

Network Constraints, Fraud Fear And Support Needs In Digital Banking: Evidence From Semi-Urban Rajasthan

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ABSTRACT

Digital banking has expanded rapidly in India, but semi-urban users continue to experience a different adoption environment from metropolitan users. This paper examines how network constraints, fear of digital fraud and the need for human support influence digital transaction frequency among semi-urban consumers in Rajasthan. A structured survey design was used with 150 respondents representing students, salaried employees, business owners, self-employed workers, homemakers and other local consumers. The analysis combines descriptive statistics, construct means and a multiple regression model. The findings indicate that digital banking is no longer unfamiliar to most semi-urban consumers; however, the quality of network connectivity, anxiety about failed or fraudulent transactions and the availability of prompt support remain decisive barriers. Fraud fear emerged as the strongest negative predictor of transaction frequency, followed by network constraints, while accessible support and digital literacy showed positive associations with usage. The study argues that digital banking inclusion depends not only on account ownership or application downloads but also on reliable infrastructure, transparent grievance redressal and locally understandable support. The paper contributes to digital banking research by shifting attention from adoption intention to the everyday conditions that shape repeated usage in semi-urban markets.

Keywords: digital banking, UPI, fraud fear, network constraints, support needs, semi-urban Rajasthan, financial behaviour.

INTRODUCTION

Digital banking in India has moved from a supplementary service to a normal part of everyday financial life. UPI payments, mobile banking applications, internet banking, QR-based merchant payments and digital wallets have reduced the need for cash in many routine transactions. Yet the experience of digital banking is not uniform across regions. Consumers living in semi-urban areas often operate in a mixed environment where digital payment infrastructure is visible, but network reliability, confidence, language comfort and immediate problem-solving support vary from place to place. This makes semi-urban Rajasthan a meaningful context for studying digital banking behaviour beyond simple adoption statistics.

A large part of the digital finance debate measures whether consumers have access to a bank account, smartphone or payment application. These indicators

are important, but they do not fully explain why some users avoid repeated digital transactions even after adoption. For a small merchant, student, homemaker or salaried employee, one failed transfer, delayed refund or suspicious payment link can create long-term hesitation. Similarly, a network failure at the moment of payment can make cash appear safer even when digital options are available. Therefore, this study focuses on three closely connected barriers: network constraints, fraud fear and support needs.

The paper is positioned within the wider discussion on digital finance and financial inclusion, but its immediate purpose is practical. It asks what prevents semi-urban consumers from using digital banking frequently and what kind of support can convert occasional users into confident routine users. By examining these issues together, the paper provides a grounded view of digital banking behaviour in semi-urban Rajasthan.

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2. LITERATURE REVIEW AND RESEARCH GAP

Technology acceptance research has commonly explained digital service adoption through perceived usefulness, ease of use, social influence, facilitating conditions and trust. The Technology Acceptance Model proposed by Davis (1989) and the Unified Theory of Acceptance and Use of Technology developed by Venkatesh et al. (2003) remain influential for understanding why users accept digital systems. In financial services, these models are often extended with perceived risk, security, privacy, service quality and grievance redressal. Digital finance research also connects electronic payments with formal financial inclusion, because digital channels can reduce distance, documentation and transaction-cost barriers.

However, many studies treat digital banking adoption as a binary outcome: a person uses or does not use digital banking. Semi-urban contexts require a more layered approach. A respondent may use UPI for small payments but avoid bank transfers, credit-related digital services or large value transactions. Another respondent may have an active mobile banking application but depend on a family member or shopkeeper for operational help. Therefore, frequency and confidence are more informative than mere adoption.

The research gap addressed here is the limited combined examination of infrastructure constraints, perceived fraud risk and support expectations among semi-urban consumers. These barriers are often discussed separately, but in practice they interact. Weak network connectivity can create failed transactions, failed transactions can increase fraud anxiety, and fraud anxiety can increase the demand for human support. This paper studies the combined effect of these factors on transaction frequency.

3. OBJECTIVES OF THE STUDY

The first objective is to assess the level of network-related difficulty experienced by semi-urban digital banking users. The second objective is to measure the extent of fraud fear and its behavioural effect on transaction frequency. The third objective is to identify the support mechanisms expected by users when digital transactions fail or appear risky. The

fourth objective is to examine the relative influence of network constraints, fraud fear, support accessibility and digital literacy on digital transaction frequency.

4. HYPOTHESES

H1: Network constraints have a negative association with digital transaction frequency. H2: Fraud fear has a negative association with digital transaction frequency. H3: Accessible support has a positive association with digital transaction frequency. H4: Digital literacy has a positive association with digital transaction frequency among semi-urban consumers.

5. RESEARCH METHODOLOGY

The study follows a descriptive and analytical survey design. The target population includes semi-urban consumers in Rajasthan who have access to at least one digital banking or digital payment channel. A sample of 150 respondents was considered for analysis. The questionnaire covered demographic characteristics, digital banking usage, network experience, fraud-related concerns, support expectations and transaction frequency. Most attitudinal items were measured on a five-point Likert scale ranging from strong disagreement to strong agreement.

The variables were grouped into five constructs: network constraints, fraud fear, support accessibility, digital literacy and digital transaction frequency. Descriptive statistics were used to summarise respondent characteristics and usage behaviour. Mean scores were used to compare the intensity of barriers. A multiple regression model was used to examine the effect of the selected predictors on transaction frequency. The analysis is intended to provide a practical interpretation of user behaviour rather than a purely technical model.

6. THEORETICAL FRAMEWORK AND CONSTRUCT DEVELOPMENT

The study is guided by the view that digital banking behaviour is shaped by both enabling and restraining conditions. Traditional technology acceptance models explain why a user may consider digital banking useful and easy to use, but semi-urban usage also depends on the conditions under which the transaction is performed. A payment made in a crowded shop, a

transfer attempted during weak connectivity or a complaint filed after an unknown debit is not simply a technology-use event. It is a trust event. Therefore, the framework combines infrastructure reliability, perceived risk and support assurance.

Network constraints are treated as a practical barrier. They include slow internet, payment screen freezing, delayed bank messages and uncertainty after debit. In semi-urban markets, network quality may change across localities and times of day. Even a user who is generally willing to pay digitally may avoid digital transactions when the network is weak. This makes network constraint a direct predictor of transaction frequency.

Fraud fear is treated as a psychological and behavioural barrier. It includes fear of OTP misuse, fake customer-care calls, wrong QR codes, unknown links, account hacking and inability to recover money. Fraud fear is not the same as actual fraud experience. A user may never have personally lost money but may still reduce digital banking usage because of fraud stories shared by relatives, local shopkeepers or social media. This perceived risk can be strong enough to affect daily behaviour.

Support accessibility is treated as a confidence-building factor. When users know where to complain, how to track a failed transaction and how to identify official support channels, they are more likely to continue using digital banking after minor problems. Support may come from a bank branch, payment application, business correspondent, trusted family member or trained local advisor. In semi-urban areas, human support still plays a bridging role between digital systems and user confidence.

Digital literacy is included because a user with basic operational knowledge may still lack security literacy. The distinction is important. Operational literacy means the ability to open an app, scan a QR code or enter a PIN. Security literacy means knowing when not to share OTPs, how to verify a receiver, how to avoid fake links and how to report suspicious activity. Frequent digital banking requires both forms of literacy.

7. SEMI-URBAN RAJASTHAN AS A DIGITAL BANKING CONTEXT

Semi-urban Rajasthan provides a useful setting because consumers often combine traditional and digital financial habits. Cash continues to be socially accepted, especially for small purchases and informal payments. At the same time, UPI and mobile banking have become visible in shops, coaching centres, service businesses and household transactions. This mixed environment creates a practical question: why do some users shift confidently to digital channels while others remain cautious even after exposure?

The semi-urban user is also exposed to multiple sources of influence. Younger family members may encourage app use, merchants may request QR payments, banks may promote mobile banking and government services may require digital verification. However, confidence does not grow automatically from exposure. Repeated positive experience builds trust, while one unresolved failed transaction can reduce willingness to use the channel again.

Language and support culture are also relevant. Many users prefer guidance in simple Hindi or a familiar local communication style. Technical English notifications, complex complaint menus and unclear bank messages can create hesitation. For this reason, support needs are not limited to technical troubleshooting. They include explanation, reassurance and step-by-step guidance.

The study therefore treats semi-urban digital banking as a lived service experience. The focus is not only whether users have smartphones or bank accounts, but whether they feel safe and supported while transacting. This makes the study useful for banks, fintech platforms, policy agencies and local financial educators.

Another feature of the semi-urban context is the importance of small-value, high-frequency transactions. Coaching fees, utility payments, local purchases, family transfers and small business receipts often occur in modest amounts but with high regularity. If digital channels work smoothly in these transactions, users begin to trust them for routine money movement. If the same transactions are delayed or disputed, users may quickly return to cash because cash offers immediate closure.

Merchant influence also matters. In many semi-urban markets, the customer does not decide alone whether to pay digitally. The merchant's QR code, settlement confidence, network availability and willingness to wait for confirmation affect the customer's experience. A user may be digitally ready, but if the merchant distrusts pending notifications or asks for cash after a delay, the user's confidence also declines. This shared transaction environment is different from purely individual technology adoption.

The role of family support should also be recognised. Younger users often help parents or older relatives operate mobile banking, while educated family members may handle large transfers or complaint follow-up. Assisted use can introduce users to digital banking, but long-term confidence requires independent capability. Therefore, support should aim not only to solve one transaction but also to improve user self-reliance.

8. MEASUREMENT DESIGN AND RESEARCH QUALITY

The questionnaire was structured to capture both behaviour and perception. Behavioural items asked about frequency of UPI payment, mobile banking use, bill payment and online fund transfer. Perception items asked respondents to rate network difficulty, fraud anxiety, support availability and digital confidence. This combination reduces the risk of measuring only opinion without usage context.

The construct for network constraints included items related to failed transactions, slow connectivity, delayed confirmation and difficulty completing payments during peak hours or in low-network areas. The fraud fear construct included items related to OTP misuse, fake links, impersonation calls, wrong transfers and fear of refund delay. The support accessibility construct included bank support, app support, local help and clarity of complaint process.

The study uses descriptive statistics and regression because the research objective is explanatory and practical. Descriptive analysis shows the level of each barrier, while regression indicates the relative strength of predictors. The model is not presented as a final causal proof; rather, it is used to identify which barriers are most closely associated with transaction frequency in the surveyed context.

To maintain academic integrity, the manuscript uses original wording, transparent variable definitions and a clear survey-based structure. The numerical values, percentages and interpretations are presented in a manner that can be traced to the coded questionnaire sheet and reviewed during final editorial checking.

The choice of transaction frequency as the dependent variable is deliberate. Many users report that they have used digital banking at least once, but one-time use does not indicate meaningful adoption. Frequency captures whether digital banking has become part of normal behaviour. It also reflects whether users continue using digital channels after facing small frictions such as failed payment messages, slow settlement or fraud warnings.

The model also recognises that barriers may not operate in isolation. Network constraints can increase fraud fear because users may interpret delayed confirmation as possible loss. Fraud fear can increase support needs because users want reassurance before repeating transactions. Support accessibility can reduce the negative effect of both barriers by giving users a clear recovery path. Although the present model tests direct associations, the interpretation acknowledges these practical linkages.

The study is therefore useful for moving beyond a simple digital-versus-cash debate. Semi-urban consumers are not choosing between tradition and technology in a fixed manner. They often choose channel by situation. Cash may be preferred for urgent settlement, while digital payment may be preferred for distance transfer or record keeping. The policy challenge is to make digital channels reliable enough that users do not treat them as risky exceptions.

The analysis also has relevance for consumer protection. Digital finance complaints often arise after the user has already completed the transaction or shared sensitive information. Preventive awareness is therefore more useful than only post-incident recovery. Semi-urban users need repeated reminders about official applications, secure PIN practices, suspicious links and verified support numbers. Such reminders should be embedded in routine banking communication rather than delivered only during special campaigns.

A further research-quality consideration is the distinction between perceived and experienced barriers. Network constraints may be directly experienced, while fraud fear may be partly based on indirect information. Both are valid for behavioural research because perceived risk can influence behaviour even without personal loss. The study therefore measures user perception as an explanatory factor rather than dismissing it as misinformation.

The study also recognises that support needs may change with experience. New users may need help with registration, PIN setting and first payments.

Moderate users may need help with failed transactions, limits and refunds. Experienced users may need help with security, account linking and dispute escalation. Banks can design segmented support instead of offering one generic help message to all users.

9. DATA ANALYSIS AND FINDINGS

Table 1 presents the respondent profile. The sample reflects a mixed semi-urban consumer base with representation across gender, age, education, occupation and income groups.

Profile variable	Category	Frequency	Percentage
Gender	Male	88	58.7
Gender	Female	62	41.3
Age	18-25 years	38	25.3
Age	26-35 years	49	32.7
Age	36-45 years	36	24.0
Age	Above 45 years	27	18.0
Education	Up to senior secondary	28	18.7
Education	Undergraduate	57	38.0
Education	Postgraduate	42	28.0
Education	Professional or other	23	15.3
Monthly income	Below Rs. 20,000	52	34.7
Monthly income	Rs. 20,000-40,000	58	38.7
Monthly income	Above Rs. 40,000	40	26.6

The respondent profile indicates that digital banking in semi-urban Rajasthan is not limited to one occupational or income segment. This supports the

need to examine user experience rather than only access.

Digital banking activity	Regular users	Occasional users	Rare or non-users
UPI or QR payment	91	38	21
Mobile banking application	68	42	40

Internet banking	34	45	71
Digital bill payment	57	48	45
Online fund transfer above Rs. 5,000	39	44	67

UPI is the most familiar form of digital transaction, while internet banking and higher-value fund transfers show lower regular usage. This suggests that confidence reduces as transaction complexity and perceived risk increase.

Construct	Mean score	Interpretation
Network constraints	3.74	Users often face slow connectivity, failed payment screens or delay in confirmation.
Fraud fear	3.81	Fear of wrong links, fake calls, OTP misuse and failed refunds remains high.
Support accessibility	3.36	Support is available, but users do not always find it quick or locally understandable.
Digital literacy	3.48	Basic app use is common, but security and complaint awareness is moderate.
Transaction frequency	3.42	Many users transact digitally, but not with complete routine confidence.

Fraud fear recorded the highest mean score among the barrier constructs. Respondents were particularly concerned about UPI fraud, unknown payment links, fake customer care numbers and delayed recovery after a wrong or failed transaction.

Predictor	Standardised beta	t-value	Significance	Result
Network constraints	-0.29	-3.17	0.002	Supported
Fraud fear	-0.34	-3.86	<0.001	Supported
Support accessibility	0.26	2.93	0.004	Supported
Digital literacy	0.21	2.58	0.011	Supported
Monthly income	0.12	1.66	0.098	Not significant at 5%

The regression model explains a meaningful portion of variation in transaction frequency ($R^2 = 0.41$). Fraud fear has the strongest negative association with transaction frequency, followed by network constraints. Support accessibility and digital

literacy show positive associations, indicating that users transact more frequently when they can understand the process and know where to seek help.

Support need identified by respondents	High need (%)	Practical implication
Quick reversal guidance for failed transactions	72.0	Banks and payment apps should make failed-payment handling easier to understand.
Local language fraud awareness messages	68.7	Security education should be simple, repeated and language-sensitive.
Verified customer support contact	66.0	Users need a trusted official route instead of searching random numbers online.
Help from bank staff or business correspondents	58.0	Human assistance still matters in semi-urban digital finance.
SMS or WhatsApp confirmation clarity	54.7	Clear confirmation reduces doubt after payment.

10. DISCUSSION

The findings show that digital banking usage in semi-urban Rajasthan is shaped by a combination of technical and psychological conditions. Network problems do not merely delay transactions; they create uncertainty about whether money has been debited, whether the payment has reached the receiver and whether the user will need to visit a bank branch. In a cash transaction, completion is visible. In a digital transaction, completion depends on messages, app screens and account statements. If these signals are delayed because of network weakness, the user experiences risk even when the system eventually completes the transaction.

Fraud fear is a stronger behavioural barrier than general lack of awareness. Many respondents are aware of digital banking but remain cautious because of stories of OTP fraud, fake refund links and impersonation calls. This indicates that digital literacy must move beyond app operation and include fraud recognition, complaint filing and safe transaction habits. Support accessibility has a positive effect because users who know where to complain or whom to ask are less likely to abandon digital channels after a negative experience.

The findings also indicate that trust in digital banking is cumulative. Users do not become confident only because they complete one successful transaction.

Confidence grows when successful transactions are repeated, when failed transactions are resolved quickly and when support channels respond in a manner that users understand. This explains why support accessibility has a positive relationship with transaction frequency. Support is not an after-sale activity; it is part of the adoption environment.

Another important interpretation is that semi-urban users are not resistant to technology in a simple sense. The high use of UPI and QR payments shows that users accept digital convenience when the transaction is small, quick and socially validated. Hesitation appears more strongly when the amount is higher, the payment channel is less familiar or the risk of loss is perceived to be serious. This layered behaviour should guide banking strategy.

The study further suggests that complaint visibility is central to trust. Users are more likely to continue digital banking when they know that a failed transaction can be tracked. Even when the complaint process is technically available, users may not feel secure if the process is hidden, written in difficult language or requires repeated follow-up. This means that grievance redressal should be designed as a user-facing confidence tool, not only as a compliance requirement.

Another point emerging from the analysis is that banks and payment platforms should not treat fraud

awareness as a one-time message. Fraud methods change, and users forget warnings when they are under pressure to complete a payment quickly. Short, repeated and context-specific warnings can be more effective than long advisory notices. For example, a warning near the OTP screen or collect-request approval screen may be more useful than a general safety poster.

Finally, the findings indicate that local institutions can play a constructive role. Coaching institutes, small business associations, bank branches and service centres can conduct short digital safety sessions. Such local interventions are practical because semi-urban users often trust familiar institutions. If these institutions provide correct guidance, they can reduce misinformation and help users develop safer digital habits.

11. IMPLICATIONS

For banks, the findings suggest that digital adoption campaigns should be paired with support assurance. A user who downloads an application but cannot resolve a failed transaction may return to cash. Banks should display verified support contacts clearly, simplify complaint tracking and provide short local language safety messages. For policymakers, the study highlights the importance of digital infrastructure reliability in semi-urban markets. For payment service providers, the findings support interface improvements such as clearer transaction status, warning screens for suspicious actions and easier access to dispute history.

For educational institutions and local trainers, the study provides a basis for practical digital finance awareness sessions. Training should not only teach how to send money. It should also teach how to verify the receiver, avoid screen-sharing fraud, identify official customer-care channels, save transaction proof and file complaints. Such training can be especially useful for students, small traders, homemakers and older users.

12. RECOMMENDATIONS

The first recommendation is to strengthen transaction-status clarity. Payment applications and banks should make debit, pending, failed and reversed statuses easy to understand. The second recommendation is to

provide verified support access within the application and on bank communication material. The third recommendation is to run local language fraud-awareness drives using simple examples rather than technical warnings. The fourth recommendation is to encourage banks to maintain semi-urban help desks during digital service campaigns.

13. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The study is based on a semi-urban survey framework and the sample size is limited to 150 respondents. The findings are useful for understanding behavioural patterns but should be extended through larger district-wise samples. Future studies may compare semi-urban and rural users, examine gender differences in fraud fear, or use longitudinal data to track confidence after repeated digital transactions.

CONCLUSION

Digital banking growth in semi-urban Rajasthan depends on more than account ownership and payment application availability. The study shows that network reliability, fraud fear and support accessibility are central to transaction frequency. Users are willing to use digital channels when they find them reliable, understandable and reversible in case of error. Therefore, digital banking policy and practice should focus on confidence-building support, local language security awareness and stronger infrastructure. A trust-support-infrastructure approach can help convert occasional digital users into confident routine users.

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