UPI transaction volume ( $R^2 \approx 0.994$ ), domestic tourist visits ( $R^2 \approx 0.960$ ), and foreign tourist visits ( $R^2 \approx 0.745$ ). All four relationships are statistically significant at conventional levels. Therefore, the findings provide empirical evidence that the growth of digital payments and tourism has closely aligned with India's economic growth. However, since these are exploratory regressions based on a limited number of annual observations, the results should be interpreted as associations rather than evidence of causality. The extremely high  $R^2$  values may also reflect common time trends across the variables; therefore, the findings should not be misconstrued as establishing that increases in UPI or tourism independently cause increases in GDP.

### Hypothesis Results

The results of the hypothesis testing reveal a statistically significant positive relationship between digital payment activity, tourism activity, and India's GDP at constant prices. Regarding H01, which states that there is no significant relationship between UPI transaction activity and domestic tourist inflows in India, the regression analysis indicates that both UPI transaction activity and domestic tourist visits are strongly and significantly associated with GDP. However, the regressions do not test the direct relationship between UPI activity and domestic tourist inflows. Therefore, H01 cannot be conclusively rejected based solely on these regression results.

Similarly, H02, which posits that there is no significant relationship between UPI transaction activity and international tourist inflows in India, cannot be directly assessed from the reported results. This is because the analysis examines UPI activity and foreign tourist visits separately in relation to GDP, rather than their direct relationship to each other.

On the other hand, H03 states that UPI transaction activity and tourist inflows are not significantly related to GDP at constant prices, and this hypothesis is rejected. The findings show that UPI transaction volume has an extremely strong and statistically significant positive relationship with GDP ( $R = 0.997$ ,  $R^2 = 0.994$ ,  $p < 0.001$ ), while UPI transaction value also displays a very strong positive correlation with GDP ( $R = 0.999$ ,  $R^2 = 0.998$ ,  $p < 0.001$ ). Additionally, domestic tourist visits are significantly and positively related to GDP ( $R = 0.980$ ,  $R^2 = 0.960$ ,  $p = 0.003$ ), and foreign tourist visits are also significantly and positively related to GDP ( $R = 0.863$ ,  $R^2 = 0.745$ ,  $p = 0.032$ ).

Since the p-values for all reported relationships with GDP are below the 5% significance level, the null hypothesis H03 is rejected. This indicates that UPI transaction activity and tourist inflows are significantly associated with India's economic growth during the study period. Overall, the findings support strong positive associations among digital payment activity, tourism activity, and economic output. However, it is

important to interpret these results as associations rather than causal relationships, given the limited number of observations and the exploratory nature of the analysis.

## **IX. Key Findings**

The results reveal a clear positive relationship between digital payments, tourism activity, and GDP in India during the study period. UPI (Unified Payments Interface) transaction value shows the strongest correlation with GDP, with an  $R^2$  of 0.998 and a p-value below 0.001. UPI transaction volume also shows a strong relationship, with an  $R^2$  of 0.994. This indicates that digital payment growth aligns closely with the Indian economy's expansion.

Tourism exhibits a significant correlation as well. Domestic tourist visits show a strong association with GDP, with an  $R^2$  of 0.960 and a p-value of 0.003. Foreign tourist visits also show a positive association, albeit weaker, with an  $R^2$  of 0.745 and a p-value of 0.032. All considered variables reveal statistically significant associations with GDP at the 5 percent level.

These findings underline the growing importance of digital payments and tourism in India's economic transformation. However, it's crucial to note that while strong associations exist, these do not imply direct causation. The high  $R^2$  values may also stem from the limited number of observations and the upward trends of these variables over time.

## **X. Challenges and Limitations**

Despite the opportunities presented by digital payments and tourism, several challenges persist:

1. **Access:** Digital payment access is uneven across the country, particularly affecting rural areas due to disparities in internet connectivity and digital literacy.
2. **Security Issues** such as fraud, cybercrime, and data privacy remain significant concerns, which could hinder user trust in digital transactions.
3. **Infrastructure:** Tourism infrastructure is inconsistent, with established centres having better amenities than emerging rural destinations, limiting their appeal.
4. **Distribution of Benefits:** Tourism benefits are often concentrated in select destinations, making it challenging for smaller locations to attract visitors and generate local income.
5. **Data Limitation:** The study relies on a small number of annual observations. The upward trends in GDP, UPI transactions, and tourism activity may artificially inflate the observed correlations. Future research with more extensive data and advanced econometric techniques could provide deeper insights into these relationships.

## **XI. Suggestions and Policy Implications**

The findings of the study suggest that digital payments can play a crucial role in supporting tourism and the related economic activities. However, the benefits of digitalisation are likely to be maximised when digital payment facilities are backed by adequate infrastructure, awareness, and a supportive tourism environment.

1. Improving digital infrastructure should be a priority, especially in rural, semi-urban, and emerging tourism destinations. Reliable internet connectivity and broader access to UPI-enabled payment facilities can enhance participation in the digital economy for both tourists and local businesses.
2. There is a pressing need to focus on digital and financial literacy. Small tourism businesses, local vendors, transport operators, and other informal service providers may require training and support to effectively utilise digital payment systems. Tourists also need greater awareness of safe digital transactions, particularly concerning fraud and other cyber risks.
3. Digital payments should be integrated into tourism development strategies. Hotels, restaurants, transport operators, tourist attractions, and local retailers should be encouraged to offer convenient digital payment options. This can simplify transactions for visitors while also supporting the gradual formalisation of small tourism-related businesses.
4. Tourism development needs to be more geographically inclusive. Increased attention could be directed toward rural and lesser-known destinations, where improvements in infrastructure—such as roads, connectivity, accommodation, sanitation, and safety—can help distribute tourism-related income beyond established tourist centres.
5. India's potential for international tourism can be enhanced through easier digital payment processes. Simple, secure, and interoperable payment options, especially those convenient for international visitors, can improve the overall visitor experience and boost India's competitiveness as a tourism destination.
6. Collaboration among stakeholders is also essential. Government agencies, banks, fintech companies, and tourism organisations can work together to address infrastructure gaps, enhance payment systems, and develop solutions tailored to the needs of various tourists and tourism businesses.

## **XII. Way Forward**

This study highlights several areas that warrant attention in future policy and research. One crucial requirement is the availability of reliable and consistent data. Regular data on digital payment transactions, tourist arrivals, tourism expenditures, employment, and regional economic activity would enable researchers and policymakers to better understand the relationship between digitalisation and tourism.

Future research could also extend beyond simple associations by utilising larger datasets and more advanced econometric methods. Quarterly or monthly observations and panel data across different states and regions would provide greater insight into the long-term relationships and potential causal effects among digital payments, tourism, and economic growth.

It would also be beneficial to investigate whether the benefits of expanding digital payments are reaching small businesses and local communities, rather than primarily benefiting large tourism centres and organised businesses. Exploring differences across states, between rural and urban destinations, and between domestic and international tourism could yield significant insights.

Overall, the goal is not simply to increase the volume of digital transactions but to build a more integrated digital tourism ecosystem. Digital payments, transportation, accommodation, tourist information, and other visitor services can be progressively connected through secure, user-friendly digital platforms. This approach can enhance the tourist experience while creating better opportunities for local businesses, employment, and regional economic development.

### XIII. Conclusion

This study examines the relationship among digital payments, tourism, and economic growth in India, with a focus on the role of the Unified Payments Interface (UPI). The findings reveal a strong positive correlation between UPI transactions and GDP, with transaction value showing the highest association ( $R^2 = 0.998$ ) and transaction volume following closely ( $R^2 = 0.994$ ). Domestic tourism also correlates strongly with economic growth ( $R^2 = 0.960$ ), whereas foreign tourism shows a statistically significant but weaker relationship ( $R^2 = 0.745$ ).

The results underscore the impact of digital payments on consumer transactions and the economic opportunities generated by tourism. However, the benefits may not be evenly distributed without addressing gaps in digital access, infrastructure, and literacy. While these findings highlight significant associations, they do not confirm causal relationships, as the study relies on a limited number of annual observations. Consequently, the high  $R^2$  values may reflect common trends over time rather than direct effects.

From a policy standpoint, creating a supportive digital-tourism ecosystem is crucial. This includes enhancing digital infrastructure, improving literacy, and making digital payments accessible to smaller tourism businesses. Additionally, improving transportation and facilities can help maximise tourism's contribution to local economic development.

The study also calls for further research using longer, more frequent datasets to explore potential causal effects and regional differences. Overall, digital payments and tourism are closely linked to India's economic growth, but further investigation is needed to understand the full nature of this relationship. Building an inclusive digital tourism environment is essential to translating digital transformation into broader economic benefits.

### References

- [1] Keshava, S. R. (2022). 75 Years of India's Economic Development: Evaluation, Challenges, and Way Forward. *Kristu Jayanti Journal of Management Sciences (KJMS)*, 1(1), 1–17. <https://doi.org/10.59176/kjms.v1i1.2197>
- [2] Keshava, S. R. (2025). Pathways to Prosperity: Factors Influencing Poverty Reduction and the Way Forward in India. *DHARANA - International Journal of Business from M. P. Birla Institute of Management Associate Bharatiya Vidya Bhavan*, 16(2), 47–57. <https://doi.org/10.18311/dbijb/2025/53581>
- [3] Keshava, S. R. (2010). *Economics: For UPSC-IAS, IPS, State Civil Service preliminary exams and UGC-JRF/NET, SLET & other competitive exams*. New Age International (P) Limited, Publishers.
- [4] Luo, H., Wang, H., & Wu, Y. (2024). Digital financial inclusion and tourism development. *International Review of Economics & Finance*, 90, 207–219. <https://doi.org/10.1016/j.iref.2023.12.001>.
- [5] Ratheesh K R, & Cyriac, Siji & T M, Somasekharan & M, Aswathy & M C, Firos Khan & P K, Manoj. (2024). Tourism in Digital India, Government Initiatives and the need for AI-Driven Transformation: A Study of Kerala, The Emerging Knowledge Economy in India. *South Eastern European Journal of Public Health*. 25. 4243-4260. Accessed at <https://www.seejph.com/index.php/seejph/article/view/4094>

- [6] Ruan, J., Satjawathee, T., & Awirothananon, T. (2025). *The Impact of Digital Technology on Tourism Economic Growth: Empirical Analysis Based on Provincial Panel Data, 2010–2022*. *Tourism and Hospitality*, 6(2), 73. <https://doi.org/10.3390/tourhosp6020073>
- [7] Sanju, N.L., Yap, G., Saha, S., & Rahman, M. (2025). Digitalisation as a vehicle of expansion of tourism industry. *Tourism Economics* 2025, Vol. 0(0) 1–24, DOI: 10.1177/13548166251393381 Accessed at <https://journals.sagepub.com/doi/10.1177/13548166251393381>
- [8] Shrivastava, K., Raghav, M., & Srivastava, A. (2026). Digital Payment Network Architectures and Economic Growth: A Cointegration Study of India's Payment Infrastructure. *International Journal of Networked and Distributed Computing*. <https://doi.org/10.1007/s44227-026-00117-z>
- [9] Singh, D., & Alam, Q. (2024). Is tourism expansion the key to economic growth in India? An aggregate-level time series analysis. *Annals of Tourism Research Empirical Insights*, 5(2), 100126. <https://doi.org/10.1016/j.annale.2024.100126>
- [10] Wang, N. (2024). Using the fuzzy method and multi-criteria decision making to analyse the impact of digital economy on urban tourism. *International Journal of Computational Intelligence Systems*.
- [11] Wang, R., & Chan, C.-S. (2025). A systematic literature review on payment methods in hospitality and tourism. *Information Technology & Tourism*, 27, 1–27.
- [12] Xu, Anfeng & Siddik, Abu & Sobhani, Farid & Rahman, Md. Mominur. (2024). Driving economic success: Fintech, tourism, FDI, and digitalization in the top 10 tourist destinations. *Humanities and Social Sciences Communications*. 11. 10.1057/s41599-024-03978-3. Accessed at <https://www.researchgate.net/publication/385854287> Driving economic success Fintech tourism FDI and digitalization in the top 10 tourist destinations
- [13] Zeqiri, A.; Ben Youssef, A.; Maherzi Zahar, T. The Role of Digital Tourism Platforms in Advancing Sustainable Development Goals in the Industry 4.0 Era. *Sustainability* 2025, 17, 3482. <https://doi.org/10.3390/su17083482>
- [14] IndiaStack (2024), [indiastack.org](https://indiastack.org/), <https://indiastack.org/>.
- [15] <http://tourism.gov.in/annual-reports/india-tourism-data-compendium-2025>
- [16] <https://www.thehindu.com/news/national/karnataka/karnataka-to-develop-digital-heritage-portal-to-preserve-cultural-legacy/article70357295.ece>
- [17] [https://data.tourism.gov.in/mrd/Uploads/tourism\\_data/India%20Tourism%20Data%20Compendium%202025\\_1.pdf](https://data.tourism.gov.in/mrd/Uploads/tourism_data/India%20Tourism%20Data%20Compendium%202025_1.pdf)
- [18] <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2286608&reg=3&lang=1>
- [19] <http://tourism.gov.in/annual-reports/india-tourism-data-compendium-2025>