

DIGITAL PAYMENT SYSTEMS, FINTECH, AND FINANCIAL INCLUSION IN RURAL INDIA: AN EMPIRICAL STUDY OF DURG DISTRICT

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ABSTRACT

The rapid proliferation of digital payment systems and financial technology (fintech) in India has created a paradigm shift in the delivery of financial services, particularly in rural and semi-urban geographies. This empirical study investigates the impact of digital payment systems and fintech innovations on financial inclusion in the rural areas of Durg District, Chhattisgarh, one of the key agrarian districts of central India. The study is anchored in primary survey data collected from 385 rural respondents across 12 gram panchayats, supplemented by secondary data from NABARD, RBI, and NPCI reports. The research employs descriptive statistics, chi-square analysis, and multiple regression modelling to assess the relationship between fintech adoption and key financial inclusion indicators including bank account ownership, credit access, insurance coverage, savings behaviour, and digital remittance usage. Findings reveal that UPI adoption, mobile banking usage, and Aadhaar-enabled payment services have significantly enhanced formal financial access among rural households, with post-fintech improvements ranging from 20.7% to 58.2% across key metrics. However, persistent barriers including low digital literacy, poor network connectivity, and fear of cyber fraud continue to constrain inclusive growth. The study contributes empirical evidence from a district-level perspective to the national discourse on digital financial inclusion, offering policy insights aligned with India's vision of a financially empowered rural economy.

Keywords: *Digital Payment Systems¹, Fintech², Financial Inclusion³, Rural India⁴, UPI⁵, Durg District⁶, Mobile Banking⁷.*

1. INTRODUCTION

The discourse on financial inclusion in developing economies has undergone a transformative reconfiguration with the emergence of fintech an umbrella term encompassing mobile banking, digital wallets, peer-to-peer lending platforms, Unified Payments Interface (UPI), and Aadhaar-linked payment systems. In India, where over 65% of the population resides in rural areas and formal financial access has historically been constrained by geographic distance, institutional inertia, and informational asymmetries, fintech represents not merely a

technological upgrade but a structural intervention in the architecture of financial democracy. The Government of India's flagship initiatives Jan Dhan Yojana (2014), Pradhan Mantri Digital Saksharta Abhiyan (2017), and the Digital India campaign alongside the National Payments Corporation of India's (NPCI) orchestration of UPI, have collectively catalysed an unprecedented expansion of the digital payments ecosystem into India's rural heartland. According to RBI's Annual Report 2023, UPI transactions crossed 83.71 billion in volume during FY 2022–23, a staggering 59% year-on-year growth, with a significant share attributed to tier-3 towns and rural segments. Yet, the extent to which this digital momentum has translated into measurable financial inclusion outcomes at the district level remains an underexplored empirical question.

1.1 CONTEXT AND SIGNIFICANCE OF THE STUDY

Durg District, situated in the Chhattisgarh Plain and forming part of the Bhilai-Durg urban agglomeration, presents a compelling case study for examining the fintech-financial inclusion nexus. The district exhibits a dual economic character: while the Bhilai Steel Plant corridor hosts industrial and semi-urban settlements with relatively higher digital exposure, the surrounding rural gram panchayats remain characterised by agrarian livelihoods, low per-capita income, and uneven digital infrastructure. The district recorded a rural literacy rate of 68.4% and a below-poverty-line (BPL) household proportion of 26.7% according to the 2011 Census, figures that have since seen partial improvement but continue to reflect structural vulnerabilities. Financial exclusion in these areas manifests through lack of access to credit, limited insurance penetration, dependence on informal moneylenders charging usurious rates, and near-total absence of investment behaviour. The post-demonetisation period (2016–2017), combined with COVID-19-induced digital acceleration (2020–2022), has dramatically altered rural digital payment behaviour in Durg, making it an ideal empirical laboratory. This study, therefore, aims to quantify and contextualise these changes through rigorous fieldwork and statistical analysis.

1.2 OBJECTIVES OF THE STUDY

The study pursues the following specific objectives: (i) to assess the level of awareness and adoption of various digital payment tools among rural households in Durg District; (ii) to measure the impact of fintech adoption on key financial inclusion indicators such as bank account ownership, savings behaviour, credit access, insurance coverage, and digital remittance usage; (iii) to identify the principal barriers that impede the uptake of digital financial services among rural populations; and (iv) to establish the statistical relationship between fintech adoption variables and a composite Financial Inclusion Index (FII) through regression modelling. The study hypothesises that higher frequency of digital payment usage, combined with greater digital literacy and formal bank linkage, will positively and significantly predict financial inclusion outcomes among rural respondents in Durg District.

1.3 SCOPE AND DELIMITATION

The study is geographically delimited to rural gram panchayats of Durg District, Chhattisgarh, and does not encompass urban or semi-urban wards. The temporal scope spans the period 2016–2023, enabling a pre- and post-fintech comparative analysis anchored around demonetisation as a critical inflection point. The study focuses on individual and household-level financial inclusion rather than enterprise-level or sectoral finance. While Chhattisgarh as a state presents multiple districts with varying digital maturity levels Raipur, Bilaspur, Rajnandgaon Durg is selected for its heterogeneous population profile and its relatively advanced BC (Business Correspondent) agent network. The findings, while contextually rooted in Durg, offer transferable insights for similar agrarian districts across the central Indian belt.

2. REVIEW OF LITERATURE

The body of literature on digital financial services and financial inclusion in developing economies has grown substantially over the past decade, intersecting development economics, information systems, and public policy. Demircuc-Kunt et al. [1] in their seminal Global Findex Database report established that approximately 1.4 billion adults globally remained unbanked as of 2021, with India accounting for a disproportionate share despite rapid progress under the Jan Dhan Yojana. The authors underscored mobile money adoption as the single most powerful predictor of financial inclusion in low-income contexts. Complementing this, Ozili [2] theorised that fintech reduces transaction costs and eliminates intermediation inefficiencies, thereby extending financial access to underserved populations a thesis that has found substantial empirical support in the Sub-Saharan African context through M-Pesa and has more recently been validated in the Indian context through studies on UPI and AePS. In the Indian context, Mukherjee and Sinha [3] conducted a large-scale survey of 1,200 rural households across Bihar and Jharkhand, demonstrating that BC agent proximity and Aadhaar seeding of bank accounts together explained approximately 47% of the variance in financial inclusion outcomes. Their findings corroborate the present study's methodological approach. Mohan [4] provided a regulatory perspective, arguing that the Reserve Bank of India's Payment Systems Vision 2025 framework and the operationalisation of NPCI's UPI architecture represent a deliberate policy architecture for financial inclusion at scale. Reddy and Rao [5] examined the district-level impact of Jan Dhan-Aadhaar-Mobile (JAM) trinity in Andhra Pradesh, finding significant improvements in savings mobilisation and DBT receipt efficiency post-JAM implementation, with marginal farmers exhibiting the highest absolute gains. This closely mirrors the demographic conditions in rural Durg.

Technological adoption theories provide theoretical scaffolding for this study. Davis's Technology Acceptance Model (TAM) [6] and its extensions TAM2 and the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. [7] have been widely applied to mobile banking adoption contexts. UTAUT posits that performance expectancy, effort expectancy, social influence, and facilitating conditions jointly determine technology adoption intention, variables that map directly onto the fintech adoption landscape

in rural India. Singh and Malik [8] validated UTAUT in the context of rural mobile banking in Rajasthan, finding social influence to be the most powerful predictor among lower-income rural women, a finding with direct implications for gendered financial inclusion strategies in districts like Durg.

Research specifically focused on Chhattisgarh and central India's fintech landscape remains sparse. Sharma and Gupta [9] examined micro-level financial behaviour in tribal districts of Chhattisgarh post-demonetisation, documenting a 34% increase in savings account activation but noting a concurrent decline in transaction frequency due to network connectivity failures a paradox that highlights the infrastructure gap separating account ownership from active financial participation. Yadav et al. [10] assessed digital payment adoption among MGNREGS beneficiaries across four districts of Madhya Pradesh and Chhattisgarh, concluding that mandatory DBT linkage drove passive account creation while genuine fintech engagement required sustained digital literacy interventions. These findings directly inform the analytical framework of the present study, which distinguishes between nominal financial inclusion (account ownership) and substantive financial inclusion (active digital transacting, credit access, and savings mobilisation).

Lauer and Lyman [11] established an analytical distinction between access to financial services and use of financial services, arguing that supply-side interventions bank branches, BC agents, digital platforms are necessary but insufficient conditions for financial inclusion, which fundamentally requires demand-side enablers including financial literacy, income security, and trust in formal institutions. This distinction is embedded in the study's Financial Inclusion Index (FII), which incorporates both access and usage dimensions. Klapper et al. [12] further demonstrated that mobile-based payment systems in developing economies reduce the gender gap in financial inclusion by lowering the social and physical barriers to formal financial participation faced by women. This gender dimension is explicitly tested in the regression model of the present study. The foregoing review underscores the need for district-level empirical studies that can capture context-specific adoption trajectories and contextualise national-level fintech metrics within the heterogeneous realities of rural India.

3. METHODOLOGY

This study employs a mixed-methods research design, with primary emphasis on quantitative empirical analysis supplemented by qualitative contextual insights drawn from semi-structured interviews with key informants including bank correspondents, CSC (Common Service Centre) operators, and gram pradhan representatives. The research adopts a cross-sectional survey design, with primary data collected over a period of four months (March–June 2023) from rural households across 12 gram panchayats in four blocks of Durg District, namely Durg, Patan, Dhamdha, and Utai. The sample was stratified by block and further sub-stratified by gender and income quintile to ensure representativeness across the socioeconomic spectrum. A total of 385 respondents were finally included in the analysis after eliminating incomplete questionnaires, with a response rate of 88.7%. The sample size was determined using Cochran's formula for finite populations at a 95% confidence level and 5% margin of error. The survey instrument was a semi-structured questionnaire administered in Hindi, pre-

tested on 30 respondents and refined for clarity and cultural appropriateness. The questionnaire covered five thematic domains: (i) demographic and socioeconomic profile; (ii) digital device and internet access; (iii) awareness and usage of digital payment tools; (iv) financial inclusion outcomes; and (v) perceived barriers to fintech adoption.

The Financial Inclusion Index (FII) was constructed as a composite measure drawing on seven binary and scaled indicators: bank account ownership, active account usage, access to formal credit, insurance coverage, regular savings behaviour, digital remittance use, and UPI or mobile wallet transaction frequency. Each indicator was scored on a 0–1 scale and the composite FII was calculated as an unweighted mean, producing a continuous variable ranging from 0 (complete exclusion) to 1 (complete inclusion). This approach is consistent with the multi-dimensional financial inclusion indices proposed by Sarma [13] and subsequently refined by Chakravarty and Pal [14]. Secondary data for longitudinal comparison (pre-fintech 2016 baseline versus 2023 study year) was sourced from NABARD's District Credit Plan for Durg, RBI's Basic Statistical Returns, NPCI's Annual Report, and the State Level Bankers' Committee (SLBC) Chhattisgarh reports.

Statistical analysis was performed using SPSS version 26.0. Descriptive statistics including frequency distributions, means, and standard deviations were computed for all study variables. Chi-square tests of independence were applied to examine associations between categorical demographic variables and digital payment adoption categories. A multiple linear regression model was estimated with FII as the dependent variable and eight independent predictor variables UPI usage frequency, mobile banking adoption, Jan Dhan account linkage, digital literacy score, network connectivity index, gender, education level, and annual household income capturing both technological adoption and structural socioeconomic determinants. Model assumptions including normality (Shapiro-Wilk), homoscedasticity (Breusch-Pagan), multicollinearity (VIF), and linearity were tested and confirmed prior to regression estimation. All significance tests were conducted at the 5% alpha level, with additional 1% and 0.1% levels noted where applicable.

4. Data Collection and Analysis

This section presents the primary empirical findings of the study organised across five analytical dimensions: demographic profile of respondents, digital payment tool awareness and adoption, pre- and post-fintech financial inclusion indicators, perceived barriers to adoption, and regression analysis of financial inclusion predictors. Together, these five datasets provide a layered and internally consistent empirical architecture that supports the study's central argument: that fintech adoption is a statistically significant and practically meaningful driver of financial inclusion in rural Durg District, though its impact remains unequally distributed across gender, education, and income strata.

Table 1: Demographic Profile of Survey Respondents (n = 385)

Demographic Variable	Category	Frequency (n=385)	Percentage (%)
Gender	Male	218	56.6
	Female	167	43.4
Age Group	18–25 years	89	23.1
	26–35 years	124	32.2
	36–50 years	112	29.1
	51+ years	60	15.6
Education	Illiterate	43	11.2
	Primary/Middle	98	25.5
	Secondary	126	32.7
	Graduate & Above	118	30.6
Occupation	Farmer	142	36.9
	Daily Wage Labour	89	23.1
	Small Business	76	19.7
	Govt. Employee	78	20.3
Annual Income (INR)	Below 1 Lakh	156	40.5
	1–2.5 Lakh	134	34.8
	2.5–5 Lakh	71	18.4
	Above 5 Lakh	24	6.3

Table 1 presents the demographic distribution of the 385 survey respondents. The sample comprised 56.6% male and 43.4% female respondents, reflecting the gender balance of adult rural household decision-makers. The dominant age cohort was 26–35 years (32.2%), followed closely by 36–50 years (29.1%), indicating that the majority of respondents are economically active adults with high fintech adoption potential. Educational attainment was distributed across secondary (32.7%) and graduate-and-above (30.6%) categories, though a significant 11.2% were illiterate a critical population segment for whom fintech access requires specialised intermediation. Farming (36.9%) and daily wage labour (23.1%) dominated occupational profiles, consistent with the agrarian character of the study area. Nearly 40.5% of respondents reported annual household incomes below INR 1 lakh, underscoring the low-income vulnerability of the sample population.

Table 2: Awareness and Adoption of Digital Payment Tools Among Rural Respondents

Digital Payment Tool	Aware (%)	Ever Used (%)	Regular User (%)	Never Used (%)
UPI (BHIM/GPay/PhonePe)	91.4	74.8	58.2	16.6

Mobile Banking App	68.3	43.1	31.4	25.2
Debit/ATM Card	82.6	69.4	51.7	13.2
Jan Dhan + RuPay Card	76.1	56.4	41.3	19.7
Aadhaar-enabled Payment (AePS)	61.8	38.7	24.9	23.1
Internet Banking	48.3	26.5	18.7	21.8
Digital Wallets (Paytm etc.)	79.2	62.3	44.9	16.9
NEFT/RTGS/IMPS	39.2	21.6	14.3	17.6

Table 2 reveals a nuanced pattern of digital payment awareness and adoption. UPI platforms (BHIM, Google Pay, PhonePe) recorded the highest awareness (91.4%) and regular usage (58.2%), driven by their intuitive interface, QR-code operability, and aggressive rural outreach by telecom and banking channels. Debit/ATM card awareness (82.6%) and usage (51.7%) ranked second, largely propelled by Jan Dhan account issuance. Digital wallets (Paytm and equivalents) recorded high awareness (79.2%) but somewhat lower regular usage (44.9%), reflecting intermittent adoption patterns. Internet banking exhibited the lowest awareness (48.3%) and usage (18.7%), attributable to literacy requirements and cybersecurity anxiety. AePS, while vital for last-mile access, had relatively lower regular use (24.9%) due to inconsistent biometric authentication success rates. These findings demonstrate a clear hierarchy of digital payment adoption rooted in interface simplicity and agent-assisted usability.

Table 3: Financial Inclusion Indicators – Pre-Fintech (2016) vs. Post-Fintech (2023) Comparison

Financial Inclusion Indicator	Pre-Fintech (2016) %	Post-Fintech (2023) %	Change (%)	Significance (p)
Bank Account Ownership	41.2	78.6	+37.4	0.001
Access to Formal Credit	18.7	39.4	+20.7	0.003
Insurance Coverage (Rural)	12.4	34.8	+22.4	0.002
Regular Savings Behaviour	27.1	54.3	+27.2	0.001
Remittance via Digital Mode	8.3	61.7	+53.4	0.000
Active Mobile Wallet Use	4.1	48.9	+44.8	0.000
UPI Transaction (Monthly)	0.0	58.2	+58.2	0.000

Table 3 presents the most compelling evidence of fintech's transformative impact on financial inclusion in rural Durg. Bank account ownership surged from 41.2% in 2016 to 78.6% in 2023, a net increase of 37.4 percentage points, significant at $p < 0.001$, largely attributable to the Jan Dhan Yojana and its direct linkage to government benefit transfers. The most dramatic change is observed in digital remittance via digital mode from 8.3% to 61.7% (a +53.4% shift), reflecting the deep penetration of UPI-based peer-to-peer transfers among migrant workers and seasonal agricultural labourers. UPI transaction engagement moved from zero (pre-2017) to 58.2%

regular usage in 2023. Access to formal credit improved by 20.7 percentage points, while insurance coverage rose by 22.4 percentage points, driven by PMJBY and PMSBY micro-insurance schemes delivered through digital banking channels. Regular savings behaviour improved by 27.2 percentage points, suggesting that formal account ownership has meaningfully shifted financial behaviour beyond mere transaction use.

Table 4: Barriers to Digital Payment Adoption – Likert Scale Responses (n = 385)

Barrier / Challenge	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)
Lack of Smartphone/Internet Access	38.4	29.6	14.3	17.7
Low Digital Literacy	42.1	31.7	12.6	13.6
Fear of Online Fraud/Cyber Theft	47.3	28.1	10.4	14.2
Language Barrier (Non-Hindi UI)	29.6	34.2	18.4	17.8
Unreliable Network Connectivity	51.2	26.4	11.6	10.8
Distrust in Formal Banking System	21.4	27.3	22.1	29.2
Insufficient CSC/BC Agent Proximity	34.7	31.9	18.2	15.2
Low Income / Irregular Cash Flow	36.8	33.4	16.1	13.7

Table 4 quantifies the barriers perceived by respondents as impeding their adoption of digital financial services. Unreliable network connectivity emerged as the most acute barrier, with 51.2% of respondents strongly agreeing and 26.4% agreeing a combined 77.6% affirmation rate. Fear of online fraud and cyber theft was the second most cited barrier (47.3% strongly agree, 28.1% agree), indicating that trust deficit is a more critical adoption bottleneck than technological inaccessibility per se. Low digital literacy was acknowledged by 42.1% strongly and 31.7% agreeably, making it the third most prevalent constraint. The combined barrier score across all eight dimensions reveals a structural challenge environment in which technological, infrastructural, cognitive, and trust-related factors interact to suppress fintech adoption below its potential.

Table 5: Multiple Regression Analysis – Predictors of Financial Inclusion Index (FII)

Predictor Variable	Beta (β)	Std. Error	t-value	p-value	Significance
UPI Usage Frequency	0.412	0.047	8.77	0.000	***
Mobile Banking Adoption	0.283	0.062	4.56	0.001	***
Jan Dhan Account Linkage	0.247	0.058	4.26	0.001	***
Digital Literacy Score	0.319	0.053	6.02	0.000	***
Network Connectivity (Index)	0.196	0.071	2.76	0.006	**
Gender (Female=1)	-0.143	0.061	-2.35	0.019	*
Education Level	0.228	0.055	4.15	0.001	***
Annual Household Income	0.174	0.068	2.56	0.011	*

Note: $R^2 = 0.681$, Adjusted $R^2 = 0.674$, $F(8, 376) = 99.84$, $p < 0.001$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5 presents the results of the multiple linear regression model estimating the Financial Inclusion Index (FII) as a function of eight predictor variables. The model was statistically robust, explaining 68.1% of the variance in FII ($R^2 = 0.681$, Adjusted $R^2 = 0.674$, $F(8, 376) = 99.84$, $p < 0.001$). UPI usage frequency emerged as the strongest positive predictor ($\beta = 0.412$, $p < 0.001$), confirming the centrality of UPI-based digital payments as a gateway to broader financial inclusion. Digital literacy score ($\beta = 0.319$, $p < 0.001$) ranked second in predictive strength, underscoring the foundational role of human capital in enabling technology-mediated financial access. Mobile banking adoption ($\beta = 0.283$, $p < 0.001$), Jan Dhan account linkage ($\beta = 0.247$, $p < 0.001$), and education level ($\beta = 0.228$, $p < 0.001$) also registered significant positive associations with FII. Network connectivity index ($\beta = 0.196$, $p < 0.01$) and annual household income ($\beta = 0.174$, $p < 0.05$) were significant but weaker predictors. Gender ($\beta = -0.143$, $p < 0.05$) was a significant negative predictor, confirming the persistent digital gender gap in rural fintech adoption. These findings collectively support the hypothesised positive relationship between fintech adoption variables and rural financial inclusion.

5. DISCUSSION

The empirical evidence gathered from Durg District corroborates and extends the existing literature on digital financial inclusion in rural India. The study's most salient finding that UPI usage frequency is the strongest single predictor of financial inclusion outcomes aligns with the macro-level evidence presented by NPCI and RBI, which document UPI as the dominant vector of India's digital payments revolution. This finding also resonates with Klapper et al.'s [12] theoretical proposition that mobile payment systems function as equalising instruments in underserved financial markets by dramatically reducing transaction costs and eliminating the geographic constraints of branch-based banking. What the present study adds is granular, district-level empirical validation of this proposition within the specific socioeconomic context of agrarian Chhattisgarh, a contribution largely absent from the extant literature.

The pre- and post-fintech comparative data in Table 3 reveals improvement trajectories that are broadly consistent with national-level findings but exhibit important contextual variations. The 37.4 percentage point increase in bank account ownership is comparable to NABARD's All India Rural Financial Inclusion Survey (2021–22), which reported a national rural account ownership rate of 76.5%, suggesting that Durg has achieved near-national convergence. However, the gap between account ownership (78.6%) and active usage for digital transactions (58.2% UPI, 44.9% wallet) points to what the literature terms the 'dormant account problem' a phenomenon well-documented by Demirguc-Kunt et al. [1] and Mukherjee and Sinha [3], whereby supply-driven account creation does not automatically translate into substantive financial engagement. The 20.3 percentage point gap between account ownership and regular UPI usage in the present study is consistent with NPCI's own data indicating that approximately 22% of Jan Dhan accounts remained zero-balance or near-dormant as of March 2023.

The barrier analysis in Table 4 produces findings that both confirm and complicate prior work. The primacy of network connectivity as a constraint (77.6% combined agreement) is consistent with Sharma and Gupta's [9] findings from tribal Chhattisgarh districts and with Yadav et al.'s [10] observations from Madhya Pradesh, but is quantitatively more severe than similar studies conducted in Maharashtra and Karnataka where rural network infrastructure is comparatively better developed. This confirms the central Indian digital infrastructure deficit as a distinct policy challenge that cannot be addressed through financial sector interventions alone and requires coordinated investment in telecom and broadband infrastructure. The relative salience of cybersecurity fear (75.4% combined agreement) as a barrier is notably higher than that reported by Singh and Malik [8] in Rajasthan (61.2%), suggesting that localised digital fraud incidents and a lack of grievance redress awareness may be creating specific trust deficits in the Durg rural context that require targeted community-level communications campaigns.

The regression findings merit comparison with analogous multivariate analyses in the literature. Reddy and Rao [5] reported an R^2 of 0.54 for their financial inclusion regression model in Andhra Pradesh, while Mukherjee and Sinha [3] obtained an R^2 of 0.61 in their Bihar-Jharkhand study. The present study's R^2 of 0.681 is appreciably higher, suggesting that the model specification particularly the inclusion of UPI usage frequency and digital literacy as distinct constructs captures a more comprehensive range of variation in financial inclusion outcomes. The negative coefficient for gender ($\beta = -0.143$, $p < 0.05$) confirms the persistent disadvantage faced by rural women in accessing and using digital financial services, consistent with Klapper et al. [12] and with RBI's Financial Inclusion Index data showing a 12-14 percentage point gender gap in active digital financial participation. This finding carries direct policy implications for gender-sensitive fintech interventions, including women-only digital literacy camps, female BC agent recruitment, and SHG-mediated fintech on-boarding programmes approaches that have shown promise in NABARD's SHG-Bank Linkage Programme data.

The education coefficient ($\beta = 0.228$) and its significance level ($p < 0.001$) confirm education as a structural determinant of fintech-enabled financial inclusion, echoing Lauer and Lyman's [11] framework that genuine financial inclusion requires not just supply-side infrastructure but demand-side capability. The fact that 11.2% of respondents remain illiterate and 25.5% have only primary/middle level education means that approximately 36.7% of the rural population in the study area may face fundamental literacy barriers to independent digital financial participation a proportion that cannot be addressed through app interface improvements alone and requires sustained adult literacy and digital skilling investments. The income coefficient ($\beta = 0.174$, $p < 0.05$), while significant, is the weakest of the structural predictors, suggesting that even low-income households can achieve meaningful fintech engagement when digital literacy and connectivity barriers are removed a finding that is both encouraging and consistent with the success of PMGDISHA in enabling below-poverty-line digital adoption in supported environments.

6. CONCLUSION

This study has presented comprehensive empirical evidence that digital payment systems and fintech innovations have substantially advanced financial inclusion in rural Durg District, Chhattisgarh, with statistically significant improvements across all seven measured financial inclusion indicators between 2016 and 2023. The multiple regression model confirms that UPI usage frequency, digital literacy, mobile banking adoption, Jan Dhan account linkage, and education are the most powerful and consistent predictors of financial inclusion outcomes, collectively explaining 68.1% of variance in the Financial Inclusion Index. The findings validate the study's central hypothesis and contribute district-level empirical evidence to the national debate on India's digital financial inclusion agenda.

However, the study equally documents a set of structural barriers network connectivity deficits, digital literacy gaps, cybersecurity anxiety, and the persistent digital gender divide that continue to impede the translation of fintech potential into universal financial inclusion. The dormant account paradox, whereby account creation outpaces active usage by approximately 20 percentage points, signals that supply-side interventions must be complemented by sustained demand-side enablement through financial literacy programmes, last-mile agent networks, and grievance redress mechanisms. The gender differential in fintech adoption warrants dedicated policy attention, particularly through women-centric SHG-linked digital financial programmes.

Future research may extend this framework through longitudinal panel designs tracking individual financial inclusion trajectories over time, and through comparative multi-district analyses across Chhattisgarh that control for variation in fintech infrastructure quality. Policymakers at the district and state level are urged to prioritise rural broadband expansion, BC agent capacity strengthening, and digital literacy investments as complementary pillars of India's digital financial inclusion architecture, ensuring that the transformative potential of fintech is equitably realised across all segments of rural society.

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