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Impact of Digital Wallet Adoption on Household Savings Patterns in Indore's Middle-Income Segment

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Abstract

Mobile payment apps have transformed daily transactions across urban India, driven by UPI's growth exceeding 15 billion monthly transactions in 2025. This study examines their effects on savings behavior among middle-income households (₹5-15 lakhs annual income) in Indore, a key Tier-2 commercial center. Primary survey data from 200 respondents (aged 25-55) shows weekly app usage negatively predicts savings rates ($\beta = -1.10$, $p < 0.001$), with a mean 3.9 percentage point decline post-adoption. Income and age moderate this relationship, providing partial protection. While digital wallets enhance convenience and inclusion, they increase spending through reduced transaction friction. Recommendations focus on behavioral nudges like automated savings features and financial literacy integration for sustainable adoption.

Keywords: Digital wallets, household savings, UPI adoption, behavioral economics, financial inclusion, Tier-2 cities.

1. Introduction

1.1 Digital Payment Transformation in India

India's payment ecosystem has experienced rapid evolution, with UPI transactions reaching over 15 billion per month by October 2025—more than double 2023 volumes. In Indore, Madhya Pradesh's largest city with 3.2 million residents, middle-income households (₹5-15 lakhs annual income, representing ~45% of the urban population) lead this shift. These families use apps like PhonePe, Google Pay, and Paytm for groceries, utility bills, transportation, and online shopping, achieving 65% daily wallet penetration.

Table 1: Wallet Usage Patterns in Indore (2025 Data)

Demographic Group	Daily Usage (%)	Primary Apps	Monthly Transactions (Avg.)
Middle-Income	65	PhonePe (48%), Paytm (32%)	180
Urban Youth (18-34)	78	Google Pay (55%)	220
City Average	52	PhonePe (42%)	150

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1.2 The Savings Challenge

This widespread adoption raises concerns about household financial stability. National data shows gross household savings declining from 32% to 28% of GDP between 2022-2025, with digital payments cited as a contributing factor alongside rising consumption. Behavioral research suggests "frictionless payments" reduce spending hesitation, as digital transfers lack the tangible loss associated with cash.

1.3 Research Focus and Contribution

Indore represents Tier-2 cities where fintech meets traditional saving practices (fixed deposits, gold holdings). This study addresses three questions: (1) Does wallet usage intensity predict savings decline? (2) Do income and age influence this relationship? (3) What interventions promote balanced adoption?

Primary data from 200 stratified households across Vijay Nagar, Palasia, and Bhawarkua tests these dynamics through regression analysis grounded in prospect theory. Findings offer insights for digital payment evolution in emerging markets.

2. Literature Review

2.1 Theoretical Framework

Payment method influences expenditure—a core behavioral economics principle. Prelec and Simester (2001) established that cash evokes greater "payment pain" than cards; digital one-tap transactions further minimize cognitive costs. Prospect theory explains this through reduced loss salience—digital payments bypass mental accounting boundaries that cash enforces.

2.2 Global and Domestic Evidence

International studies consistently link digital payments to spending increases:

Table 2: Key Studies on Digital Payments and Savings Behavior

Location	Sample Size	Methodology	Main Finding	Effect Size
Europe (ECB)	1,200	Quasi-experimental	Spending ↑15-20%	Cohen's d=0.45
Saudi Arabia	350	Regression	Wallet use → ↓ savings	r=-0.48
Rural India	180	Difference-in-differences	Impulse spending ↑25%	β=-0.42
Urban India	450	Fixed effects	Youth most affected	β=-0.51

2.3 Indian Context and Moderators

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UPI's zero-cost model drove 70% urban penetration by 2025, enhancing inclusion but raising overspending risks. NSSO data (2019-25) shows digital payment users allocate 12% more to discretionary spending. Middle-income households face particular vulnerability—limited financial buffers amplify small erosions.

Income Moderation: Higher earners diversify via app-linked investments (mutual funds, SIPs), offsetting direct effects.

Age Moderation: Older users maintain cash discipline; youth chase rewards/discounts.

2.4 Research Gap

Tier-2 city studies focus on adoption barriers, neglecting savings quantification. Indore lacks empirical analysis despite 65% penetration. This study fills this gap with household-level data and moderation testing.

Hypotheses:

H1: Greater weekly wallet usage predicts lower savings rates ($\beta_1 < 0$).

H2: Higher income weakens this negative relationship ($\beta_2 > 0$).

H3: Older age weakens this relationship ($\beta_3 > 0$).

3. Methodology

3.1 Research Design

Cross-sectional survey design captured current wallet-saving dynamics (October 15-November 15, 2025). Target population: Middle-income households (₹5-15 lakhs annual income) across Indore's socio-economic zones.

3.2 Sampling Strategy

Stratified random sampling ensured representation:

Table 3: Sampling Distribution

Residential Zone	Population Share (%)	Sample Allocation (%)	Respondents (n)
Vijay Nagar	35	40	80
Palasia	28	30	60
Bhawarkua	37	30	60
Total	100	100	200

Response rate: 83% (200/240 approached). Mean age: 36.8 years (SD=9.2).

3.3 Data Collection and Measures

Structured questionnaire (pilot-tested n=30, Cronbach's α=0.87) administered 60% face-to-face, 40% Google Forms:

Key Variables:

- Wallet Usage: Self-reported weekly hours (0-20; M=8.7, SD=3.1)
- Savings Rate: (Income - Expenditure)Income×100Income(Income - Expenditure)×100 (pre/post-adoption; verified by 3-month recall)
- Income: Annual household ₹ lakhs (M=9.3, SD=2.8)

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- Age: Years (M=36.8, SD=9.2)

Harman's single-factor test: 14.2% variance (below 50% threshold).

3.4 Analytical Approach

Python 3.11 (pandas 2.1.4, statsmodels 0.14.1, scipy 1.12):

1.Descriptives: Means, SD, normality tests

2.Inferential: Paired t-tests (pre/post savings)

3.Correlations: Pearson matrix

4.Regression: OLS with moderation interactions Savings Ratei = β0+β1Usagei+β2Incomei+β3Agei+β4(Usage×Income)+β5(Usage×Age)+ϵiSavingsRatei=β0 +β1Usagei+β2Incomei+β3Agei+β4(Usage×Income)+β5(Usage×Age) +ϵi

Diagnostics: VIF=1.1-1.3; Breusch-Pagan p=0.12 (homoscedastic); Durbin-Watson=1.98; significance α=0.05. SAGE University IRB approved; informed consent obtained.

4. Results

4.1 Sample Characteristics

Table 4: Descriptive Statistics (N=200)

Variable	Mean	SD	Min	Max	Skewness
Age (years)	36.8	9.2	25	55	0.11
Wallet Usage (hrs/wk)	8.7	3.1	1	18	0.42
Income (₹ lakhs/yr)	9.3	2.8	5	15	0.25
Savings Pre-adoption (%)	30.8	7.4	15	48	-0.18
Savings Post-adoption (%)	26.9	6.9	12	45	0.31

Pre-post Comparison: Paired t(199)=5.27, p<0.001, Cohen's d=0.52 (moderate effect).

4.2 Bivariate Relationships

Table 5: Pearson Correlation Matrix

	Usage	Savings Post	Income	Age
Wallet Usage	1	-0.54	-0.12	-0.21
Savings Post		1	0.38	0.29
p<0.05, p<0.01, p<0.001				

4.3 Multivariate Results

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Table 6: Hierarchical Regression Analysis

Predictor	Model 1	Model 2 (Full)
Wallet Usage	-1.10(0.25)	-1.15(0.24)
Income	0.65(0.22)	0.72(0.21)
Age	0.30(0.15)	0.35(0.14)
Usage×Income	-	0.18(0.08)
Usage×Age	-	0.12(0.06)
F(df)	55.2(3,196)	42.1(5,194)
$R^2/\Delta R^2$	0.46	0.55/0.09

All hypotheses supported. Each additional usage hour reduces savings by 1.15%; income adds 0.72% per lakh.

4.4 Subgroup Analysis

Table 7: Savings Decline by Demographics

Segment	Pre (%)	Post (%)	Decline (%)
Age 25-34	29.2	24.1	-17.5
Age 35-44	31.5	27.8	-11.7
Age 45-55	33.1	30.2	-8.8
Low Income (≤₹8L)	28.4	24.2	-14.8
High Income (≥₹10L)	32.6	28.9	-11.3

Robustness: Propensity score matching confirms ATT=-3.8% ($p<0.01$).

5. Discussion

5.1 Interpretation of Findings

The strong negative usage-savings relationship (β=-1.15, r=-0.54) confirms frictionless payments erode financial discipline, consistent with global patterns. Indore's 12% average decline mirrors national trends while highlighting Tier-2 vulnerabilities—limited diversification options amplify effects.

Moderation Effects: Income (β=0.72) reflects wealthier households' access to app-linked investments (SIPs, mutual funds). Age moderation (β=0.35) captures experiential learning—older users maintain cash habits despite digital adoption.

5.2 Theoretical Contributions

Findings extend prospect theory to Tier-2 contexts, demonstrating payment modality's enduring relevance amid fintech disruption. Moderation results advance understanding of heterogeneous treatment effects in digital finance.

5.3 Practical Implications

For Digital Wallet Providers:

1.Implement "round-up" savings (proven +8-12% savings globally)

2.Usage dashboards with spending alerts (>10hrs/week)
3.Gamified financial goals (engagement +22%)
For Households:
1.Time-based usage limits
2.Multi-channel budgeting (app+cash)
3.Regular savings audits

For Policymakers

1.RBI-mandated literacy modules in payment apps
2.Tier-2 financial inclusion targets
3.Nudge standardization guidelines

5.4 Limitations and Future Research

Cross-sectional design precludes causality; self-reports risk bias. Longitudinal panel studies tracking 2-3 years needed. Future work should test mediation (financial literacy) and rural-urban comparisons. Experimental nudge trials offer causal identification.

6. Conclusion

Digital wallet adoption in Indore reduces middle-income household savings by approximately 12%, driven by weekly usage intensity and moderated by income and age. These findings underscore the dual nature of fintech—transformative convenience shadowed by behavioral risks.

As India pursues 80% digital payment adoption by 2030, balanced evolution becomes essential. Wallet providers must integrate savings-friendly features, while regulators ensure consumer protection through literacy mandates. Households benefit from mindful usage combining digital efficiency with traditional discipline.

This Tier-2 study contributes localized evidence to national fintech discourse, demonstrating the need for context-specific interventions. Future research should track longitudinal effects and test scalable nudge architectures for sustainable digital finance ecosystems.

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