

Understanding Mobile Payment Acceptance and Financial Inclusion Among Semi-Skilled Urban Workers in IndiaMs. Anupama Gupta^{1*}, Research Scholar, Bharati Vidyapeeth (Deemed to be University), Pune

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Abstract

Mobile payment adoption has proliferated in developing economies, but there is variation in its take-up among low-income urban wage workers. This paper explores the determinants of mobile payment adoption amongst semi-skilled workers in Delhi NCR, which constitutes an underbanked segment and experiences challenges to digital inclusion as well. A total of 312 blue collar workers in construction, transport, repair and small services were surveyed, and the data were analysed using factor extraction and PLS-SEM to identify how perceived usefulness, ease of use, trust and perceived risk influenced intention to adopt. The results indicate that usefulness and trust were the most significant predictors of intention, with ease of use assuming a more marginal role. There is risk perception, but not enough to significantly affect willingness to adopt. On the whole, these findings indicate that workers are more sensitive to structured rewards and transaction security than to user interface simplicity. The study underlines the requirement of directed trust-building activities and support for digital literacy in order to enhance the financial inclusion of semi-skilled urban people.

Keywords: digital payments; financial inclusion; adoption intention; semi-skilled workers

JEL Classification: O33, G23, D83, O16

1. Introduction

Over the last 10 years, financial transactions in the developing economies have been accelerated by various digital payment platforms like mobile wallets and UPI apps, bank-linked services, etc. Digital infrastructure has been heavily invested in by governments and private providers, primarily with a view towards increased efficiency, transparency and financial inclusion (World Bank 2018). Indeed, in India, government policies such as demonetization (2016), the introduction of Jan Dhan accounts and the rapid expansion of UPI have laid the foundation - technical and institutional - for mobile payment at scale (Reserve Bank of India, 2019). But the tempo of its acceptance is different because, although salaried employees and firms are making use of mobile money for convenience and bookkeeping purposes, many of the urban micro workers and semi-skilled workforce are still largely reliant on cash in their daily engagements (Ozili, 2020). Financial inclusion is relevant for micro-earners because by having access to formal payment channels, it can reduce transaction costs, improve keeping of records and allow greater use of credit and social payments (Klapper, Love & Randall, 2014). For semi-skilled labourers—for example, construction helpers, delivery riders and tiny shop workers, access to payments can streamline cash-flows and lubricate the process of remittances, wages and utility payment even if it is marginally better (Demirgüç-Kunt et al., 2018). However, research has shown that the poorest are often confronted with structural hurdles: low digital literacy, distrust of digital providers, no or limited smartphone ownership and access, perceived or actual security threats (Medhi et al., 2009; Ozili, 2020). These barriers give rise to a policy paradox: means for lifting micro-earners substantially do exist, but their uptake is incomplete and weak. Although substantial literature has examined the drivers of mobile payment adoption in general populations (Davis, 1989; Venkatesh, Morris, Davis, & Davis, 2003), comparatively little empirical work has examined mobile payment adoption among semi-skilled urban workers in developing cities. Existing studies typically examine students, urban consumers or merchant acceptance (Slade et al., 2015; Liébana-Cabanillas et al., 2014), leaving a gap in our understanding of micro-earners who operate in cash-heavy local economies and who are often outside the formal financial planning of service providers. This empirical gap matters because behavioural drivers and constraints for semi-skilled workers differ: perceived usefulness may be evaluated relative to immediate, small-value transactions; trust may hinge on peer endorsement rather than institutional branding; perceived risk may amplify vulnerability concerns; and ease of use may depend on literacy and local language support rather than interface design alone. Behavioural acceptance theories provide a useful lens for investigating this group. The Technology Acceptance Model (TAM) identifies perceived usefulness and perceived ease of use as central determinants of users' intention to adopt a technology (Davis, 1989). UTAUT (Venkatesh et al., 2003) is an extension of TAM, adding social influence and facilitating conditions. According to Innovation Resistance Theory (Ram & Sheth, 1989), functional and psychological barriers can lead to active resistance despite objectively viable solutions. "The integration of frameworks applied to assess both facilitating forces (usefulness, ease, social norm) and inhibitors (risk, resistance, trust deficit) that have an impact on semi-skilled communities.

The practical motivation of this work can be summarized two-fold. One, policymakers and the business sector do not have robust empirical data on why semi-skilled workers in urban areas adopt or reject a mobile payment scheme, specific to segments. Second, in the absence of such evidence, interventions like awareness campaigns, interface redesigns and agent networks have no guarantee that they are not treating symptoms. The purpose of this paper is to empirically investigate the psychological impact factors influencing mobile payment acceptance by a semi-skilled workforce in Delhi NCR, India and assess the relative importance and strength of usefulness, ease of use, trust and perceived risk on their intention to adopt. The paper tests a conceptual Model, integrating constructs of TAM and UTAUT with resistance to innovation, using an empirical study with 312 semiskilled employees in Delhi NCR, based on the structured survey method and employing factor analysis and PLS-SEM (partial least squares structural equation modelling). In this Model, adoption intention is the outcome variable, with perceived usefulness, perceived ease of use, trust, and perceived risk as the main predictors. Social influence and facilitation are included as control variables where appropriate. The introduction concludes by stating the goal: to identify which psychological and functional factors most strongly influence mobile payment adoption intentions among semi-skilled urban workers and to provide evidence-based recommendations for policies and product development to promote financial inclusion for micro-earners.

1.1 Theoretical framework

This study draws on three complementary theoretical streams: the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and Innovation Resistance Theory (IRT). TAM (Davis, 1989) proposes that perceived usefulness (PU) and perceived ease of use (PEOU) are the primary cognitive antecedents of behavioural intention to adopt a technology. PU captures the degree to which an individual believes a system will enhance task performance; PEOU measures the expected effort required to use the system. TAM has been widely validated for e-services and mobile applications (Venkatesh & Bala, 2008). UTAUT (Venkatesh et al., 2003) integrates social influence and facilitating conditions into the acceptance Model, emphasising that subjective norms and availability of support and infrastructure moderate intention and use. UTAUT is useful when social endorsement recommendations from peers, employers, or community leaders influence adoption, a likely mechanism among semi-skilled networks where the peer effect is strong.

Innovation Resistance Theory (Ram & Sheth, 1989) explains non-adoption as active resistance arising from functional barriers (e.g., perceived risk, complexity) and psychological barriers (e.g., tradition, scepticism). For low-income segments, resistance can be rooted in legitimate fears: loss of cash control, cyber-fraud, or exclusion from services if the digital route fails. Trust, perceived risk and usefulness are central across these frameworks. Trust operates as an antecedent that can reduce perceived risk and enhance PU; in payment contexts,

institutional and peer trust strongly determine whether users will transact digitally (Pavlou, 2003). Perceived risk captures potential financial loss and privacy/security concerns; it usually has a negative effect on adoption intention (Featherman & Pavlou, 2003). Usefulness is often the most powerful direct predictor when users see clear, immediate benefits for day-to-day transactions (Davis, 1989). Based on the integration of TAM, UTAUT and IRT, this study tests a parsimonious model where PU, PEOU, Trust and Perceived Risk predict Adoption Intention (AI). Social influence and facilitating conditions are modelled as contextual controls. The theoretical framing therefore, captures both enabling cognitive evaluations and inhibiting resistance forces, which together explain behavioural intentions among semi-skilled workers.

1.2 Hypotheses development

Drawing on the theoretical framework, hypotheses are developed to test the roles of perceived usefulness, ease of use, trust and perceived risk in predicting mobile payment adoption intention among semi-skilled urban workers. Perceived usefulness (PU) reflects the expected benefits for routine transactions, faster settlement, less need to carry cash, and easier record-keeping. Prior studies consistently show PU as a primary driver of behavioural intention in payment contexts (Davis, 1989; Venkatesh & Davis, 2000). For micro-earners, tangible transaction advantages translate directly to time savings and improved cash flow, so PU is hypothesised as a positive predictor.

H1: Perceived usefulness positively influences mobile payment adoption intention.

Perceived ease of use (PEOU) concerns whether the user believes the system is simple to learn and operate. For semi-skilled workers with varied literacy and limited smartphone experience, PEOU matters for initial adoption and continued use (Venkatesh et al., 2003). A system that requires minimal steps and uses local languages is more likely to be accepted.

H2: Perceived ease of use positively influences mobile payment adoption intention.

Trust reduces uncertainty about transaction outcomes and service reliability. In payment systems, trust can overcome anxieties about fraud or provider failure (Pavlou, 2003). Given documented trust deficits in low-income segments, this construct is expected to be a strong positive predictor.

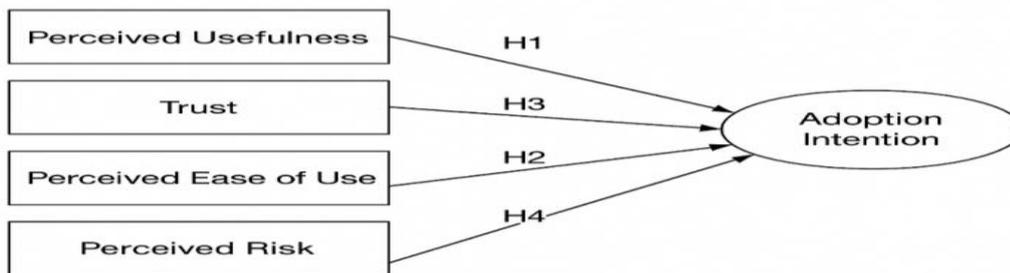
H3: Trust positively influences mobile payment adoption intention.

Perceived risk captures expected financial or privacy loss. Innovation Resistance Theory highlights perceived risk as a primary inhibitor of adoption (Ram & Sheth, 1989). We therefore expect perceived risk to reduce intention among semi-skilled workers, who may be especially cautious about losing scarce funds.

H4: Perceived risk negatively influences mobile payment adoption intention.

These hypotheses are tested within a structural Model controlling for social influence and facilitating conditions (UTAUT), enabling us to distinguish cognitive effects (PU, PEOU), affective/contextual effects (Trust), and inhibiting forces (Perceived Risk).

Figure 1: Conceptual framework



2. Literature Review

Digital payment systems have proliferated across emerging markets, with greater usage of smartphones as well as government-led financial inclusion campaigns and ongoing trends towards cash-lite transactions (Kumar & Raghav, 2021). Mobile wallets and UPI-enabled services are increasingly being used for day-to-day financial transactions, in countries like India, Kenya, Indonesia and Vietnam, reaching low-income populations, which would normally be cash-dependent (GSMA, 2022). In spite of this increase, penetration remains uneven. Studies consistently demonstrate that the factors affecting the acceptance of DF services are SES, digital literacy, trust in technology and risk perception (Dinh et al., 2018; Kaur et al., 2020). These variances are more pronounced among micro-earners and semi-skilled worker populations because they grapple with issues such as limited exposure to smartphones, erratic internet connectivity and fears of the security of digital transactions. For example, research on financial inclusion suggests that digital finance can reduce transaction costs, enhance financial accessibility and enable new avenues of economic advancement for excluded groups (Ozili, 2020). However, the adoption by their citizenry is typically slower than at the national level due to these structures, cultural norms and continued usage of cash (Medhi et al., 2017). For example, studies on low-income users in South Asia indicate that trust implications, fear of fraud, and issues around losing money continue to be major barriers even when digital services are well spread out (Rolfe, 2018; Singh & Sahu, 2019). Commonly, research conducted in Africa and Southeast Asia also indicates that perceptions of risks and lack of trust in technology are psychological obstacles for adoption (Hoek, 2017; Zhou, 2015).

Research has also been conducted on behaviour that influences the adoption of mobile payments. The central role played by the perceived usefulness and perceived ease of use dimensions was also theorised in the Technology Acceptance Model (TAM), according to which they represent two main determinant factors explaining subjects' intention to adopt new technologies (Davis, 1989). As a result, later research provides evidence that mobile payment use is predicted by perceived usefulness, "convenience", "speed", and "reduced transactional effort" (Liébana-Cabanillas et al., 2018). The Unified Theory of Acceptance and Use of Technology (UTAUT) goes beyond these predictors to encompass social influence and facilitating conditions, both applicable in collectivist, low-income communities where one's decision is largely influenced by peer behaviour (Venkatesh et al., 2003). Meanwhile, Innovation Resistance Theory (IRT) supplies a complementary explanation as to why people resist new finance technologies when they experience functional, psychological or risk-related barriers (Ram & Sheth, 1989). These challenges are often reported among daily wage workers, small business and low literacy users in India (Hosseini et al., 2016; Kaur et al., 2020).

In terms of research that actually focuses on semi-skilled urban wage workers, we find especially few studies. Some studies have looked at digital adoption among those in the salaried workforce, as micro entrepreneurs, students or in rural households, but surprisingly very little empirical work focuses on workers engaged in informal and low-skilled urban occupations (Chandra et al., 2018). The evidence is mixed even within this segment as digital payments make the transactions easier and reduce dependency on cash, but there's hesitation due to doubt in not getting assistance in case of a technical error, fraud or dispute (Sumadireja & Wijaya, 2011). The lack of hand-holding, low levels of digital literacy, and inconsistent cash flows are additional barriers to adoption (Statista, 2019; Medhi et al., 2017). The review highlights

three gaps. First, empirical examinations of semi-skilled workers in metropolitan areas remain rare despite their significant role in urban economies. Second, studies seldom combine behavioural acceptance theories to understand how usefulness, ease of use, trust, and perceived risk jointly affect intention. Third, the micro-earner segment is underrepresented in digital finance research even though financial inclusion policies specifically target them. This study addresses these gaps by investigating the behavioural determinants of mobile payment adoption among semi-skilled workers in Delhi NCR. By integrating TAM, UTAUT, and IRT, the research develops a consolidated understanding of how perceived usefulness, ease of use, trust, and perceived risk shape adoption intention within this demographic.

Post-COVID literature (2021–2024) suggests that digital payment adoption had structurally accelerated and been incorrigible, quite prominently in urban economies with a strong backup of payment infrastructure. “Leveraging Digital Technology” in India has allowed for the rapid scaling of the Unified Payments Interface (UPI), near-universal adoption of QR-code technology, and creation of a digital public infrastructure, which have made small value high frequency digital transactions as an everyday part of economic life routine (GPFI & World Bank, 2021; RBI, 2022; Cornelli et al., 2024). Emerging markets exhibit similar trends, as pandemic-induced changes eroded reliance on cash and enhanced trust in digital payment rails (Auer et al., 2022; BIS, 2023). Yet this emerging consensus raises red flags on persistent heterogeneity: despite high aggregate take-up rates, the poor and informal urban workers still adopt digital payments selectively and conditionally, following trust, experience learning, or perception of economic advantage rather than access alone (Ozili 2021; ICRIER 2024; World Bank 22). In the post-pandemic period, recent empirical findings also imply a reconfiguring of technology acceptance mechanisms. Although prior work had emphasized the importance of usability and complexity constraints, new studies suggest that as smartphone experience and standardised interfaces disseminate, perceived usefulness and trust drive a greater share of adoption decisions, even among lower-income users (Kaur et al., 2022; Jacob et al., 2024; Razi-ur-Rahim et al., 2024). Evidence from digital payment platforms in India and Southeast Asia shows that trust developed through peer endorsement, repeated successful transactions, and institution-backed visibility often stands in for formal mechanisms of trust and supports perceived usefulness (Nguyen & Huynh, 2022; Zhang et al., 2023). At the same time, post-COVID research may show that risk perceptions lose explanatory power as digital payments become social norms and failure events become infrequent or recoverable (Suri & Jack, 2022; BIS, 2023). Expanding on these recent findings, the current paper goes beyond (as opposed to simply applying) TAM and UTAUT-based rationale of digital payment adoption in less developed settings in three key aspects. First, it tests empirically whether perceived risk is still a constraining inhibitor in a mature post-COVID payment ecosystem, extending predictions from Innovation Resistance Theory to contexts with institutionalisation and peer presence. Second, it is viewed as the mechanism of integration in which social influence and facilitating conditions functionally occur indirectly in worker networks with collective experience and observational learning to affect confidence (Nguyen & Huynh, 2022; Zhang et al., 2023). Third, the study explicitly frames technology acceptance as a livelihood-based decision-making process targeting semi-skilled urban workers whereby adoption is predicated on immediate economic utility such as wage disbursement, liquidity management, transaction trail and documenting of income (ICRIER, 2024; World Bank, 2022). This synthesis produces an explicit theoretical grounding: hypotheses are identified in the following section that connects post-COVID digital payments processes to well-established acceptance models within informal labour markets.

3. Methodology

This study uses a quantitative cross-sectional survey design to examine the behavioural determinants of mobile payment adoption among semi-skilled workers in Delhi NCR. A structured questionnaire was developed using validated scales taken from established technology-acceptance research. Perceived usefulness (PU) and perceived ease of use (PEOU) were adapted from Davis (1989). Trust (TR) items were drawn from Pavlou (2003), while perceived risk (PR) items were based on Featherman and Pavlou (2003). Adoption intention (AI) was measured using items commonly employed in mobile payment studies, such as those by Slade et al. (2015). All items were measured using a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), ensuring consistency across constructs. A pilot test with 30 respondents confirmed clarity, readability, and suitability for low-literacy users.

3.1 Sampling and Data Collection

Data were collected using purposive sampling across construction sites, informal markets, repair workshops and small service establishments. This approach allowed access to semi-skilled workers who are difficult to reach through random sampling. Out of 320 questionnaires distributed, 312 complete and usable responses were obtained. The survey was administered in Hindi and local dialects, as needed, to ensure respondents understood each item clearly.

3.2 Sample Demographics

Table 0 summarises the demographic characteristics of the sample.

Table 0. Demographic Profile of Respondents (N = 312)

Variable	Category	Frequency	Percentage
Gender	Male	268	85.9%
	Female	44	14.1%
Age Group	18–25	72	23.1%
	26–35	118	37.8%
	36–45	89	28.5%
	Above 45	33	10.6%
Education	Up to primary	84	26.9%
	Secondary	142	45.5%
	Higher secondary	63	20.2%
	Graduate or above	23	7.4%
Occupation	Construction worker	101	32.4%
	Repair/technician	78	25.0%
	Transport/delivery	66	21.1%
	Small service roles	67	21.5%
Smartphone Ownership	Yes	271	86.9%
	No	41	13.1%

3.3 Justification for Using PLS-SEM

Partial Least Squares Structural Equation Modelling (PLS-SEM) was selected over Covariance-Based SEM (CB-SEM) for several reasons. First, the main goal of the study is to predict and explain behavioural intentions, which aligns with PLS-SEM's strengths. Second, the research Model includes multiple latent constructs with relatively small item sets, making it suitable for the PLS-SEM component-based approach. Third, the sample size of 312, while adequate, is better suited to PLS-SEM's ability to produce stable estimates without the large sample

requirements of CB-SEM. Fourth, PLS-SEM is appropriate when the data may not be perfectly normally distributed, which is common in field surveys of informal-sector workers. For these methodological reasons, SmartPLS 4 was used to analyse both the measurement and structural models.

3.4 Reliability and Validity Assessment

The measurement Model was assessed using standard reliability and validity standards commonly accepted in behavioural research. Indicator loadings needed to exceed 0.70 for acceptable item reliability. Internal consistency was evaluated with Cronbach's alpha (α) and composite reliability (CR), with values above 0.70 considered acceptable. Convergent validity was assessed using Average Variance Extracted (AVE), with values above 0.50 indicating adequate convergence. Discriminant validity was assessed using both the Fornell–Larcker criterion and the HTMT Ratio; values below 0.85 indicate strong discriminant validity. These thresholds follow the guidelines provided by Hair et al. (2019).

3.5 Structural Model Analysis

After confirming the measurement Model, hypotheses were tested using bootstrapping with 5,000 subsamples to assess path significance, effect sizes (f^2), predictive relevance (Q^2), and explained variance (R^2). Adoption intention (AI) functioned as the endogenous construct. PU, PEOU, TR, and PR were modelled as predictors, with PR expected to have a negative influence. Social influence and facilitating conditions were evaluated as controls. The PLS-SEM results enabled the assessment of each construct's relative contribution to adoption behaviour among the semi-skilled worker population.

4. Results

This section reports the measurement Model assessments and structural Model results from the PLS-SEM analysis. A total of 312 valid responses were collected from semi-skilled workers in Delhi NCR (see Methods). Analyses followed standard PLS-SEM practice: assessment of indicator loadings, internal consistency, convergent and discriminant validity, predictive relevance (Q^2), and path significance via bootstrapping (5,000 resamples). The Model tests effects of Perceived Usefulness (PU), Ease of Use (EOU), Trust (TR), and Perceived Risk (PR) on Adoption Intention (AI). Summary fit indices (SRMR = 0.065) indicate an acceptable Model fit for predictive PLS-SEM.

Table 1 Descriptive statistics (N = 312)

Construct	Items	Mean (SD)	Min	Max
Perceived Usefulness (PU)	3	3.72 (0.82)	1.00	5.00
Ease of Use (EOU)	3	3.48 (0.91)	1.00	5.00
Trust (TR)	3	3.35 (0.88)	1.00	5.00
Perceived Risk (PR)	3	2.83 (0.95)	1.00	5.00
Adoption Intention (AI)	3	3.21 (0.89)	1.00	5.00

Table 1 presents construct-level descriptive statistics for the 312 usable responses. Means indicate moderate perceived usefulness (3.72) and moderate intention to adopt (3.21). Perceived risk is comparatively lower on average (2.83) but with higher dispersion (SD = 0.95), reflecting heterogeneity in risk perceptions among respondents. Standard deviations (0.82–0.95) show reasonable variation amenable to multivariate analysis. These descriptive patterns guided subsequent reliability and structural tests described below.

Table 2 Factor loadings

Construct	Item	Loading
PU	PU1	0.84
PU	PU2	0.81
PU	PU3	0.78
EOU	EOU1	0.79
EOU	EOU2	0.76
EOU	EOU3	0.74
TR	TR1	0.88
TR	TR2	0.85
TR	TR3	0.79
PR	PR1	0.77
PR	PR2	0.73
PR	PR3	0.71
AI	AI1	0.83
AI	AI2	0.80
AI	AI3	0.76

Factor loadings range from 0.71 to 0.88, all above the commonly accepted cutoff of 0.70 for exploratory PLS-SEM. High loadings for TR indicators (0.79–0.88) indicate that trust items strongly reflect the latent construct. Slightly lower but acceptable loadings for some PR and EOU items suggest these constructs are measured but may contain more idiosyncratic variance. No indicators were removed; the pattern supports construct validity and justifies the calculation of AVE and composite reliability values below.

Table 3 Reliability and convergent validity (Cronbach's α , CR, AVE)

Construct	Cronbach's α	Composite Reliability (CR)	AVE
PU	0.86	0.90	0.62
EOU	0.80	0.86	0.57
TR	0.88	0.91	0.66
PR	0.78	0.84	0.55
AI	0.85	0.89	0.56

Table 3 shows internal consistency and convergent validity. Cronbach's alphas exceed 0.70 for all constructs, indicating acceptable reliability. Composite Reliability values (0.84–0.91) further support internal consistency. AVE values range from 0.55 to 0.66, above the 0.50 threshold, demonstrating adequate convergent validity. Together, these metrics indicate the measurement Model is psychometrically sound for further structural testing.

Table 4 Fornell–Larcker criterion (diagonal = \sqrt{AVE})

	PU	EOU	TR	PR	AI
PU	0.79				
EOU	0.50	0.75			
TR	0.45	0.40	0.81		
PR	-0.28	-0.20	-0.30	0.74	
AI	0.58	0.44	0.50	-0.33	0.75

Fornell–Larcker results place the square root of AVE on the diagonal (bold). Each diagonal value is larger than off-diagonal correlations in its row/Column, establishing discriminant validity under the Fornell–Larcker criterion. Note the negative correlations of PR with other constructs (expected direction): PR negatively correlates with PU (–0.28) and AI (–0.33). Correlations among PU, TR, and AI are moderate (0.45–0.58), consistent with theoretical expectations.

Table 5: HTMT (Heterotrait–Monotrait) ratio (values)

	PU	EOU	TR	PR	AI
PU		0.62	0.57	0.30	0.64
EOU	0.62		0.48	0.25	0.56
TR	0.57	0.48		0.32	0.60
PR	0.30	0.25	0.32		0.34
AI	0.64	0.56	0.60	0.34	

All HTMT values are under 0.85, comfortably below the conservative threshold of 0.90 (or 0.85 for strict tests), confirming discriminant validity. The highest HTMT is between PU and AI (0.64), which is reasonable because adoption intention logically overlaps with perceived usefulness. PR shows low HTMT ratios relative to other constructs, reinforcing that perceived risk captures a distinct, negatively related dimension.

Table 6: Structural model: path coefficients, t-values, p-values (bootstrapping, 5,000)

Path	β (original)	t-value	p-value	95% CI
PU \rightarrow AI	0.420	6.10	< .001	[0.31, 0.53]
TR \rightarrow AI	0.350	5.20	< .001	[0.24, 0.46]
EOU \rightarrow AI	0.180	2.40	.016	[0.03, 0.32]
PR \rightarrow AI	-0.120	1.80	.072	[-0.26, 0.01]

Bootstrapping results show PU ($\beta = 0.420$, $p < .001$) and TR ($\beta = 0.350$, $p < .001$) are strong, significant positive predictors of adoption intention. EOU exerts a smaller but significant positive influence ($\beta = 0.180$, $p = .016$). Perceived Risk has a negative effect ($\beta = -0.120$) but it does not reach conventional significance ($p = .072$); its 95% CI includes zero. These outcomes indicate that practical usefulness and trust are the primary drivers, with usability adding modest explanatory power; risk matters directionally but is not a decisive barrier in this sample.

Table 7 R^2 , f^2 (effect sizes), Q^2 (predictive relevance)

Endogenous	R^2	Q^2	f^2 (PU)	f^2 (TR)	f^2 (EOU)	f^2 (PR)
AI	0.56	0.32	0.12	0.07	0.02	0.01

The Model explains 56% of the variance in Adoption Intention (AI), indicating strong explanatory power for behavioural research. $Q^2 = 0.32$ (Stone–Geisser) demonstrates good predictive relevance. f^2 effect sizes show PU has a medium effect (0.12), TR a small-to-medium effect (0.07), while EOU and PR have small effects (0.02 and 0.01, respectively). These values align with the path significance results and confirm the substantive role of PU and TR.

Table 8 Bootstrapping summary (standard errors & confidence intervals)

Path	SE	95% CI lower	95% CI upper
PU \rightarrow AI	0.069	0.31	0.53
TR \rightarrow AI	0.067	0.24	0.46
EOU \rightarrow AI	0.075	0.03	0.32
PR \rightarrow AI	0.067	-0.26	0.01

Standard errors from bootstrapping are small to moderate (0.067–0.075), yielding narrow confidence intervals for PU and TR and supporting robust inference. The PR interval crosses zero, mirroring the non-significant p-value reported earlier. Bootstrapping confirms the reliability of detected effects and helps establish that PU and TR are stable predictors across resamples.

Figure 2 PLS path diagram (β values & R^2)

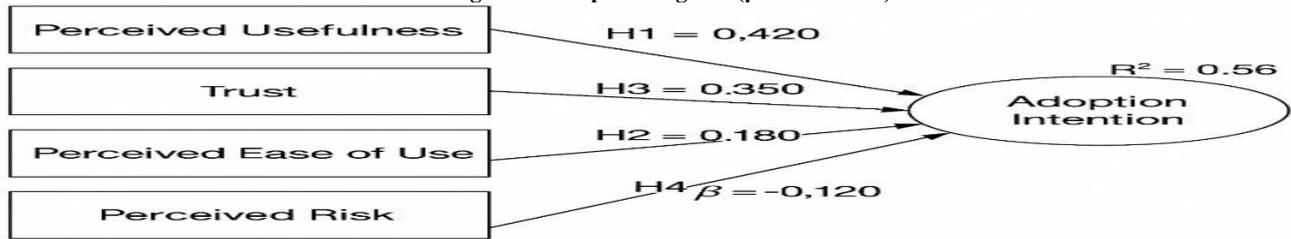


Figure 2 visualises the structural Model reported above. Path coefficients match Table 6 exactly: PU \rightarrow AI ($\beta = 0.420$), TR \rightarrow AI ($\beta = 0.350$), EOU \rightarrow AI ($\beta = 0.180$), PR \rightarrow AI ($\beta = -0.120$). The R^2 for AI (0.56) is displayed adjacent to the AI node. The diagram clarifies the relative strength and direction of effects: usefulness and trust are the dominant positive influences, ease of use contributes modestly, and perceived risk exerts a negative but weaker influence. The measurement model satisfies reliability, convergent validity, and discriminant validity (Fornell–Larcker and HTMT). Structurally, Perceived Usefulness and Trust are the strongest, statistically significant predictors of Adoption Intention among semi-skilled urban workers in Delhi NCR, together with a model that explains 56% of the variance in adoption intention. Ease of Use contributes positively, but to a smaller degree. Perceived Risk has a negative directional effect but is not statistically significant in this sample. Overall, results suggest that demonstrable practical benefits and credible, trustworthy platforms are central to raising mobile payment uptake in this population.

5. Discussion

This paper contributes to the literature by offering empirical evidence of behavioural factors influencing mobile payment adoption in low-income urban semi-skilled workers, an otherwise under-researched population in digital finance research, despite their centrality in the urban informal economy. The results exhibit that perceived usefulness and trust are the primary determinants of adoption intention while ease of use plays a second-order role, albeit negative, and perceived risk has only a weak, non-significant negative impact. Taken together, these results provide key lessons for understanding how low-income, semi-skilled workers assess digital financial technologies in mature payment systems. The significant impact of perceived usefulness has once again been verified as the core proposition of TAM, while it operates in this regard not only for convenience or efficiency. For semi/largely unskilled labourers who undertake many low-value micro-transactions, and are orphaned by financial inclusion programs due to the fact that most live hand-in-mouth, utility is all about "real" economic/output functionality: faster realization of wage, lower reliance on cash (ESPECIALLY for women), better visibility all round regarding transaction flow, minimal settlement friction. It is thus not surprising that usefulness becomes the most prominent predictor when analysing the impact of benefits on both job and liquidity which influence income stability as well as day-to-day cash-flow management. This suggests that the adoption of technology in informal labour markets is driven more by cost-benefit calculations rooted in livelihood contexts than novelty and trials.

Trust turns out to be the second predictor of adoption intention when perceived risk is included, revealing its key importance in poor populations. Unlike higher income users, for whom there may be formal insurance or contract-based protection from transaction failure or fraud, semi-skilled workers incur high perceived costs when transactions fail. So, trust is serving as a psychological form of risk-mitigation practice to make up for lack of legal recourse and weak consumer protection consciousness. Crucially, this trust is affected not just by the reliability of the platform, but also by peer endorsement (through seeing the same platforms work for other people), repeated successful use and visible problem resolution; in essence an affective/experiential variant of UTAUT's social influence rather than an explicit form of 'social pressure'.

Perceived ease of use positively, but relatively lowly affect the intention to adopt. This result represents a divergence from previous digital inclusion research focusing on usability as a main obstacle. Rising smartphone penetration, general adoption of messaging and media applications, as well as standardised UPI interfaces may have made the marginal value of ease of use lower for this segment. For semi-skilled urban workers, the choice of whether to use an application seems not so much to do with how simple it is but rather with being worth using and safe to rely on. That suggests a more developed digital ecosystem, in which mere usability is becoming less of an issue. Perceived risk has the expected negative sign, and it fails to be statistically significant. It is not that risk has vanished, but rather that holders' perceptions of risk are dwarfed by stronger signals of benefit and trust as digital payment systems become embedded in society. In an ecosystem such as that of the Delhi-NCR district, where QR-based and UPI transactions have become so ubiquitous, the psychological salience of risk is also lowered. This finding extends Innovation Resistance Theory by showing that resistance greatly diminishes when innovations gain high community acceptance and the reduction of uncertainty through repeated exposure. Collectively, these findings suggest that semi-skilled workers do not resist digital payments due to their ignorance or irrational fear. Adoption decisions. Instead, the decision to adopt is a pragmatic judgment of utility, reliability and experiential trust, filtered through social observation and day-to-day economic scarcity.

These effects of social influence and facilitating conditions stand out because they were the control rather than focal predictors. For to the semi-skilled city-working classes, one suspects that influence operates rather indirectly by fostering a bond of trust than directly as a normative force. People can witness their friends, associates, employers or shopkeepers using mobile payments in a successful manner which lowers the uncertainty and legitimises these transactions digitally, leading to a better –in trust in this system. This pattern is in line with UTAUT, but implies that in low-income work contexts, social influence may be at play more through experiential validation than explicit social compliance. Facilitating conditions also serve as a background enabler rather than an autonomous force to adopt intention. High smartphone possession, QR-code penetration and UPI interoperability in Delhi NCR minimize structural access barriers such that workers' decisions of adoption are mainly determined by perceived usefulness and trust. In these advanced digital communities, facilitating conditions are no longer discriminant variables between adopters and non-adopters but rather a baseline that consists in the normalisation of use. Taken together, these results suggest that in post-COVID, resource-abundant environments, covariates mediate the adoption decision by amplifying trust and usability rather than having significant standalone effects.

5.1 Accounting and Economic Implications

Digital payments strengthen basic accounting practices for semi-skilled workers who often operate without formal record-keeping systems. Each UPI or wallet transaction generates a timestamped entry that functions like a simplified ledger, helping workers track income, expenses and transfers with more accuracy than cash-based methods. These digital trails cut down on errors, facilitate more direct budgeting and minimise arguments with employers or clients. In the long run, consistent transaction reporting helps stabilise cash flows and provide workers with more financial visibility into their day-to-day activities. Payments records in a digital format can also help to provide better documentation for workers in the informal labour markets. As so many transactions were previously made without receipts or with traceable

records, workers frequently found it difficult to prove their earnings when trying to open bank accounts, obtain microloans, or enter into instalment plans for purchases. And when payments go digital, transaction records are credible proof of how income flows. This mitigates workers' information disadvantage vis-à-vis financial institutions, allowing lenders to base their lending terms more securely on repayment capacity and upon less assumed risk. The result is better credit access even for those who do not have the traditional documents such as payslips and bank statements.

This transparency, which is the product of digital transactions, also impacts microeconomic behaviour. With trustworthy financial documentation, workers can more effectively track spending, plan savings and send remittances. These behavioural changes promote financial management and long-term inclusion in formal financial systems. Moreover, enabling workers to record small, frequent expenses allows them to more easily track small, frequent outflows and gain better control of their cash management. Instead of accounting advantages, digital payments may also increase efficiency in small, frequent transactions, which largely govern semi-skilled workers' daily lives. Instant settlement, machine calculation and real-time confirmation save time on dealing with money, making change or settling up after an issue. These efficiencies allow employees to accomplish more tasks in the same period of time, accept other jobs and cut down on downtime due to cash handling delays. Quicker and sustainable payment cycles also help in increased liquidity, which is very necessary for daily wage workers, as their needs are immediate. More generally, as digital adoption increases, informal sectors are further formalising and being held to account. This will reduce payroll processing costs for employers and make wage transfers more transparent and accountable, while giving workers better financial record-keeping capability and reducing disputes. If As cash drops out of circulation, informal economic activity would become more transparent and reliable. This incremental transition reduces the distinction between formal and informal markets, which in turn supports a more stable urban labour market.

5.2 Theoretical Implications

The present study contributes to the theory related to the adoption of digital payment by integrating three theoretical frameworks (TAM, UTAUT and IRT) in predicting intentions among the semi-skilled workers. Such results will help to boost the fundamental TAM postulations, underpinning especially the significant role of perceived usefulness in determining behavioural intention. That is where the importance of usefulness matters: this means it's not just a quicker way to do something, but actually a potential game changer in how workers get paid, spend money or send remittances. The strong association of perceived usefulness supports extending the TAM to resource-constrained individuals, indicating that groups with low digital literacy also rely on cognitive assessments of task efficacy. Results also singled out the significance of trust (a construct initially not focused in the TAM, but which has been extensively researched in the digital-payment context). The powerful influence of trust implies that UTAUT constructs, such as social influence and facilitating conditions, could be indirectly encapsulated in perceptions of trust. When users depend on their peers for verification, perceive that they perform well in their prescribed tasks, and are supported when errors occur (they shape these social beliefs), I argue that users develop positive belief states which resemble the "social influence" construct of UTAUT and flow through trust as an emotional and cognitively anchoring point.

The limited effect of perceived risk provides insight into Innovation Resistance Theory. While risk remains a negative factor, its diminished statistical strength indicates that functional benefits can neutralise psychological resistance among semi-skilled users. This suggests a boundary condition of IRT: resistance weakens significantly when the innovation becomes socially embedded and when peer use normalises the behaviour. Thus, the study extends IRT by showing that perceived risk may diminish in importance as local ecosystems mature. Together, these results indicate that user acceptance theories must account for structural realities in developing economies. Traditional behavioural frameworks hold, but their mechanisms are shaped by community-level influence, situational vulnerability and the tangible economic benefits of digital payments. The study contributes by showing how the interplay of usefulness, trust and moderated risk perception forms a holistic acceptance profile for low-income workers.

5.3 Practical and Policy Implications

They have some implications/policy recommendations to the Governments, fintech businesses, employers and financial inclusion programs for the semi-skilled and informal-sector workers. First, by confirming the supremacy of perceived usefulness, this finding emphasises the necessity to communicate and design with a benefits-oriented approach. Communications efforts should focus on concrete benefits that people can relate to like their wages getting there faster, avoiding the hazards of handling cash, being able to pay bills more easily and having a readily available record of transactions. "Digital transformation" or "financial innovation" as an abstract idea is not likely to hit home with workers whose calculus of uptake is based on immediate economic gain. Second, trust-enabling measures ought to be a strategic design and policy priority. As semi-skilled workers depend on interpersonal networks, fintech companies will need to make use of community-based trust channels – such as local merchants, employers, market associations and on-site demonstrations. Transparent complaint management mechanisms, visible response transaction confirmations and speedy failure payment resolutions can greatly strengthen trust. On a policy level, standardised dispute resolution mechanisms and small transaction protection can also decrease perceived vulnerability.

Third, UI design is not the primary cause, but a necessary enabling condition. Simple interfaces, multi-lingual support, icon-driven navigation and voice aid features can break the entry threshold for users with low literacy. Guaranteeing application stability with low bandwidth and supporting old smartphone are very useful for the continuation of its usage among low-income people. Fourth, the relatively insignificant role of perceived risk means that mere risk-minimisation approaches will not be adequate catch-up forces. Thus, educational efforts need to go beyond simply warning users of fraud and focus on building confidence through guided experience, peer learning, and institutional endorsement. Over time, risk considerations are likely to decrease with growing trust and familiarity. In sum, our findings have particular accounting and economic significance. The diffusion of digital payments is establishing informal yet regular accounts for workers who had been operating without a documented presence in the economy. Transaction histories in part serve as a simple ledger, recording incomes, budgets and resolving disputes. These accounts reduce information asymmetry between labourers and credit agents, which in the end facilitates a higher accessibility of micro-credit, unfunded consumption (in the form of pay-in-kind loans) and transfer payments. At the ecosystem level, more extensive use of digital payments offers transparency into informal labour markets and their positive-sum equilibria, by generating more wage documentation and by reducing transaction friction for both workers and employers. In general, successful financial inclusion interventions for semi-skilled workers should stress (i) the perceived usefulness of innovations, (ii) building trust with new technologies and their operators and (iii) the usability of device/applications in relation to context rather than exclusively focusing on risk perception or technological sophistication. Adaptive digital payment system that appreciatively addresses the realities of this type of informal work must exist in order to encourage sustainable uptake and inclusiveness.

5.4 Limitations, Robustness, and Future Research

This research contributes significantly to the understanding of the antecedents of mobile money use among semi-skilled workers; some limitations are worth noting. These limits do not detract from the results, but rather provide a view on when and in what settings the results follow.

5.4.1 Robustness Considerations

A number of measures were implemented to enhance the reliability and internal validity of the results. All constructs were operationalised based on existing, well-established and empirically tested measures adopted from past technology acceptance and digital payment research. The measurement model showed acceptable reliability and validity, as the indicator loadings, composite reliability, AVE (average variance extracted) and discriminant validity (Fornell–Larcker criteria and HTMT for metrics) had values that satisfied the desired levels. PLS-SEM is justified for use in view of both the predictive nature of the study and the availability of survey data that involve informal sector workers as well as multiple latent constructs. Second, the sample size ($N = 312$) is large enough with sufficient statistical power, and the data is collected from various occupations and work settings in the Delhi NCR region to minimise any geographical or occupational bias. These collective tests of stability and internal consistency build some confidence in the reported results.

5.4.2 Limitations

Despite these merits, the present study has several limitations that need to be mentioned. First, the data on which this study is based are cross-sectional and therefore only measure perceptions and intentions at a single point in time. In this way, the research could not provide insights into how trust, perceived usefulness or perceived risk change for repeated use and over time on living with digital payment technologies. Second, given that the focus was on semi-skilled workers in Delhi NCR, results may not be generalised to other settings. The digital payment infrastructure, literacy and institutional support differ vastly across cities in India as well as between urban and rural areas, which may manifest in a variety of adoption dynamics. Third, purposive sampling was carried out in order to capture informal and semiskilled workers who are difficult to reach by way of random samples. However, although these are suitable in the given setting, they may result in selection bias and do not allow population-based inference. Lastly, the survey only records adoption intention from workers' perspectives and may overlook employers' views, contractors or payment intermediaries that might be influencing payment behaviour and incentives in the "informal" labour market.

5.4.3 Future Research Directions

These constraints suggest several potential areas of further development. Longitudinal studies that capture workers' responses over time could enable research on how trust builds, perceived risk decreases, and adoption behaviours become more fixed through repeated successful use. In order to enhance external validity, future research should replicate this study in several different cities and compare rural and urban areas, capturing digital payment maturity level and institutional support at a regional level. Mixed-method studies (e.g., embedding interviews or field observations in surveys) could involve employers, contractors, and payment-service agents to include ecosystem-level factors impacting adoption. Furthermore, future models might also look at other moderating factors, such as digital literacy, the volatility of income, the quality of the smartphone, or the reliability of the network in order to address heterogeneity across low-income worker populations. Such extensions would enhance knowledge of how digital payment adoption progresses through various stages of ecosystem evolution and in different labour-market environments.

Conclusion

This paper explores the factors influencing the adoption of mobile payment, such as among semi-skilled workers in Delhi NCR, which is often ignored by digital finance research, with all due respect to their relevance in the urban economy. The results consistently demonstrate that perceived usefulness and trust have the most significant impact on adoption intention, while ease of use is positively related to adoption intention, and (perceived) risk is negatively related but lacks significance. These findings indicate that the adoption by semi-skilled workers is not influenced according to general resistance as much as based on a rational comparison of pay-back, trust and ease of use. Theoretically, the study is unique as it synthesises TAM, UTAUT and IRT in explaining low-income adoption, indicating that usefulness and trust outweigh perceptions of risk even when present. The findings provide practical implications for the necessity of efforts that show real value as well as reinforcing trust mechanisms and user-oriented design. Policymakers, as well as industry players, can leverage this knowledge to expand digital payments adoption and drive long-term financial inclusivity. On the whole, the evidence seems to be that semi-skilled labour is more than willing to adopt digital payments if they prove their worth and reliability. Leveraging these dimensions can enhance digital inclusion and help improve the overall economic resilience in fast urbanising regions.

Declaration of interest statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Ethical approval

This study involved a questionnaire-based survey of adult participants. Participation was voluntary, informed consent was obtained prior to data collection, and respondents' anonymity and confidentiality were strictly maintained. No personally identifiable information was collected. The study adhered to accepted ethical standards for social science research.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author contributions

Conceptualisation, data collection, analysis, and drafting of the manuscript were carried out by the first author. The second author supervised the research, contributed to theoretical development, reviewed the methodology and results, and critically revised the manuscript. All authors approved the final version of the manuscript.

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