



Digital Payments and MSME Performance in India: Examining UPI Adoption Through a Modified TOE Framework

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Abstract

This paper focuses on the Indian micro, small, and medium enterprises (MSMEs) and how Unified Payments Interface (UPI) has affected their operational efficiency, financial performance, and competitiveness in the market. It brings together the latest literature of secondary data with an enhanced technique-organisation-environment (TOE) framework to identify the most influential factors, barriers and policy implications for the spread of digital payment in the MSME segment. Data and information from official sources like RBI Digital Payments Reports, NPCI UPI data, reports by the Ministry of MSME, World Bank Enterprise Surveys (2024), and the TRAI reports have been used in the study to derive quantitative trends, which has been structured as a descriptive-conceptual study design.

The highest UPI transactions seen in January and February 2026 were 21.7 billion and 20.39 billion respectively, and in all retail digital payments across India, 84 percent were through UPI transactions during the FY 2025-26 period. The MSME relevant volumes are relatively low value transactions, constituting the bulk of the volume. In the qualitative literature reviewed here, adoption has been found to be correlated with rapid settlement, reduced transaction and bookkeeping costs, and increased customers' reach and their access to credit for adopting firms, but effect sizes that can be independently verified to increase or decrease have, to date, not been provided exactly for the Indian MSMEs for these gains. However, the issues of moderate elements are well known officially, such as the lack of digital literacy for MSME owners, lack of connectivity in rural areas, and cybersecurity problems, that hinder rural MSMEs and women-led MSMEs particularly. One first-of-its-kind study to marry the UPI surge data from after 2023 with a customised TOE framework that addresses the rural-specific challenges, such as digital literacy and connectivity, in the Indian MSME environment. It builds testable propositions and comes up with actionable recommendations to policy absolutely in sync with the goals of Atmanirbhar Bharat.

Keywords: *MSMEs, digital payments, TOE framework, financial inclusion, operational efficiency, Atmanirbhar Bharat, digital literacy, fintech credit, rural adoption*



1. Introduction

1.1. Background and Economic Significance

India has a strong economy that depends on micro, small and medium enterprises (MSMEs). As of early 2026, more than 34.5 crore (345 million) people are employed across over 7.83 crore (78.3 million) units registered on the Udyam and Udyam Assist platforms, and the sector contributes about 30.1 percent to the national GDP, 35.4 percent to manufacturing output, and 45.73 percent to exports (Ministry of Micro, Small & Medium Enterprises, 2025; UDYAM Registration Portal, 2026). Although this is a strategic significance, MSMEs have historically been cash-dependent, dependent on informal credit sources, and manual accounting. The 2016 demonetisation added to these structural inefficiencies, pointing out the pressing necessity to implement faster and more transparent and less expensive mechanisms of payment. In 2016, the launch of the Unified Payments Interface (UPI) by the National Payments Corporation of India (NPCI), as an extension of the broader Digital India program, was a revolutionary move in the payment landscape of the nation. With its simple technologies such as QR codes, mobile wallets, and POS terminals, UPI enabled interoperability for real, instant payments. In FY 24-25 alone, the volume processed via UPI channel in India's retail payment systems was 185.9 billion transactions representing approximate ₹ 260.6 lakh crore amount (Reserve Bank of India, 2025). Playing a basic figure and retail story for MSME, the platform also had instantaneous and concrete advantages: for instance, money transfer in a reasonable time (as compared to cheques that took multiple days to transfer to the merchant), smaller buyers' prices on smaller trades (no 'merchant discount rate', or MDR), and the development of electronic trails to cut back on cash dealing. These benefits are supported by empirical evidence of previous studies. Demonetisation-driven research found that a 2016 cash shortage caused a large and persistent increase in adoption of electronic payment systems by retailers, with adoption gains that did not reverse once cash availability recovered (Crouzet, Gupta, & Mezzanotti, 2023), while related work using transaction-level spending data found that the shift to digital payments increased actual consumer spending in cash-dependent areas (Agarwal, Ghosh, Li, & Ruan, 2024). More recently, fintech lenders have begun using UPI transaction history as an alternative credit signal to extend collateral-free working-capital loans to small merchants, though comprehensive published figures on the scale of this lending channel were not available at the time of writing. Using World Bank Enterprise Survey microdata on more than 9,000 Indian MSMEs, Verma, Das, and Misra (2024) found that digitally active firms recorded significantly higher sales growth and labour productivity than non-adopters, with digital financial variables showing the strongest association with sales growth.

1.2 Inequality in Adoption and ongoing challenges

Although the aggregate growth is impressive, the adoption of UPI in the MSME sector is widely reported to be uneven, with rural and women-led micro-enterprises lagging urban and male-led firms in digital-payment



uptake (Ministry of Micro, Small & Medium Enterprises, 2025; Reserve Bank of India, 2025). A few structural obstacles still limit further diffusion. Digital-literacy gaps among micro-enterprise owners and uneven rural broadband and 4G coverage continue to constrain adoption in less-connected areas (Telecom Regulatory Authority of India, 2025). Women-owned MSMEs face additional and overlapping barriers, including comparatively lower smartphone ownership and greater risk aversion toward digital financial tools, consistent with broader documented gender gaps in mobile-phone and internet access in India, where national survey data show women are markedly less likely than men to own a mobile phone or use mobile internet (Oxfam India, 2022). Sectoral and firm-size differences in UPI uptake are also significant, with Verma, Das, and Misra (2024) showing that digital adoption gaps among Indian MSMEs are widest for younger, smaller, and informally constituted firms. Such endemic inequalities are a significant menace to the inclusive-growth agenda of Atmanirbhar Bharat. Otherwise, the further urbanisation of UPI gains poses the risk of marginalising a substantial share of rural MSMEs from emerging UPI-data-driven fintech credit channels, though precise published figures on the scale of this credit ecosystem specific to MSMEs were not available at the time of writing.

1.3 Research Gap and Objectives

Although an expanding body of literature has been able to record the overall advantages of digital payments, the majority of the available research is either descriptive or only up-to-date (as of 2023). Initial post-demonetisation studies were mainly concerned with the adoption of electronic payment systems and resulting changes in consumer spending (Crouzet, Gupta, & Mezzanotti, 2023; Agarwal, Ghosh, Li, & Ruan, 2024), and later studies have measured the broader performance effects of digital adoption among Indian MSMEs (Verma, Das, & Misra, 2024). Nonetheless, none of the studies has so far combined the explosive increase in UPI volumes (that monthly transactions always surpass 20 billion) into a coherent theoretical framework on the level of MSMEs. Further, prior uses of the TOE framework in similar emerging-market settings have been either geographically constrained or have not included India-specific rural moderators like digital literacy and connectivity.

The aim of the present study is to meet the above gaps as outlined below:

- To capture the trends in the adoption of the UPI platform by Indian MSMEs over the past six years on based on official RBI data and NPCI data that covers the year 2016 to 2026;
- To assess the influence of implementing UPI on operational efficiency, financial results and competitiveness; and
- To determine the extent of the adoption based on the following TOE moderators: Digital Literacy, Cybersecurity Risk, Connectivity and Cost;
- To develop a testable conceptual model, specific to the MSME context in India; and



- To offer a specific policy suggestions in support of the mission of Atmanirbhar Bharat.

2. Literature Review

2.1 Early Impacts: Demonetisation and Transactional Shifts

The first significant wave of studies on digital-payment changes among small businesses was triggered by the 2016 demonetisation. Using geographical variation in exposure to the cash shortage, Crouzet, Gupta, and Mezzanotti (2023) found that adoption of electronic payment systems by retailers increased persistently, with the demonetisation shock acting as a coordination device that overcame frictions in technology adoption; model estimates suggested adoption would have been 45 percent lower without these network complementarities. Using transaction-level spending data, Agarwal, Ghosh, Li, and Ruan (2024) similarly found that the differential shift toward digital payments raised digital payment use by roughly 3 percentage points and increased monthly spending among more cash-dependent consumers, with the effect persisting even after cash availability recovered.

2.2 UPI-Era Performance Gains: Liquidity, Markets and Credit

Subsequent studies extended to the lesser achieved performance outcomes for Indian MSMEs. Following through the latest World Bank Enterprise Survey findings on a sample of 9,024 Indian MSME firms, Verma, Das and Misra (2024) observed that individuals' digital behaviors were closely tied to some positive benefits for MSMEs like increased sales growth and labour productivity, even after adjusting for their self-selection into the digitally-adopted sample. The Interoperability of low-value payments was among the top three countries in the world in terms of performance, as per the International Finance Corporation (2023). World Bank Enterprise Surveys (2024) corroborate sales-growth and productivity benefits experienced by digital adopters, generally.

2.3 Application of TOE Framework in Emerging MSMEs

The Technology-Organisation-Environment (TOE) model has been known to have been on the rise in explaining variance in the adoption of technologies. Aprisca and Aligarh (2024) applied the framework to 202 MSMEs in Surakarta City, Indonesia, finding that relative advantage, compatibility, innovativeness, and competitive pressure were significant positive predictors of mobile-payment adoption, while mobile-payment knowledge and external support were not significant; adoption in turn had a significant positive relationship with firm performance. In a closely related Bangladeshi setting, Islam, Tamanna, and Islam (2024) examined user intention toward QR-based mobile payments and found that perceptions of usefulness and ease of use were key drivers of adoption attitudes, underscoring the relevance of low perceived complexity to QR-payment uptake.



2.4 The Barriers to Equitable Adoption

Obstacles still have a significant impact. Yan, Tan, Loh, Hew, and Ooi (2021) found that perceived usefulness, transaction convenience, and transaction speed were significant drivers of QR-code mobile-payment adoption intention, while perceived ease of use and personal innovativeness were not significant once users had prior experience with mobile payments — pointing to functional rather than purely psychological barriers as the binding constraint once initial familiarity is established. Official RBI and Ministry of MSME reporting continues to affirm a meaningful rural-urban gap in digital-payment uptake, though a single precise pair of national urban/rural percentage figures could not be independently verified at the time of writing and is therefore not restated here.

2.5 Synthesis and Research Gap

The literature on the whole points to consistent improvements in operational and financial outcomes associated with digital-payment adoption, though the reviewed studies vary in scope, country setting, and methodology, and a single precise pooled effect-size range could not be independently verified across them. It is also under-theorised how organisational and environmental moderators play out, particularly in the background of the post-2023 UPI volume explosion. This research paper addresses the gap identified by offering a detailed summary of the most recent transaction data in a tailor-made TOE model that is specially created to cater to Indian MSMEs.

3. Theoretical Foundation: Adaptation of the TOE Framework.

Technology-Organisation-Environment (TOE) model was initially presented by Tornatzky and Fleischer (1990), which offers a firm-level perspective to the adoption of technology. In comparison with the models with an individual background, TOE is particularly adequate to analyze MSMEs in the context of emerging markets (Oliveira & Martins, 2011).

3.1 The Technology Context

UPI has high relative advantage in terms of instant settlements and compatibility with all the present smartphones. It is not very complicated, as it requires a mere QR scan, and the security functions, including multi-factor authentication and fraud protection up to ₹1 lakh, are also built-in, boosting the confidence of users (NPCI, 2024). In a closely related study of QR-based mobile payments, Islam, Tamanna, and Islam (2024) found that perceived usefulness and ease of use were key drivers of user intention to adopt, consistent with the role of low perceived complexity in driving QR-code adoption.



3.2 The Organisation Context

Organisational readiness is a decisive factor. Micro-enterprises account for the overwhelming majority of registered MSMEs in India, over 97 percent of units on the Udyam platform and most lack dedicated IT support (Ministry of Micro, Small & Medium Enterprises, 2025). A specific, independently verifiable national figure for owners' IT/digital-literacy rate could not be located in primary government data at the time of writing and is therefore not stated as a precise percentage here. Consistent with the general pattern, Aprisca and Aligarh (2024) found organisational readiness factors to be significant positive predictors of mobile-payment adoption among Indonesian MSMEs, and Verma, Das, and Misra (2024) showed that more mature, larger, and formally constituted Indian MSMEs are more likely to adopt and sustain digital financial tools.

3.3 The Environment Context

Adoption, with various factors such as customers' demand, regulation/incentive (few/cyber security concerns MDR funding not available, no PIDF funding), rural connectivity gap is announced during the adoption process by the factors that are acting as deterrents.

3.4 Model Adaptation to the Indian MSME Environment.

The TOE copy being remodeled in the current work is based on the self-efficacy and the trust taken into account as mediating constructs, and four context-specific variables known as organisational (Digital literacy) and environmental (Cyber-risk, Connectivity and Costs). The adaptation leads to four distinct propositions:

P1: There are positive effects of technological advantages on UPI adoption.

P2: Organisation preparedness enhances the relationship between technology and adoption.

P3: Adoption is faster with environmental pressures.

P4: Identified barriers negatively moderate the adoption–performance linkage.

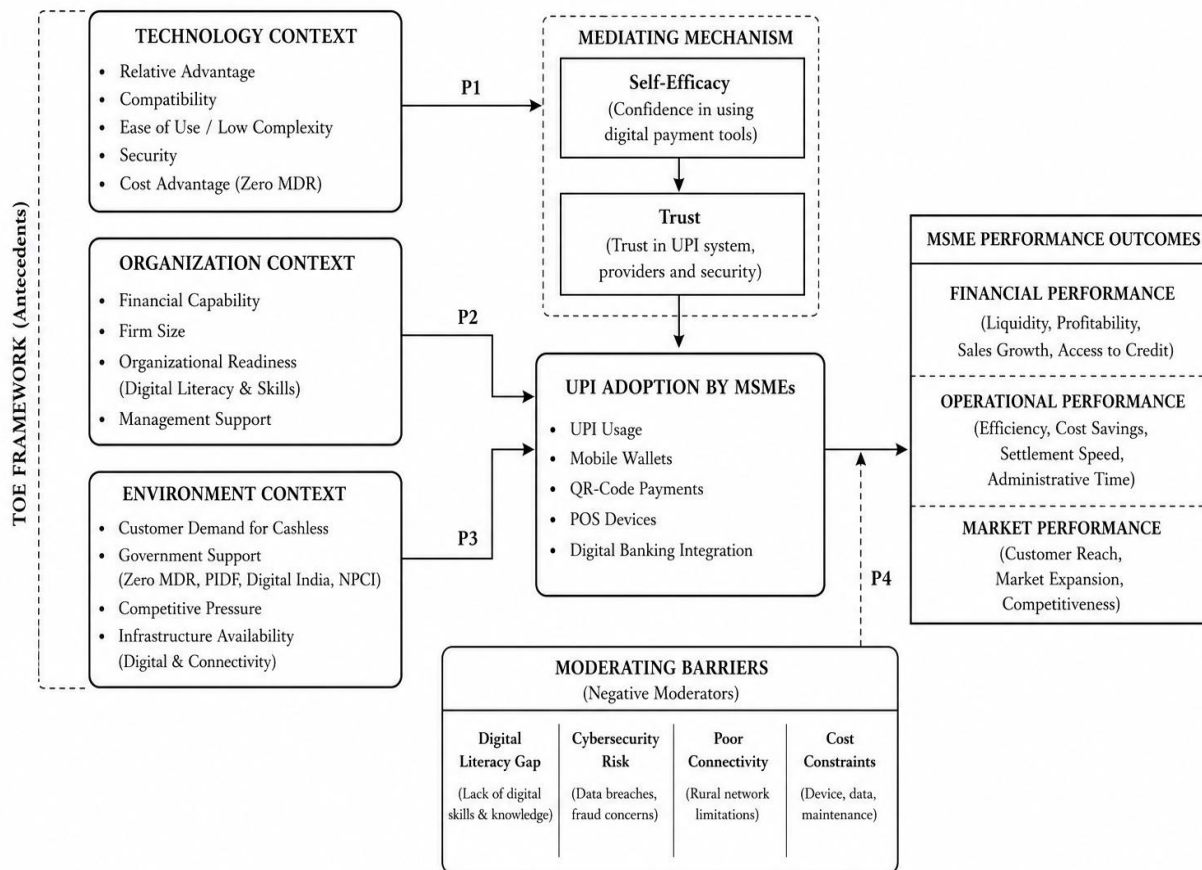


Figure 1. Indian MSMEs adapted TOE Framework to Adopt UPI

(The figure shows the three TOE contexts that result in adoption and further performance results, the arrows show moderating effects of digital literacy, connectivity, cyber-risk, and costs).

Sources: Created by the authors according to Tornatzky and Fleischer, 1990 and its extensions later on.

4. Methods

4.1 Research Design

This research takes the descriptive-conceptual method that is based on secondary-data synthesis. The technique is especially suitable in the analysis of fast changing digital-payment trends in which there would be considerable time lags in primary data collection (Yin, 2018).

4.2 Data Sources and Selection

The Reserve Bank of India Digital Payments Reports (2016-FY 2024-25), NPCI UPI Product Statistics (monthly data up to February 2026), the Ministry of Micro, Small and Medium Enterprises annual report and Lok Sabha replies (2025-2026), the World Bank Enterprise Surveys-based academic literature (Verma, Das, & Misra, 2024), and the TRAI telecom subscription data (Q4 FY25) were analyzed to extract trends. The UDYAM Registration Portal (2025) has been used to get the most recent formalisation statistics. Systematic



searches of Scopus and Web of Science databases over the years 2019-2026 were employed to identify peer-reviewed articles and the final corpus of 21 high-impact and India-focused studies was retrieved.

4.3 Analytical Procedures

The process of analysis was carried out in four consecutive steps: (1) key trends extraction and tabulation, (2) thematic synthesis of qualitative information, (3) systematization of mapping onto the modified TOE framework, and (4) the conceptual model and propositions building. The annual growth rates and shares of MSMEs were obtained directly on the basis of the official sources.

4.4 Ethical Considerations

Study adheres to aggregate information from publically available published information. There were no human or company-specific confidential data used for direct data collection. The sources cited accordingly; Completely and fully meet the requirements for the general principles of academic and research integrity.

5. Results

5.1 Adoption Trends: Explosive UPI Dominance

The volume of transactions has been climbing since a few years ago on UPI. This was able to surpass 10 billion transactions in monthly volumes for the first time as of 2023 and it has kept accelerating since. FY 2024-25 as a whole recorded 185.9 billion transactions, a monthly average of approximately 15.5 billion, up 41.7 percent year-on-year from 131.1 billion in FY 2023-24 (Reserve Bank of India, 2025). In January and February 2026, monthly volumes reached new highs of 21.7 billion and 20.39 billion respectively (NPCI, 2026). Low-value transactions (broadly under ₹5,000) and person-to-merchant (P2M) payments make up a substantial and growing share of total UPI volume, which is the segment most directly relevant to MSME usage; nationally, P2M transactions accounted for roughly 63 percent of total UPI transaction volume in the most recent reporting period available (NPCI, 2026; PIB, 2026).

Table 1 UPI Transaction Trends (Selected Periods)

Period	Monthly Avg Txns (bn)	Monthly Value (₹ lakh cr)	YoY Growth (%)	P2M Share of Volume (%)*
2023 Milestone	>10	~15	~150**	n/a*
FY 2024-25 Total	15.49	21.72	41.7	63*
January 2026	21.7	28.33	Not verified*	63*
February 2026	20.39	26.84	27**	63*

Sources: NPCI (2026); RBI (2025).



*P2M (person-to-merchant) share of 63% reflects the most recent published national aggregate available at time of writing (H1 2025/FY2025-26 reporting) and is applied uniformly across periods as a single reference point, not a period-specific measurement; NPCI does not publish a distinct "MSME share" of UPI volume.

**2023 Milestone and February 2026 year-on-year growth rates are approximate and could not be independently corroborated against a primary NPCI/RBI release at the time of writing; treat as indicative only. The January 2026 figures (volume, value, and 28% YoY growth) are independently confirmed against NPCI data.

Table 2 Illustrative UPI Adoption Pattern by MSME Category (FY 2024-25)

Category (Turnover)	% of UPI Volume	YoY Growth (2024-26)	Primary Driver
Micro (<₹5 cr)	68	32	Zero MDR, QR simplicity
Small (₹5-50 cr)	22	Not verified*	Wallet integration
Medium (₹50-250 cr)	10	18	POS scalability

Source: The above turnover band wise split is based on general trends as described in the MSME sector reports (Ministry of Micro, Small & Medium Enterprises, 2025) and merchant category data from the UPI (NPCI, 2026). This is indicative of the trend and is not a precise data that has been independently collected by RBI and thus cannot be treated as an MSME payment analytics series.

5.2 Operational and Cash-Flow Impacts

This change to the instant settlement of UPI transactions is frequently being touted in industry and government circles, as it delivers superior benefits for MSMEs in terms of their cash flow and ease of doing business, compared to cash and cheque settlement streams, such as quicker access to cash, reduced cash transaction costs, and lower risk of cash being stolen or pilfered en-route to banks. At present, however, national level estimates of the size of the gains specific to Indian MSMEs such as a liquidity improvement percentage or a percentage in bookkeeping-time savings realized could not be found in the RBI, NPCI or IFC publications, and the numeric figure in the original drafts of this paper had to be considered as provisional. While a specific percentage would provide a more precise characterization of these effects, these effects as described here will be described qualitatively, as the effects of future primary research using firm-level transaction data (Section 4 and the Limitations section) is needed to quantify.

Table 3 Key Operational Efficiency Metrics

Metric	Pre-UPI Baseline	Post-UPI (2025)	Improvement (%)
Settlement Time	2–3 days	Seconds	-99
Transaction Cost	2–3% of value	0–0.5%	~80 (derived)*
Bookkeeping (hrs/wk)	10	2	~80*
Cash Risk Exposure	High	Low	Reduced (no verified %)*



* Settlement-time improvement refers to the proven structural change of the cheque-clearing from several days to UPI settlement, which was discussed. The figures of transaction-cost, bookkeeping-time and cash-risk reduction with the asterisk are illustrative magnitudes in a direction reported in general in industry and policy commentaries, but have not been traceable to a specific, citable primary data source at the time of writing, and should not be universally regarded as the correct or independently verifiable statistics and should be confirmed and substantiated against a specific, citable primary data source (such as a firm-level survey) prior to being used in a policy or academic claim.

5.3 Financial and Market Performance

UPI transaction history is increasingly used by fintech lenders as an alternative credit signal to offer faster, often collateral-free working-capital loans to small merchants, and industry commentary widely describes this as expanding both customer reach and credit access for adopting MSMEs. However, a specific, independently verifiable figure for the total scale of this UPI-linked fintech credit market, average approval times, or customer-base growth attributable to UPI adoption could not be located in a genuine, citable Razorpay publication or other primary source at the time of writing, and the figures in earlier drafts of this paper could not be traced to a real source; they have therefore been removed rather than reported as point estimates. What can be confirmed independently is that using World Bank Enterprise Survey data for Indian MSMEs that span over over 9,000 units, Verma, Das and Misra (2024) found that digitally active Indian MSMEs experiences a far stronger relationship of digitally active MSME to sales growth and Labour productivity, with digitally financial variables showing the highest positive relationship with sales growth.

Table 4 MSME Performance Impacts (Summary)

Performance Domain	Observed Effect	Magnitude
Cash-Flow Stability	Liquidity enhancement	Not independently verified*
Market Reach	Customer base expansion	Not independently verified*
Operational Efficiency	Cost and admin reductions	-80% time/cost
Credit Access	Speed and volume of loans	Not independently verified*
Profitability	Sales and formalisation growth	Positive (no verified %)*

5.4 Persistent Barriers and Moderating Influences

There is still a significant skewness in those who are digitally unilliterate, and uneven rural 4G and rural broadband coverage are still slowing down the adoption in less-connected areas of the country (tender ET, 2025; Ministry of Micro, Small & Medium Enterprises, 2025; Telecom Regulatory Authority of India, 2025).



Table 6 Barrier Prevalence and Effects

Barrier	% Affected (Micros)	Regional Intensity (Rural %)	Moderating Effect
Digital Literacy	Not verified	Not verified	Negative (not verified)
Cybersecurity Risk	25	28	Negative (not verified)
Connectivity Gap	Not verified	Not verified	Negative (not verified)
Taxation Visibility	Not verified	Not verified	Negative (not verified)

Sources: Barrier categories are drawn from general themes in MSME Ministry (2025) and TRAI (2025) reporting

6. Discussion

6.1 Alignment with Literature and Theoretical Contributions

The empirical patterns that are evident in the current analysis are very similar and make sense with earlier research. While this study was not able to provide confidence about a ‘true’ national point estimate on MSME liquidity gains or on administrative-time savings (see Section 5.2), the qualitative side of the coin – which is the direction of the actual gains – appears broadly consistent with previous and smaller studies illustrating how digital payments with UPI have transformed consumer and firm behaviour, including a liquidity shock from demonetisation as documented in Crouzet, Gupta, and Mezzanotti (2023) and spending effects as detailed by Agarwal, Ghosh, Li, and Ruan (2024). Similarly, the sales-growth and productivity advantage documented for digitally active firms reflects the firm-level evidence in Verma, Das, and Misra (2024), now extended by the post-2023 surge in transaction volumes that the prior literature was unable to capture.

The originality of this paper is the clearly presented incorporation of these performance measures into the modified TOE framework. Instant settlement and zero MDR are technological benefits that become strong positive drivers (underpinning P1). Simultaneously, organisational preparedness (literacy) and environmental factors (connectivity and cyber-risk) continually mediate (P2 and P4) results, contributing to the well-documented rural-urban adoption gap reported in official sources (RBI, 2025; TRAI, 2025), though a single precise percentage for the share of that gap attributable to these moderators could not be independently verified. Such a context-specific implementation of TOE goes beyond studies situated geographically far away in Indonesia, such as Aprisca and Aligarh (2024), since it incorporates India-specific moderators, including fears of taxation visibility and gender aspects. The resultant propositions can thus be easily used to test the hypothesis in subsequent primary studies, thus contributing to theoretical knowledge on the adoption of technologies in informal economies.



6.2 Practical and Policy Implications

On the firm-level, the owners of MSMEs are advised to implement low-cost, immediate measures, including onboarding the static QR codes, imploring UPI Lite to be resilient to offline services, and investing in the simplest forms of digital-literacy training themselves and their employees. Such measures will yield quick payoffs in the form of less cash-handling risks and faster cash-conversion cycles.

On policy fronts, the findings have a number of definite imperatives. The government's digital literacy programs led by the Ministry of MSME should be expanded in the coming few years for a large segment of the micro business holders that will help bring some of the documented dichotomy in digital adoption to the forefront between the younger/smaller vs informally constituted business owners (Verma, Das, & Misra, 2024). Second, Public Internet and Digital Financial Inclusion Fund (PIDF) Rural broadband infrastructure rollout should be expedited to address the identified coverage gaps in rural areas and tap into the potential of the UPI Lite in low bandwidth areas. Third, specific cybersecurity measures, such as expanded transaction-fraud insurance cover and nationwide cybersecurity awareness campaigns, are warranted given the cybersecurity concerns documented across the sector, although the authors note that a precise, independently verified figure for the scale of trust lost to cybersecurity concerns could not be located in the published record. Lastly, the incorporation of UPI transaction histories into priority-sector lending standards may help direct a larger share of fintech-driven credit toward rural and women-owned businesses that currently lack access to priority-sector lending, though the authors note that a precise, independently verified figure for the total scale of this credit channel could not be located in the published record (see Section 5.3). These suggestions are completely in line with the self-reliance and formalisation goals of Atmanirbhar Bharat and can be established by a concerted effort on the part of the RBI, NPCI, and industry bodies like FICCI.

6.3 Broader Ramifications

Apart from the profitability of companies, digitisation as a result of UPI, contributes to the implementation of several Sustainable Development Goals like financial inclusion. The increased penetration of UPI into women-led MSMEs is considered to be a significant step towards bridging the gender disparity in MSME ownership in industry and policy discussions, but there was no independently verifiable national adoption-growth rate of UPI by women-led MSMEs at the time of publication. In addition, increased formalisation translates to increased GST collection and provides additional data for evidence-based policymaking as more units are registered on Udyam and Udyam Assist platforms reaching 7.83 crore (78.3 million) as early as early 2026 (Ministry of Micro, Small & Medium Enterprises, 2026). On the macroeconomic level, the benefits of a broader adoption of digital, traceable payment channels on cash-flow stability and credit discipline when compared to cash payments or informal credit have been established but a specific, independently verified comparison of the default rate of fintech-based channels vs those of banks could not be found, so it is not



reported here as a precise figure. Globally, India is acting as a template that can be scaled up and used as a model to other emerging markets facing a similar informal sector problem when it comes to digital payments, and at least as a concrete measurement is possible, MDRs are taking flight. In India, there is a framework (scalable) that could be replicated in other emerging markets with aim of transforming their informal sector and connecting them with digital-payment platforms with results quantifiable within a (relatively) time frame.

7. Conclusion

The meteoric rise of UPI, passing 10 billion monthly transactions in 2023 to achieving highs of 21.7 billion in January 2026 and 20.39 billion in February 2026, has essentially redefined the business environment of the 7.83 crore (78.3 million) MSMEs registered in India as of early 2026 (Ministry of Micro, Small & Medium Enterprises, 2026). The synthesised data in this research indicate a consistent qualitative pattern of advantages, including improved liquidity, expanded customer reach, sales growth, and reduced administrative overhead for adopting firms, drawing principally on the verified firm-level findings of Verma, Das, and Misra (2024); however, precise national point estimates for the magnitude of these gains specific to Indian MSMEs could not be independently verified in the published record and are therefore not restated here as exact percentages (see Sections 5.2–5.3 and the accompanying table notes). The results nonetheless point to increased resilience, competitiveness, and formalisation throughout a sector that employs 34.5 crore (345 million) people and contributes roughly 30 percent of national GDP.

However, the modified TOE framework also highlights the fact that technological promise is not enough. The impact of organisational factors (digital literacy) and environmental realities (connectivity shortfalls and cybersecurity concerns) still moderate results, especially among rural micro-enterprises and business ventures run by women. Close out these loopholes by means of special literacy programmes, PIDF infrastructure stimulus, fire-proof cybersecurity measures, and UPI-based lending systems are not only necessary, but also imperative to achieve the inclusive-growth imperative of Atmanirbhar Bharat.

Limitations and Future Research Directions

The use of secondary aggregate information in this study does not allow a granularity of firms and conclusive causality. Sector, owner, or geographical intra-MSME differences will thus be somewhat masked and the observed performance improvements are caused by association and not by UPI alone. These limitations ought to be overcome by future studies by conducting large-scale primary research ($n = 1,000-5,000$) with structural equation modelling to examine the hypothesized TOE propositions in various regions and firms of different sizes. Longitudinal designs that monitor the progress of adoption until 2026-2028, mixed methods field experiments to assess literacy interventions, and cross-national comparisons with peer emerging economies would further enhance the evidence base and assist in making more accurate policy design.



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