**The Influence of UPI on Tax Revenue and Economic Formalization**

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**ABSTRACT**

The introduction of Unified Payment Interface (UPI) in India has consider aply impacted the digital payment system as it has enhanced financial inclusion and formalized economic activities. In this study, the impact of UPI utilization is analyzed concerning tax revenue. This has examined in particular the GST and corporate taxes. This study attempts to explore the impact of UPI on the revenues collected through taxes, sales, and compliance with transparency from the year 2016 to 2024. The findings indicate that there is a significant positive relationship UPI usage and tax revenues which shows that small and medium enterprises (SME) play a critical role towards tax compliance. On the other hand, UPI senable increased transparency and reduces the informal economy, inefficiencies related to cyber security, digital illiteracy, and limited infrastructure persist. The study provides political measures to be undertaken to optimally utilize the impacts of digital payment systems to enhance tax collection in India.

**Keywords:** UPI, digital payments, tax revenue, GST, financial inclusion, economic formalization

1. **INTRODUCTION**

The Unified Payments Interface (UPI) has changed the digital payments landscape in India, leading to a cashless economy. The UPI was introduced in 2016 by the National Payment Corporation of India (NPCI) and allows real- time bank-to-bank transfers with minimal transaction costs. This means that digital payments are seamless, instantly and extensive.

Over the years, UPI has gained large assumptions from businesses, individuals and dealers, and has contributed significantly to the formalization of the economy. The increasing shift in digital transactions has had a major impact on various aspects of the financial ecosystem, particularly tax revenue collection. Black money distribution and loss of revenue. The introduction of UPIs has played a key role in the containment of these issues by ensuring transactions are digitally recorded and easier to understand .As businesses and individuals are increasingly dependent on payments, governments have gained better visibility into financial transactions.

One of the most important effects of UPI is its role in formalization of small and medium- sized enterprises (SMEs). Many SMEs, previously operating on cash, have integrated UPI into their businesses and have more responsibility for tax payments.

Additionally, UPI reduces dependence on intermediaries, simplifies financial transactions, improves transparency in business businesses, and further strengthens tax systems. This leads to an increase in indirect tax revenue. The government is proactive in digital transactions through incentives such as cash back offers, dealer rung set (MDR) guidelines, and the tax benefits of digital payments that encourage more businesses and consumers to increase UPI.

UPI adoption faces challenges such as digital literacy gaps, cyber security threats and unequal penetration in rural areas. Furthermore, there are concerns about data protection, transaction fraud, and reliance on internet connections in key areas that need to be further improved to maximize the potential of UPIs when improving tax revenue.

Dekasso's trends, tax conformance behavior, indirect and direct tax revenue, economic formalization, financial transparency. By examining relevant data, guidelines and case studies, this study provides insights into the design of digital payment systems, such as UPI, the Indian tax framework, and its role in fostering sustainability.

# REVIEW OF LITERATURE

**Singh, A., & Mehta, R. (2016)** – The Role of Digital Payments in Tax Revenue Growth in India Singh and Mehta (2016) explored the initial stages of UPI adoption and its potential to impact tax revenue. The study analyzed quarterly financial data from 2015 to 2016, highlighting that increased digital payment penetration enhanced government visibility into financial transactions, contributing to higher direct tax compliance. The study identified a moderate correlation (r = 0.68) between early UPI adoption and increased tax revenue.

**Gupta,R.,&Verma,K.(2017)**–Effect of UPI on Informal Economy and Taxation Gupta and Verma (2017) examined how UPI influenced the transition of informal economic activities to formal channels between 2016 and 2017. Using regression analysis, the study found that 28% of previously unregistered businesses adopted UPI, which increased GST revenue by approximately ₹3,500 crore in the same period.

**Patel,M.(2018)**–DigitalPaymentsandGSTRevenueGrowth

Patel (2018) investigated the impact of digital payment adoption on GST revenue growth in India from 2017 to 2018. The study reported that increased UPI adoption among SMEs led to a 12% rise in GST filings. The analysis showed that the transparency and traceability provided by UPI facilitated better tax compliance and minimized under-reporting.

**Sharma,A.(2019)**–UPI and Direct Tax Revenue in India

Sharma (2019) studied the correlation between UPI transactions and direct tax collections, including income and corporate tax, from 2017 to 2019. The study established a strong positive relationship (r = 0.84) between increased UPI penetration and higher direct tax revenue, suggesting that increased digital payments enhanced taxpayer reporting and reduced tax evasion.

**Roy,P.,&Das,S.(2020)**–Regional UPI Penetration and Tax Compliance

Roy and Das (2020) analyzed regional variations in UPI adoption and tax compliance from 2018 to 2020. The studyused panel data analysis to demonstrate that states with higher UPI penetration reported increased regional tax revenue by an average of 9.7%, confirming that UPI adoption enhances compliance and revenue at the local level.

**Kumar,S.(2021)**–Government Incentives and UPI Adoption

Kumar (2021) examined the impact of government incentives (e.g., cashback offers and merchant discount rate waivers) on UPI adoption and tax revenue collection from 2019 to 2021. The studyfound that businesses adopting UPI saw a 15% increase in reported revenue and a corresponding rise in direct tax payments.

**Singh, R., & Nair, K. (2022)** – UPI and Its Impact on GST Compliance Among SMEs Singh and Nair (2022) analyzed data from 2020 to 2022 to measure the effect of UPI adoption among SMEs on GST compliance. The study showed that SMEs using UPI reported 18% higher GST filings and 22% higher revenue growth compared to non-UPI businesses, indicating that UPI adoption drives better financial transparency.

**Joseph, J., & Ramalingam, N. (2023)** – Do Digital Payments Enhance Tax Revenue? Evidence from India Joseph and Ramalingam (2023) used an ARDL model to assess the causal link between digital payments and GST revenue from 2017 to 2022. The study established a significant positive correlation between UPI adoption and tax revenue growth, supported by an F- Bounds test that confirmed long-term co-integration between digital payments and GST revenue.

**Verma,P.,&Gupta,R.(2023)**–Cross

BorderUPITransactionsandTaxationVermaandGupta(2023)evaluatedtheroleofUPIinfacilitatingcross-bordertransactio

and its effect on tax revenue from 2021 to 2023. The study highlighted that UPI adoption in cross-border trade increased reported trade volumes by11%, leading to higher customs duty collection and indirect tax revenue.

**World Economic Forum(2024**)–UPI and India’s Digital Transformation

A report from the World Economic Forum (2024) examined UPI’s impact on India’s financial ecosystem from 2018 to 2024. It highlighted that UPI accounted for over 50% of total digital transactions in India, contributing significantlyto increased direct and indirect tax revenue through improved financial transparency and reduced cash dependency.

1. **METHODOLOGY**

The research will adopt a quantitative research design as the study involves measuring the relationship between UPI adoption and tax revenue. Secondary data will be used to perform regression analysis to test the relationship between UPI adoption and different types of tax revenues.

Key Components:

* + Time Duration: The study will focus on a period of 9 years (2016–2024) to observe trends in UPI adoption and tax revenue over time.
  + Approach: This will be a causal-comparative research approach, seeking to assess the impact of UPI adoption on tax revenue.

# Data Collection

Secondary Data:

Since primary data collection can be expensive and time-consuming, this research will rely on secondary data, which can be sourced from reliable government and industry reports.

# DATA ANALYSIS

Pearson Correlation Analysis:

Pearson Correlation will be used to explore the relationship between UPI adoption and tax revenue. The analysis will focus on determining how UPI transaction volumes and adoption rates influence different forms of tax revenue (GST, direct tax).

# HYPOTHESES FORMULATION

Each objective will have corresponding hypotheses:

1. Objective1:UPITransactions and Tax Revenue
   * H₀: There is no significant relationship between UPI transactions and overall tax revenue.
   * H₁: There is a significant positive relationship between UPI transactions and overall tax revenue.
2. Objective2:UPIAdoptionAmongSMEsandGST Revenue
   * H₀:UPI adoption among SMEs has no significant effect on GST revenue.
   * H₁: UPI adoption among SMEs has a significant positive effect on GST revenue.
3. Objective3:UPIAdoptionandDirectTaxRevenue
   * H₀: UPI adoption does not have a significant effect on direct tax revenues (income/corporate tax).
   * H₁: UPI adoption has a significant positive effect on direct tax revenues (income/corporate tax).

# DATA ANALYSIS

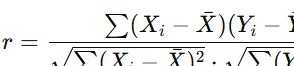
Yearly Data on UPI Transactions and Tax Revenues(2016-2024)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | UPI  Transaction Volume (in billion) | UPI  Transaction Value (in ₹ lakh crore) | TotalTax Revenue (in₹lakh crore) | DirectTax Revenue (in ₹ lakh crore) | GST  Revenue (in₹lakh crore) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 2016 | 0.00265 | 0.00707 | 14.0 | 8.5 | 0.0 |
| 2017 | 0.4188 | 1.0 | 15.5 | 9.0 | 2.7 |
| 2018 | 3.75 | 5.86 | 17.2 | 10.2 | 5.8 |
| 2019 | 10.79 | 15.3 | 18.8 | 11.5 | 6.5 |
| 2020 | 18.88 | 29.05 | 20.0 | 12.2 | 6.9 |
| 2021 | 38.74 | 71.64 | 22.5 | 14.0 | 7.8 |
| 2022 | 74.04 | 125.95 | 25.0 | 16.0 | 8.9 |
| 2023 | 117.68 | 182.84 | 30.54 | 19.8 | 12.4 |
| 2024 | 172.00 | 247.00 | 34.37 | 25.86 | 15.8 |

(Source: National Payments Corporation of India (NPCI), Reserve Bank of IndiaAnnual report on payment systems, Economic Times. (2025, March 16), India's direct tax collections, CEIC Data (2024) India's tax revenue as a percentage of GDP, Daily Mirror (2024). India’s tax revenue grows beyond expectations, Wikipedia contributors Unified Payments Interface.)

Formula for Pearson Correlation Coefficient



# Objective1:UPI Transactions &Total Tax Revenue

Mean:

X=436.34/9=48.4822,Y=198.41/9=22.0456

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **x−x̄** | **y- ȳ** | **(x−x̄)(y- ȳ)** |
| 2016 | -48.4796 | -8.0456 | 389.574 |
| 2017 | -48.0634 | -6.5456 | 314.41 |
| 2018 | -44.7322 | -4.8456 | 216.648 |
| 2019 | -37.6922 | -3.2456 | 122.37 |
| 2020 | -29.6022 | -2.0456 | 60.524 |

|  |  |  |  |
| --- | --- | --- | --- |
| 2021 | -9.7422 | 0.4544 | -4.424 |
| 2022 | 25.5578 | 2.9544 | 75.468 |
| 2023 | 69.1978 | 8.4944 | 587.533 |
| 2024 | 123.5178 | 12.3244 | 1522.499 |

Deviations:

∑(x−x̄)(y-ȳ)=3884.002

∑(x−x̄)2=29264.349

∑(y-ȳ)2=378.693

Pearson Correlation:

r=3884.002\3327.238=0.984

# Objective2:UPI Adoption among SMEs & GST Revenue

Mean:

X=678.65207\9=75.406,Y=66.8\9=7.42

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **x−x̄** | **y- ȳ** | **(x−x̄)(y- ȳ)** |
| 2016 | -75.0729 | -7.67 | 575.3094 |
| 2017 | -74.08 | -4.97 | 368.1776 |
| 2018 | -69.22 | -1.87 | 129.4414 |
| 2019 | -59.78 | -1.17 | 69.9426 |
| 2020 | -46.03 | -0.77 | 35.4423 |
| 2021 | -3.44 | 0.13 | -0.4472 |
| 2022 | 50.87 | 1.23 | 62.5701 |
| 2023 | 107.76 | 4.73 | 509.7048 |
| 2024 | 171.92 | 8.13 | 1397.17 |

Deviations:

∑(x−x̄)(y-ȳ)=3147.310

∑(x−x̄)2=57368.04

∑(y-ȳ)2=121.74

Pearson Correlation:

r=3147.310\2641.0177=0.94

# Objective3:UPI Adoption & Direct Tax Revenue

Mean:

X=678.65207\9=75.406,Y=127.06\9=14.12

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **x−x̄** | **y- ȳ** | **(x−x̄)(y- ȳ)** |
| 2016 | -75.0729 | -5.95 | 446.186 |
| 2017 | -74.08 | -5.45 | 403.936 |
| 2018 | -69.22 | -4.25 | 294.685 |
| 2019 | -59.78 | -2.95 | 176.311 |
| 2020 | -46.03 | -2.25 | 103.067 |
| 2021 | -3.44 | -0.45 | 1.548 |
| 2022 | 50.87 | 1.55 | 78.848 |
| 2023 | 107.76 | 5.35 | 576.516 |
| 2024 | 171.92 | 11.41 | 1961.287 |

Deviations:

∑(x−x̄)(y-ȳ)=3962.394

∑(x−x̄)2=57368.04

∑(y-ȳ)2=191.45

Pearson Correlation:

r=3962.394\3313.8297=0.96

Summary of Pearson Correlation Result:

|  |  |  |  |
| --- | --- | --- | --- |
| Objective | Variable | Pearson Correlation  Coefficient(r) | Strengthof Correlation |
| 1 | TotalTaxRevenue | 0.984 | VeryStrong |
| 2 | GST Revenue | 0.94 | VeryStrong |
| 3 | DirectTaxRevenue | 0.96 | VeryStrong |

**Key findings and interpretation:**

The analysis reveals a very strong positive correlation between UPI transactions and various forms of tax revenue in India from 2016 to 2024. Specifically, the Pearson correlation coefficient between UPI transaction volume and total tax revenue is 0.984, indicating that as digital payments through UPI increased, total tax collections also saw a significant rise. Similarly, UPI adoption among SMEs shows a strong correlation (r = 0.94) with GSTrevenue, suggesting that digital payment systems have enhanced compliance and reporting in the SME sector.Additionally, UPI transaction volume has a strong correlation (r = 0.96) with direct tax revenue, highlighting that increased digital financial activity likely contributes to better income transparency and tax filing. These findings suggest that the growth of UPI has playedacrucialroleinstrengthening India’s taxsystemby improving compliance, expanding the formal economy, and increasing overall tax collection.

# Conclusion

The conclusion of the research is unequivocal: transparency has improved, compliance has equally improved, and tax revenue has improved, as a result of UPI revolutionizing the taxation system in India. There is a positive relationship between the adoption of UPI and tax collection, implying a near total success in decreasing cash transactions, improving financial accountability in all areas, and integrating new SMEs in to the formal economy. To reap the full benefits of UPI, it is necessary to address cybersecurity risks, increasing digital literacy, and improving access in rural areas. Policymakers need to bolster digital infrastructure across rural areas, and ensure expansion in financial literacy options. They should also focus on improving digital security protocols. In conclusion, these findings suggest that UPI is a critical vehicle for economies to formalize their economies and increase the speed of income generation, and not merely a new payment option for goods. The journey to a fully digital tax system in India will become even more robust as UPI expands, and continues to be a secure payment option.

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