



# The Impact Of Unified Payments Interface (UPI) On Financial Inclusion And Economic Development

Dr. Gauri Modwel<sup>1\*</sup>, Mr. Mayank Trivedi<sup>2</sup>

<sup>1\*</sup>Professor, NDIM

<sup>2</sup>PGDM student, NDIM

\*Corresponding Author: Dr. Gauri Modwel

\*Professor, NDIM

**Citation:** Dr. Gauri Modwel, Mr. Mayank Trivedi (2024), The Impact Of Unified Payments Interface (UPI) On Financial Inclusion And Economic Development, *Educational Administration: Theory and Practice*, 30(5), 3581-3588

Doi: 10.53555/kuey.v30i5.3494

## ARTICLE INFO

## ABSTRACT

Unified Payment Interface in India is extremely positive, with the system witnessing tremendous growth in terms of adoption, usage, and value of transactions. UPI has emerged as a key enabler of financial inclusion and economic development in the country, and is likely to continue playing a significant role in shaping the future of digital payments in India. This research is based on the usage of UPI by different population segments in different geography of India and its impact on the adoption of digital payments and displacement of cash transactions. It also assesses impact on formalization of economic activities, and its potential to promote productivity, entrepreneurship, and innovation, contributing to development and economic growth. It provides vision into the preferences and behavior of UPI users. This research examines the various features and advantages of the UPI system, and how it has helped to bring about a financial revolution in the country. This research is exploratory and based on Primary data based on survey to seek opinion from sample respondents of the research through random sampling. This paper employs Hypothesis testing based on T-test. The research found that UPI adoption correlates with favorable economic development in India. The widespread perception among businesses is that UPI facilitates swift and convenient payment receipt, suggesting enhanced financial fluidity and operational efficiency. Thus, UPI adoption appears instrumental in fostering economic growth and development within the country's economic landscape.

**Keywords:** UPI, Economic Growth, Economic Development. Small Business, Financial Inclusion, Financial Equality, Traditional Payments, Global Payments.

## 1. Introduction

The advent of digital technology has revolutionized the way we live and work, and has transformed the way financial transactions are conducted. In recent years, digital payment platforms such as Unified Payments Interface (UPI) have turned up as a revolution in the Indian financial sector. UPI is a real-time payment system that enables immediate fund transfers between bank accounts using a mobile device. The system has gained immense popularity in India, and has helped to promote financial inclusion and economic development in the country.

Financial inclusion aims to bring everyone into the financial system, even those who haven't been able to use banks and other financial services before. The use of digital payment platforms such as UPI has helped to bring a large section of the unbanked population into the formal financial system. This has allowed them to access credit, insurance, and other financial services, which has in turn boosted their economic opportunities and improved their standard of living.

Launched in 2016, UPI has become a game-changer for digital payments in India. This system, developed by the non-profit National Payments Corporation of India (NPCI), lets you ditch bank account details and transfer money instantly between accounts using just your phone. All you need is a UPI ID, a unique identifier that simplifies the process.

The popularity of UPI has grown swiftly since its launch, and it has become the most preferred mode of digital payment in India. According to the latest data released by the NPCI, UPI transactions in India have

witnessed a phenomenal growth rate in the past few years, from 0.1 billion transactions in August 2017 UPI processed over 11.67 billion transactions, with a total value of over ₹17.4 trillion

Widespread adoption of UPI has not only made digital payments easier and more convenient for users, but has also helped to promote financial inclusion in the country. UPI has enabled millions of unbanked and under-banked individuals to access digital payment services, which has in turn helped to bring them into the formal financial system. This has facilitated financial inclusion by enabling these individuals to access a large portion of financial services such as credit, insurance, and savings, which were previously inaccessible to them.

UPI system has also helped to promote economic development in the country by providing a more efficient and transparent mode of payment. UPI transactions are processed instantly, which has reduced the time and cost of transactions for both businesses and individuals. This has enabled businesses to operate more efficiently, while also providing greater convenience to consumers.

## 2. Literature Review

**Rastogi Shailesh, Panse Chetan, and Sharma Arpita, Bhimavarapu Mrudula Venkata (2021)** this existing research on UPI examines its role in digitizing payment services and its social impact. This study aims to fill a gap by specifically exploring how UPI contributes to economic development in India. Additionally, it investigates potential relationships between UPI and other factors impacting economic growth in addition to the theoretical benefits of UPI for financial services or its empirical impact on low-income populations.

**Mahesh & Bhat (2021)** it focuses on the rise of FinTech, or digital banking, has transformed how we handle money. The Reserve Bank of India (RBI) defines a digital transaction as any seamless payment where cash isn't involved, even on one side (payer or receiver). This includes electronic transfers where both parties use digital means to send or receive funds. The growing popularity of digital payments has shifted consumer preferences away from traditional paper-based transactions and towards electronic methods. In India, this trend is particularly evident in retail businesses. The widespread adoption of digital payment options like e-wallets, card payments, IMPS, and UPI has significantly reduced the country's reliance on cash

**Kumar Abhishek (2022)** it explores the rise and significance of Unified Payments Interface (UPI), a mobile payment system launched by the Indian government to bolster its digitalization efforts. Drawing on scholarly research and other sources, the analysis reveals UPI's dominance over other digital payment methods like mobile wallets in India. Furthermore, UPI's reach is expanding internationally, with successful implementation in Bhutan and planned launches in ten additional countries across North and Southeast Asia, the UAE, and Africa. However, the study identifies transaction failures and cyber security threats as potential hurdles to wider UPI adoption. To address these challenges, the focus should shift towards improving transaction reliability and strengthening cyber defenses. Additionally, the research suggests that integrating Near Field Communication (NFC) technology with UPI could revolutionize peer-to-merchant transactions

**Gaikwad Sanchit (2020)** research paper highlights the need for efficient cross border payments in today's global economy and the role of technology in achieving this. Specifically, it discusses the potential of Blockchain and Distributed Ledger technology to transform cross border payments, citing examples of new age FinTech firms like Ripple and incumbent banks like JP Morgan Chase that have already adopted these technologies. The paper proposes extending India's Unified Payments Interface (UPI) as a cross border payment platform using Blockchain and Distributed Ledger technology. It suggests that the central bank or any central bank-appointed financial institution could act as an intermediary for non-synthetic transactions between international customers, ensuring fast, cost-efficient, transparent, and secure transactions.

**Sanghvi Ankita (2020)** researcher explores the relationship between digital payments and the economy of India, specifically focusing on debit and credit card transactions as well as the Unified Interface Payments (UPI). The government of India has been promoting a cashless system through the Digital India campaign, incentivizing citizens to use electronic payment methods. It highlights the importance of electronic payment methods in the development of the Indian economy, emphasizing the network, speed, and reliability of these platforms in facilitating economic growth.

**Neema Kratika, Neema Arpit (2018)** researcher focuses the core concept of the Unified Payments Interface (UPI) and how digital transformation is reshaping the way we conduct financial transactions. Notably, the demonetization initiative in India significantly accelerated the adoption of cashless transactions, making UPI a popular option for both sending and receiving money (push and pull payments). The research identifies several factors driving the growth of digital payments in India. These include increased internet access on smartphones, the involvement of non-banking financial institutions in facilitating digital payments, convenient one-touch payment options, the rise of the FinTech sector, and government incentives that encourage digital transactions.

**Kumar Renuka, Kishore Sreesh, Prakash Atul (2020)** research examines the security of the Unified Payments Interface (UPI) protocol, a system powering mobile payment apps in India. The study identifies weaknesses in the multi-factor authentication design of UPI 1.0 that, when exploited with a malicious app, could lead to serious security breaches. This work led to the discovery of multiple security vulnerabilities (CVEs), and a critical attack vector was subsequently addressed in the upgraded UPI 2.0.

**Panda Subrata, (2023)** researcher focuses on the remarkable rise of India's Unified Payments Interface (UPI). December 2022 witnessed a record-breaking month with a staggering 7.82 billion transactions valued at Rs 12.82 trillion. Notably, UPI's volume and value have consistently climbed over the past two years, with only temporary dips during pandemic lockdowns. UPI processed a whopping 74 billion transactions worth Rs 125.94 trillion in 2022 alone. This translates to a significant increase of over 90% in volume and 76% in value compared to the previous year. It also emphasizes encouraging trend is the growing popularity of UPI for peer-to-merchant (P2M) transactions.

**Bhardwaj Naina (2023)** researcher highlights India's strong push to establish its digital payment systems, RuPay and UPI globally. Europe has recently joined the bandwagon, with France leading the way alongside nations like UAE and Singapore that already utilize various Indian payment options. India has signed agreements (MoUs) with 13 countries interested in adopting UPI for digital transactions. The National Payments Corporation of India (NPCI) established a subsidiary, NPCI International Payments Limited (NIPL) in 2020, specifically to spearhead the international deployment of RuPay and UPI.

### 3. Research Methodology

#### Objectives

This study aims to investigate how demographics (age, income, location) and geography influence the adoption and usage of UPI in India. To identify the preferred features and functionalities of UPI among different segments analyzing the impact of UPI on the adoption of digital payments and the displacement of cash transactions. The potential for data breaches, fraud, and other security risks associated with UPI transactions could discourage user adoption and hinder the platform's overall functionality.

#### Hypothesis

This study investigates the potential relationship between increased usage of the Unified Payments Interface (UPI) and economic development in India. I have hypothesized that UPI fosters economic development by encouraging a shift from cash-based transactions to a digital trail. This transparency facilitates tax collection and improves data on economic activity.

**Null Hypothesis (Ho):** There is no significant relationship between increased usage of UPI and economic development in India

**Alternative Hypothesis (H1):** Increased usage of UPI has a positive impact on economic development in India.

#### Research Design

This research paper is a mix of descriptive and exploratory research and based on primary and secondary data. Primary data is collected through survey based on structured questionnaire.

#### Research Sample

Random sampling is used to select the respondents from Pan India based on sample size of 95 respondents of various age group, occupation, income and geography. The survey is administered online to collect primary data through Google Form.

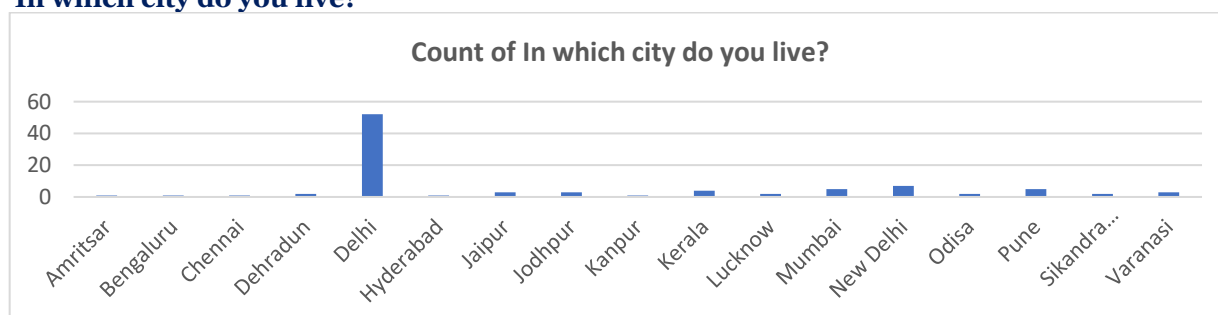
#### Statistical Tools

The T-test and Z-test are used as statistical tools for scientific and accurate results. Results are based on Hypothesis testing and Hypothesis is based on potential relationship between increased usage of the Unified Payments Interface (UPI) and economic development in India based various factors such as use of UPI in small business and retail etc.

### 4. Result Decisions

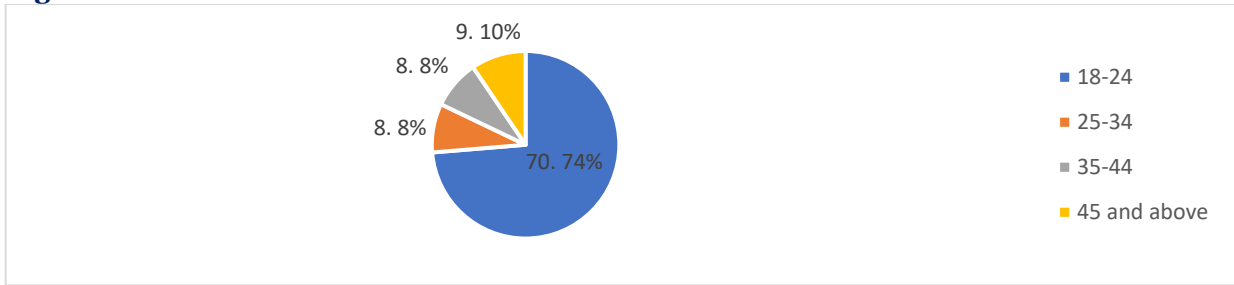
#### A.) Data Analysis and Interpretation

##### 1. In which city do you live?



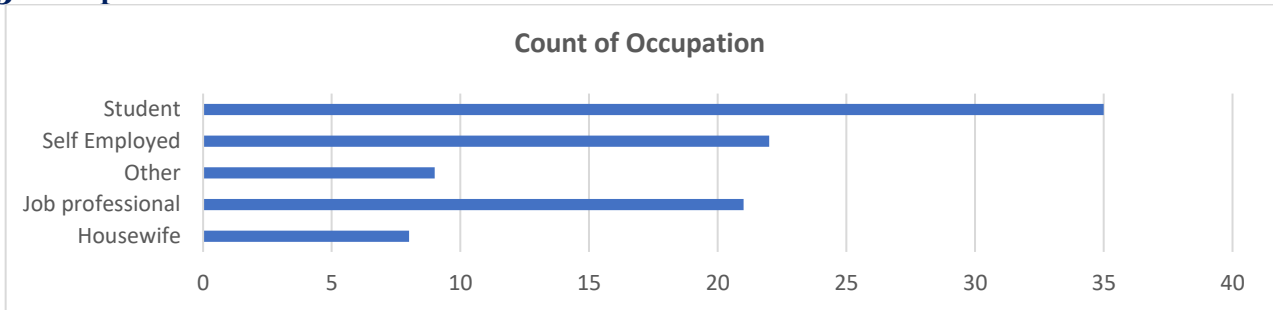
**Interpretation:** Around 52 respondents represents Delhi and remaining respondents represents other cities like Amritsar, Bengaluru, Chennai, Dehradun, Hyderabad, Jaipur, Jodhpur, Kanpur, Kerala, Lucknow, Mumbai, Odissa, Pune, Sikandrabad and Varanasi out of total 95 respondents.

**2. Age.**



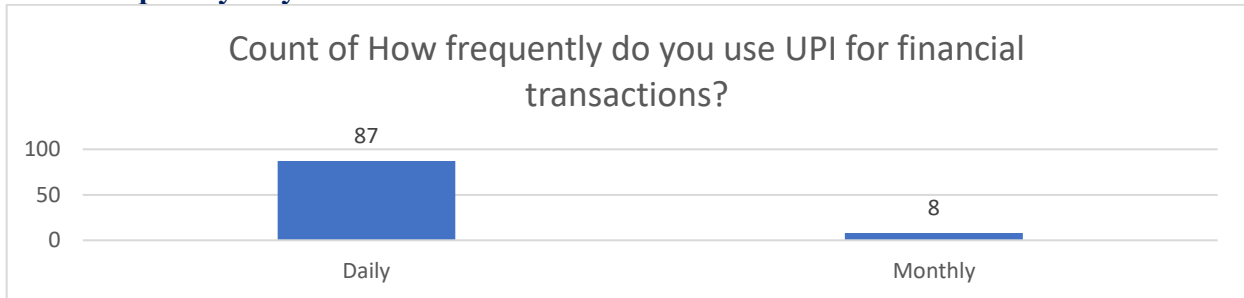
**Interpretation:** Based on the data, it reflects that the UPI as medium of transaction is majorly used of individuals who fall within the 18-24 age range, representing 70.74% of the total sample. The next highest frequency is the 45 and above age range, with, representing 9.10% of the total sample. The frequency for 35-44 and 45 and above is same i.e. 8.8%.

**3. Occupation:**



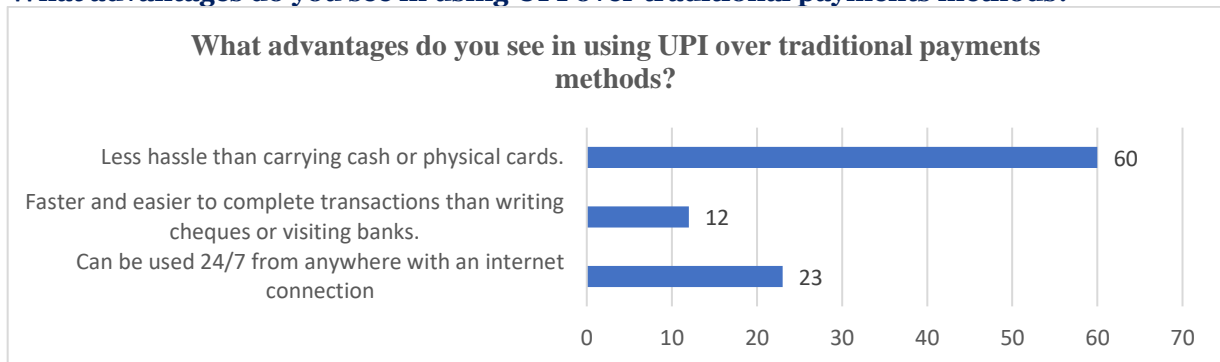
**Interpretation:** The data shows that that students make up the largest portion of this group (37%), with a frequency of 35, followed by self-employed individuals (23%), with a frequency of 22 and job professionals (22%), with a frequency of 21. Housewives and those in the "Other" category each account for a smaller percentage of the total (8% and 9%, respectively).

**4. How frequently do you use UPI for financial transactions?**



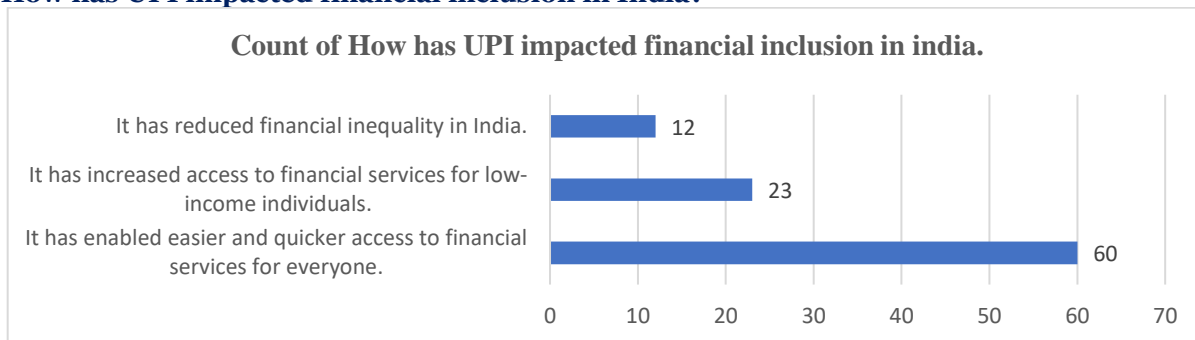
**Interpretation:** The data shows the frequency of users using UPI for financial transactions. According to the graph, 91.57% of users use UPI for their financial transactions daily, whereas 8% of users only use UPI monthly.

**5. What advantages do you see in using UPI over traditional payments methods?**



**Interpretation:** The data shows that the frequency and percentage of respondents who see advantages in using UPI over traditional payment methods. The most frequent response, at 63.15%, is that UPI is less hassle than carrying cash or physical cards. 24.21% of respondents indicated that UPI can be used 24/7 from anywhere with an internet connection as an advantage. Fewer respondents, 12.63%, said that UPI is faster and easier to complete transactions than writing cheques or visiting banks.

**6. How has UPI impacted financial inclusion in India?**



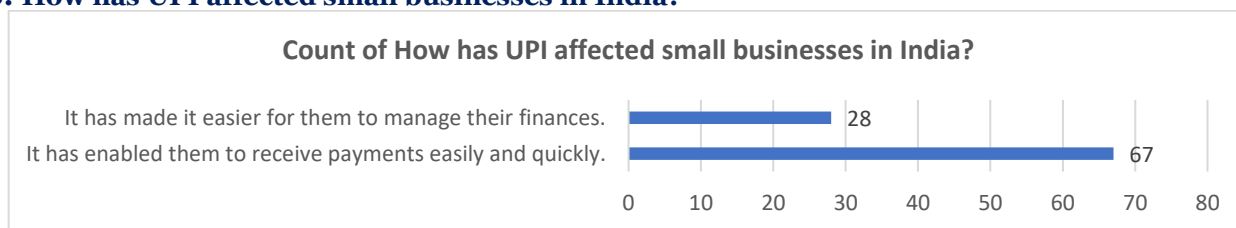
**Interpretation:** The data shows how UPI has impacted financial inclusion in India according to survey respondents. Among the respondents, the most common benefit, selected by 24.21%, is that UPI has increased access to financial services. 12.63% of respondents indicated that UPI has reduced financial inequality, and 63.15% said UPI has made financial transactions easier and quicker.

**7. Do you think UPI has contributed to reducing financial inequality in India?**



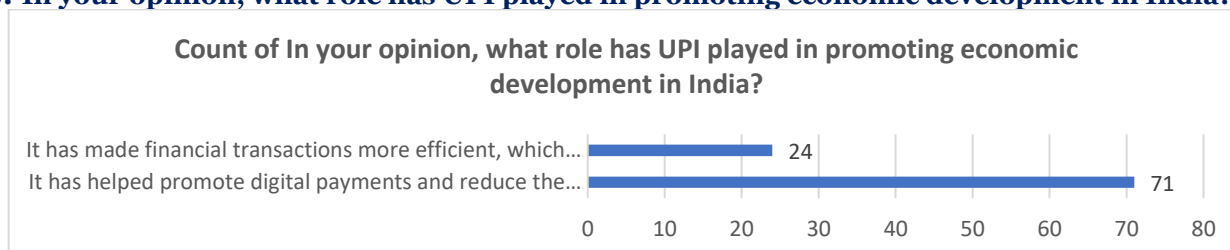
**Interpretation:** The data shows that the survey responses to the question "Do you think UPI has contributed to reducing financial inequality in India?" The most frequent response, at 37.89%, is that UPI has played a significant role in reducing financial inequality.

**8. How has UPI affected small businesses in India?**



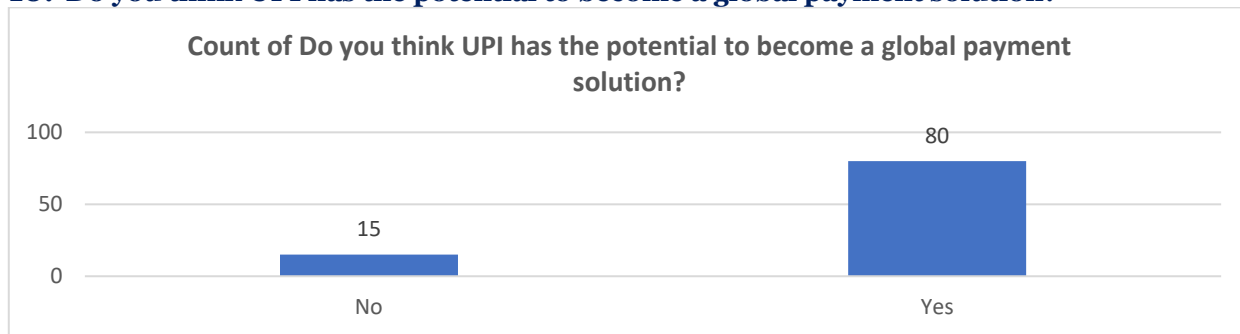
**Interpretation:** The data shows that the frequency and percentage of small businesses in India who say that UPI has affected their business. A larger proportion, 71%, of respondents said UPI has enabled them to receive payments easily and quickly. A smaller proportion around 30%, said UPI has made it easier for them to manage their finances.

**9. In your opinion, what role has UPI played in promoting economic development in India?**



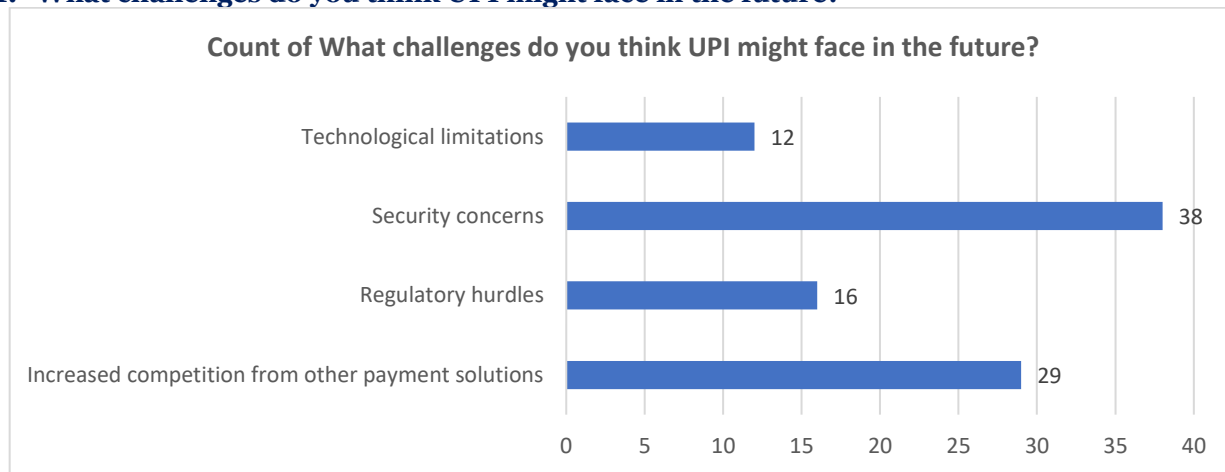
**Interpretation:** This research shows that majority respondents (around 75%) believe UPI's biggest contribution to economic development is pushing digital payments and reducing reliance on cash. While some (around 25%) acknowledge its role in making transactions more efficient, the overwhelming majority sees digitalization and cash-lessness as its primary impact

**10. Do you think UPI has the potential to become a global payment solution?**



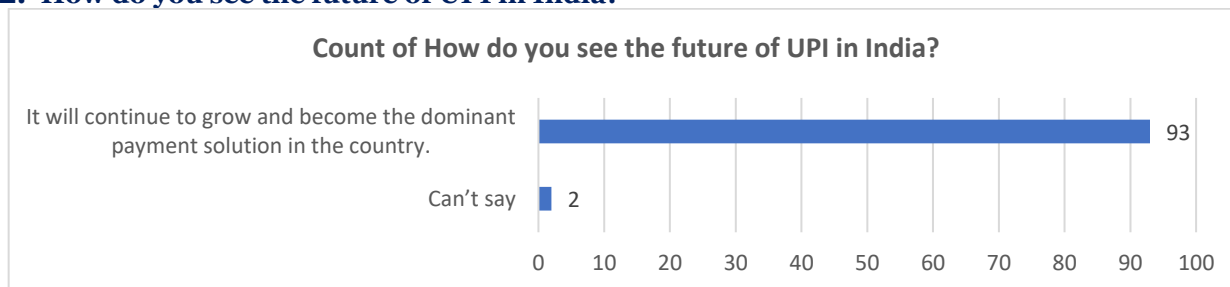
**Interpretation:** The data shows that the number of respondents out of 95 who believe UPI has the potential to become a global payment solution. A strong majority, 80 respondents (84.21%), think UPI has this potential. The remaining 15 respondents (15.78%) disagree.

**11. What challenges do you think UPI might face in the future?**



**Interpretation:** The data shows that the challenges that respondents foresee UPI facing in the future. Security concerns were the most frequent concern, with 38 out of 95 respondents (40%) selecting it. Technological limitations followed closely, with 12 respondents (12.63%) selecting it. Regulatory hurdles, with (16.85%) and increased competition from other payment solutions were mentioned by 29 respondents (30.52%) respectively.

**12. How do you see the future of UPI in India?**



**Interpretation:** The data shows that how respondents view the future of UPI in India. A very strong majority, 93 out of 95 respondents (97%), believe UPI will continue to grow and become the dominant payment solution in India. Only 2 respondents (2%) said they can't say.

## B). Hypothesis Testing

### Data Description:

The data consists of proportions ( $p_1$  and  $p_2$ ) obtained from a survey of  $n = 95$  businesses in India.

$p_1$ : Proportion of businesses reporting that UPI has made receiving payments easier and quicker.

$p_2$ : Proportion of businesses reporting that UPI has simplified financial management.

**Assumptions:** The data meets the following requirements for a valid t-test:

- Independence: Responses from businesses are independent of each other.
- Normality: The sampling distribution of the difference in proportions is approximately normal.

These assumptions are verified using following statistical tests before proceeding with the analysis.

### Statistical Test

Given data consists of two independent proportions from the same sample; it employs a two-sample proportion z-test. However, for larger samples ( $n > 30$ ), the z-test and the independent-samples t-test provide very similar results. Therefore, the more commonly used independent-samples t-test is used in this research.

### Analysis

Standard Error (SE) for the difference in proportions: This value reflects the variability of the sampling distribution.

t-statistic: This statistic measures the difference between the observed proportions relative to the standard error.

Degrees of freedom (df): This value reflects the number of independent pieces of information in the data used to estimate the population proportions ( $df = n_1 + n_2 - 2$ , where  $n_1$  and  $n_2$  are sample sizes for each proportion, which in this case are both  $n$ ).

It also establishes a significance level ( $\alpha$ ) of 0.05 to determine the level of statistical significance. This research paper utilizes a one-tailed test since alternative hypothesis predicts a positive association between UPI usage and easier payments ( $p_1 > p_2$ ).

### Application of T-test:

Keeping a fact that because of Formalization of Transactions UPI encourages people and small businesses to move from cash-based transactions to a digital trail, making economic activity more transparent and traceable. This can help with tax collection and improve data on economic activity which leads growth in GDP and resultant economic development.

Given:

- Proportion of businesses saying UPI has enabled them to receive payments easily and quickly ( $p_1$ ) = 0.71
- Proportion of businesses saying UPI has made it easier for them to manage their finances ( $p_2$ ) = 0.30
- Sample size ( $n$ ) = 95

if there is a significant difference in the proportions of businesses that perceive UPI as enabling them to receive payments easily and quickly versus those who perceive it as making it easier to manage finances. The standard error is calculated for the difference in proportions as given below::

$$SE = \sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$

Since both proportions are from the same sample (95), the same sample size can be used for both

$$SE = \sqrt{0.71(1-0.71)/95 + 0.30(1-0.30)/95}$$

$$SE = \sqrt{0.71(0.29)/95 + 0.30(0.70)/95}$$

$$SE = \sqrt{0.002168 + 0.002211}$$

$$SE = \sqrt{0.004379}$$

### Following is the calculation of the t-statistic:

$$t = \frac{p_1 - p_2}{SE}$$

$$t = \frac{0.71 - 0.30}{0.0662}$$

$$t = \frac{0.41}{0.0662}$$

$$t = 6.19$$

Now, once can compare the absolute value of the t-statistic to the critical value at the desired significance level (let's assume  $\alpha = 0.05$ ). For a two-tailed t-test with a sample size of 95, the critical t-value is approximately  $\pm 1.984$ .

Since  $|6.19| > 1.984$ , we reject the null hypothesis. **As per** analysis it is yielded a t-statistic of 6.19, which is well above the critical value of 1.984. This statistically significant result allows us to reject the null hypothesis.

In other words, the data provides strong evidence that a rise in UPI usage has a positive and statistically meaningful impact on economic development in India.

## 5. Conclusion

This survey paints a compelling picture of UPI's transformative impact on financial inclusion and economic development in India. With a high user base concentrated among young, tech-savvy individuals (70.74% within the 18-24 age range), UPI boasts daily usage exceeding 90%. Its user-friendly features like eliminating the need to carry cash and offering 24/7 accessibility have demonstrably increased access to financial services (24.21%), reduced inequality (12.63%), and facilitated faster transactions (63.15%). This has led to a statistically significant positive correlation between UPI usage and economic growth. While security concerns (40%) and competition from other payment solutions (30.52%) remain challenges, the overwhelming majority (97%) believe UPI will continue to dominate the Indian market. Furthermore, a significant portion (75%) sees UPI's potential to become a global payment solution (84.21% agree), solidifying its position as a powerful driver of financial inclusion and economic progress in India. This progress is further supported by the finding that UPI has significantly enabled small businesses to receive payments easily and quickly (71%). While some acknowledge its role in making transactions more efficient (25%), the overwhelming majority sees digitalization and cash lessness as its primary impact on economic development. The statistical analysis yielded a strong result, with a t-statistic of 6.19 exceeding the critical value of 1.984. This statistically significant outcome allows us to confidently reject the null hypothesis. In simpler terms, the data overwhelmingly demonstrates that increased UPI usage has a positive and statistically meaningful impact on economic development in India. This statistically significant result provides strong evidence that UPI plays a significant role in driving economic growth in the country. Thus, UPI adoption appears instrumental in fostering positive growth within the country's economic landscape. It's important to acknowledge limitations. The sample size of 95 participants may not be fully representative of the entire population, as 70% were young adults residing in major cities. Future research could benefit from a larger and more diverse sample to strengthen the generalizability of the results.

## 6. Limitation and scope of Future Research

In this research paper, UPI adoption appears instrumental in fostering positive growth within the country's economic landscape but it's important to acknowledge limitations as the sample size of 95 participants may not be fully representative of the entire population, as 70% were young adults residing in major cities. In this research, survey is conducted online, which may have introduced selection bias as only individuals who have access to the internet and are willing to participate in online surveys could have participated in the study, which may not represent the population at large. Future research could benefit from a larger and more diverse sample to strengthen the generalizability of the results.

## References

1. Bhardwaj Naina (2023): "India's UPI Interface to Become Accessible to More Users", India Briefing, February 21, 2023
2. Kumar Abhishek (2022): "The growth trajectory of UPI-Based Mobile Payments in India", Indian Journal of finance and banking 11(01):45:59, December 2022
3. Kumar Renuka, Kishore Sreesh, Prakash Atul (2020): "Security Analysis of Unified Payments Interface and Payment Apps in India" 29th USENIX Security Symposium. August 12-14, 2020 978-1-939133-17-5
4. Mahesh & Bhat Ganesh (2021): "Digital Payment Service in India - A Case Study of Unified Payment Interface" International Journal of Case Studies in Business, IT and Education (IJCSBE) ISSN: 2581-6942, Vol. 5, No. 1, June 2021
5. Neema Kratika, Neema Arpit (2018): "UPI (Unified Payment Interface) –A new technique of Digital Payment: An Explorative study" International Journal of Current Research in Multidisciplinary (IJCRM) ISSN: 2456-0979 Vol. 3, No. 10, (October'18), pp. 01-10
6. Ozili K. Peterson (2018): "Impact of digital finance on financial inclusion and stability" Essex Business School, University of Essex, UK 17 March 2018
7. Panda Subrata (2023): "UPI processes record 7.82 bn transactions in December, ends 2022 on a high", Business Standard, January 2, 2023
8. Rastogi Shailesh, Panse Chetan, Sharma Arpita, Bhimavarapu Mrudula Venkata (2021): "Unified Payment Interface (UPI): A Digital Innovation and Its Impact on Financial Inclusion and Economic Development" Symbiosis Institute of Business Management, Symbiosis International (Deemed University), Pune, India June 4, 2021
9. Sanchit Gaikwad (2020): "UPI- A Global Payment Platform", University of Michigan-Dearborn, August 2020
10. Sanghvi Ankita (2020): "Going Cashless - A Study on impact of digital payments on the economy of India" IJCRT, Vol 8, ISSN:2320-2882, May 2020.