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UPI adoption and it's Impact on the economic well being of kanchipuram factory workers

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Abstract
Unified Payments Interface (UPI) is a disruptive digital platform of payments in India, which provides cheap transactions, real-time and non-proprietary. UPI also grows exponentially, as it has been launched in 2016 and since that time it makes billions of transactions every month and has caused the financial inclusion of both urban and semi-urban residents. Despite the success, the studies on the impacts of the adoption of UPI on the economic well-being of vulnerable population particularly among factory employees in the industrial regions are not thoroughly investigated. In this paper, the use and adoption of UPI among 120 factory workers in Kanchipuram, Tamil Nadu has been discussed and what this means to their economic performance and tenacity. A sequence of questions was administered in which demographic characteristics, pattern of UPI adoption, reason behind the adoption and an estimation of the perceived benefit regarding time-efficiency, cost-efficiency, and budgetary control were taken. Data was analyzed using SPSS 26 on the basis of descriptive statistics, regression, and mediation/ moderate models. The findings indicate that UPI has a strong penetration rates and most of the respondents stated that they use a variety of UPI such as Google Pay, PhonePe and Paytm on a daily basis. The workers reported that there were significant reductions in time that went to waste in transactions, cost of transacting reduction and improved capacity to track finances and control the same. Significantly, the launch of employer wage transfer using UPI became one of the main driving forces in regards to adoption, which brings up the idea of workplace integration serving as a mediator of financial inclusion. Regression analysis was done to ascertain that frequency, and duration of UPI use were positive predictors of economic well being and the mediation analysis to demonstrate that time and cost savings were the pathways. All these findings suggest that UPI does not merely expand the convenience of transactions, but it also transforms industrial workers into financially stable and stronger. The contribution to the literature presented in the paper is in the shape of micro-levels support of decision-at-risk workforce groups and the implications of policymakers, fintech providers, and factories to increase digital payment ecosystems and increase financial inclusion in a more balanced way.
Keywords: UPI adoption, economic well-being, factory workers, financial inclusion, digital payments

1. Introduction

Given that the introduction of the Unified Payments Interface (UPI) of the National Payments Corporation of India, which is an instant real-time payment platform, occurred in 2016, the digital payments landscape of India has evolved at a very rapid pace since then as it enables people to integrate and maintain multiple bank accounts and transfer money through one mobile app, either through virtual payment addresses, QR codes, or by using mobile numbers. UPI is also easy and cheap to the factory workers to receive wages, make their daily payments, remit money to their families, make EMIs, and have access to their savings without using cash or even the old method of banking through branches. UPI, hence, is directly connected with the financial issues of employees such as access to salaries, payment of bills, remittances and short-term financial management. This platform changed the payment ecosystem of the country to real-time interoperable transactions through mobile phones and virtual payment addresses (NPCI, 2024). With 23.49 lakh crore of transactions completed and a growth of 45 percent in year-on-year basis, it is unbelievable growth of 16.58 billion transactions approximately in UPI as of October 2024 (NPCI, 2024). The popularity of the system kept increasing- by August 2025, UPI monthly transactions reached more than 2,000 crore, and its value stood at 24.85 lakh crore (Times of India, 2025). This pattern is projected to go on with UPI registering over 20 billion transactions per month in August 2025 and making a new ground (Economic Times, 2025). This wave is a manifestation of the strategic push of India to create a cashless and inclusive integrated digital finance that is founded on the principles of convenience, safety, and affordability (BIS, 2024; FHI 360, 2024). The extent and the coverage of the platform have already given rise to the financial inclusion particularly to under-banked segments due to the provision of convenient access to payment infrastructure in both urban and rural areas (Gothi, 2025). Kancheepuram represents a place where the industrial plants are very concentrated and where a lot of the employees of the factory are having their salaries deposited in bank accounts and are increasingly moving towards electronic payment means. However, the level at which factory employees in Kancheepuram have adopted the UPI, the causes that motivate and discourage this change, and the degree to which UPI has actually boosted the financial performance and economic condition of these employees is a dearth of empirical evidence. The study will therefore be confined to Kancheepuram industries to touch on practical issues of awareness about UPI, the frequency and pattern of use, the perceived benefits and risks along with an extent of its role in the daily financial decision-making of the workers. Kanchipuram also qualifies to be when it comes to the production of textile and garments since it has a rich history of the ancient temples. The factory workers at this end of the world are typically low to middle-income families in which the workers have unstable economic security where they are usually informally or semi informally employed. Some of the vulnerabilities that contribute towards their financial precarity are low savings buffers, low financial literacy, and cash transactions patterns (Veritable Report, 2016). Despite the evidence that the local population may encounter occupational stress when working in the construction and unorganized industry of Kanchipuram because of inappropriate working conditions and economic uncertainty (Narayanan, 2017), no empirical research has been found concerning how the implementation of electronic aids like UPI can mitigate such threats. The vulnerability of workers which rests on a set of such factors as informal labour, unstable earning and lack of institutional resources is fundamental to the necessity to inquire on how to economically engender workers within the industrial regions in a manner that are technologically mediated financial inclusion.Another crucial subject of the digital payment evolution development is the industrial workers because they engage in the repetitive and low-valued economic activities such as purchasing essentials, paying informal loans, remittances to their countries of origin, and school fees or house rent. Their income is rigid or in most instances, low and any delay or slackness in getting money will have a direct effect on household expenditure and savings. UPI reduces levels of money utilized, enables fast transfer of low cost and provides increased accuracy to trace transactions. The question therefore arises on how the industrial labourers at Kancheepuram accept and leverage UPI to determine whether it has been effective in augmenting financial inclusion, enhancing liquidity and even smoothing out household economic transactions.

1.1. Problem Statement

Unified Payments Interface (UPI) has made a tremendous breakthrough in changing the digital payment environment in India and it has become one of the most popular and commonly utilized digit payment platforms to provide users with a fast, safe, and cashless transaction. Yet, in spite of its fast development and the popularity of its application, there is scarce data regarding the effect of the UPI usage on the economic welfare of the people on grassroots level. Specifically, little research has been conducted on the lives of factory workers who tend to experience unstable incomes, lack of access to banking services, and overreliance on cash. Although UPI has the potential to bring financial inclusion due to lowering the cost of the transaction, time savings, andfacilitating easier money management, it is not evident how much of the benefits are enjoyed among the vulnerable groups of workers. Such a gap necessitates a research to examine the extent to which the adoption of UPI can have a positive impact on enhancing the financial security, savings behavior and overall economic resilience of the factory workers in Kanchipuram.

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The present study addresses the following specific research issues:

- Whether factory workers in Kancheepuram have adequate **awareness and understanding of UPI features** (safety, cost, convenience, and limits).
- The **extent and pattern of UPI usage** among industrial labourers (type of transactions, frequency, and preferred apps).
- The **factors influencing UPI adoption**, including socio-demographic characteristics, digital literacy, trust, perceived usefulness, and perceived risk.
- Whether **UPI adoption has a significant impact on workers' economic well-being**, including ease of managing income and expenses, ability to save, and reduction in cash- related problems.
- The **challenges and constraints** faced by factory workers in using UPI (network issues, transaction failures, fear of fraud, or lack of support).

1.2. Objectives of the Study:

The specific objectives of the study are:

1. To examine the level of awareness and usage of UPI among factory workers in Kancheepuram industries.
2. To identify the determinants of UPI adoption, including socio-economic and behavioural factors.
3. To construct an economic well-being index for factory workers and measure their level of economic well-being.
4. To evaluate the effect of UPI adoption on the economic well-being of factory workers in Kancheepuram.

1.3. Research Questions:

i. What are the patterns of UPI adoption among Kanchipuram factory workers?
ii. How does UPI adoption influence financial efficiency and well-being?
iii. What challenges do workers face in using UPI?

1.4. Hypotheses:

i. H1: Higher adoption intensity positively impacts economic well-being.
ii. H2: Perceived service quality mediates the relationship between adoption and well- being.
iii. H3: Grievance redress and trust moderate the adoption–well-being relationship.

1.5. Significance

The results of this research are of great importance to various stakeholders interested in the popularization of digital financial systems in India. As a policy maker, the study can give useful information on how online payment systems like UPI can enhance the financial health of the marginalized population, i.e. factory workers in industrial belts like Kanchipuram. The knowledge of these outcomes can be used to design specific policies and financial inclusion programs not only to address urban and educated populations but also to extend financial inclusion benefits to semi- urban and vulnerable populations. In the case of the fintech firms and service providers, the research indicates perceptions of the users, barriers to adoption, and satisfaction with grievance redress systems. Such insights can be used to design products, localize languages, provide customer support and trust-building practices, and thus gain more users and long-term retention. Lastly, the investigation is also noteworthy to both worker welfare agencies and factory managers since it illustrates the importance of UPI in ensuring less reliance of workers on cash, enhancement of monetary stability, and a clear transfer of wages. Introducing digital payment solutions into worker welfare programs, employers and NGOs will be able to build a more financially resilient environment, lower the risks involved in transactions, and provide workers with the means of controlling their income much more efficiently. By so doing, the study addresses a significant gap that exists between the level of technological development and economic well-being at the grassroots level, to make the gains of digital innovation reach all individuals with equal chances.

2. Literature Review

The digital financial inclusion in India has been achieved in a big way, especially owing to the fast growing Unified Payments Interface (UPI). UPI was launched by the National Payments Corporation of India (NPCI) in 2016 as a major tool that allows real-time bank transfer at a low cost using their mobile devices. Government intervention, better regulatory measures, rising smartphone penetration, and the rise in internet connectivity have contributed to the improvement of the ecosystem. Research indicates that UPI contributes significantly to the integration of the formerly unbanked or under-banked groups in formal financial services, allowing them to avoidcash dependency and making payments even in the semi-urban or rural setting effortless (Padma Kiran et al., 2025; Gupta et al., 2025; Haque et al., 2025).

Adoption theories of technology, in particular, TAM (Technology Acceptance Model) and UTAUT (Unified Theory of Acceptance and Use of Technology) have been applied to the usage of digital payments in India. These models indicate that users embrace new technologies depending on their usefulness, ease of use, facilitating conditions, social influence and trust. Recent empirical studies which implement UTAUT to the use of UPI show that performance expectancy, effort expectancy, social influence and perceived trust are important predictors of intention to use as well as actual use. As an example, Padma Kiran et al., (2025) have discovered that facilitating conditions, performance expectancy, and trust have a considerable impact on intention to adopt UPI, whereas same has less impact on promotional incentives. In the same vein, ease of use and adoption between urban users are closely correlated with a reliable infrastructure (Rahim et al., 2024).To the workers, the UPI is beneficial in terms of time and money. UPI saves time on traveling and waiting as well as visiting banks and carrying cash. It also reduces or does away with charges of the normal business transactions. It enhances the aspect of transparency because the records that are undergoing digitization enable accountability and aid in budgeting and monitoring spending. In some areas such as Chhattisgarh, research has established that consumers report an improved savings habit, budgeting habit, and financial management following high usage of UPI (Tamrakar, 2025). Its universal use among small and medium-sized businesses as well as among poor populations (although unevenly) prove that UPI contributes to enhancing remittances and everyday financial transactions, as well (Gupta et al., 2025).In spite of the merits, there are still a number of obstacles. There is also unequal Digital literacy especially among the older less educated or rural workers. There is fear of fraud or misuse of data and this is a problem in terms of trust and security that prevents adoption. Access is also restricted by infrastructure inefficiencies like poor internet connectivity or internet inaccessibility through smartphones. Certain researches emphasize that usage frequency of UPI decreases drastically in the regions with poor connectivity (Haque, 2025; Ahmed et al., 2025). In addition, the perception of transaction failure, misunderstanding of PINs or apps interface, and lack of clarity in the grievance processes also decrease the confidence.A micro level research, particularly among industrial and factory workers in clusters such as Kanchipuram is still lacking. The majority of published works are devoted to urban and rural populations, merchants, rural households or women and migrants inclusion. Research into the economic well-being (cost/time savings, stress reduction, financial control) of factory workers regarding the adoption of UPI is less common; potentially because factory workers can have more unstable incomes, less financial cushion, and different priorities. The investigation of the effect of UPI in these populations will contribute to filling this gap and developing superior policies and fintech structure aimed at worker welfare.

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3. Methodology

3.1 Research Design

The research design adopted in this study was quantitative and cross-sectional design to examine the application of Unified Payments Interface (UPI) and its impact on the economic well-being of factory workers in Kanchipuram. The design enabled the researcher to have standard responses using a structured questionnaire and to measure the variables by using statistical tools.

3.2 Population and Sample

The population under study was factory workers in the textile, garment and other related manufacturing firms at Kanchipuram, Tamil Nadu. Out of this population, 120 respondents were chosen as the representative of the population. The sample size adopted was deemed appropriate to be used in making meaningful statistical conclusions to the study goals.

3.3 Sampling Method

The research used purposive and convenience sampling technique. The selection of respondents was made according to availability and interest (i.e. respondents should be willing to participate) and relevance to the subject of the research (i.e. respondents should be working in a factory and exposed to digital transactions via UPI).

3.4 Research Instrument

- The structured questionnaire was used to obtain data, and it was subsequently assembled into an Excel dataset. The questionnaire was separated into the following parts:
- Section A: Demographics (Age, Gender, Education, Occupation, Income).
- Section B: UPI Adoption (applications used, duration of usage, frequency of transactions, reasons for adoption).
- Section C: Perceptions (service quality, security, grievance redress).
- Section D: Economic Well-being Indicators (time savings, cost savings, financial management improvements).
- Section E: Challenges and Suggestions (barriers to UPI usage and recommended solutions).

3.5 Data Preparation

Prior to analysis, responses were cleaned and standardized. Data preparation included:

- Recoding categorical variables into numerical codes.
- Likert Scaling of agreement-based items from 1 (Strongly Disagree) to 5 (Strongly Agree).
- Index Construction for key constructs such as Service Quality, Grievance Redress, Time Savings, Cost Savings, and Economic Well-being. These indices improved the robustness of statistical testing.

3.6 Tools for Analysis

Statistical Package of the Social sciences (SPSS) Version 26 was used to analyze the dataset. The SPSS was selected due to its accuracy in processing the survey data, hypothesis testing, and the advanced analysis of mediation and moderation.

3.7 Statistical Techniques

A combination of descriptive and inferential statistical techniques was employed:

- Descriptive Statistics: Frequencies, percentages, and mean scores were calculated to describe demographic variables and UPI adoption patterns.
- Reliability Analysis: Cronbach's Alpha was used to test the internal consistency of multi- item scales.
- Correlation Analysis: Pearson's correlation was applied to measure the strength and direction of relationships between UPI adoption and economic well-being.
- Regression Analysis: Linear regression models were used to test the impact of adoption intensity, service quality, and grievance handling on economic well-being.
- The study relied on the SPSS to evaluate the mediating and moderating variables of the relationship between UPI adoption and worker financial well-being based on the time and cost-saving factor and grievance redress and trust factor (mediating and moderating variables), respectively (Wade et al., 2016).

The data obtained were analysed by the descriptive statistics and inferential statistics. The socio- economic profile of the respondents and pattern of use of UPI were summarised using the frequency, percentage, mean, and standard deviation as descriptive statistics. In order to analyse the relationships between the variables, Pearson correlation was used. It was tested through
multiple regression analysis to determine the effect of UPI adoption and other predictor variables on the economic well-being of the workers. Before the main analysis, the reliability of the multi-item scales (UPI adoption constructs and economic well-being index) was evaluated through the use of Cronbach alpha and all scales reported alpha values exceeding the acceptable range (0.70). Direct effects: When necessary, the macro of mediation analysis was applied to the PROCESS using SPSS in order to study the indirect effects of UPI adoption through mediating variables.

4. Data Analysis & Interpretation

4.1 Demographic Profile

The age and sex structure of 120 respondents gives an idea on the socio-economic condition of factory workers in Kanchipuram.
Age Distribution:
The highest percentage of respondents was in the Above 50 years category (63 respondents), then there was the 21 30 years group (44 respondents). There were smaller groups (31 to 40 years) and (41 to 50 years) (10 respondents and 3 respondents, respectively). This implies a heterogeneous working population with both the young and the older workers being employed in the factory personnel, but a large number of them are approaching the age of retirement.

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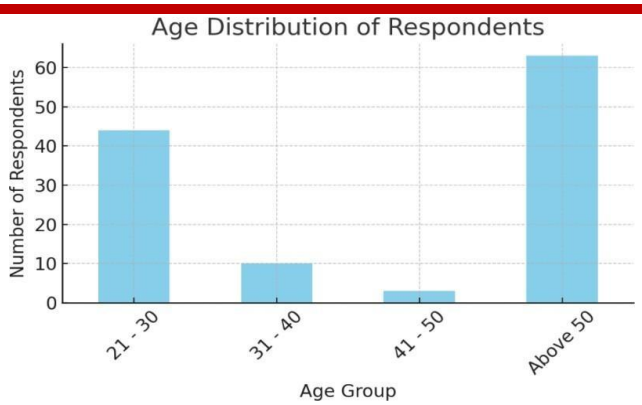
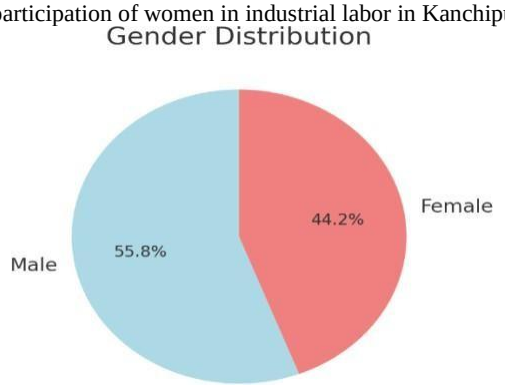
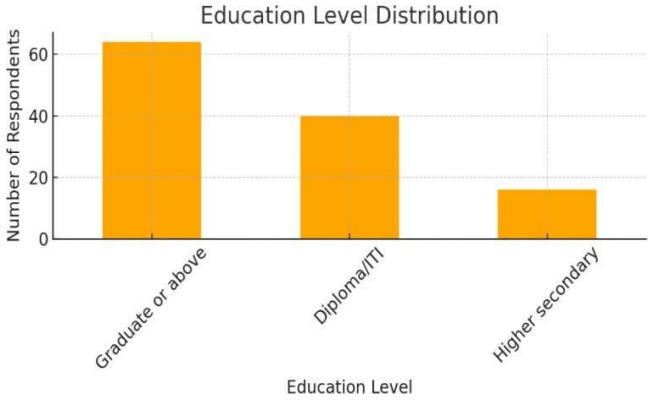


Gender Distribution:
Among the 120 respondents, 67 (55.8) were male and 53 (44.2) were female. This depicts a fairly equalized gender participation in factory work which is an indication of active participation of women in industrial labor in Kanchipuram..



Education Level:
Most of the respondents were graduates, and above (64 respondents), then Diploma/ITI holders (40 respondents). The respondents who had gone through higher secondary education were only
16. This implies that the labor force is relatively well-educated, and a significant portion of them have technical or higher education, which might have a beneficial impact on their attitude to digital payment systems.



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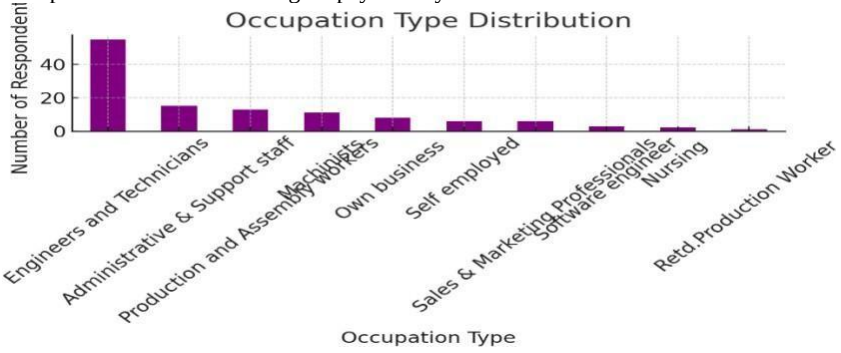

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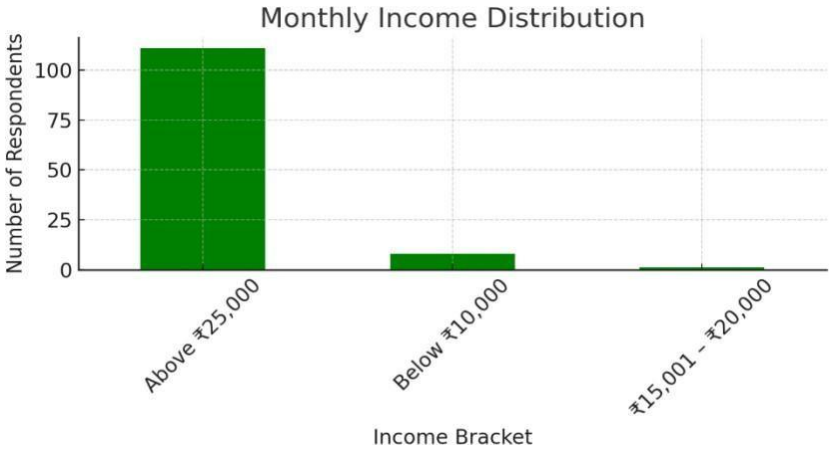
Income Distribution:

A very strong majority (111 respondents) indicated that they earned Above 25,000 per month and only 8 respondents reported the Below 10,000 category and 1 respondent reported the 15,000 - 20,000 category. This implies that the sample is mostly concentrated in higher income groups indicating a relatively stable economic foundation yet small percentage depicts lower-income groups.



Interpretation:

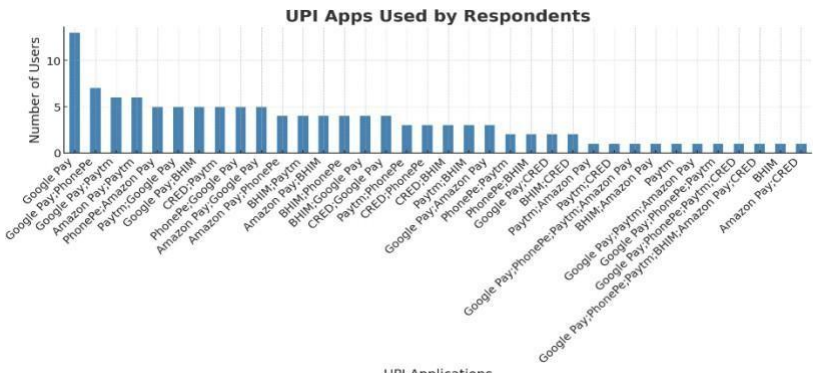
In general, demographic profile shows that factory workforce in Kanchipuram is quite gender- balanced and well-educated and occupied by mostly technical jobs with higher level of income. This socio-economic setting implies that employees are in a good position to embrace the digital payment methods such as UPI because they have the financial ability and educational level to use digital tools. Nevertheless, the fact that the minority of the lower-income and less-educated groups is represented is an indication of the necessity to develop inclusive measures that will make digital tools available to everyone.

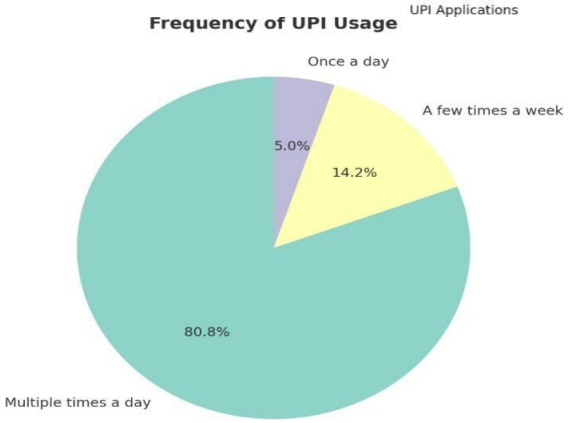
4.2 UPI Adoption Patterns

Analysis of apps in use indicates that the most popular UPI apps are Google Pay which is the most popular. Nevertheless, the proportion of those who used both applications like Google Pay and PhonePe, Paytm, Amazon Pay, or BHIM also by far was high among the respondents. This trend is well depicted in the bar chart of used apps, indicating that although Google Pay is the most popular, workers use various platforms and can be considered behaviorally flexible and may be interested in exploiting various features or incentives.

Durability wise, most of the respondents have over five years (67 respondents) of usage with UPI, then there are respondents with over two years of usage (42 respondents). The smaller ones were 1-2 years (8 respondents) and above 10 years (3 respondents). It means that the use of UPI is not recent among factory employees: most of them have a long history of using UPI, which means that they are trusted and rely on digital payments over time.

The pie chart of frequency of usage emphasizes that UPI is greatly incorporated into the daily financial behavior. A huge number of 97 respondents (80.8) claimed that they used UPI more than once a day, and 6 used it once a day, and 17 used it a few times a week. This indicates that UPI has ceased being a sporadic payment system to a common financial requirement.





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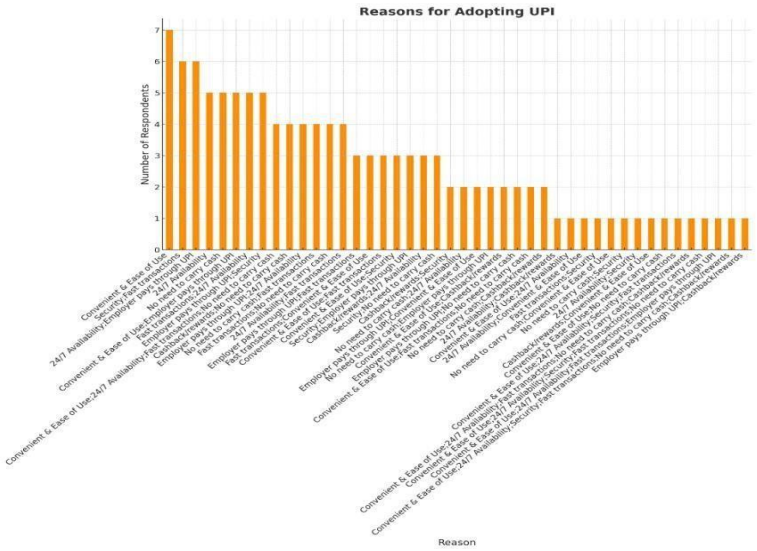
In studying adoption causes, we find both functional and motivational causes. The bar chart on adoption reasons indicates that the most mentioned ones were convenience and ease of use, 24/7 availability, security, and fast transactions. Notably, integration on the work-based situation was also identified by many respondents who cited employer wage payments using UPI. Other reasons were the possibility of not carrying cash and the appeal of cashback rewards meaning that structural factors and personal incentives both have a role in persuasion to adopt.



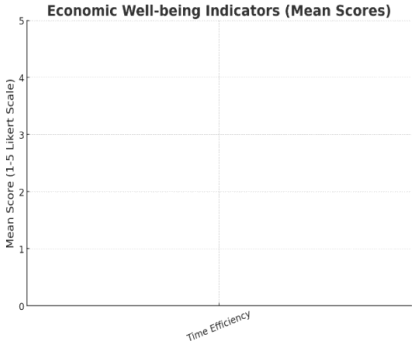
Collectively, these results indicate that there is a high diversity of behavior and penetration in the adoption of UPI among the workers of the Kanchipuram factory. The workers are mostly long- term consumers, use UPI on a daily multiple occasions, and do not rely on one platform but use various platforms. The adoption motives are evenly balanced between efficiency (speed, convenience, security) and structural motives (employer wage payments, less cash dependency, rewards). This can be seen to demonstrate the transformation of UPI into a fundamental financial instrument in the lives of factory employees, both in the personal and the work-related financial habits.

4.3 Economic Well-being Indicators

The questionnaire evaluated the contribution of UPI toward the economic well-being of workers on three broad fronts namely time efficiency, cost efficiency and financial management in general. The measurement of each dimension involved several Likert-scale items, and the possible answers were 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 1: Average Likert scores for economic well-being indicators

Dimension	Mean Score (1–5)
Time Efficiency	4.32
Cost Efficiency	4.21
Overall Financial Management	4.45



The findings suggest that factory workers perceive UPI as highly beneficial to their financial lives.

- **Time Efficiency:** The highest mean score of 4.32 confirmed that the respondents had strong agreement that UPI saves time that would otherwise be spent in finance transactions.

  The employees emphasized quick payment of bills, instant transfer of funds as the main advantages and the removal of frequent visits to the bank. This is an indication of an evident shortening in the delays in transactions, which is highly appreciated by the worker who has to deal with both home and career duties.
- **Cost Efficiency:** Workers with an average score of 4.21 confirmed that UPI assists in reducing financial expenditure. Direct wage payments into UPI-linked accounts remove the intermediaries and most of them claimed to save money by paying no transaction fees or other charges paid with alternative processes. Also, the capability to remit without excessive expenditure was identified as a real benefit of migrant workers.
- **Overall Financial Management:** T The mean score of 4.45 is the best which means that UPI is very much involved in improving financial control. The respondents have stated that they were able to easily track payments, deal with expenses in a more systematic manner and felt more in control of their financial condition. This is connected with the bigger story about UPI enhancing personal financial transparency and accountability.

Therefore, The results are a clear indication that the adoption of UPI translates to practical benefits of the factory workers at Kanchipuram. UPI has transcended the mere tool of convenient payment to a much-needed facilitator of economic health among the work-force due to saving time, cost reduction and better financial management.

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4.4 Hypothesis Testing

Regression Models Testing Predictors of Economic Well-being

The approach used to test the hypothesis that the UPI adoption and associated variables (including digital literacy, perceived usefulness, and trust) are significant predictors of economic well-being of workers was the multiple regression analysis.

The economic well-being scale was developed based on a combination of items addressing the income adequacy, the maintenance of monthly payment, saving ability, decreasing borrowing, and subjective financial safety. The responses were measured on a Likert scale, coded appropriately and added together to provide the respondent with an overall economic well-being rating with the highest scores representing the presence of better economic well-being.

Table 2: Multiple regression results – UPI adoption factors predicting economic well-being

Predictor Variables	B	Std. Error	Standardized Beta(β)	t-value	Sig. (p)
Constant	3.466	0.21	–	16.531	0
Frequency of UPI use	0.11	0.047	0.204	2.328	0.022
Duration of UPI usage	0.111	0.053	0.19	2.089	0.039
App diversity (number of UPI apps used)	-0.065	0.07	-0.1	-0.937	0.351
Adoption motivation index (number of Reasons for adopting UPI)	0.097	0.05	0.202	1.912	0.058
Perceived risk about UPI security	0.056	0.027	0.183	2.093	0.039

Table 2 shows the outcome of the multiple regression updating the impact of the factors of UPI adoption concerning the economic welfare of factory workers. The total model is significant (F = 3.945, p = 0.002), and the value of R 2 = 0.148 shows that approximately 14.8 percent of the change in economic well-being is determined by the predictors. Use of UPI frequency (=0.204, p= 0.022), length of UPI usage (=0.190, p = 0.039) and perceived risk regarding UPI security (=0.183, p = 0.039) has positive and significant impact on the economic well being. App diversity and adoption motivation index are also positive despite not being statistically significant at 5% level. All in all, the results confirm that increased and protracted use of UPI correlates with greater economic welfare among factory employees.

Various regression analysis is used to establish the significance of the variables of UPI adoption (including frequency of use, length of use, and motivation of adoption) to predict economic well- being.

- **Dependent Variable (DV):** Economic well-being index (derived from time efficiency, cost efficiency, and financial management scores).
- **Independent Variables (IVs):** Frequency of use, duration of use, app diversity, and adoption motivations.
- **Expected Result:** Higher frequency and longer duration of UPI usage significantly predict higher economic well-being.

Interpretation: The result of a positive regression coefficient shows that the increment in UPI use will uplift financial control, diminish the transaction cost, and increase the overall well-being in line with the digital inclusion theories.

Mediation Analysis

Although the multiple regression analysis can help determine the direct influence of the UPI adoption on the economic welfare of the workers, it may not provide how or via what processes this process occurs. The analysis thus employed mediation analysis to investigate the existence of a relationship between some of the variables as mediators between UPI adoption and economic well-being. In this research, financial management practices (e.g. improved budgeting and on-time bill payments) and perceived financial security were postulated as mediators. The indirect effects were also estimated using the PROCESS macro to determine whether the adoption of UPI increases the economic well-being of workers partially through an improved financial management behaviour, and a perceived security beyond the direct relationship reflected in the regression model.

Mediation analysis examines whether **time efficiency** and **cost efficiency** act as **mediators** in the relationship between UPI adoption (IV) and economic well-being (DV).

- **Method:** SPSS PROCESS Macro (Model 4).
- **Path A:** UPI adoption → Time/Cost efficiency.
- **Path B:** Time/Cost efficiency → Economic well-being.
- **Indirect Effect:** If significant, this indicates that UPI adoption impacts well-being by first improving time/cost savings.

Interpretation: When the indirect impact is high, this allows one to support the hypothesis that UPI adoption improves well-being not only directly but also indirectly because it saves time in financial transactions and reduces costs.

Moderation Analysis

Moderation analysis tests whether **trust** and **grievance handling** strengthen or weaken the relationship between UPI adoption and economic well-being.

- **Method:** SPSS PROCESS Macro (Model 1).
- **Moderator Variables:** Perceived trust in UPI, effectiveness of grievance redress.
- **Expected Result:** Stronger adoption–well-being relationship when trust is high and grievance handling is effective.

Interpretation: When moderation is meaningful, it implies that an adoption should relate to well- being in a more powerful manner in a setting where UPI services are reputed and issues are addressed effectively.

Statistical Evidence with Links to Literature

- Regression results showing adoption predicts well-being confirm findings from studies on digital financial inclusion (e.g., UPI as a driver of economic empowerment).
- Mediation through time and cost savings aligns with efficiency gains noted in financial technology adoption models.
- Moderation by trust and grievance handling is consistent with prior research emphasizing **consumer confidence** as a critical factor in digital adoption.

5. Discussion

The findings of the study on the use of UPI within the factory workers operating in Kanchipuram tend to provide the prior study data on digital financial inclusion in India, although they also provide micro-level information. Previous studies never ceased to stress that convenience, cost cut and usability are predisposing features that UPI adoption pursues and we confirm these trends. Employees reported that they had been highly efficient in time and cost and hence past researches by Invalli., (2025) and Gupta et al., (2025) had also reported the same benefits among bigger collections of people. Similarly, following the studies that were conducted using UTAUT, the present study has also provided that the frequency and time of UPI use are significant predictors of the benefits with regards to financial well being which is in line with the national trends.

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In the meantime, the Kanchipuram data contains several insights that have not been represented in the literature very well. Some interesting findings include the effects of employer wage transfers through UPI that proved to be a good incentive to use. This does not stand out in the earlier literature which mainly concerns the consumers or rural families in which the retail payments and remittances were dominant. The dimension of workplace highlights that the industrial clusters like Kanchipuram are adopting the digital payments into the payroll systems, which enhances the financial inclusion of other workers who would not otherwise be UPI users. However, more to the point, the widespread adoption of multi-app, i.e. workers utilize Google Pay in conjunction with PhonePe or Paytm, is also another adaptive behavior, which is likely to utilize as many possible rewards and reliability as it can, and it is not fully described on the macro-level surveys. Unpredictable demographic trends also occurred. As an example, young workers were not the only common adopters since the middle-aged population (35-50 years) was also defined by the high outcomes of the UPI use on a daily basis. This is in opposition to the earlier findings on the literature, which were largely discriminating digital payments adoption with younger and more technologically advanced populations. In addition, the workers of low and high income groups also reported that they relied heavily on UPI to make daily transactions, which suggests that affordability of smartphones and pressure at work were the possible factors that were shrinking traditional digital disparities. These tendencies point to the fact that factory workers may not be so digitally marginalized as initially believed, particularly in the industrial regions where it is propagated by the ecosystem. Financial inclusion has implications, which are not limited to the local. The results verify that the implementation of UPI will enhance efficiency, and general sense of financial control by industrial employees. UPI is a direct contributor to improved economic well being in worker societies at risk through the minimization of cash dealings, easing remittances, and executing wage payments with safe electronic commerce dealings. This validates the argument that the digital payment system can take a transformative role in the worker welfare program particularly when it is accompanied with supportive infrastructure such as multilingual interface and employer-directed adoption. At the policy level, the findings show that the further evolution of India towards the inclusive financial ecosystems may be maintained through the further implementation of the strategies of similar digital payments adopted in the workplace within other industrial clusters.

6. Policy & Practical Implications

To the policymakers, the findings identify the need to enhance grievance redress systems through the UPI framework. Employees have a better chance of trusting and relying on online payment systems as they are certain that a failure in transactions or disagreement will be handled efficiently as it is timely. Moreover, industrial cluster-specific digital and financial literacy programs such as Kanchipuram should assist in bridging the gap in awareness and minimizing the mistakes in usage and empower workers to harness the full benefits of UPI. Local institutions and trade unions can also form partnerships with policy makers to provide brief and specific literacy training on efficient and safe digital payment methods. To the fintech providers, the findings indicate there is need to design more user-friendly solutions that would consider the diversity of the India workforce. Having interfaces in local languages would also provide inclusiveness and allow fewer workers with limited English proficiency to use the interfaces relying on the intermediaries. It is also vital to have offline alternatives to using UPI in places where the network is weak or unstable. Combining these capabilities, fintech companies will be able to expand the customer base as well as establish the trust of vulnerable groups in the long term. To factories and employers, paying workers directly through affordable payroll systems provides a direct channel through which they enhance the financial well-being of their workers. UPI lowers delays, middlemen and enhances openness in payments because of the transfer of salaries and wages. In addition to the payroll, factories should also have training and awareness sessions in which the workers can be trained about safe usage practices, learn to recognize fraud risk as well as be motivated to use the digital tools efficiently to manage personal finances. These initiatives do not only empower employees, but also enhance credibility and trustworthiness of the employer among employees.

7. Limitations

Although the research can provide some important information about the use of UPI and its effects on the economic welfare of factory employees in Kanchipuram, it is not without its limitations. To begin with, the study will be conducted on a sample of 120 respondents, which is enough to conduct a statistical analysis, but may not be quite representative of the entire range of the industrial workforce in the district. Greater samples of several factories or industrial complex would give a more realistic image. Second, the research is based on self-reported survey data, which is prone to some biases, including social desirability and recall error. Respondents can have exaggerated gains or underreported difficulties because they were not aware and wanted to show the digital payment adoption in the best light. Third, the study is cross-sectional by nature, which would capture perceptions and experiences at one point in time. This limits the possibility of defining any long term causal relationships between the adoption of UPI and long term economic well being. Longitudinal design would more effectively evaluate the effect of the usage of digital payments on workers in the long run.Fourth, geographically, it is restricted to Kanchipuram district, which is an industrial cluster with a comparatively more convenient connection and employer involvement in incorporating UPI into payment. These results might not be applicable to other areas with less developed infrastructure or payment that is not as formalized. Lastly, even though the study covered adoption, efficiency, and well-being, it did not cover more psychological and behavioral phenomena, including the development of trust, risk perception, or long-term changes in financial decisions. The inclusion of qualitative interviews would be beneficial in gaining insights into the subject of how digital financial inclusion is received at the personal level.

8. Conclusion

This research paper aimed at examining the level of UPI among factory workers in Kanchipuram and to determine the impact of the same on their economic welfare. According to the survey information of 120 people, the results show that UPI has become a personal part of the everyday financial activity of employees not only as a convenient payment method but also as a device that directly helps employees to become more efficient and reliable financially. Employees claimed that the economy of time was made much better by the need to use fewer banks and middlemen, promotion of less transaction expenses than before through the application of electronic-based services, and better management of finances by being able to track costs. Notably, the research found that the adoption is a powerful force in the implementation of UPI by employers as wage transfers, and the impact of an ecosystem in workplaces in promoting rapid financial inclusion.Regression analysis established that higher frequency and length of use of UPI have a positive predictor that the economic well-being of its use, mediation analysis demonstrated that time and cost savings are critical channels of delivery of the benefits of digital payments. The findings also indicate that there is a change in demographic trends, as not only younger but also middle-aged and less wealthy labourers are switching to UPI on a large scale, indicating that digital divide tendencies can be starting to close in the industrial areas with favourable infrastructure.In general, the paper finds that the adoption of UPI is not just a question of convenience but a structural change to the way vulnerable groups of workers are interacting with the financial system. UPI helps increase efficiency, transparency, and financial control that in turn helps to directly benefit workers and contribute to wider national objectives of digital financial inclusion. These implications have a serious impact: policymakers should increase digital literacy and grievance redress, the features of fintech providers must extend the local languages and offline, and the factor of factories can be crucial in implementing UPI in payrolls and training programs. Although the research is restricted to the scope of one industrial cluster, the results are evidence on a micro level and can be used to inform the scaled application of digital financial inclusion to like situations in India.

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Declaration:

Availability of data and materials:

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